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Moise Louisy-Louis

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THESE

pour l'obtention du titre de

DOCTEUR ES SCIENCES DE GESTION

The determinants of rates used in defined-benefit pension plans:
A pan-European study of financial institutions over 2005/2011

Présentée et soutenue publiquement par

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ABSTRACT

In light of the current debate about pension accounting, the dissertation examines the strengths and weaknesses of pension accounting as stipulated by the International Accounting Standards Board (IASB). To substantiate our arguments, we study the influence of key parameters, namely profitability, cash flow, leverage, funding status, and plan asset investment allocation, among others, on the choice of the discount rate and the expected rate of return used when accounting for defined benefit pension schemes. Prior literature, including research performed by Amir and Benartzi (1998), Asthana (1999), Picconi (2006), and Adams, Frank and Perry (2011), identifies these factors as influential in the choice of these rates. At a micro level, the impact of these rates can be tremendous on the financial status of reporting entities (e.g. inflated/deflated indebtedness or earnings) and at a macro level, the correct provisioning of pension represents a major challenge for sectors, industries or nations as a whole (OECD, 2011).

In such a context, the dissertation reviews in details current regulation, research, and practices across Europe, a region which has historically attracted relatively little empirical research on a pan-European basis mainly because of the great diversity in accounting practices and local jurisdictions. A study focused on members of Stoxx Europe Total Market Index is performed to address the following research question:

What are the factors impacting and explaining the choice of the discount rate and the expected rate of return?

The dissertation's contributions are as follows. First, in terms of theoretical contribution, the dissertation is enrooted in both Positive Accounting Theory and Neo-Institutionalism Theory, further demonstrating the adequacy of these theories to explain accounting choices. It is worthy to point that Neo-Institutionalism Theory is rarely used in pension accounting study (as researchers, explicitly or implicitly, rely frequently on variants of agency or signaling theories). In addition, only a handful of authors have previously combined these theories to explain the managerial decision-making process (Mezias, 1990; Neu, 1992; Neu and Simmons, 1996; Tournon, 2004; and Collin *et al.*, 2009). Second, in terms of empirical contribution, a large-scale study is performed. Although there is a dearth of prior research dealing with pension accounting (the most popular focusing on determinants of actuarial choices, earnings management and value-relevance), the dissertation's empirical originality is that it runs regression analyses including variables bred in Neo-Institutionalism Theory (which traditionally relies on qualitative approaches). Third, the dissertation seeks to fill a gap in the literature since the study focuses on Europe, contrasting with prior research which has traditionally centered on US markets. Lastly, the dissertation examines in depth the 2011 revised IAS 19 as a means of providing further substance to the current debate about the net interest approach (which would eliminate the use

of the expected rate of return). Consequently, results of our study have implications for standard-setters and users of financial information.

KEYWORDS

IAS 19, defined benefit pension plans, discount rate, expected rate of return, determinants

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My parents, Daniel and Christine LOUISY-LOUIS

My wife and son, Caroline and Nathan

When I opened my eyes I instinctively searched for the time. The alarm clock mockingly displayed 6:33. The last time I had checked, it coldly showed 1:26, right after I had sent a text message to one of my dearest friends who happened few hours earlier to offer me some reassuring guidance on econometrics. The message simply said: “Et voilà!”

When I opened my eyes, I felt relaxed and happy to have finalized the dissertation. Then, I had realized that my doctoral journey took roughly five hours... of sleep... that followed nearly five years when for the very first time I envisioned this assignment. At the time, I was changing career path (going from equity analyst to professor) and was excited about the topic of my dissertation (I barely recall that my very first choice had to do with designing an index measuring the quality and reliability of the information disclosed in annual reports), and frankly, I underestimated the task.

Over these past five years I obviously remember the emotionally-loaded times: conference in Ljubljana (Slovenia) where I had a great time with my advisor, Dominique DUFOUR, and my colleague, Samira DEMARIA, dissertation presentations of colleagues, Bassem KAMAR and Michelle SISTO, moments when my son would interrupt my ceremonial writing to proudly share one of his latest artistic outputs, and many more feelings including joy, frustration, excitement, fatigue, happiness, or disenchantment. Now, I sincerely appreciate the journey and tell myself that the quest for knowledge is a never ending story...

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TABLE OF CONTENTS

ABSTRACT	2
ACKNOWLEDGEMENTS	4
LIST OF ABBREVIATIONS	8
PART I - THEORETICAL FRAMEWORK: PENSION ACCOUNTING CONCEPTS, RULES AND PRACTICES	10
CHAPTER I: SCOPE AND RESEARCH QUESTION	12
1: SCOPE OF THESIS	13
2: RESEARCH QUESTION.....	16
3: THEORETICAL FRAMEWORK	19
4: HYPOTHESES DEVELOPMENT	22
5: CONCEPTS AND DEFINITIONS.....	25
6: EPISTEMOLOGICAL AND EMPIRICAL FRAMEWORKS	31
7: DISSERTATION STRUCTURE.....	37
CHAPTER II: A REVIEW OF PENSION ACCOUNTING RULES	41
1: OVERVIEW OF THE EUROPEAN PENSION FUND INDUSTRY	43
2: PENSION ACCOUNTING: REGULATORY ENVIRONMENT.....	92
3: PENSION ACCOUNTING: RULES AND PRACTICES	117
4: REVIEW OF ACADEMIC LITERATURE.....	138
5: CHAPTER CONCLUSION.....	176
CHAPTER III: THEORETICAL FRAMEWORK	178
1: POSITIVE ACCOUNTING THEORY	179
2: NEO-INSTITUTIONALISM THEORY	203
3: OTHER THEORETICAL CONSIDERATIONS	231
4: CHAPTER CONCLUSION.....	241
PART II – EPISTEMOLOGICAL AND EMPIRICAL FRAMEWORKS: STUDY OF THE DETERMINANTS OF THE RATES ASSUMPTIONS	244

CHAPTER IV: STUDY OF THE DETERMINANTS OF THE RATES ASSUMPTIONS	246
1: RESEARCH DESIGN.....	247
2: EPISTEMOLOGICAL PERSPECTIVES	248
3: JUSTIFYING THE DISSERTATION’S RESEARCH HYPOTHESES.....	257
4: RESEARCH METHODOLOGY.....	262
5: CHAPTER CONCLUSION.....	271
CHAPTER V: ANALYSIS OF RESULTS.....	273
1: OVERVIEW OF RESULTS.....	274
2: DETAILED ANALYSIS	275
3: DISCUSSION OF FINDINGS	317
4: CHAPTER CONCLUSION.....	330
CHAPTER VI: CONCLUSION AND ELEMENTS FOR FURTHER RESEARCH	332
1: OVERALL CONCLUSION	333
2: PRACTICAL USEFULNESS AND APPLICABILITY	337
3: RESEARCH LIMITATIONS.....	341
4: ELEMENTS FOR FURTHER RESEARCH.....	342
REFERENCES.....	343
INDEX OF SCHEDULES	362
DEFINITIONS AND NOTES.....	369

LIST OF ABBREVIATIONS

ABO:	Accumulated Benefit Obligation
AICPA:	American Institute of Certified Public Accountants
ALM:	Asset-Liability Management
APB:	Accounting Principles Board
ARC:	Accounting Regulatory Committee
ASC:	Accounting Standards Codification
AUM	Asset under Management
CFA:	Chartered Financial Analyst
CICA:	Canadian Institute of Chartered Accountants
CPA:	Certified Public Accountant
CRSP:	Center for Research in Security Prices
CT:	Conventions Theory
DB:	Defined Benefit
DC:	Defined Contribution
DOL:	(US) Department of Labor
DR:	Discount Rate
EAN:	Entry Age Normal
EC:	European Commission
EFRAG:	European Financial Reporting Advisory Group
EIOPA:	European Insurance and Occupational Pensions Authority
EIOPC:	European Insurance and Occupational Pensions Committee
ERISA:	Employee Retirement Income Security Act
ERR:	Expected Rate of Return
FAF:	Financial Accounting Foundation
FASAC:	Financial Accounting Standards Advisory Council
FASB:	Financial Accounting Standards Board
FRS:	Financial Reporting Standard
GAAP:	Generally Accepted Accounting Principles
GASAC:	Governmental Accounting Standards Advisory Council
GASB:	Government Accounting Standards Board
IAS:	International Accounting Standard
IASB:	International Accounting Standards Board
IASC:	International Accounting Standards Committee
IASCF	International Accounting Standards Foundation
IFRIC:	International Financial Reporting Interpretations Committee

IFRS:	International Financial Reporting Standards
IMF:	International Monetary Fund
INPRS:	International Network of Pension Regulators and Supervisors
IOPS:	International Organization of Pension Supervisors
IORP:	Institutions for Occupational Retirement Provision
IOSCO:	International Organization of Securities Commissions
LDI:	Liability-Driven Investment
LHP:	Liability Hedging Portfolio
OCI	Other Comprehensive Income
OECD:	Organization for Economic Co-operation and Development
NIT:	Neo-Institutionalism Theory
PAT:	Positive Accounting Theory
PAYG:	Pay-As-You-Go
PBGC:	Pension Benefit Guaranty Corporation
PBO:	Pension Benefit Obligation
PSP:	Performance Seeking Portfolio
PUC:	Projected Unit Credit
PVB:	Projected Value of Benefits
RCI:	Risk-Controlled Investing
SARG:	Standards Advice Review Group
SASB:	Swedish Accounting Standards Board
SDC:	Securities Data Company
SEO:	Secondary Equity Offerings
SETMI:	STOXX Europe Total Market Index
SFASC:	Swedish Financial Accounting Standards Council
SSAP:	Statement of Standard Accounting Practice

**PART I - THEORETICAL FRAMEWORK: PENSION
ACCOUNTING CONCEPTS, RULES AND PRACTICES**

CHAPTER I
SCOPE AND RESEARCH QUESTION

CHAPTER I: SCOPE AND RESEARCH QUESTION

Chapter 1 sets precisely the scope of the dissertation by defining the main concepts, terminology and factors relating to pension accounting. In particular, the chapter highlights the controversy around the two main financial rates used in the accounting of defined benefit pension plans, and overviews the quantitative study and the theoretical framework on which the dissertation is grounded. In addition, chapter 1 presents the research question and hypotheses and describes the expected theoretical, empirical, conceptual and management contributions.

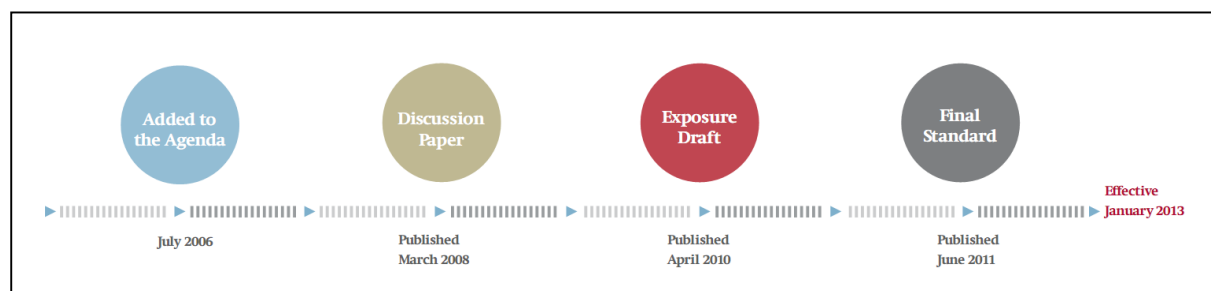
Table of contents

CHAPTER I: SCOPE AND RESEARCH QUESTION	12
1: SCOPE OF THESIS	13
2: RESEARCH QUESTION.....	16
3: THEORETICAL FRAMEWORK	19
3.1: Positive Accounting Theory	19
3.2: Neo-Institutionalism Theory	20
4: HYPOTHESES DEVELOPMENT	22
5: CONCEPTS AND DEFINITIONS.....	25
5.1: Pensions	25
5.2: Pension accounting	28
5.3: Discount rate	29
5.4: Expected rate of return.....	30
6: EPISTEMOLOGICAL AND EMPIRICAL FRAMEWORKS	31
6.1: Epistemic assumptions.....	31
6.2: Empirical assumptions.....	33
7: DISSERTATION STRUCTURE.....	37

1: SCOPE OF THESIS

In 2006, the International Accounting Standards Board (IASB), the global standard-setter, in coordination with its US counterpart, the Financial Accounting Standards Board (FASB), launched an ambitious plan to review rules and practices for the accounting of pension obligations. Efforts have first crystallized in March 2008 when the IASB released a discussion paper highlighting potential changes to the International Accounting Standard (IAS) 19, entitled *Employee Benefits*. The publication indicated an inclination toward i) the immediate recognition of a reporting entity's net pension liability on the face of the balance sheet and ii) the expected termination of the possibility for firms to delay the recognition of elements of their pension liabilities in both the balance sheet and the income statement provided they met certain criteria (which makes reference to the notorious corridor method). More recently, the IASB has taken further steps toward the termination of the corridor method when it released an exposure draft in April 2010 and amendments to the standard in June 2011. The revision project, which began in July 2006, ended in January 2013 when the new rules became effective, as shown below:

Exhibit I: IASB's IAS 19 due process



Source: IASB, *Project Summary and Feedback Statement*, 2011

Broadly speaking, the project time line appears straightforward. Yet, one can imagine the difficulties to reach a consensus given the history of standard-setting and the political environment that surrounds standard-setters. For instance, the first texts relating to pension accounting date back to the 1950s with the AICPA and the APB¹, which preceded similar attempts by international standard-setters to rethink pension accounting by nearly four decades (IAS 19 was first issued by the International Accounting Standards Committee, or IASC in February 1998). Moreover, it is noteworthy to note that the IASB conducts its activities amidst a difficult political environment. Kieso, Warfield and Weygandt (2011) explain indeed that “user groups are possibly the most powerful force influencing the development of

¹ In the 1950s, the Committee on Accounting Procedures of the American Institute of Certified Public Accountants (AICPA) was the first body to address pension accounting. In the 1960s, its successor, the Accounting Principles Board (APB) recognized that “improvements in pension accounting were necessary beyond what was considered practical at those times” (FAS 87, Summary).

International Financial Reporting Standards (IFRS).” Similarly, Queisser, Whitehouse and Whiteford (2007) acknowledge the impact of political power on the management of both public and private pension systems. In their study of OECD countries, Queisser *et al.* (2007) indicate that “cuts in future public pension benefits are one of the main ways that governments have improved affordability of pension systems. For obvious political reasons, these changes have often exploited the complexity of pensions to reduce future benefits in less-than-transparent ways.”

Given the historical context, the global convergence efforts and the significance of the finances at stake (for both public and private sectors as evidenced by Dawson and Deans (2012), Hamacher and Pozen (2012), Jackson (2012), Jenkins (2011), and Woolfe (2012)), pension accounting has fueled much controversy and generated a plethora of research and studies. Empirical work has in particular focused at a large extent on i) the value-relevance of pension accounting information and earnings management, and ii) US accounting and capital market data (Glaum, 2009; Napier, 2009). The dissertation seeks to partly address this imbalance as it presents current pension accounting practices across Europe. Although European companies have adopted common accounting standards only relatively recently (as of January 1, 2005) following the European Commission’s decree EC 1606-2002, which compares to the three decades since the FASB has been “the designated organization in the private sector for establishing standards of financial accounting that govern the preparation of financial reports by nongovernmental entities” (*Source: FASB.org, 2010*), the Old Continent appears ripe for pan-European studies as financial data for six to eight years is now available. As a result, the dissertation’s underlying ambition is twofold. First, the dissertation will provide a detailed description of current practices as a means of identifying meaningful trends, corporate behavior, or phenomena. Second, in a context of global convergence toward IFRS and amidst the prolonged revision of IAS 19², the dissertation i) provides elements to nurture the current debate about pension accounting rules and ii) helps accounting scholars and practitioners foresee changes that will affect the determination of both the discount rate and the expected rate of return.

The dissertation is structured as a means of fulfilling the following objectives. The first objective of the dissertation is to perform an in-depth review of strengths and weaknesses of current pension accounting rules. A rigorous literature review is then essential to bring evidence about the necessity and usefulness of the study performed in this dissertation, which represents the second objective. The third objective of the dissertation is to exploit the results of a quantitative study of the factors influential in determining the discount rate and the expected rate of return. It is expected that this analysis will have implications for standard-setters and users of financial information. In particular,

² The IASB announced on March 25, 2013 that in order to address concerns raised about the 2011 revised IAS 19 (specifically about the accounting for contributions for employees and third parties to defined benefit plans), it had a new Exposure Draft opened for comments until July 25, 2013. This event in fact prolongs the revision of IAS 19 beyond its expected ending date which was January 1, 2013.

we highlight the fact that our study also brings substance to the debate about the right balance between relevance and reliability. The fourth and final objective of the dissertation is to draw meaningful conclusions, address potential limitations and provide elements for further research.

2: RESEARCH QUESTION

According to Beaud (2006), the research question is a component essential in the work of the doctoral student. It is as important as the brain or the nervous system for a human being. In addition to this vision, Beaud explains how the research question acts a central theme or a backbone on which the dissertation is constructed. In order to produce a rigorous dissertation, one therefore needs to precisely identify the scope of the research, formulate a research question which is clearly stated and in relation with the field of study, and a methodology which is appropriate and suitable in order to access, record and analyze the desired phenomena. Having these principles in mind, the next paragraph introduces the central question addressed in the dissertation.

As noted by Picconi, “in the last few years, defined benefit pension plans have gained increased attention from investors, regulators, and politicians” (2006). Picconi immediately identifies the core issues: “a complex system of pension accounting,” impacting both financial performance and financial position, and “the fact that small changes in assumptions can result in large changes in pension value.” Others including Bodie, Light, Morck, and Taggart (1987), Thomas (1988), Ghicas (1990), Thomas and Tung (1992), Blankey and Swanson (1995), Amir and Benartzi (1998), Asthana (1999), Godwin (1999), Bergstresser, Desai, and Rauh (2006), and Adams, Frank, and Perry (2011) have all identified and discussed one or all of the following three main determinants of pension accounting information: discount rate, expected rate of return, and compensation growth rate. More recently, Elwin and Gupta (2012), research analysts affiliated to J.P. Morgan Cazenove, have anticipated the financial impacts of the recently revised IAS 19 on a sample of UK companies. For Elwin and Gupta, the financial stakes appear significant: “the new discount rate assumptions are expected to negatively impact reported earnings and equity, which could be equivalent to at least of 5% of market capitalization” for certain companies (2012).

In such a context, the dissertation builds on existing research but also seeks to fill important gaps: the lack of research focused on i) Europe and ii) the recently revised IAS 19. As noted by Glaum (2009), empirical pension accounting research has traditionally concentrated on the US context for various reasons (especially because of the existence of a common set of accounting standards, i.e. US GAAP, and availability of data). Furthermore, at the exception perhaps of Amen (2007) who treats IAS 19 in the German context (other studies which focus on individual European regions are discussed in the literature review section), no study has so far addressed the potential impacts of the revised IAS 19 on a pan-European basis most likely for two main reasons: the revision of IAS 19 is fairly recent (took place in 2011 and became effective in January 2013), the fragmented European landscape (in terms of culture, history and practices), and the limited availability (or cost) of data.

As a result, the dissertation addresses the following research question:

What are the factors impacting and explaining the choice of the discount rate and the expected rate of return?

To provide a rigorously-constructed answer to this question, the dissertation begins with a detailed discussion of i) pension practices across Europe, ii) the regulatory environment impacting reporting entities, iii) conceptual issues in applying IAS 19, both before and after the 2011 revision, and iv) prior scientific literature.

As a matter of fact, a majority of empirical research focuses on US market data. In particular, a stream of research puts forward the issues and challenges in identifying and measuring the effects of pension accounting assumptions (which are typically classified as financial or actuarial). The dissertation builds on this stream of research at different levels, especially in terms of theoretical background and methodology. The work of Gopalakrishnan and Sugrue (1995), Amir and Benartzi (1998), Asthana (1999), Picconi (2006), and Adams, Frank and Perry (2011) are especially valuable. Based on a sample of 150 firms and information collected for the year 1986 and 1987, Gopalakrishnan and Sugrue find that “leverage and pension plan funding play important roles in the choice of” the discount rate and the rate of salary progression (1995). To explore “the effects of firms’ financial and pension profiles on their funding strategies and actuarial choices,” Asthana tested a series of hypotheses which in particular compared firm’s profitability, cash flows from operations, and marginal tax rate to actuarial choices (1999). In order to examine “whether [...] pension parameters (especially PBO³, firm’s funded status, the expected rate of return on pension assets, the discount rate, and the compensation rate) are predictive of future returns,” Picconi (2006) ran a series of regressions which provide substance for the present dissertation. Adams et al. (2011) were concerned by the expected rate of return and in particular whether firms take advantage of the existing leeway in accounting standards to “inflate earnings through the expected rate of return.” Very interestingly, their study has evidenced that “on average, the expected rate of return is not overstated relative to several benchmarks.” In addition, it is worth noting that the protocol used by Adams et al. (2011) has been influential here. Similarly, the longitudinal study performed by Blankey and Swanson (1995) focusing on the discount rate, the expected rate of return and the expected rate of future compensation, demonstrates the interest and benefits of longitudinal studies. Furthermore, it is worthy to note that other researchers have challenged the current emphasis on the discount rate and wonder whether the discount rate is the right metrics to consider when one seeks to gauge the relevance and reliability of pension accounting information (alternative answers borrowed from the field of economics are later

³ Pension Benefit Obligation (or PBO) and other pension accounting metrics mentioned above will be discussed in further details in Chapter 2.

considered in the literature review section). Lastly, Amir and Benartzi (1998) appear to be also concerned about “the trade-off between the relevance and reliability of financial information,” which is a central issue surrounding accounting standards for Adams et al. (2011). Amir and Benartzi studied the correlation between the ERR and the composition of pension investment portfolio, measured in terms of the percentage invested in equities.

The next section discusses the theoretical foundations on which the dissertation is grounded. In prior comparable research focusing on the determinants of accounting choices, several organization and economics theories are often referred to. In particular, the next section introduces the precepts of Positive Accounting Theory and Neo-Institutionalism Theory, on which the dissertation is enrooted: we explain why we believe that these theories are the most adequate theoretical frameworks to perform our quantitative study.

3: THEORETICAL FRAMEWORK

Research about the field of financial accounting is unquestionably plethoric. The main reason why the research community nurtures such a persistent interest for the field has to do probably with the fact that financial matters have tremendous repercussions for public or private institutions, governments, NGOs, investors, creditors, and individual consumers. The literature commonly refers to the concept of decision-usefulness to explain the importance of financial accounting information. More specifically, Ryan, Scapens and Theobald (2002) explain that “financial accounting is usually considered to be the process whereby the economic activities of an organization are measured, summarized and communicated to entities outside the organization.” Moreover, “financial accounting gained its importance as a practical activity long before accounting researchers came on to the scene. Consequently, accounting practices were shaped by accounting practitioners and the government agencies which took an interest in the protection of share-owners and creditors” (Ryan *et al.*, 2002) The dissertation puts emphasis on a subset of financial accounting which is pension accounting. Again, the literature treating pension accounting is extremely rich. In order to produce a systematic and rigorous literature review, the first step of the researcher’s task is to identify a theoretical framework which will serve as the backbone of the empirical product. We have selected two theories, namely Positive Accounting Theory and Neo-Institutionalism Theory, which appear to match our empirical strategy. When planning our analysis we did not expect any of these theories to have superior explanatory power over the other one. We assumed that the results of our study would permit *ex post* to confirm our theoretical choice. In the next paragraphs, we overview the precepts of Positive Accounting Theory and Neo-Institutionalism Theory. These theories will be further developed in a later section of the dissertation.

3.1: Positive Accounting Theory

Since the underlying purpose of the dissertation is to observe and understand the factors influencing the choice of accounting policies relative to pension accounting, we have naturally considered the literature treating accounting choices. It appears that Positive Accounting Theory represents an unquestionable cornerstone of the literature. Casta (2009) affirms that the theory promoted by the Rochester school of Accounting has revealed extremely fertile⁴. Furthermore, Casta explains that Positive Accounting Theory gained rapidly in popularity since the 1960s because its precursors sought to distance themselves from normative approaches. Positive Accounting Theory seeks to explain and predict and, as a result, puts emphasis on choices made by actors, managers and standard-setters.

⁴ Translated from the French: “Le cadre d’analyse défini par l’*Ecole de Rochester* s’est avéré très fécond” (Casta, 2009, p. 1399).

Obviously, Positive Accounting Theory finds applications within financial accounting research. According to Colasse (2009) author of *Théories comptables*, Positive Accounting Theory is often relied on by standard-setters in the context of the adoption of international standards or by firms when facing various accounting options or methods. Positive Accounting Theory seeks to explain accounting choices in light of political costs that firms are subject to and contractual costs linked to management compensation and debt covenants. Although, Positive Accounting Theory appears to be one of the main streams of literature used in explaining accounting choices, the theory has limitations that have been revealed for instance by Christenson (1983), Schreuder (1983), Whittington (1987), Jeanjean (1999), Dumontier and Raffournier (1999) or Casta (2009). These limitations will be further discussed in a later section of the dissertation. Taking into consideration these limitations, it appears reasonable to consider other theoretical streams to explain accounting choices.

3.2: Neo-Institutionalism Theory

In recent years, Neo-Institutionalism Theory has gained unparalleled popularity in wide research domains. Becuwe and Szostak-Tapon (2007) produced a detailed review of research enrooted in Neo-Institutionalism Theory. The authors have classified variables studied in the context of Neo-Institutionalism Theory under three categories (“univers professionnel,” “univers économique,” and “univers social”). This analysis builds on prior work by Mizruchi and Fein (1999) and led to the identification of 69 articles (published since 1983) based on Neo-Institutionalism Theory and treating a wide variety of topics such as management of corporate data, professional experience, geographical data, financial, accounting and legal data, national resources, and so on.

The attractiveness of Neo-Institutionalism Theory originates from a question raised some three decades ago by DiMaggio and Powell (1983). Starting from the observation that “much of modern organizational theory posits a diverse and differentiated world of organizations and seeks to explain variation among organizations in structure and behavior,” [...] “we ask, instead, why there is such startling homogeneity of organizational forms and practices; and we seek to explain homogeneity, not variation” (DiMaggio and Powell, 1983, p. 148). Since then research grounded in neo-institutionalism seeks to understand this homogeneity in practices. Furthermore, the concept of isomorphism represents a cornerstone of Neo-Institutionalism Theory. Referring to Hawley’s (1968) work, DiMaggio and Powell defines isomorphism as “a constraining process that forces one unit in a population to resemble other units that face the same set of environmental conditions” (DiMaggio and Powell, 1983, p. 149). Therefore, we believe that Neo-Institutionalism Theory permits to highlight sociological pressures experienced by firms in their quest for legitimacy. More recently, Rojot (2005), in his comprehensive theoretical review entitled, *Théorie des Organisations*, shares similar view when he affirms that “firms tend to emulate other companies belonging to the same field, which they

consider more legitimate or successful⁵.” In the same context, Scott (1987) notes that “organizational investigators have invoked institutional arguments in order to explain features of organizational structure.” Consequently, Neo-Institutionalism Theory appears to contain the theoretical foundations on which we can build our analysis of the choice of the rates assumptions used in the context of the accounting of defined benefit pension plans.

⁵ Translated from the French: “Les organisations tendent ainsi à se modeler sur d’autres organisations dans leur champ, qu’elles considèrent comme plus légitimes ou ayant du succès” (Rojot, 2005, p. 429).

4: HYPOTHESES DEVELOPMENT

In light of the literature previously discussed and the theoretical frameworks that, we believe, can explain the determinants of accounting choices, we formulate the below hypotheses:

Positive Accounting Theory Hypothesis: the choice of rates assumptions can be explained by a firm's political and contractual costs as well as and economical characteristics. Consequently, we test the PAT hypothesis through several research hypotheses formulated around financial metrics, which are variables identified in prior pension accounting literature. PAT hypotheses are as follows and are further discussed in chapter 4:

HYPOTHESIS 1: *Ceteris paribus*, firms with weaker profitability are likely to assume a higher discount rate and expected rate of return.

HYPOTHESIS 2: *Ceteris paribus*, firms which offer share-based bonus incentives to top management are likely to assume a higher discount rate and expected rate of return.

HYPOTHESIS 3: *Ceteris paribus*, firms with higher leverage are likely to assume a higher discount rate and expected rate of return.

HYPOTHESIS 4: *Ceteris paribus*, larger firms are likely to assume a lower discount rate and expected rate of return.

Neo-Institutionalism Theory Hypothesis: the choice of rates assumptions can be explained by institutional pressures that a firm is exposed to. Thereafter, we test the NIT hypothesis through several research hypotheses formulated around firms and management's industry affiliations, firms' international presence, management's level of education and professionalization which are variables identified in prior literature. Research hypotheses are as follows and are further discussed in chapter 4.

HYPOTHESIS 5: *Ceteris paribus*, in the presence of State or governmental agencies, Supervisory Financial Authorities (i.e. local or international in the case of foreign listing), or international regulatory agencies, firms are likely to assume more conservative discount rate and expected rate of return.

HYPOTHESIS 6: *Ceteris paribus*, firms characterized by a concentrated shareholder base are likely to assume a lower discount rate and expected rate of return.

HYPOTHESIS 7: *Ceteris paribus*, firms characterized by large institutional shareholder base are likely to assume a lower discount rate and expected rate of return.

HYPOTHESIS 8: *Ceteris paribus*, in dealing with their Auditor, firms are likely to assume more conservative/aggressive discount rate and expected rate of return.

HYPOTHESIS 9: *Ceteris paribus*, firms whose top management has enjoyed similar training are likely to assume more aggressive discount rate and expected rate of return.

HYPOTHESIS 10: *Ceteris paribus*, firms whose top management displays significant industry affiliation are likely to assume more aggressive discount rate and expected rate of return.

HYPOTHESIS 11: *Ceteris paribus*, in response to country, industry or sector's pressures, firms are likely to assume more aggressive discount rate and expected rate of return.

HYPOTHESIS 12: *Ceteris paribus*, firms which are deemed to be more "internationalized" or opened to international activities are likely to assume more aggressive discount rate and expected rate of return.

As a result, we believe that these two theoretical frameworks provide guidance in our understanding of the determinants of rates assumptions, in formulating our research design and in collecting and analyzing empirical data.

It is conceivable that addressing the research question and hypotheses previously described will bring substance to the current debate about pension accounting. Furthermore, as mentioned before, the issues discussed here appear to be of strategic importance for scholars, accounting practitioners and certainly for reporting entities because, for instance, the discount rate is central to the accounting of pension obligations. Directly extending from the concept of time value of money, the discount rate is used to estimate at the balance sheet date the amount (i.e. the present value commonly referred to as PV) of pension obligation which will be paid to beneficiaries in future periods. Discount rate and PV are inversely proportional and a slight change in the discount rate can cause significant change in PV and therefore on the reporting entity's leverage and ability to meet debt covenants. As a matter of fact, research analysts affiliated to Citigroup, Neil Dawson and Sarah Deans, have released on April 10, 2012 an analysis that perfectly illustrates the importance of the discount rate. In their report, Dawson and Deans (2012) estimates that a drop of 84 bps in the "iBoxx € AA 10 + index yield" (i.e. a proxy for the discount rate used by members of the Euro Stoxx 50 index) has led to a 13% rise in pension liabilities to €418 billion for the first quarter of 2012. Separately, it is worth noting that until June

2011 the rate of return on pension assets was estimated using a DCF approach since investment portfolio typically include various asset classes (equity, debt, cash/liquid assets, P/E, etc...). Given that certain assets are difficult to value or fair value cannot be reliably established (given that certain markets are not deep enough), future cash flows are discounted and an expected rate of return is estimated at the start of the accounting period. As prescribed by the international standard-setter, “the expected return on plan assets is based on market expectations, at the beginning of the period, for returns over the entire life of the related obligation” and “the difference between the expected return on plan assets and the actual return on plan assets is an actuarial gain or loss” (IFRS Foundation, IAS 19, p. A618). However, in practice, the determination of this rate lacks of transparency, making the comparison of financial statements difficult from year to year or across reporting entities or industries. In contrast, the discount rate used in determining the PV of pension obligation is based on end-of-period yields on high quality (i.e. “investment grade”) corporate or government bonds and rated at least AA.

Despite the detailed guidance provided by the standard-setter on how to determine discount rates, it appears that reporting entities sharing similar characteristics (such as operating activities, size, tax jurisdiction or industry) implement rates that differ sharply (Beechy, 2009; Beprestis and Xu, 2006). In particular, Beechy makes a striking observation: “an odd thing about accounting standards is that they treat the discount rate and the return on plan assets as largely independent variables,” which leads to “a discount rate that is disconnect from the reality of both liability measurement and the investment strategy” (2009).

5: CONCEPTS AND DEFINITIONS

Before delving into our analysis, it is necessary to identify and define the main concepts that will be referred back throughout the dissertation. This exercise will allow stressing again on the reasons why the dissertation is of interest to the financial community and in particular to standard-setters and users of financial information. In the next paragraphs we will discuss the mechanics of pensions, the complexity of pension accounting, and the importance of the discount rate and the expected rate of return.

5.1: Pensions

For a concise but explicit definition of what a pension is, we rely on The New Palgrave Dictionary of Economics (2008), which quotes the work of Zvi Bodie:

Pensions are benefit contracts that replace a person's earnings after she reaches old age and retires from the labour force. Pension systems vary widely across countries, but everywhere the government's role is to provide a minimum through a mix of cash and medical benefits. Governments often provide tax incentives for employers and unions to sponsor occupational pension plans that complement the government-run system. The nature of the pension benefits promised and the assets that back them have profound effects on social welfare, on the development of a country's domestic asset markets, and on the global financial system.

Today, pensions represent an important element of deferred compensation. As indicated by Glaum (2009, p. 275), “based on contracts, and often encouraged by tax incentives, employees agree to temporarily forego part of the remuneration owed to them for services rendered in a given period, in exchange for a promise to receive pension payments in later periods, usually after retirement.” It appears therefore that pensions-related questions (such as how much to contribute or which type of schemes to select) represent critical issues for individuals. At a macro-level, for instance at a state-level, pensions also epitomize a crucial matter.

The table and graphs shown below are extracted from the 2011 edition of the OECD sponsored *Pensions at a Glance*, which is a comprehensive statistical report published every two years. For example, the main table shows the size of public expenditure on cash benefits for old-age and survivors as a percentage of total government spending for OECD members for the years 1990 and 2007. Overall, there has been an increase in this percentage between 1990 and 2007. The most striking observations are for certain Western European countries where the percentage reaches between a quarter to a third of total government spending: this is the case for Austria, France, Germany, Greece, and Italy. The impression of financial size is further reinforced when considering the bottom-right graph showing public pension expenditure as a percentage of GDP. Again, Austria,

France and Italy stand out as they devote between 10% and 15% of their GDP to public pension expenditure.

Exhibit II: Size of public pension expenditure for OECD countries

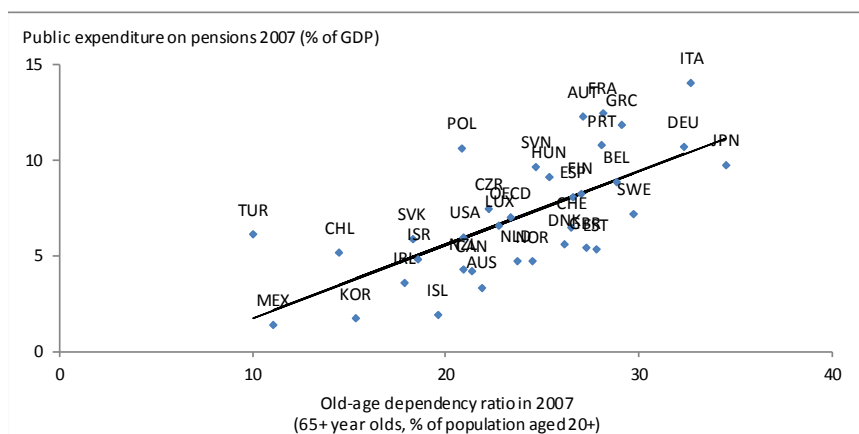
Public expenditure on old-age and survivors benefits

	Public expenditure on cash benefits for old-age and survivors									Total inc. non-cash (% of GDP)
	Level (% of GDP)					Change (%)	Level (% of total government spending)		Level in net terms (% of GDP)	
	1990	1995	2000	2005	2007		1990	2007		
Australia	3.0	3.6	3.8	3.3	3.4	11.2	8.6	10.1	3.3	4.5
Austria	11.4	12.3	12.3	12.5	12.3	7.8	22.1	25.3	10.6	12.7
Belgium	9.1	9.4	8.9	9.0	8.9	-2.9	17.4	18.3	8.0	9.0
Canada	4.2	4.7	4.3	4.2	4.2	-1.2	8.5	10.6	3.9	4.2
Chile		6.9	7.5	5.9	5.2					5.2
Czech Republic	6.1	6.3	7.5	7.3	7.4	21.8		17.5	7.4	7.7
Denmark	5.1	6.2	5.3	5.4	5.6	8.6	9.2	10.9	4.1	7.3
Estonia			6.0	5.3	5.2			15.2		5.3
Finland	7.3	8.8	7.7	8.4	8.3	13.3	15.1	17.5	6.8	9.2
France	10.6	12.0	11.8	12.3	12.5	17.5	21.5	23.9	11.7	12.8
Germany	9.0	10.7	11.2	11.5	10.7	19.1		24.5	10.4	10.7
Greece	9.9	9.6	10.7	11.7	11.9	20.9		26.3		12.0
Hungary			7.4	8.6	9.1			18.3		9.6
Iceland	2.2	2.4	2.2	2.0	1.9	-14.7		4.5	1.8	2.3
Ireland	3.9	3.5	3.1	3.4	3.6	-7.7	9.0	9.7	3.4	3.9
Israel		4.7	4.9	5.1	4.8			10.7		5.0
Italy	10.1	11.3	13.6	14.0	14.1	38.9	19.1	29.4	12.4	14.1
Japan	4.9	6.1	7.4	8.7	8.8	80.5		27.0	8.4	10.1
Korea	0.7	1.2	1.4	1.5	1.7	130.5	3.7	5.7	1.7	1.9
Luxembourg	8.2	8.8	7.5	7.2	6.5	-19.8	21.6	18.1	5.9	6.6
Mexico	0.5	0.7	0.9	1.2	1.4	202.0		7.2	1.4	1.4
Netherlands	6.7	5.8	5.0	5.0	4.7	-29.8	12.2	10.4	4.1	5.5
New Zealand	7.4	5.7	5.0	4.3	4.3	-41.8	14.0	10.9	3.5	4.3
Norway	5.6	5.5	4.8	4.8	4.7	-16.6		11.4	3.8	6.5
Poland	5.1	9.4	10.5	11.4	10.6	107.0		25.2	9.7	10.7
Portugal	4.9	7.2	7.9	10.3	10.8	119.8			10.2	10.8
Slovak Republic		6.3	6.3	6.2	5.8			17.0	5.8	6.2
Slovenia			10.6	9.9	9.6			22.7		9.7
Spain	7.9	9.0	8.6	8.1	8.0	1.5		20.5	7.4	8.5
Sweden	7.7	8.2	7.2	7.6	7.2	-6.8		14.1	5.3	9.5
Switzerland	5.6	6.7	6.6	6.8	6.4	14.2	18.6	19.9		6.7
Turkey	2.4	2.7	4.9	5.9	6.1	159.2				6.2
United Kingdom	4.8	5.4	5.3	5.6	5.4	11.0	11.6	12.0	5.1	5.9
United States	6.1	6.3	5.9	5.9	6.0	-1.5	16.4	16.3	5.6	6.0
OECD	6.1	6.7	6.9	7.1	7.0	14.5		16.5	6.2	7.4

Note: See Adema, W. and M. Ladaique (2009), "How Expensive is the Welfare State? Gross and Net Indicators in the OECD Social Expenditure Database (SOCX)", Social, Employment and Migration Working Paper No. 92, OECD Publishing, Paris for more details on the data, sources and methodology.

Source: OECD Social Expenditures database (SOCX); OECD Main Economic Indicators database.

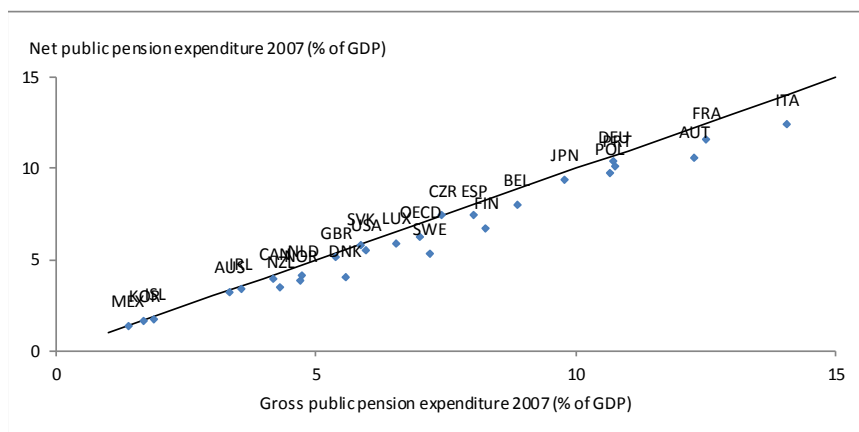
Demographic pressures and public pension expenditure



Note: regression line is pension expenditure = -2.091 (1.908) + 0.3835 (0.07814) x dependency ratio, where heteroskedasticity adjusted standard errors are given in parentheses. The coefficient on the dependency ratio is significant at the 1% level and the R2 of the regression is 0.4670.

Source: OECD Social Expenditures database (SOCX); United Nations, World Population Prospects – The 2008 Revision.

Gross and net public pension expenditure



Note: the chart shows a 45° line. See Adema, W. and M. Ladaïque (2009), “How Expensive is the Welfare State? Gross and Net Indicators in the OECD Social Expenditure Database (SOCX)”, Social, Employment and Migration Working Paper No. 92, OECD, Paris for more details on the data, sources and methodology.

Source: OECD Social Expenditures database (SOCX).

Source: OECD, Pensions at a glance, 2011, p. 155

Main economic, political, demographic, and pension practices across Europe will be further discussed in a later section of the dissertation. The next paragraph introduces pension accounting, which has been described by Larsson, Sundén and Settergren (2009) in an OECD Journal’s article as “necessary but rarely sufficient to aid the insured or insurer in making well-informed decision.”

5.2: Pension accounting

Although we will consider various elements of financial reporting (including balance sheet, income statement or off-balance sheet items) and regulation stipulated by the FASB in later sections of the dissertation, the focus of our analysis will be on rules promulgated by the IASB. IAS 19, *Employee Benefits*, the IASB's main pronouncement relative to pension accounting, applies to all forms of employee benefits (except share-based payments which are addressed by IFRS 2). Employee benefits⁶ traditionally encompass short-term schemes (e.g. wages, salaries, annual leave, bonuses or non-monetary benefits such as medical care, housing or other in-kind goods or services) and long-term benefits (e.g. pensions, post-employment life insurance, medical care, or other benefits such as paid absences, sabbatical leave, and long-term disability). Termination benefits represent a third category of employee benefits.

Furthermore, pension arrangements are classified as defined contribution plans and defined benefit plans. In defined contribution plans, employers commit to pay regular contributions into schemes managed by or for beneficiaries (i.e. employees). The amounts of future pension benefit depend on contribution paid and returns generated by contributions over time. The accounting for pension contribution is straightforward (only the cash contribution paid is accounted for in the income statement) as the employer has no (or limited) obligation beyond the payments made. In contrast, the accounting for defined benefit plans is more complex since it requires the formulation of a sophisticated set of assumptions (e.g. financial and actuarial postulations about inflation, life expectancy, employee turnover, etc...) over long period of time. The choice of these assumptions can have tremendous effects on the financial statements of reporting entities. As a result, over the years a controversy has burgeoned because of the perceived discretion granted to companies in formulating these assumptions. Such flexibility tends to be detrimental to users of financial statements because it renders comparison of corporate performance difficult across sectors, regions and time.

As explained in the previous section, pensions represent promises made by employers to employees who temporarily forego remuneration in the hope of future payments. "Pension obligations are thus as a form of debt, owed by the company, or a third party on behalf of the company, to the employees" (Glaum, 2009). It is worth noting that Napier (2009) discusses another dimension of a liability by contrasting legal and constructive obligation, which will be further discussed in a later section. Nonetheless, the valuation of pension obligation is precisely at the center of the pension accounting controversy: the amount of reported obligation depends heavily on the choice of the discount rate.

⁶ The IASB defines employee benefits as "all forms of consideration given by an entity in exchange for service rendered by employees or for the termination of employment" (IFRS Foundation, IAS 19, 2011, p. 12).

5.3: Discount rate

As mentioned in a previous section of the dissertation, the discount rate is central to the accounting of pension obligations. Directly extending from the concept of time value of money, the discount rate is used to estimate at the balance sheet date the amount (i.e. the present value commonly referred to as PV) of pension obligation which will be paid to beneficiaries in future periods.

In particular, the concept of time value of money states that a sum of money to be received today is worth more than if received tomorrow because of uncertainty about future outcomes and opportunity cost (Brealey, Myers and Allen, 2006, p. 88). Furthermore, discount rate and PV are inversely proportional and a slight change in the discount rate can cause significant change in PV and therefore on the reporting entity's leverage and ability to meet debt covenants.

Despite this relatively straightforward rhetoric, Glaum notes that "the question of which discount rate should be used in pension accounting is contentious" (2009). Historically, the practice has been to formulate assumptions based on "long-term average rates of return on pension investments" (because employers' goal is to book obligations that can be realistically met, thus obligations should be in line with the historical performance of pension assets). In addition to the dichotomy between funding and valuation, researchers have argued for the use of the company's cost of capital (thus implying that pension liabilities are similar to other financial or operating liabilities, a supposition which is highly questionable). Lastly, Glaum echoes a recent interest for including into the discount rate "a premium for the riskiness of pension liabilities" (Glaum, 2009).

The international standard-setter has acknowledged the issues raised by the choice of the discount rate by implementing corrective measures over the years. Today, IAS 19 stipulates that the discount rate "shall be determined by reference to market yields at the end of the reporting period on high quality corporate bonds. In countries where there is no deep market in such bonds, the market yields (at the end of the reporting period) on government bonds shall be used" (IFRS Foundation, IAS 19, 2011, p. 38). Napier has identified the limitations in using corporate bond rate and suggests some elements to better users' understanding of the impact of changes in the discount rate. "The bond rate could be considered as the aggregate of: (i) the real risk-free rate (the pure time value of money); (ii) expected inflation; and (iii) the average expected rate of default. Although the first two components are relevant, there is no obvious link between the probability of default on corporate bonds and the measurement uncertainties relating to pension liabilities" (Napier, 2009).

In practice, reporting entities state that they rely on the yields observed on AA-rated debt instruments as a proxy. However, the literature did not corroborate such a fact (Blankey and Swanson, 1995). Our analysis will address the debate about the discount rate and shed light on practices employed in Europe.

5.4: Expected rate of return

Similarly to the discount rate, the expected rate of return on pension assets is another source of controversy. The expected rate of return is a metric used to estimate the return that can be anticipated on pension assets at the start of the accounting period. It is used to determine a (comprehensive) income statement item (and thus can inflate or deflate earnings) rather than for estimating the fair value of pension assets (balance sheet item). The debate around the expected rate of return is caused by the fact that accounting standards have historically allowed great discretion in determining this rate. Napier is not naïve and asserts that the use of the expected rate of return is “one of the occasions when accountants invent an artificial number to supplant a real number” (Napier, 2009). In contrast, Glaum employs a softer tone and recognizes that the actuarial dimension of modern accounting renders the smoothing of returns potentially useful: “it is argued, average, smoothed long-term returns reflect more appropriately the economic nature of the assets than short-term returns which are more volatile” (Glaum, 2009).

In June 2011, the IASB has adopted the revised version of IAS 19 which eliminates the use of the expected rate of return (replaced by the net interest approach in which the discount rate is used to estimate both pension liabilities and assets). This move has been perceived by many as an expedient to end abusive earnings management practices but it has brought unavoidable conceptual issues. In particular, the use of a single rate to estimate both pension liabilities and assets assume that pension liabilities and assets have similar characteristics, a view which is highly debatable. These points will be further discussed in a later section of the dissertation.

6: EPISTEMOLOGICAL AND EMPIRICAL FRAMEWORKS

Our empirical ambition is to perform the most extensive and rigorous statistical analysis the data permits. Knowing the fact that we seek to run a large-scale quantitative study, we mainly rely on regression techniques to evaluate the impact of various independent variables on our two dependent variables (i.e. the discount rate and the expected rate of return) within Positive Accounting Theory and Neo-Institutionalism Theory. Before delving into the mechanics of our empirical strategy, it is important to define how the dissertation will contribute to knowledge, in other words we will describe in the next paragraphs our epistemological approach.

6.1: Epistemic assumptions

According to Gavard-Perret, Gotteland, Haon and Jolibert (2012), themselves referring to Piaget (1967), “epistemology is the study of what constitutes acceptable knowledge⁷.” This definition consequently invites the researcher to address three follow-up questions. What is knowledge? How is it elaborated? How to justify the validity of knowledge (Gavard-Perret et al., 2012)? Furthermore, the authors argue that the initial epistemological question is not limited to a discussion about methodology but to justify the notion of knowledge on which the research is built. As such, the researcher must design a coherent research strategy by formulating a research question that is in line with the chosen theoretical, epistemological and empirical frameworks.

Thereafter, the authors develop the concept of epistemological paradigm and differentiate the following paradigms:

- Positivism postulates that the nature of reality (i.e. ontology) is external, objective and independent of social actors. In terms of epistemology, the researcher believes that only observable phenomena can provide credible data and facts. As such, the researcher is primarily concerned with causality and the perspective of generalization. In terms of axiology (i.e. the researcher’s view of the role of values in research), the researcher conducts a value-free protocol and seeks to maintain an objective standpoint. Lastly, positivism translates into data collection methods that are highly structured, involving large samples and relying on quantitative procedures (though qualitative approaches are also adequate)
- Finding its roots in positivism, post-positivism addresses criticisms made by Popper (1963), who advocates for a hypothetico-deductive approach and for a theory of science (which advances the idea that progress toward a true theory can be made only by refuting old theories), and Kuhn (1972) who rejects Popper’s view of falsifiability and argues that a

⁷ Translated from the French: “L’*épistémologie* est l’étude de la constitution des connaissances valables. L’*épistémologie* s’intéresse donc principalement aux trois questions suivantes: Qu’est-ce que la connaissance? Comment est-elle élaborée? Comment justifier le caractère valable d’une connaissance” (Gavard-Perret et al., 2012, p. 13)?

scientific revolution takes place when researchers cannot explain anomalies using contemporary models. Additionally, post-positivism recognizes that it may not be possible to fully capture reality in its entirety. In order to reach the highest standard of objectivity, post-positivism requires controlling precisely research conditions and recommends the use of multiple methods for collecting data. Lastly, post-positivism has evolved in two major currents: scientific realism and critical realism (Gavard-Perret et al., 2012)

- Pragmatism, also called constructivist pragmatism, assumes that it is individual human experience that defines what knowledge is. Thus, in terms of ontology, reality is external and multiple. In terms of epistemology, “either or both observable phenomena and subjective meanings can provide acceptable knowledge” (Saunders, Lewis and Thornhill, 2012). Because there is interdependence between the research object and the researcher, “values play a large role in interpreting results” (Saunders et al., 2012). Lastly, pragmatism recommends “mixed or multiple method designs, both quantitative and qualitative” (Saunders et al., 2012)
- Interpretivism builds on various schools which favor ontological precepts based on hermeneutics and ethnographic methods. As such, reality is seen as “socially constructed, multiple, subjective and may change” (Saunders et al., 2012). Acceptable knowledge is derived from subjective meanings and social phenomena. Lastly, interpretivism requires the researcher to immerse with the research object in order to perform an in-depth investigation. Consequently, methods commonly used by interpretivist researchers require small samples and are essentially qualitative.

In the context of the dissertation, our main goals are to observe and understand the factors that influence the choice of rates assumptions implemented by reporting entities across Europe over the 2005/2011 study period. Given the size of our sample, our concern for objectivity and external validity and our desire to produce results derived from econometrics, our research can be framed on a post-positivist stance. Lastly, because our aim is to perform a research structured in theory(ies) and design a research strategy to test the theory(ies), we plan on using a deductive approach.

Epistemological questions will be further discussed in chapter 4.

6.2: Empirical assumptions

As stated previously, our ambition is to conduct a quantitative study encompassing public companies incorporated across Europe over the 2005/2011 period. To do so, we rely on quantitative tools (namely econometrics) as a means to measuring global phenomena and allowing generalization of findings.

We have built a database comprising mainly financial data extracted from annual reports and compiled by Bloomberg. This information has been downloaded through Bloomberg proprietary excel files allowing to retrieve data disclosed on the face of financial statements and accompanying footnotes. In addition, these excel files permit to download market data, company data (such as biography and compensation of managers or operating information) and other qualitative information about companies.

After performing random checks on the data and noticing significant gaps, we decided to hand-collect from annual reports information about our key variables of interest (i.e. the discount rate and the expected rate of return).

In light of the theoretical framework and the literature review previously discussed, regression methodologies appear the most appropriate tools to employ in order to gauge the existence and the strength of relationships between our interest variables. In fact, Saunders *et al.* (2012) explain the benefits of using multiple regression analysis when two or more independent variables and confirm the pertinence of our choice of methodology. Furthermore, Gavard-Perret *et al.* (2012) recommend performing simple checks to find out whether a linear regression methodology is adequate. In our case, scatter plots, VIF (or variance inflation factor) metrics, and normally distributed residuals, confirmed our choice of methodology.

Furthermore, we will implement our analysis following Saunders *et al.*'s recommendations (2012) starting by constructing a workable sample (by identifying pertinent companies or eliminating companies using accounting standards other than IAS/IFRS), performing random checks of the data (by comparing the downloaded data with the one disclosed in annual reports), constructing graphs to gauge major trends, performing descriptive statistics and correlation analyses, and lastly performing linear regression analyses.

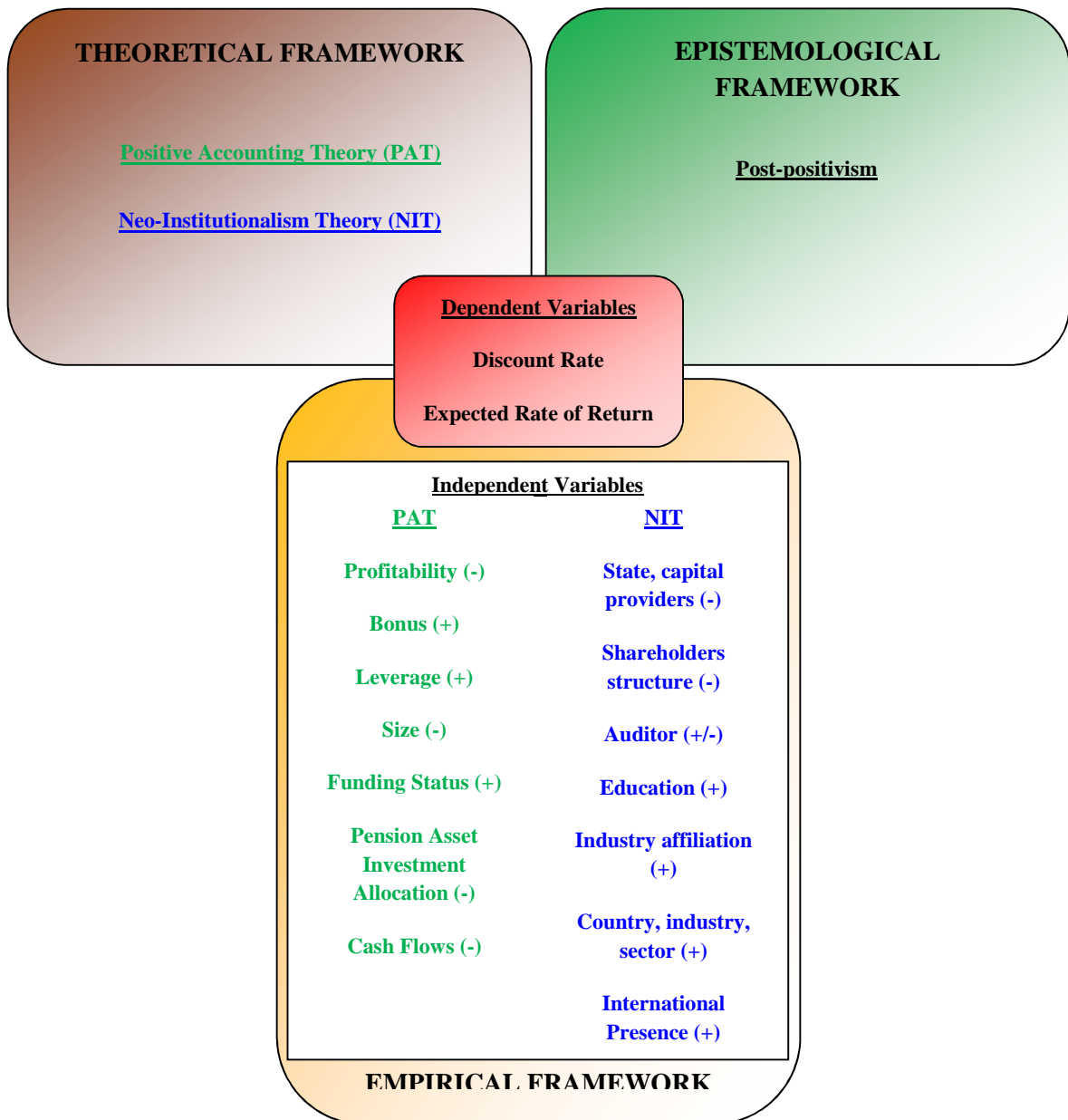
Based on prior literature, we have identified the following variables:

- Dependent variables: discount rate and expected rate of return
- Independent variables: measures of profitability (net profit margin, ROA, ROE, etc), cash flows generation capability (cash flows from operations, free cash flows, etc), leverage (debt ratio, debt to capital, etc), funding status (funding ratio), allocation of pension assets (percentage of assets invested in equity, in debt, etc), firm size (total assets, market capitalization, etc), share-based compensation, institutional shareholding, details about

managers (education, professional association, etc...), and details about firms (political and lobbying activities, and international presence)

Before presenting and discussing the dissertation's structure, the next chart and tables summarize topics developed in this introductory chapter, set the scope of the research, and identify key anticipated contributions:

Exhibit III: Chart showing dissertation theoretical, epistemological and empirical frameworks⁸⁹



⁸ Methods relative to Positive Accounting Theory are based on work Watts and Zimmerman (1978), Bodie, Light, Morck, and Taggart (1987), Ghicas (1990), Gopalakrishnan and Sugrue (1995), Asthana (1999), and Adams, Frank and Perry (2011), and among others. References will be further discussed in Chapter 4.

⁹ Methods relative to Neo-Institutionalism Theory are based on work by DiMaggio and Powell (1983), Scott (1987), El-Gazzar, Finn and Jacob (1999), Rojot (2005), Touron (2005), and Judge, Li and Pinsker (2010) among others. References will be further discussed in Chapter 4.

Exhibit IV: Scope of research

Scope	Observe and understand accounting choices relative to defined benefit pension plans
What	Pan-European study focused on defined-benefit pension plans
Who	Members of Stoxx Europe Total Market Index
Where	Firms are incorporated in Europe
When	Data set spans over 2005/2011
Why	Identified gaps in literature (lack of pan-European focused research and conceptual issues in applying recently revised IAS 19)
	Complex pension accounting despite the recent 2006-2011 Due Process to revamp IAS 19, <i>Employee Benefits</i> , which became effective on January 1 st , 2013
	Financial and political stakes are significant
How	Several research hypotheses to be tested
	Quantitative study based on historical data (Bloomberg data) and annual reports for members of Stoxx Europe Total Market Index
	Accounting choices explained through the lenses of: <ul style="list-style-type: none"> • Positive Accounting Theory • Neo-Institutionalism Theory

Exhibit V: Contributions

Theoretical	Accounting choices potentially explained by both Positive Accounting Theory and Neo-Institutionalism Theory
Empirical	Quantitative study structured around an econometrics model including variables bred in Neo-Institutionalism Theory (which traditionally relies on qualitative approaches)
Conceptual	Understanding of key conceptual issues in IAS 19 and implications of the net interest approach
Management	Guidance for preparers including reporting entities, accounting professionals, standard-setters and governmental agencies
	Guidance for users of financial information such as individual and institutional investors, creditors, market participants and analysts

7: DISSERTATION STRUCTURE

For Saunders et al. (2012), “writing should be a highly creative process.” However, the goal of the researcher is not to write *per se* but to present facts, introduce a question, and structure elements of answers addressing the central question raised. Following this rationale, Saunders et al. (2012) recommend the researcher to present a “storyline,” meaning that ideas should be discussed according to a “logical flow.” Having this requirement in mind, we have structured the dissertation into two main parts, which are divided into chapters and sub-chapters where necessary.

Part I of the dissertation presents the research context, expected contributions, pension accounting, and theoretical framework. Part I is further divided into three chapters described as follows.

Chapter 1 sets precisely the scope of the dissertation by defining the main concepts, terminology and factors relating to pension accounting. In particular, the chapter highlights the controversy around the two main financial rates used in the accounting of defined benefit pension plans, overviews the quantitative study and the theoretical framework on which the dissertation is grounded. In addition, chapter 1 presents the research question and hypotheses and describes the expected theoretical, empirical, conceptual and management contributions.

Chapter 2 discusses in depth the accounting for pension obligations. In addition, the section reviews the literature and describes the regulatory environment and the main practices implemented across Europe. The first section of chapter 2 is devoted to an overview of the mechanics of pensions and a description the European accounting landscape, as a means of highlighting trends and issues. The second section describes the accounting regulatory environment and focuses on the main two authoritative bodies, the IASB and FASB. An in-depth discussion of the accounting of pensions is then performed in the third section. In particular, we contrast accounting rules before and after the 2011 revision of IAS 19. The final section is devoted to a rigorous review of the literature.

Chapter 3 establishes the theoretical framework on which the dissertation is structured. The chapter presents and discusses the two theories, Positive Accounting Theory and Neo-Institutionalism Theory, which appear the most adequate to explain the choice of rates assumptions. For each theory, we provide historical perspective, present main precepts and discuss key limitations.

Part II of the dissertation addresses the research epistemological and empirical frameworks, discusses results, and proposes concluding remarks and elements for further research. Part II is broken down into three chapters described as follows.

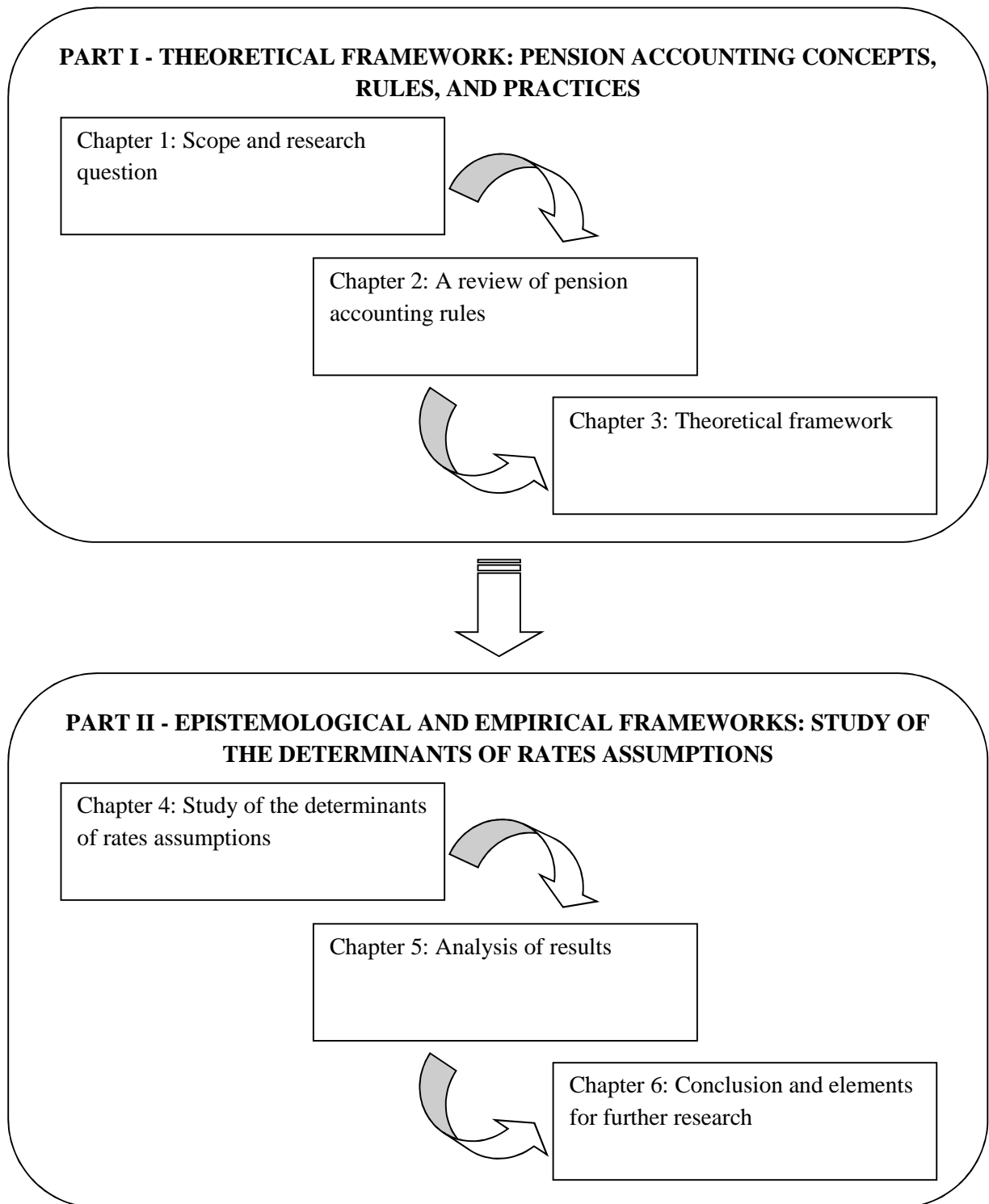
Chapter 4 details the aim and protocol established to carry out the study. Chapter 4 begins with a description of our research design, which is articulated around the research epistemological and empirical frameworks. In this section, we demonstrate why we adopt a post-positivist stance in order to perform a quantitative study. In particular, this analysis allows us to develop our research hypotheses, describe our population and sampling methodology as well as the econometrics that we employ.

Chapter 5 presents the results of the study. We propose to perform an-depth analysis of our results by first presenting and synthesizing key trends and facts. Second, we relate our findings to the research question and hypotheses. Furthermore, we question the validity and reliability of our results and consider ethical issues.

Chapter 6 rephrases main findings and essentially draws concluding remarks. In addition, we assess the dissertation's practical usefulness and applicability. After having acknowledged certain limitations, we can finally provide direction and elements for further research.

Before delving into chapter 2, the below schedule summarizes points developed above and displays the dissertation's general structure.

Exhibit VI: Dissertation structure



CHAPTER II
A REVIEW OF PENSION ACCOUNTING RULES

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Chapter 2 discusses in depth the accounting for pension obligations. In addition, the section reviews the literature and describes the regulatory environment and the main practices implemented across Europe. The first section of chapter 2 is devoted to an overview of the mechanics of pensions and a description the European pension fund landscape, as a means of highlighting trends and issues. The second section describes the accounting regulatory environment and focuses on the main two authoritative bodies, the IASB and FASB. An in-depth discussion of the accounting of pensions is then performed in the third section. In particular, we contrast accounting rules before and after the 2011 revision of IAS 19. The final section is devoted to a rigorous review of the scientific literature from which we elaborate our empirical strategy.

Table of contents

CHAPTER II: A REVIEW OF PENSION ACCOUNTING RULES.....	41
1: OVERVIEW OF THE EUROPEAN PENSION FUND INDUSTRY	43
1.1: Overview of pension schemes and products	43
1.2: Overview of pension funds	62
1.3: Public vs. private pension funds	72
1.4: Pan-European regulatory pressures and prospects for the pension fund industry.....	82
1.5: Current state of the European pension system	90
2: PENSION ACCOUNTING: REGULATORY ENVIRONMENT	92
2.1: IFRS: Authoritative bodies and key principles	93
2.2: US GAAP: Authoritative bodies and key principles	103
2.3: Issues and challenges with financial reporting	110
2.4: Global convergence towards IFRS	115
3: PENSION ACCOUNTING: RULES AND PRACTICES	117
3.1: Historical perspective.....	117
3.2: Introduction to IAS 19	122
3.3: Conceptual and technical issues (IAS 19 including amendments up to December 31 2010)	125
3.4: Conceptual and technical issues (IAS 19 revised as of June 2011).....	133
4: REVIEW OF ACADEMIC LITERATURE.....	138
4.1: Overview.....	138

4.2: Research treating the determinants of pension accounting choices	139
4.3: Other research treating pension accounting	157
4.4: Limitations of prior research and research opportunities.....	173
5: CHAPTER CONCLUSION.....	176

1: OVERVIEW OF THE EUROPEAN PENSION FUND INDUSTRY

1.1: Overview of pension schemes and products

In return for their productivity and contribution toward the achievement of corporate goals, employees earn benefits that are classified in four categories for accounting purposes (which are discussed in further details in a later section). We focus our attention on the second of these categories, post-employment benefits, which include retirement benefits (such as pensions and lump sum payments on retirement), post-employment life insurance and post-employment medical care (IFRS Foundation, 2011). As previously indicated in reference to the work of Bodie (The New Palgrave Dictionary of Economics, 2008):

Pensions are benefit contracts that replace a person's earnings after she reaches old age and retires from the labour force. Pension systems vary widely across countries, but everywhere the government's role is to provide a minimum through a mix of cash and medical benefits. Governments often provide tax incentives for employers and unions to sponsor occupational pension plans that complement the government-run system. The nature of the pension benefits promised and the assets that back them have profound effects on social welfare, on the development of a country's domestic asset markets, and on the global financial system.

Similarly, Glaum (2009) indicates that “based on contracts, and often encouraged by tax incentives, employees agree to temporarily forego part of the remuneration owed to them for services rendered in a given period, in exchange for a promise to receive pension payments in later periods, usually after retirement” (2009, p. 275). As such, pensions represent an important element of deferred compensation and therefore are central to corporate reward policy. It appears therefore that pensions-related questions (such as how much to contribute or which type of schemes to select) represent critical issues for individuals. In practice, pension beneficiaries are mainly concerned about the amount of the monthly cash flow they will receive upon retirement. It is not uncommon for the monthly cash flow to be calculated based on the number of years of service, the employee’s salary at the end of his/her career (sometimes the average of the best years), and a fixed multiplier, of 2.6% for example. In this case, if an employee works for 28 years and earns a final average salary of €48,000, the annual pension benefit will amount to €34,944 ($48,000 \times 28 \times 0.026$), which is equivalent to a monthly cash flow of €2,912. In contrast to this simplified example, pension schemes’ features are much more complex than it appears. We discuss these characteristics in the next paragraphs.

According to material provided by the OECD, pension regimes vary widely across member states which renders the classification of pension regimes and schemes difficult. For the sake of simplicity, we rely on the classification described by the OECD in its *Private Pensions, Classification and*

Glossary published in April 2005. The nomenclature commonly used refers to Pillars or Tiers. Pillar I or first-tier includes “redistributive components” designed to ensure that pensioners achieve some absolute, minimum standard of living (Pillar I is commonly referred to as “social security” in vernacular language), whereas Pillar II or second-tier comprises “insurance components” which are conceived to achieve some target standard of living in retirement compared with that when working (OECD, 2007). In practice, Pillar I pension schemes correspond to public plans, typically structured around defined benefit schemes incorporating some safety net and redistributive features, whereas Pillar II pension schemes represent employment-related schemes (in fact such schemes are referred to as occupational plans when there is a professional relationship between beneficiaries or plan members and the sponsor or employer or group of employers). Lastly, “voluntary provision, be it individual or employer-provided, makes up a third-tier” or Pillar III (OECD, 2007). Within these tiers, schemes are classified further by their provider (public or private) and the way benefits are determined (defined benefit or contribution, for instance).

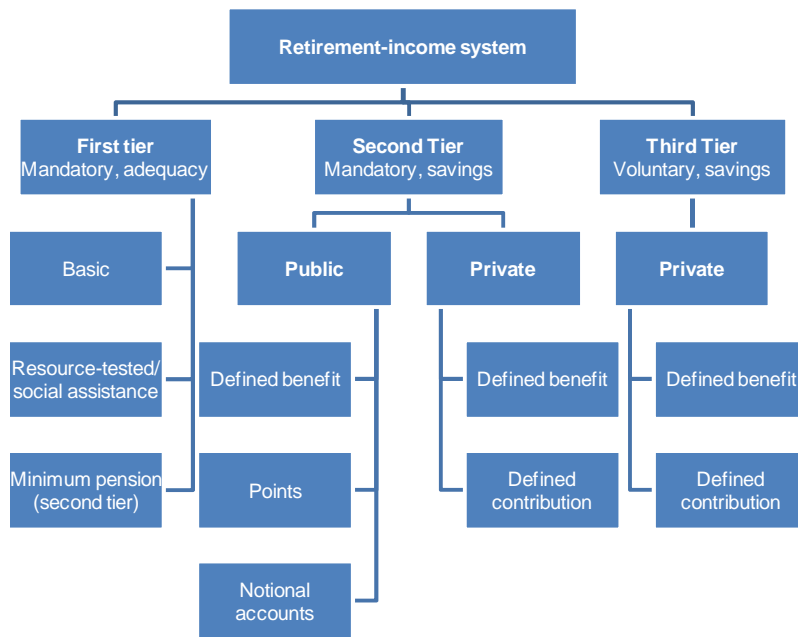
As a result, public pension plans represent social security or programs sharing similar goals and are commonly managed by the government or some governmental bodies. Such pension schemes are typically funded through PAYG schemes (i.e. pay-as-you-go plans are in fact unfunded plans in which current contributions paid by workers serve to pay current benefits). As this unfunded pension system is not sustainable in the long run, increasingly OECD countries tend to partially fund public pension liabilities or to discontinue PAYG funds and replace those by private pension schemes. Funding of such publicly managed programs is commonly achieved through payroll taxes. Contrary to public pension plans, private pension plans are run by private organizations, either a firm acting as a plan sponsor, a pension fund or an entity representing a sector or a trade association. Private pension schemes are in general funded by employer and employees and typically provide a pension complement or surrogate for public pension schemes. Lastly, unfunded private pension schemes are banned across OECD countries.

According to the OECD taxonomy, first-tier pension schemes seek to provide a minimum level of pension benefit and are further divided into three categories including resource-tested (pension benefit based on a beneficiary’s financial status), basic (a flat rate of pension is paid and depends on years of work), and minimum schemes (similar as resource-tested but differ in the way financial status is determined). Similarly, the OECD material classifies second-tier pension schemes into four categories, namely defined benefit plans (DB), defined contribution (DC), point schemes (PS), and notional-accounts (NA). DB plans are provided by both public and private sponsors and pension benefit is commonly function of the number of years of contribution and individual earnings. Furthermore, DB plans are sub-classified into traditional (in which pension benefit is calculated using a formula encompassing salaries, work period, or other parameters), mixed (which consist of two separate DB and DC plans), and hybrid plans (in which a rate of return is guaranteed in relation or

regardless of pension asset performance). In contrast to DB plans, a sponsor does not retain any legal or constructive obligation to pay additional contributions to a DC plan in the case pension asset performance would be short of expectations. Typically, under DC plans, contributions accumulate into individual accounts which in general convert into annuities at retirement. The PS system is relatively rare across the OECD area (used only in four countries) and is commonly administered by public entities. Under such a system, employees accumulate over their work life points calculated based on annual earnings. Upon retirement, the accumulated number of pension points is multiplied by a pension-point score in order to determine the amount of pension paid. Finally, NA plans, also relatively rare across OECD countries, are in general managed by public entities. Similarly to PS plans, NA plans take into account the amount of a notional capital accumulated over a worker's period of service and which is converted into regular pension payments upon retirement. Pension payment is often function of life expectancy. Because NA plans are aimed at mirroring DC plans, they are frequently referred to as notional defined-contribution plans (NDC).

In the final category, pillar III pension plans, one finds programs funded under a voluntary basis which can take the form of DB, DC, hybrid or mixed pension schemes. It is worthy to note that voluntary pension plans differ from mandatory programs in which employees are legally required to participate. To illustrate the above description of the taxonomy used by the OECD, the below diagram is shown.

Exhibit VII: Classification of pension schemes



Source: OECD, Pensions at a glance, 2011, p. 107

The next table associates the above classification to member states. It should be noted that all OECD countries offer Pillar I pension schemes whereas Pillar II pension schemes vary significantly (though public schemes are predominantly DB plans and private schemes are mainly DC plans).

Exhibit VIII: Pension regimes across OECD countries

Structure of retirement-income provision

OECD member	Public			Public	Private	OECD member	Public			Public	Private
	Resource-tested	Basic	Minimum	Type	Type		Resource-tested	Basic	Minimum	Type	Type
Australia	√				DC	New Zealand	√				
Austria				DB		Norway			√	NDC	DC
Belgium	√		√	DB		Poland			√	NDC	DC
Canada	√	√		DB		Portugal			√	DB	
Chile	√		√		DC	Slovak Republic			√	Points	DC
Czech Republic		√	√	DB		Slovenia			√	DB	
Denmark	√	√			DC	Spain			√	DB	
Estonia		√		Points	DC	Sweden			√	NDC	DC
Finland			√	DB		Switzerland	√		√	DB	DB
France			√	DB+points		Turkey			√	DB	
Germany	√			Points		United Kingdom	√	√	√	DB	
Greece			√	DB		United States				DB	
Hungary				DB	DC						
Iceland	√	√			DB	Other major economies					
Ireland		√				Argentina		√		DB	
Israel		√			DC	Brazil				DB	
Italy	√			NDC		China		√		NDC/DC	
Japan		√		DB		India				DB + DC	
Korea	√	√		DB		Indonesia				DC	
Luxembourg	√	√	√	DB		Russian Federation		√		NDC	DC
Mexico			√		DC	Saudi Arabia			√	DB	
Netherlands		√			DB	South Africa	√				

Note: In Iceland and Switzerland, the government sets contribution rates, minimum rates of return and the annuity rate at which the accumulation is converted into a pension for mandatory occupational plans. These schemes are therefore implicitly defined benefit.

DB = Defined benefit; DC = Defined contribution; NDC = Notional accounts.

Source: OECD, *Pensions at a glance, 2011, p. 107*

The next table, extracted from the 2012 Ageing Report produced by the European Commission, focuses on Pillar I pension schemes offered across Europe. Again, the table shows how diverse are methodologies and practices implemented across the region. In particular, the table details the parameters used in calculating pension benefits.

Exhibit IX: Key parameters of pension systems used across Europe

Key parameters of pension systems in Europe (old-age pensions)			
Country	Pensionable earnings reference	General valorisation variable(s)	General indexation variable(s)
BE	Full career	Prices	Prices and living standard
BG	Full career	Wages	Prices and wages
CZ	Full career	Wages	Prices and wages
DK	Years of residence	Not applicable	Wages
DE	Full career	Wages	Wages
EE	Full career	Social taxes	Prices and social taxes
IE	Career average contributions	Not applicable	No rule
EL	Full career	Yearly decree	Prices and GDP (max 100% prices)
ES	Last 25 years (as of 2022)	Wages (with maximum value closer to prices)	Prices
FR	25 best years (CNAV)	Prices	Prices
IT	Full career	GDP	Prices
CY	Full career	Wages	Prices and wages
LV	Full career	Contribution wage sum index	Prices (as of 2014)
LT	5 best from the period 1984-1993 and 25 best years after 1994	Yearly discretionary decision	Yearly discretionary decision
LU	Full career	Prices and wages	Prices and wages
HU	Full career	Wages	Prices and wages
MT	10 best of last 40 years (for people born as of 1962)	Cost of living	Prices and wages
NL	Years of residence	Not applicable	Wages
AT	2010: 22 best years, as of 2028: 40 best years	Wages	Prices
PL	Full career	NDC 1st: Wages, NDC 2nd: GDP	Prices and wages
PT	Full career (as of 2042, max 40): Weighted average between full career and 10 best out of last 15 (before 2042)	Prices (and wages 2002-2011)	Prices and GDP
RO	Full career	Prices (and wages until 2030)	Prices (and wages until 2030)
SI	Best consecutive 18 years	Wages	Wages
SK	Full career as of 1984	Wages	Prices and wages
FI	Full career	Prices and wages	Prices and wages
SE	Wages	Wages	Wages
UK	Years of insurance contributions	Prices, wages and GDP	Prices, wages and GDP
NO	Full career	Wages	Wages

Source: Commission services, EPC

Source: European Commission, *The 2012 Ageing Report, 2012*, p. 92

In addition to the classification of pension schemes, the OECD material treats important pension issues such as pensionable age, life expectancy, trends in retirement, pension incentives, finances of pension systems and demographic trends. Prior to discussing technical accounting issues, we believe that it is important to show that pension matters (especially funding, demographic and economic

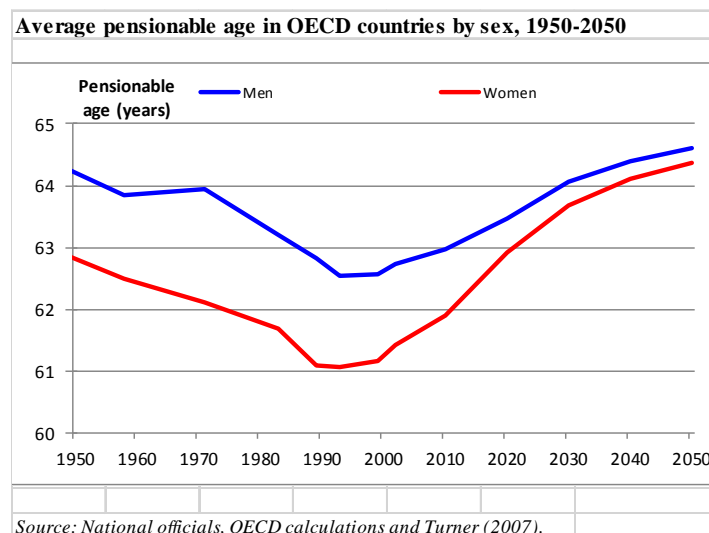
trends) significantly impact individuals and countries at a large extent. We present these issues in the following paragraphs.

Pensionable age and life expectancy

Populations around the globe are experiencing rapid ageing coupled with steadily increasing life expectancy. Such a demographic pattern further stresses the financial viability of pension systems. To evaluate demographic trends, researchers focus on a parameter which is central for pension systems: “the age of eligibility for mandatory pension benefits” (OECD, 2011, p. 20). Enacted through state legislation, the retirement age or pensionable age represents the age at which an individual can claim full pension benefits without incurring actuarial penalty for early retirement. As such, the retirement age represents a strategic element for individuals who manage and plan the end of their work career (indeed the retirement age obviously impacts financial incentives). Likewise, governments have often made the retirement age a central (and controversial) issue in their pension strategy. The OECD has collected data since 1950 and made predictions as far as 2050 about the retirement age. The most interesting findings are as follows:

- The average retirement age has shrunk by approximately 2 years over the second half of the 20th century to 62.5 for men and 61.1 for women
- Current state laws will cause the retirement age to rise to nearly 65 for both sex groups by 2050

Exhibit X: Historical and expected pensionable age in OECD countries



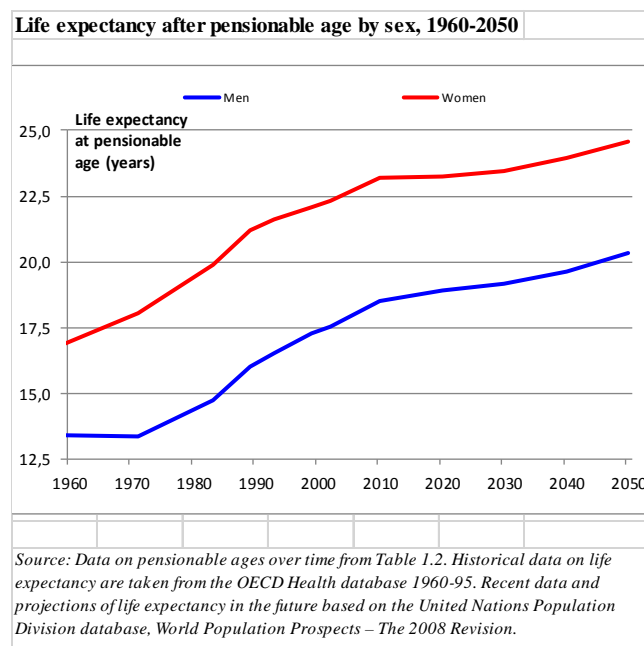
Source: OECD, *Pensions at a glance, 2011*, p. 33

In addition, the above chart shows a drop in retirement age between the years 1990 and 2000. In fact, declines in retirement age until 1993 were in many OECD countries concomitant with rapid rises in

life expectancy. At the start of the 20th century, life expectancy improved notably because of the lower mortality experienced at younger ages (whether at birth, childhood or adulthood). Additionally, during the second half of the century, mortality rates at the time of retirement have also dropped markedly. As a result, over the period spanning from 1960 to 2010, the average life expectancy at 65 for OECD countries rose nearly 4 years for men and 5.4 years for women. It is worthy to note that comparable analytics compiled by the United Nations predict further increases in life expectancy averaging 3.1 and 3.6 years respectively for men and women between 2010 and 2050 (OECD, 2011, p. 27).

In parallel with pensionable age, the OECD has gathered data about life expectancy because retirement age and expectancy are intertwined. Indeed, analytics indicate that the estimated length of retirement has been and continues being impacted by legislated changes in retirement age and steadily rising life expectancy (as populations overall enjoy better living conditions and medical treatment). Historical data notably reveals that life expectancy beyond the age of retirement has grown on average from 13.4 to 17.3 years for men and from 16.8 to 22.1 years for women. Researchers, however, anticipate life expectancy to plateau at 20.3 and 24.6 years respectively for men and women by 2050.

Exhibit XI: Historical and expected life expectancy at pensionable age in OECD countries



Source: OECD, *Pensions at a glance*, 2011, p. 34

A closer look at the above chart reveals that since the 1990s, governments have sought to reverse the trend and have enacted texts aiming at increasing retirement age up to 2050. Governmental official releases indicate in particular that since 1993 14 states have increased or indicated the intention to increase retirement ages for men and 18 for women. As a result, by 2010, average retirement ages had

already increased by 0.5 and 0.8 year for respectively men and women. Moreover, governmental reforms will cause the same metrics to rise to 64.6 and 64.4 years for both sex groups by 2050. Lastly, it is worthwhile to point that trends observed since the 1960s should be carefully interpreted because they not only reflect measures undertaken to increase pension age but also tougher conditions for early retirement and cash flows to beneficiaries. Looking forward, OECD experts anticipate that roughly half of member states will continue to raise pension ages over the next four decades.

Trends in retirement

OECD data indicates that trends in earlier retirement halted for men in the mid-1990s while slightly later for women. Then, a trend for later retirement has been observed in recent years despite the slight impact caused by the global financial crisis. In fact, the percentage of workers aged 55-64 remain flat between 2007 and 2009, compared with declines of 1.7% for the 25-54 year-old tranche and 3.6% for the 20-24 year-old group. In contrast, the 65-69 year old category recorded a slight increase from 21.1% to 22.0% over the same period.

These trends are closely monitored by OECD authorities. Indeed, governmental policies take into account the assumption that individuals will retire later in the future. However, the task of governments in planning and running healthy budgets remain daunting. OECD experts predict that “if life expectancy continues to increase, as most forecasts show, then significant increases in the effective retirement age are required to maintain control of the cost of pensions. In 2050, only an effective retirement age of 66.6 for men and 65.8 for women would leave the duration of retirement at the same level as it is now (based on the United Nations population projections) (OECD, 2011, p. 47).

Incentives to retire

Typical studies of incentives rely on the replacement rate which accounts for the relationship between incomes in and out of work. Nonetheless, it appears that a mere analysis of replacement rates at different ages does not account for the full impact of the pension system on incentives to retire or to remain in work. To be effective, an examination of replacement rates needs to incorporate the effects of unemployment and social-assistance benefits on incentives to work, pension entitlements in the future, and ages at which individuals exit the labor market. As a result, studies commonly evaluate incentives around the notion of “pension wealth” which is the present value of the lifetime flow of pension benefits. Another metric used is the change in pension entitlement from working an additional year. The next table surveys the main features that might impact the decision to exit the labour market.

Exhibit XII: Pension incentives to retire across OECD countries

Pension incentives to retire in different kinds of pension plan				
	Defined benefit	Points	Notional accounts	Defined contribution
Longer working period	Extra year's entitlement	Extra year's entitlement	Extra year's entitlement	Extra year's contributions
	Extra year towards qualifying conditions	Extra year towards qualifying conditions	Extra year towards qualifying conditions	—
	Valourisation of earlier years' earnings	Uprating of pension-point value	Notional interest on accumulated notional capital	Investment returns on accumulated balance
	Higher earnings replace earlier, perhaps lower, earnings in benefit formula	Higher earnings replace earlier, perhaps lower, earnings in benefit formula	—	—
Shorter retirement duration	Forgo a year's benefits	Forgo a year's benefits	Forgo a year's benefits	Forgo a year's benefits
	"Actuarial" adjustment	"Actuarial" adjustment	Lower annuity factor	Lower annuity factor
Delay in claiming	Probability of dying	Probability of dying	Probability of dying	Probability of dying
	Discounting	Discounting	Discounting	Discounting

Source: OECD, *Pensions at a glance, 2011*, p. 52

Data indicates that sharp contrasts between OECD countries regarding pension wealth, which can be twice larger in the group of countries considered enjoying high pension wealth compared to those in the low group. OECD states have sought to address this phenomenon by bettering incentives to work longer over the past 20 years. The main tool used has been to raise the normal pensionable age. Moreover, member countries have enacted tougher qualifying conditions for early retirement (including longer period of contribution), elimination of certain tax incentives, or increments to benefits for late retirement. Overall, it appears that governmental authorities have sought to cut retirement benefits as a means of incentivizing individuals to work longer. This also means that workers entering the labour market today are likely to enjoy significantly lower benefits than workers with the same career history retiring today. Recent statistics support this prediction: "14 out of 20 major pension reforms in OECD countries will cut benefits for average earners, by an average of around 20%" (OECD, 2011, p. 62).

Finances of pension schemes

OECD data reveals that pension contribution rates were largely flat over the past 25 years since the average rate in the 25 OECD states that manage public systems increased from 19.2% in 1994 to 19.6% in 2009 with a peak of 20% reached in 2004. In addition, statistics show that these contributions were equivalent to an average of 5.1% of national income, corresponding to 14.2% of total government revenues generated from taxes and contributions. From the employee perspective contributions raised represent 1.8% of GDP compared to 2.9% of GDP for employers. Furthermore, employees contribute on average 35% of the total while employers account for 57% (the remainder is mainly due to contributions from the self-employed and the unemployed). The next table provides a global view of practices across OECD member states.

Exhibit XIII: Historical public pension contribution rates and revenues across OECD countries

Public pension contribution rates and revenues

	Pension contribution rate (per cent of gross earnings)							Pension contribution revenues, 2008			(per cent of total taxes)	
	1994	1999	2004	2007	2009	Employee 2009	Employer 2009	(per cent of GDP)				
								Employee	Employer	Total		
Australia			Private pension contributions only						0	0	0	0.0
Austria	22.8	22.8	22.8	22.8	22.8	10.3	12.6	3.5	3.8	8.0	18.9	
Belgium	16.4	16.4	16.4	16.4	16.4	7.5	8.9	2.3	2.0	4.7	10.7	
Canada	5.2	7.0	9.9	9.9	9.9	5.0	5.0	1.3	1.3	2.8	8.3	
Chile			29.8	29.8	29.8	28.8	1.0					
Czech Republic	26.9	26.0	28.0	32.5	28.0	6.5	21.5	1.8	6.0	8.3	22.2	
Denmark			Private pension contributions only						0.0	0.0	0.0	0.0
Estonia			35.0	22.0	22.0	2.0	20.0					
Finland	18.6	21.5	21.4	20.9	21.6	4.5	17.1	1.6	7.1	9.1	21.2	
France	21.5	16.7	16.7	16.7	16.7	6.8	9.9					
Germany	19.2	19.7	19.5	19.9	19.9	10.0	10.0	2.6	3.0	6.6	18.2	
Greece	20.0	20.0	20.0	20.0	20.0	6.7	13.3	3.1	3.7	7.9	24.7	
Hungary	30.5	30.0	26.5	29.5	33.5	9.5	24.0	1.1	5.8	6.8	17.3	
Iceland			No separate pension contribution									
Ireland			No separate pension contribution									
Israel			6.1	6.2	6.9	3.9	3.1					
Italy	28.3	32.7	32.7	32.7	32.7	9.2	23.8	2.1	6.5	8.6	19.9	
Japan	16.5	17.4	13.9	14.6	15.4	7.7	7.7	2.9	2.9	5.8	20.4	
Korea	6.0	9.0	9.0	9.0	9.0	4.5	4.5	1.5	1.0	2.5	9.3	
Luxembourg	16.0	16.0	16.0	16.0	16.0	8.0	8.0	2.6	2.4	6.0	16.5	
Mexico			Private pension contributions only						0.0	0.0	0.0	0.0
Netherlands	17.9	17.9	17.9	17.9	17.9	17.9	0					
New Zealand			No contributions						0.0	0.0	0.0	0.0
Norway			No separate pension contribution									
Poland		19.5	19.5	19.5	19.5	9.8	9.8	3.6	2.7	7.7	22.1	
Portugal			No separate pension contribution									
Slovak Republic	28.5	27.5	26.0	24.0	18.0	4.0	14.0	0.8	2.3	4.1	13.8	
Slovenia			24.4	24.4	24.4	15.5	8.9					
Spain	29.3	28.3	28.3	28.3	28.3	4.7	23.6	1.3	6.8	9.0	24.2	
Sweden	19.1	15.1	18.9	18.9	18.9	7.0	11.9	2.6	3.7	6.4	13.3	
Switzerland	9.8	9.8	9.8	9.8	9.8	4.9	4.9	2.7	2.7	5.9	20.3	
Turkey	20.0	20.0	20.0	20.0	20.0	9.0	11.0	1.1	1.1	2.2	9.3	
United Kingdom			No separate pension contribution									
United States	12.4	12.4	12.4	12.4	12.4	6.2	6.2	2.3	2.3	4.6	16.3	
OECD34	19.2	19.3	20.0	19.8	19.6	8.4	11.2	1.8	2.9	5.1	14.2	
Other major economies												
Argentina			28.0	23.7	23.7	11.0	12.7					
Brazil			31.0	31.0	31.0	11.0	20.0					
China			28.0	28.0	28.0	8.0	20.0					
India			24.0	24.0	24.0	12.0	12.0					
Indonesia			6.0	6.0	6.0	2.0	4.0					
Russian Federation			28.0	26.0	26.0	0.0	26.0					
Saudi Arabia			18.0	18.0	18.0	9.0	9.0					
South Africa			No contributions									
EU27			23.8	23.3	22.5	7.9	14.0					

Note: All figures are rounded to one decimal place. The OECD average figure for contribution rates excludes the countries for which there are no pension contributions or they are part of contributions to wider social security programmes. The OECD average figure for contribution revenues includes zero for the countries with no contributions in the calculation.

In some cases, pension contribution revenues have been calculated assuming that the revenues are split between different social security programmes in the same proportion as the contribution rates. The total contribution includes payments from people who are not employed (principally the self-employed).

Finland: contribution rates are now higher for employees aged 53 and over. There is an additional levy on employers that varies between 0.8% and 3.9% of payroll, depending on the employer's capital. France and the Netherlands: it is not possible to separate the contribution revenues into those for pensions and for other purposes. Poland: the contribution rate for pensions was cut by 3 percentage points in July 2007; the earlier, higher figure is shown.

Source: OECD (various years), Taxing Wages; OECD (2008), Revenue Statistics; Social Security Administration, United States (various years), Social Security Programs throughout the World; OECD pension and tax models.

Source: OECD, Pensions at a glance, 2011, p. 153

Overall, OECD statistics indicate that public expenditures on cash old-age pensions and survivors' benefits expanded 15% faster than the growth in national income between 1990 and 2007, from an average of 6.1% of gross domestic product (GDP) to 7.0%. In fact, public pensions typically account

for the largest single item of government expenditure, accounting for 17% of total government spending on average.

When considering the details, we notice that spending was a relatively constant percentage of GDP over the period 1990-2007 in six countries, namely, Belgium, Canada, Ireland, Spain, Sweden and the United States. In five countries, public pension spending swelled more slowly than national income. In the particular case of New Zealand, the drop of more than 40% mirrors two policies: freezing the value of the basic pension in 1992-94 and increasing pension age from 60 to 65. The next table shows trends across all OECD member states. The subsequent two graphs illustrate the overall trend in the old-age dependency ratio vs. public expenditure and the gross vs. net public pension expenditure for the year 2007. In both analyses, we notice that Italy is an outlier.

Exhibit XIV: Size of public pension expenditure for OECD countries

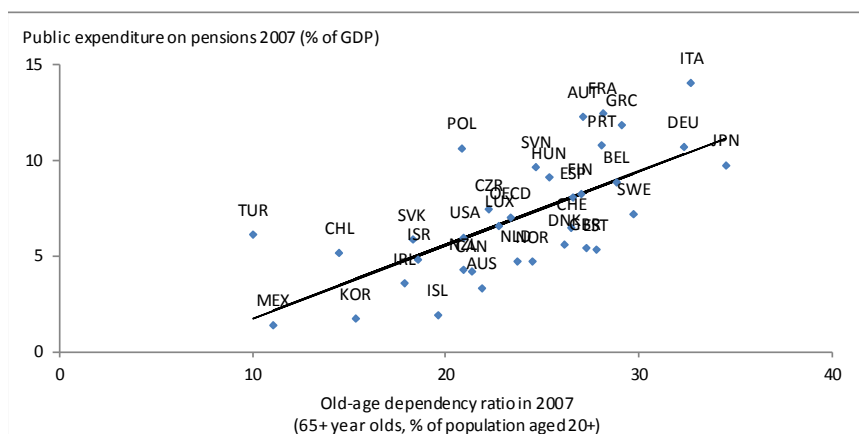
Public expenditure on old-age and survivors benefits

	Public expenditure on cash benefits for old-age and survivors									Total inc. non-cash (% of GDP)
	Level (% of GDP)					Change (%)	Level (% of total government spending)		Level in net terms (% of GDP)	
	1990	1995	2000	2005	2007		1990	2007		
Australia	3.0	3.6	3.8	3.3	3.4	11.2	8.6	10.1	3.3	4.5
Austria	11.4	12.3	12.3	12.5	12.3	7.8	22.1	25.3	10.6	12.7
Belgium	9.1	9.4	8.9	9.0	8.9	-2.9	17.4	18.3	8.0	9.0
Canada	4.2	4.7	4.3	4.2	4.2	-1.2	8.5	10.6	3.9	4.2
Chile		6.9	7.5	5.9	5.2					5.2
Czech Republic	6.1	6.3	7.5	7.3	7.4	21.8		17.5	7.4	7.7
Denmark	5.1	6.2	5.3	5.4	5.6	8.6	9.2	10.9	4.1	7.3
Estonia			6.0	5.3	5.2			15.2		5.3
Finland	7.3	8.8	7.7	8.4	8.3	13.3	15.1	17.5	6.8	9.2
France	10.6	12.0	11.8	12.3	12.5	17.5	21.5	23.9	11.7	12.8
Germany	9.0	10.7	11.2	11.5	10.7	19.1		24.5	10.4	10.7
Greece	9.9	9.6	10.7	11.7	11.9	20.9		26.3		12.0
Hungary			7.4	8.6	9.1			18.3		9.6
Iceland	2.2	2.4	2.2	2.0	1.9	-14.7		4.5	1.8	2.3
Ireland	3.9	3.5	3.1	3.4	3.6	-7.7	9.0	9.7	3.4	3.9
Israel		4.7	4.9	5.1	4.8			10.7		5.0
Italy	10.1	11.3	13.6	14.0	14.1	38.9	19.1	29.4	12.4	14.1
Japan	4.9	6.1	7.4	8.7	8.8	80.5		27.0	8.4	10.1
Korea	0.7	1.2	1.4	1.5	1.7	130.5	3.7	5.7	1.7	1.9
Luxembourg	8.2	8.8	7.5	7.2	6.5	-19.8	21.6	18.1	5.9	6.6
Mexico	0.5	0.7	0.9	1.2	1.4	202.0		7.2	1.4	1.4
Netherlands	6.7	5.8	5.0	5.0	4.7	-29.8	12.2	10.4	4.1	5.5
New Zealand	7.4	5.7	5.0	4.3	4.3	-41.8	14.0	10.9	3.5	4.3
Norway	5.6	5.5	4.8	4.8	4.7	-16.6		11.4	3.8	6.5
Poland	5.1	9.4	10.5	11.4	10.6	107.0		25.2	9.7	10.7
Portugal	4.9	7.2	7.9	10.3	10.8	119.8			10.2	10.8
Slovak Republic		6.3	6.3	6.2	5.8			17.0	5.8	6.2
Slovenia			10.6	9.9	9.6			22.7		9.7
Spain	7.9	9.0	8.6	8.1	8.0	1.5		20.5	7.4	8.5
Sweden	7.7	8.2	7.2	7.6	7.2	-6.8		14.1	5.3	9.5
Switzerland	5.6	6.7	6.6	6.8	6.4	14.2	18.6	19.9		6.7
Turkey	2.4	2.7	4.9	5.9	6.1	159.2				6.2
United Kingdom	4.8	5.4	5.3	5.6	5.4	11.0	11.6	12.0	5.1	5.9
United States	6.1	6.3	5.9	5.9	6.0	-1.5	16.4	16.3	5.6	6.0
OECD	6.1	6.7	6.9	7.1	7.0	14.5		16.5	6.2	7.4

Note: See Adema, W. and M. Ladaïque (2009), "How Expensive is the Welfare State? Gross and Net Indicators in the OECD Social Expenditure Database (SOEX)", Social, Employment and Migration Working Paper No. 92, OECD Publishing, Paris for more details on the data, sources and methodology.

Source: OECD Social Expenditures database (SOEX); OECD Main Economic Indicators database.

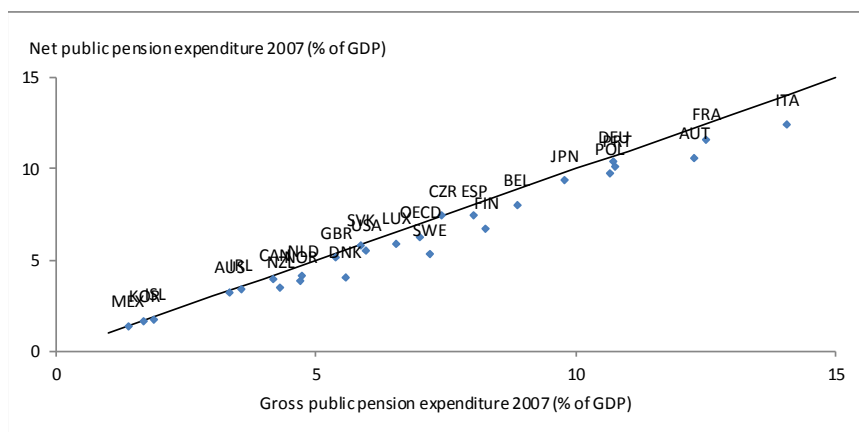
Demographic pressures and public pension expenditure



Note: regression line is pension expenditure = -2.091 (1.908) + 0.3835 (0.07814) x dependency ratio, where heteroskedasticity adjusted standard errors are given in parentheses. The coefficient on the dependency ratio is significant at the 1% level and the R2 of the regression is 0.4670.

Source: OECD Social Expenditures database (SOCX); United Nations, World Population Prospects – The 2008 Revision.

Gross and net public pension expenditure



Note: the chart shows a 45° line. See Adema, W. and M. Ladaïque (2009), “How Expensive is the Welfare State? Gross and Net Indicators in the OECD Social Expenditure Database (SOCX)”, Social, Employment and Migration Working Paper No. 92, OECD, Paris for more details on the data, sources and methodology.

Source: OECD Social Expenditures database (SOCX).

Source: OECD, Pensions at a glance, 2011, p. 155

Furthermore, the above graphs reveal that on average private pension schemes' payments were equivalent to 1.6% of GDP in 2007 in the 25 OECD countries for which data are available. Alternatively, these retirement benefits represent roughly 20% of total public spending. Another interesting trend is that private-pension benefits grew 23% faster than GDP between 1990 and 2007, which is also faster than public pension spending. Moreover, trends differ depending on status (public vs. private) and tax treatment. Interestingly, there is a rapid growth in private pension entitlements resulting from the fact that successive generation of retirees has spent longer on average covered by

private pensions. Additionally, a large proportion of member states propose a favorable tax treatment incentive made through private pension plans in the form of contributions being fully or partially deductible from income-tax liabilities and investment returns being fully or partially relieved from tax.

The cost of these fiscal incentives is quantified in OECD countries using the concept of “tax expenditures,” which compares preferential tax treatment to a benchmark tax treatment. The rationale is that this represents the amount the government would have to fund as a subsidy (a direct expenditure) to achieve the same effect. However, tax expenditure figures bring important caveats: they are not comparable between countries because of differences in the benchmark tax system chosen. The data shown in the far-right column in the next table attempts to circumvent such a caveat.

Exhibit XV: Pension benefit expenditures for public and private schemes across OECD countries

Scheme type		Benefit expenditure of private pension schemes					Change (%)	Public and private benefit spending (% of GDP)	Tax breaks for private pensions (% of GDP)
		Level (% of GDP)							
		1990	1995	2000	2005	2007 ¹			
Australia	v		1.8	2.9	1.9	1.9		5.3	2.7
Austria	v	0.4	0.4	0.5	0.5	0.5	22.4	12.8	0.1
Belgium	v	1.0	1.7	2.0	3.5	3.7	261.2	12.6	0.1
Canada	v	2.6	3.5	4.0	4.3	4.1	58.4	8.2	2.0
Chile	m		1.0	1.1	1.3	1.1		6.3	
Czech Republic	m	a	a	0.2	0.2	0.2		7.7	0.1
	v	a	0.0	0.0	0.0	0.1			
Denmark	q/m	1.5	1.8	2.0	2.3	2.2	41.2	7.7	
Estonia								5.2	
Finland	v	0.1	0.4	0.3	0.2	0.2	154.3	8.5	0.1
France	m	0.2	0.1	0.2	0.2	0.2	10.6	12.8	0.0
	v	0.1	0.1	0.1	0.1	0.1	162.8		
Germany	v	0.6	0.7	0.8	0.8	0.8	24.1	11.5	0.8
Greece	v	0.4	0.4	0.5	0.4	0.4	6.9	12.3	
Hungary								9.1	
Iceland	v	1.4	1.8	2.3	2.8	3.0	113.5	4.9	1.0
Ireland	v	0.9	1.1	1.0	1.0	0.9	0.9	4.5	1.2
Israel								4.8	
Italy	m	2.7	3.1	1.2	1.1	1.2	-57.1	15.5	0.0
	v	0.3	0.2	0.2	0.2	0.2	-22.1		
Japan	m	0.2	0.3	0.5	a	a		11.7	0.7
	v	a	a	3.0	2.3	2.9			
Korea	v	m	0.0	0.0	0.0	0.0		1.7	
Luxembourg	v	a	a	a	0.6	0.5		7.0	0.5
Mexico								1.4	0.2
Netherlands	m	a	0.0	0.0	0.0	0.0		10.0	
	q	3.9	4.7	4.8	5.2	5.2	34.8		
New Zealand								4.3	
Norway	v	0.6	0.6	0.6	0.6	0.6	2.7	5.3	0.6
Poland								10.6	0.2
Portugal	v	0.3	0.3	0.4	0.6	0.5	58.8	11.3	0.1
Slovak Republi	v	a	0.1	0.2	0.4	0.5		6.3	0.2
Slovenia								9.6	
Spain								8.0	0.2
Sweden	q/m	1.2	1.9	1.8	2.1	2.1	72.8	9.3	
Switzerland	m	3.2	4.9	5.8	6.0	6.0	88.7	12.4	
	v	0.0	0.0	0.0	0.0	0.0	23.5		
Turkey								6.1	
United Kingdo	v/m	4.3	5.2	6.1	4.8	4.5	6.2	9.9	1.2
United States	v	2.7	3.1	3.8	3.8	4.3	61.0	10.3	0.8
OECD34		1.3	1.4	1.5	1.6	1.6	23.3	8.4	0.6

Note: m = Mandatory private scheme, q = Quasi mandatory; and v = Voluntary.

1. Data for Australia, Canada and Chile are from 2005.

2. Data for Iceland, Norway, Poland and the United Kingdom are from 2005. See Adema, W. and M. Ladaique (2009), "How Expensive is the Welfare State? Gross and Net Indicators in the OECD Social Expenditure Database (SOCX)", Social, Employment and Migration Working Paper No. 92, OECD Publishing, Paris for more details on the data, sources and methodology.

Source: OECD Social Expenditures Database (SOCX) ; OECD Main Economic Indicators Database.

Source: OECD, Pensions at a glance, 2011, p. 157

Demographic trends

This final sub-section aims at providing a brief overview of demographic trends observed across OECD countries. First, the total fertility rate is short of the replacement level (i.e. the number of children needed to keep the total population constant) in 29 out of 34 OECD countries over the 2005-2010 period. Few exceptions include Israel and Mexico (with 2.8 and 2.2 children per woman, respectively) and Iceland, Turkey and the United States (at replacement level of 2.1). Nonetheless, in more than two-thirds of OECD countries there has been a slight rise in fertility rates over the past 10 years. In contrast, fertility rates averaged 1.69 across OECD countries in the period 2005-10, well below the level that ensures population replacement. The trend to fewer children has been going on since the 1970s. The drop in fertility rates reflects changes in both individuals' lifestyle preferences and in the constraints of everyday living, such as labour-market insecurity, difficulties in finding suitable housing and unaffordable childcare. Other factors influence the decision to raise children. Women express clearly the number of children they wish to have. Marital status has also evolved. Experts suspect that fertility rates fell further in countries such as Japan and Korea due to the larger proportion of women that are unmarried. Marital status is also believed to have been influential across Europe notably in France, Iceland, Norway and Sweden where nearly half or more of births now take place outside marriage. In consequence, fertility rates have a profound implication for pension systems because they, along with life expectancy, are the drivers of population ageing (OECD, 2011, p. 162).

Second, as discussed previously, sustainable increase in life expectancy has a profound impact on demographic trends. At the end of the 2005-2010 period, life expectancy was on average 76.1 and 81.8 years respectively for men and women. For women, the highest numbers were recorded in Japan (86.2 years), then France, Switzerland Italy and Spain whereas highest numbers for men were registered in Iceland (80.2 years), Switzerland, Australia, Japan and Sweden. Moreover, demographics experts anticipate that gender gaps in the longevity of older people will remain relatively flat in relative terms but increase in absolute terms in the foreseeable future despite significant variation between OECD countries. For example, women in Japan are expected to live another 27.3 years on reaching age 65 in 2045-50 whereas counterparts in Turkey are expected to live an extra 19.2 years over the same period. Lastly, by and large, improvements in longevity result not only from rising living standards but also from better access to quality health services. However, improvements have been smaller among people from lower socio-economic groups (OECD, 2011, p. 164).

As an overall conclusion for this section, we would like to stress on the following points. An ageing population poses significant difficulties for organizations, governments and society as a whole. Decision-makers need to plan and anticipate living conditions, consumption patterns, or financial needs for a growing number of elderly dependents. Additionally, demographic trends have a profound

impact on the population age structure across Europe. Notably, pensionable age, life expectancy and fertility significantly affect the viability of pension systems. Moreover, experts anticipate that trends in life expectancy, fertility and coupled with migration will dramatically transform the EU age structure: although the size of the population is expected to be slightly larger by 2060 (and reach c. 517 million individuals), the population will be much older. When considering detailed trends, experts expect the 15-64 year old group to decline 14% whereas the 65 and above group to grow very markedly over the same period (European Commission, The 2012 Ageing Report, p. 27). The immediate consequence is that the old-age dependency ratio is expected to jump from 26% to 52.5% across the EU region (which corresponds to going from having four working-age individuals for every individual aged over 65 years to only two working-age individuals).

It appears evident that a rapidly ageing population creates significant challenges in funding pension systems. Policy-makers need to anticipate not only higher public expenditures (roughly 1.6% of GDP today to about 13% of GDP in 2060) but also sharp contrasts across member states. Although a large number of states have introduced pension reforms by enacting the increase of the retirement age, other initiatives are needed to control budget. For instance, eligibility requirements have been tightened in several states and incentives to retire later are becoming popular. As a result, demographics experts posit that “pension policies in a majority of EU Member States will lead to a containment of the increase in old-age and early pensions spending through: (i) reducing the generosity of public pension schemes to make these programmes financially more sustainable in view of the demographic trends, (ii) pushing up the retirement ages, including the statutory retirement age, in a gradually phased way for old-age pensions, and (iii) restricting access to early retirement schemes” (European Commission, The 2012 Ageing Report, p. 39)

The next section presents pension funds and pension fund industry players. We will notably discuss contrasts between public vs. private entities.

1.2: Overview of pension funds

In order to fund the payment of pension benefits, contributions paid by employers and employees are commonly transferred to a third party which act on behalf of beneficiaries. In practice, pension benefits are funded through pension funds or pension insurance contracts. On the one hand, “pension funds can be defined as a pool of assets ring-fenced from the sponsor, with the overarching purpose of protecting the pension rights of employees from the possible failure of the sponsor” (EDHEC-Risk Institute, 2011). As such, pension funds take the form of either a special purpose entity with legal personality (such as a trust, foundation, or corporate entity) or a legally separated fund without legal personality managed by a dedicated provider (pension fund management company) or other financial institution (OECD, 2005). On the other hand, pension benefits can be funded via pension insurance contracts that stipulate contributions to an insurance undertaking in exchange for which the pension plan benefits will be paid when the members reach a specified retirement age or on earlier exit of members from the plan. It is noteworthy to know that most countries limit the integration of pension plans only into pension funds, as the financial vehicle of the pension plan. Other countries also consider the pension insurance contract as the financial vehicle for pension plans (OECD, 2005). Other distinctions that commonly characterize entities has to do with whether a fund is open or closed (i.e. membership is restricted to certain employees) and a fund is single or multi-employer (i.e. the pension fund pool the assets of pension schemes created by different sponsors) (OECD, 2005). Typically, single-employer funds are established as dedicated corporate pension plans through which employees and sponsor make contribution with the latter has responsibility for any shortfall (in case of defined benefit pension schemes). Single-employer funds are popular in the United Kingdom and across Europe whereas multi-employer funds are predominant in Northern Europe especially in the Netherlands. Such funds are established by firms, unions, or trade associations, result from collective agreements between social parties, and require contributions from employees and sponsors who both may be responsible for any shortfall.

Lastly, a pension fund is a legal entity independent of the sponsor and as such can be registered on the one hand as a trust/foundation or a corporate entity (and thus enjoys a legal personality) or on the other hand as a dedicated provider or another type of financial institution (and thus does not enjoy a legal personality). Across Europe, trusts (especially in the United Kingdom) and foundations (especially in the Netherlands) are the most common forms adopted by pension funds with legal personality. Furthermore, in the below paragraphs, we consider important features of pension funds including governance, risks, investment strategy, and reporting.

Pension fund governance

In order to achieve their overarching goal, pension funds ought to be managed following strict governance rules. The responsibility for managing pension assets usually falls on a “board made up of

the sponsor, employee representatives (provided that employees contribute to the fund), the financial institution that manages the plan, and an independent adviser (typically the pension actuary)” (EDHEC-Risk Institute, 2011). Because pension assets are ring-fenced (therefore do not belong to the sponsor) they are segregated into a trust which is administrated by a pension committee or trustee. The pension committee “must act in the sole interest of members,” and its role is to guarantee that a number of obligations are executed, such as membership of eligible workers, payment of contributions, design of an investment policy, selection and monitoring of financial professionals, and proper dissemination of information to interest parties. Pension literature emphasizes on the fact that the board is legally obliged to employ the degree of prudence, diligence and skill that a reasonable party would use in similar conditions (again in the best interests of beneficiaries). The same literature furthermore prescribes that board members must avoid conflicts of interest, are prohibited against receiving fees or advantages (especially in relation to the fund’s investment activities) or benefiting from the use of pension assets. Last but not the least, board members are typically jointly and severally responsible for the fund’s decisions, which means that any board member could be prosecuted or held responsible for the wrongdoing of other board member(s). It is therefore advisable for pension trusts to provide trustees with some form of personal liability insurance.

Because board members may not hold the expertise required to manage pension assets, certain duties may be transferred to others. Through a mandate, the pension committee can grant power to a third party in order to represent the committee and fulfill a set of duties (for example, a representative acting on behalf of employees may exercise this power through a mandate). Through a service contract, a third party would be hired in order to carry a specific set of activities without enjoying the power to act on behalf of the pension committee (for instance, a pension actuary would sign a service contract). Additionally, through delegation the pension committee can transfer duties to a third party that agrees to bear the same obligations and incur the same liability as the pension committee. In case a third party (whether linked via a mandate or a service contract) can enjoy some degree of discretionary power (i.e. the ability to act or make a decision without prior approval from the pension committee), this third party is deemed to act as a delegate. In any case, regardless of the type of relationship that links the third party to the pension fund, the pension committee has the obligation to check the third party’s professional credentials, delineate specific tasks to be performed, and continuously monitor progress.

To conclude this brief section on governance and before discussing risks inherent to pension funds, we believe that it is important to comment a recent attempt to revisit the concept of fiduciary duty. In fact, Waitzer and Sarro (2013) argue that “as society faces governance challenges, there is a growing recognition that we need to take a longer-term and more systemic view of fiduciary obligations. This challenge is particularly acute in financial services sector organizations such as pension funds” (Waitzer and Sarro, 2013). Relying on several pronouncements made by the Supreme Court of Canada, the law professor and his student demonstrate that pension fund trustees have fiduciary duties

of care, loyalty, impartiality, to inform and educate, and to consult. At the end of their analysis, Waitzer and Sarro (2013) make a striking but compelling conclusion:

It is imperative to move beyond a focus on portfolio-level benefits to a consideration of systemic effects – considering how investment can be used to create better markets tomorrow, rather than simply “beating the market” today. This means taking into consideration how investment decisions will affect the stability of financial systems, the direction of the economy, and the sustainability of our environment. Put differently, the fact that an investment decision may produce positive relative financial returns over the short term (in which performance management is typically measured) has no bearing on whether such an investment will yield benefits to current or future pension beneficiaries. [...] It is in this context that pension trustees become “public” fiduciaries. Given the mission, size, and systemic significance of pension funds, this suggests a “duty to collaborate” (and consequent behavioral shifts), going beyond seeking cost advantages to the heart of effecting systemic reform.

This is a fascinating approach which contrasts sharply with a view recently adopted by the international accounting standard-setter. Indeed, in a later section, we explain that the recent revision of the accounting of pension plans has focused on short-term metrics (especially in regards to the determination of discount rates used in the valuation of pension liabilities).

Risks faced by pension funds

Pension funds are exposed to a wide range of risks in conducting their activities. According to a document¹⁰ jointly produced by OECD and IOPS (which stand for International Organization of Pension Supervisors), a pension fund, its sponsor, or a third party contractually or legally linked to the pension fund may be exposed to (OECD/IOPS, 2011):

- Investment or market risk: risk of losses due to adverse movements in interest rates and other market prices
- Counterparty default / credit risk: risk of loss from the failures of a counterparty to meet its obligations
- Funding and solvency risks: the risk that a pension fund does not have sufficient assets to meet its liabilities, and the risk of insolvency in the plan sponsor affecting its ability to fund the plan
- Liquidity risk: the risk that an entity will not be able to meet its financial obligations as they fall due for lack of fungibility

¹⁰ Entitled OECD/IOPS Good Practices for Pension Funds' Risk Management Systems, the document outlines the main features of risk management systems which pension funds implement. A draft version of the document was opened for public comments between July and September 2010. Moreover, the document provides guidance for pension fund regulators and supervisors in assessing the efficiency of systems put in place by pension funds.

- Asset-liability mismatch risk: risk arising from insufficient assets to meet liabilities, which may arise from, for example, adverse market movements having a differential effect on assets and liabilities
- Actuarial risk: risk arising from inappropriate actuarial valuation methods and assumptions (e.g. mortality, longevity, disability, inflation, liquidity etc.)
- Governance and agency risks: risks which could otherwise be described as ‘competition risk’ or ‘competition failure’. Issues include excessive fees, conflicts of interest, etc
- Operational and outsourcing risks: the risk of losses resulting from inadequate or failed internal processes, people and systems, including IT systems, as well as the risks related to the outsourcing of business activities
- External and strategic risk: these are the inherent risks with regard to the sensitivity of the fund to external factors (such as political risk, demographics, competition, technology, reinsurance, mergers, plan sponsor risk, political stability, natural disasters, etc.)
- Legal and regulatory risk: the likelihood of adverse consequences arising from the failure to comply with all relevant laws and regulations
- Contagion and related party / integrity risk: risks arising as a result of close association with another entity – the risks may be direct through financial exposure or indirect through reputation damage

This list is rather exhaustive and describes well the risks borne by pension funds. We need, however, to stress on risks that we believe pension fund trustees and pension funds professionals ought to pay particular attention. In reference to a survey performed by EDHEC-Risk Institute (2011) during which hundred sponsors and pension funds were polled across Europe, accounting risk (defined as the increase in the reported cost of pensions), economic risk (viewed as additional cash contributions to the pension fund) and reputation risk (arising when bad reputation follows news of shortfalls) are perceived by respondents as the most critical risks faced by pension funds. In response to the largely-unanticipated collapse of financial behemoths (such as Enron or United Airlines), supervisory authorities have envisioned and enacted more transparent accounting rules. This focus on transparency has crystallized into “marked-to-market valuations for pension assets and the discounting of pension liabilities at an AA corporate rate,” ultimately causing sponsors to disclose higher pension obligations (EDHEC-Risk Institute, 2011). Although changes in accounting rules will be discussed in further details in a later section, it appears that these changes have a significant impact on how pension funds and sponsors apprehend risk management (Demaria et al., 2012; Sandu, 2012).

Investment strategy

Risk management and investment strategy are highly intertwined for pension funds. An optimal asset allocation, probably one the most visible aspects of a fund’s investment strategy, can only be achieved

provided that a risk management system is in place and allows funds to monitor investment risk and adopt the necessary actions to correct difficulties. As a matter of fact, OECD and IOPS jointly recommend that “pension funds should have a written policy in place, covering at a minimum strategic asset allocation, performance objectives, any broad decisions regarding tactical asset allocation, and trade execution” (OECD/IOPS, 2011). Furthermore, the institutions indicate that such an investment policy would comprise investment objectives, asset allocation, diversification rules, liquidity requirements, valuation methodology, Asset-Liability Management (or ALM) objectives, control procedures, reporting protocol, and leverage tolerance (if appropriate). In particular, asset allocation and ALM appear fairly connected in practice. In fact, OECD and IOPS state that “detailed analysis and management of this asset/ liability relationship will therefore be a pre-requisite to the development and review of investment policies and procedures which seek to ensure that the pension fund adequately manages the investment-related risks to its solvency” (OECD/IOPS, 2011). Amid the recent global financial crisis, marked by record low interest rates and a fast-evolving geopolitical environment (EU debt crisis, Arab spring, terrorism, to name a few), risk management models used by pension funds have revealed their weaknesses. Changes in accounting rules and regulations have caused pension funds professionals to revisit their traditional ALM strategies and explore new models such as Liability-Driven Investment (or LDI). We overview these models in the next paragraphs.

As described previously, the overarching goal of a pension fund is to protect the interest of beneficiaries. One of the most practical aspects of fulfilling this goal is the payment of pension benefits at regular intervals in time. To finance the payment of pension benefits, a pension fund manages pension assets by simultaneously attempting to satisfy pension liabilities. As such, in its broadest sense, ALM represents the process of managing risks that result from mismatches between assets and liabilities. Specifically, Blome *et al.* (2007) indicates that “ALM is a financial risk assessment and asset planning tool used by pension funds to help them choose the strategic pension policy under uncertainty in a coherent and consistent balance sheet approach. ALM involves developing mathematical scenarios of the future evolution of pension fund assets and liabilities, given certain assumptions about the statistical properties of economic, financial and biometric variables that affect the evolution of assets and liabilities.” Although ALM techniques may take multiple forms to meet pension funds’ specific needs and constraints, we review here the basic techniques used in ALM: cash-flow matching, immunization, surplus optimization, and Liability-Driven Investment (or LDI).

Cash-flow matching is made possible when cash flows from pension assets perfectly match with pension liabilities. In practice, this means that pension assets would deliver the cash flows required to pay monthly pension benefits: a portfolio made up of zero-coupon bonds would permit to meet the regular pension commitments. Although this technique is simple, it brings a number of limitations. Pension obligations are determined by a set of evolving parameters including financial (e.g. discount

rate) and actuarial assumptions (e.g. worker turnover) or demographics. In addition, regulations typically require pension benefits to be somehow inflation-adjusted (indexation¹¹ is in fact mandatory at a large extent). It appears virtually impossible to find securities that possess these characteristics. Besides, fixed-income securities pay coupons, which leads to the issue of reinvesting the coupons. To partly address this issue, pension funds can rely on synthetic instruments such as interest rates or inflation swaps. Moreover, immunization allows circumventing the interest rate risk (and reinvestment risk) that arise from the imperfect match between pension assets and liabilities. Immunization builds on the concepts of duration¹² and convexity¹³ and requires to determine the duration of promised cash outflows (pension benefits) and to invest in a portfolio of fixed-income securities that enjoys identical duration. As a result, immunization permits to manage the mismatch between assets and liabilities in a dynamic manner. The technique, however, suffers few limitations. First, immunization requires that fixed-income securities will not default nor be called before maturity (in practice, to account for this or embedded options, asset managers rely on effective duration). Second, to be effective immunization assumes that the yield curve is horizontal and that any shifts in it will be parallel (Sharpe *et al.*, 1999). Once more, in practice, the yield curve does not behave as predicted by models (in fact, short-term securities tend to exhibit greater volatility than longer term instruments), causing the asset manager to implement the so-called cash matching (which is however difficult to implement). Third, with the passage of time, immunization requires asset managers to sell some components of the portfolio and replace those in order to maintain the duration of expected cash flows. “Rebalancing” a portfolio generate transaction costs that may offset potential gains.

Cash-flow matching and immunization techniques therefore seek to eliminate the risk of mismatch between assets and liabilities. The disadvantage with this approach is that these techniques also eliminate the potential for return. Indeed, “we can say that the cash-flow matching approach in asset-liability management is the equivalent of investing in the risk-free asset in an asset management context. [...] However, the lack of return, related to the absence of risk premia, makes this approach very costly, which leads to an unattractive level of contribution to the assets” (EDHEC-Risk Institute, 2006). In order to stimulate pension assets’ return, it becomes indispensable to formulate an asset allocation policy and consider investing in various asset classes (in addition to low-risk-and-low-return fixed income securities) which are ideally correlated with pension liabilities. Surplus optimization techniques need therefore to provide the best compromise between risk and return while

¹¹ The method with which pension benefits are adjusted to take into account changes in the cost of living (e.g. prices and/or earnings) (OECD, 2005).

¹² A measure of the average maturity of the stream of payments generated by a financial asset. Mathematically, it is a weighted average of the lengths of time until the asset’s remaining payments are made. The weights in this calculation are the proportion of the asset’s total present value represented by the present value of the respective cash flows (Sharpe *et al.*, 1999, p. 912).

¹³ The tendency for bond prices to change asymmetrically relative to yield changes. Typically, for a given yield change, a bond will rise in price more if the yield change is negative than it will fall in price if the yield change is positive (Sharpe *et al.*, 1999, p. 910).

integrating pension liabilities' specific constraints (for inflation, indexation, interest rate, actuarial or demographic elements). Asset managers employ stochastic models to design and run surplus optimization techniques. Advantages and pitfalls of these techniques are summarized as follows: “one of the appealing features of surplus optimization models is that they can handle important practical issues such as transaction costs, multiple state variables, and market incompleteness stemming from uncertainty in liability streams and not spanned by existing securities, taxes and trading limits, regulatory restrictions, and corporate policy requirements. On the other hand, these features come at the cost of tractability. Analytical solutions are not possible, and stochastic programming models must be solved via numerical optimization (EDHEC-Risk Institute, 2009). Another problem with surplus optimization is that the introduction of risky assets which are not perfectly correlated with pension liabilities.

Lastly, in contrast to surplus optimization techniques (in which the best compromise between risk and return is sought after simultaneously), the LDI approach combines two strategies: one based on risk management (notably immunization) in which portion of the pension assets is invested in a liability matching portfolio or liability hedging portfolio (or LHP), and one based on performance generation in which pension assets are invested in a performance seeking portfolio (or PSP). This approach complies with the separation theorem¹⁴, allows the use of leverage and permits to construct “a dynamic, as opposed to static, allocation between the liability-matching portfolio and the performance-seeking portfolio (leading to the so-called contingent immunization or optimization) (EDHEC-Risk Institute, 2009). The below table summarizes the ALM techniques discussed above.

¹⁴ A feature of the capital asset pricing model that states that the optimal combination of risky assets for an investor can be determined without any knowledge about the investor's preferences toward risk and return (Sharpe *et al.*, 1999, p. 928).

Exhibit XVI: Overview of ALM and corresponding asset management techniques

Risk/Return Profile	Asset Management (absolute risk)	Asset-Liability Management (relative risk)
Zero risk - no access to risk premia	Investment in risk-free asset	Cash-flow matching and/or immunisation
Optimal risk-return trade-off	Optimally diversified portfolio of risky assets	Optimisation of the surplus
Fund separation theorem	Capital market line (static mix of cash and optimal performance-seeking risky portfolio)	LDI solution (static mix of cash, liability-matching portfolio and optimal risky portfolio)
Dynamic and skewed risk management (non-linear payoffs)	Portfolio insurance (dynamic mix of risk-free asset and optimal risky portfolio)	Dynamic LDI (also known as contingent immunisation)

Source: EDHEC-Risk Institute, Impact of regulations on the ALM of European pension funds, 2009, p. 79

From a practical standpoint, pension funds typically hedge pension liabilities through the liability hedging portfolio (or LHP) based on replication and using mainly inflation-linked securities and interest rate swaps. To improve return, pension funds build the performance seeking portfolio (or PSP) and select market indices as benchmarks for the various asset classes. The next table shows results of a survey conducted by EDHEC-Risk Institute (2010), towards 129 respondents of the pension fund industry (representing assets under management of about €3 trillion) which were asked to describe their ALM policies.

Exhibit XVII: Overview of ALM techniques used across Europe

	Question	UK	Core Europe	Northern Europe (inc. The Netherlands)	Total sample
Liabilities and LHP	% of hybrid schemes	0	23	71	35
	% having defined and LHP	75	63	53	62
	% allocating more than 20% to inflation derivatives	40	12	13	24
	% allocating more than 20% to inflation-linked assets	64	30	39	32
	% using more than 20% swap contracts	60	33	54	40
LDI - static risk budgets	% that use LDI	71	46	52	46
	% that use surplus optimisation	14	25	29	21
	% that use economic capital	57	21	33	30
Performance-seeking portfolio	Average % of equities in PSP	34	27	40	32
	Average cumulative % of private equity, hedge funds, and infrastructure in PSP illiquid assets	19	15	15	16
Risk insurance	Master RCI techniques	77	61	61	56
	Currently use RCI techniques	54	44	40	41
	Use RCI to manage prudential risks	17	18	24	28
	Use economic capital to manage prudential risks	25	56	52	56
Holistic view	Model sponsor risk	62	42	52	48
	Manage prudential risk	33	55	50	49
	Manage accounting risk	17	38	33	33
Risk aggregation	Use explicit risk factors to aggregate risk	0	26	33	24
Performance measurement, implementation	PSP evaluation frequency once per year or less	38	44	31	39
	% of respondents having outperformance of a market index as a sole performance measure for the PSP	67	33	57	48
	% having risk-return efficiency as a performance measure for PSP	22	12	11	12

Source: EDHEC-Risk Institute, *EDHEC Survey of the asset and liability management practices of European pension funds, 2010*, p. 10

The EDHEC-Risk Institute survey provides a very interesting look at pension funds' practices across Europe. For instance, European pension funds are not risk averse since roughly a third of PSP is exposed to equities (though exposure to alternative investment such as private equity remains low). Note as well that the table displays information about risk insurance, an element of pension funds' investment strategy that we did not discuss here. In short, in addition to risk management and performance generation, pension funds must guarantee minimum funding ratios as stipulated by accounting and prudential rules. We specifically discuss regulatory pressures and asset allocation in later sections. To conclude this overview of pension funds, we briefly discuss the need for funds to effectively communicate with interest parties.

Reporting

As part of an effective risk management system, pension funds must establish an adequate and comprehensive reporting and disclosure protocol for the benefit of key stakeholders, service providers and supervisory authorities on the one hand, and pension beneficiaries on the other hand. According to the OECD/IOPS good practices guide, information should be reliable, timely, accessible and consistent. The international bodies also recommend that funds establish proper internal control mechanisms, encourage adverse reporting (e.g. whistle blowing), safeguard and restrict access to confidential information and have proper information technology protection and recovery procedures. In reference again to Waitzer and Sarro (2013) who explore the notion of fiduciary duty of pension funds through a novel approach, the dissemination of information can transcend the immediate need of individual pensioner: “one means of fulfilling this duty to inform, in a way that answers concerns about intergenerational equity and sustainable development, may be to embrace concepts such as the intergenerational reports that are required by law in Australia. To be relevant to concerns about distributive fairness, such reports would also need to focus specifically on the needs and perspectives of prospective beneficiaries.”

After having reviewed some common features that characterize pension funds, in the next section, we specifically discuss differences between public and private pension funds.

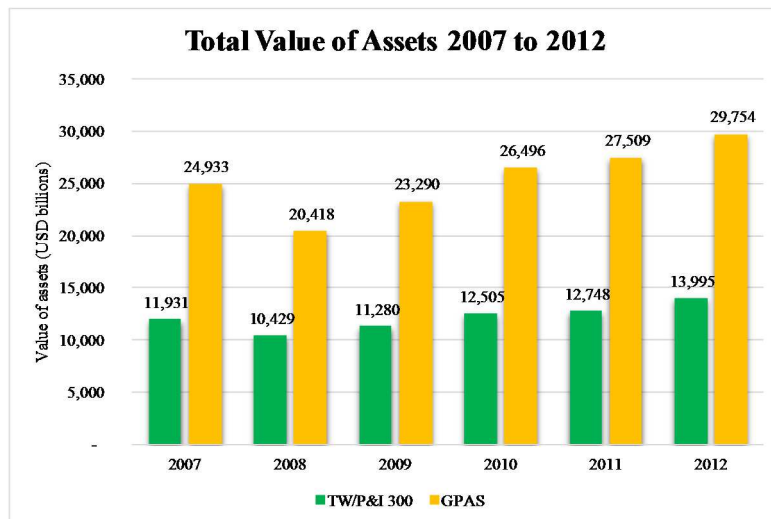
1.3: Public vs. private pension funds

In this section, we contrast public vs. private pension funds since we believe such a comparison adds value to our presentation of the pension fund industry. Although the line separating public and private entities may be blurred, public pension funds are typically managed under public law, administered by some governmental authority, and provide predominantly Pillar I pension schemes (thus implying PAYG schemes). Private pension funds are therefore administered by a private party other than a representative of the government. When comparing public and private pension funds, we consider in particular three differentiating factors: size, asset allocation, and accounting rules.

Size

In contrast to individual investors, pension funds can enjoy certain advantages at a larger scale. In fact, funds can pool assets, engage in diversification, gather and process large quantity of information, implement levered strategies, and create and enjoy economies of scale (e.g. reduced transaction costs for example). In the asset management industry, size is commonly measured in terms of assets under management (or AUM). It appears that size does matter as shown in the below graphs. We present summary statistics prepared by Pensions and Investments and Towers Watson (2013). The latter entity is a leading global financial adviser specialized in research and retirement issues and a public company whose shares (ticker TW) trade on the NYSE and NASDAQ.

Exhibit XVIII: Evolution of the size of pension funds between 2007 and 2012

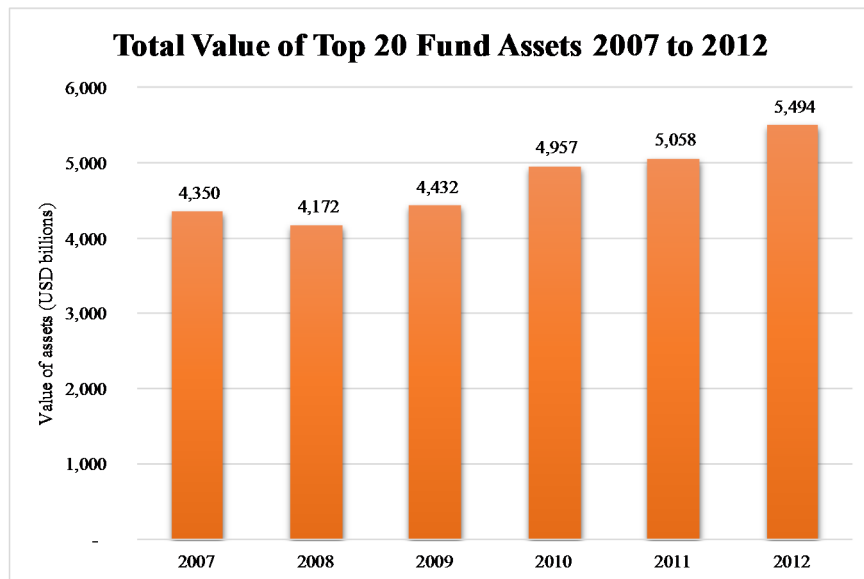


Source: Towers Watson, 2013, p. 7; GPAS stands for Global Pension Asset Study and represents a measure of the global pension assets

The first striking point revealed by Towers Watson's study has to do with the overall astronomical size of the global pension industry, nearly \$30 trillion, which compares to the USA's 2012 GDP of

\$16.2 trillion as indicated by the World Economic Outlook Database produced by the International Monetary Fund. Of these \$30 trillion, the world's 300 largest funds account for 47% (\$14 trillion). The above graph also indicates that the industry has been impacted by the global financial crisis but has recently enjoyed rejuvenated annual growth of 9.8% in 2012 (vs. 1.9% in 2011), which contributed to a 5.6% annualized growth over the 2007-2012 period.

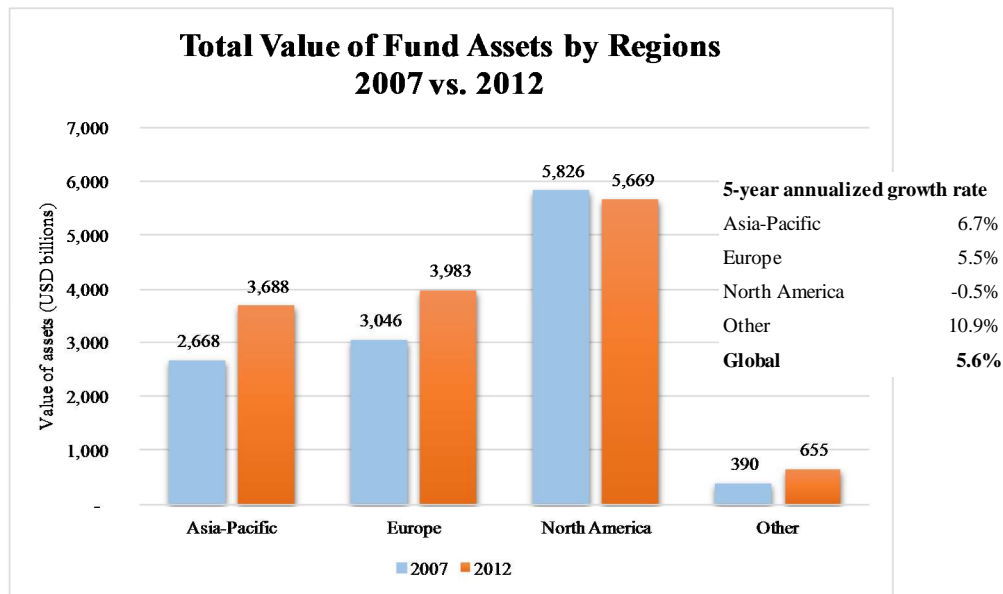
Exhibit XIX: Evolution of the size of the top 20 pension funds between 2007 and 2012



Source: Towers Watson, 2013, p. 8

Although the pension industry enjoyed steady growth since 2008, the performance is fairly uneven amongst industry players. As shown on the above graph, the 20 largest pension funds represented AUM of \$5.5 trillion at the end of 2012, or nearly 18.5% of the global pension industry. Disparities are even sharper when considering geographical distribution of AUM. The next graph displays distribution across Asia-Pacific (accounting for 26.4% of global AUM), Europe (28.5%), North America (40.5%) and Rest of the world (4.6%).

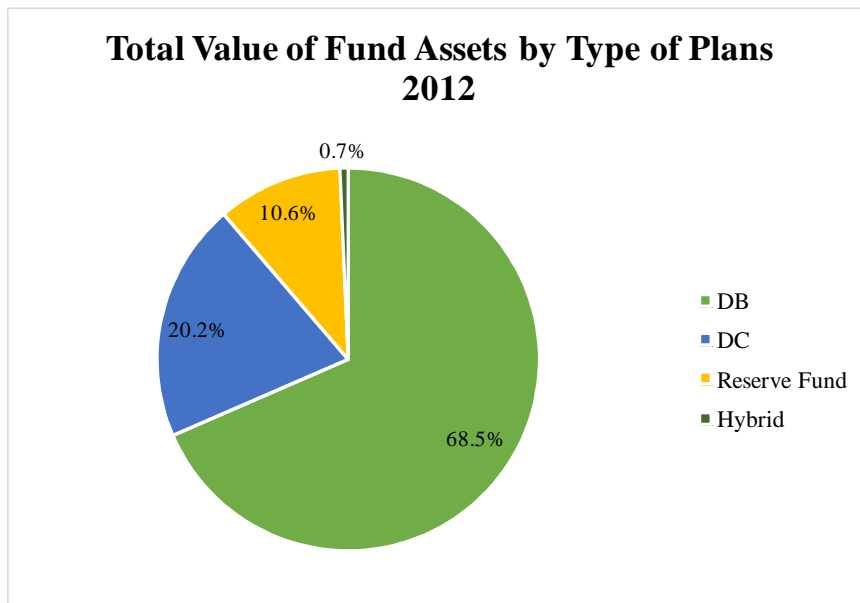
Exhibit XX: Geographical distribution of pension fund assets



Source: Towers Watson, 2013, p. 25

Although more than 50% the global pension fund assets are managed by funds domiciled in North America and Europe, the largest pension fund is Japanese, Government Pension Investment, with AUM of \$1.3 trillion at the end of 2012. Norway’s Government Pension Fund (\$713 billion) and Netherlands’ ABP (\$373 billion) complete the world’s top 3 largest pension funds. US’ Federal Retirement Thrift (\$326 billion) and California Public Employees (\$245 billion) are respectively ranked 5th and 6th. Interestingly enough General Motors (\$118 billion), IBM (\$94 billion), and Boeing (\$91 billion) managed the world’s largest private pension funds. These funds are ranked respectively 21st, 23rd, and 25th in the Towers Watson study.

Exhibit XXI: Breakdown of pension fund assets in terms of types of pension liabilities

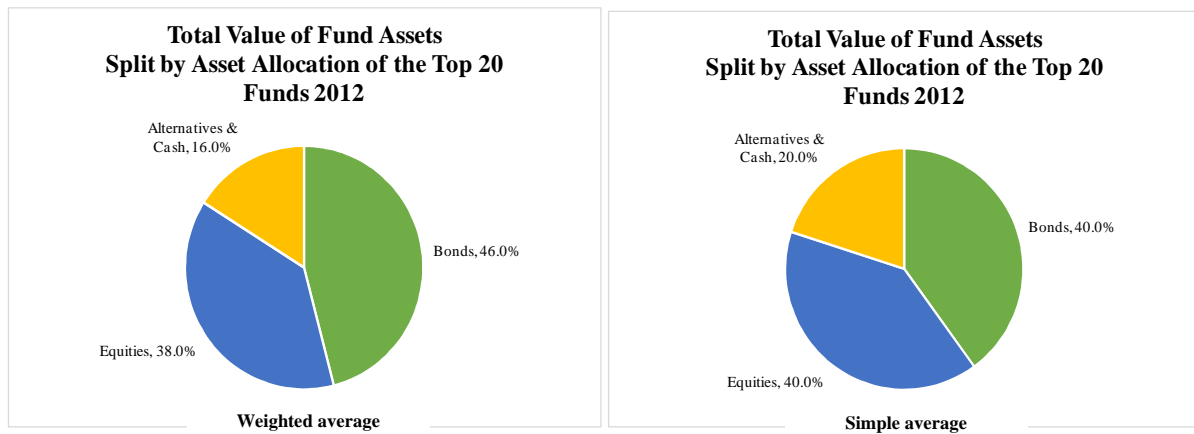


Source: Towers Watson, 2013, p. 30; Note that disclosure by type of fund was available for 282 funds accounting for 94% of the AUM in the P&I/TW 300

The above graph illustrates another interesting aspect of the global pension fund industry. Indeed, we observe that defined benefit pension schemes represent more than two thirds (68.5%) of pension schemes managed globally. Despite the fact that DB plans have lost their appeal in recent years, DB plans remain the main vehicle used in deferred compensation policies. In contrast, defined contribution pension schemes account for a fifth (20.2%) of global pension fund assets. Other schemes represent 11%.

The final graph in this series presents the breakdown of the top 20 pension funds' assets by asset classes and introduces our next topic.

Exhibit XXII: Breakdown of pension fund assets by asset classes



Source: Towers Watson, 2013, p. 33

From the above graph we learn that “the weighted average portfolio for the top 20 funds” contained 46.0% of the total assets invested in fixed income securities. This weight compares to 38% and 16% allocated respectively to equities and alternatives & cash instruments. The authors of this study, however, indicate that these results are “heavily influenced by the allocation of the Government Pension Investment fund from Japan and the rest of the Asia-Pacific funds which invested 61.0% of their assets in fixed income” (Towers Watson, 2013). This policy contrasts sharply with North America where funds invest a larger portion of their portfolio in riskier assets: 49.0% on average allocated to equities.

Asset allocation

Prior literature shows that asset allocation is heavily influenced by regulation but also by corporate goals. In line with this statement, Rauh (2009) explains that the Employee Retirement Income Security Act (or ERISA) enacted in 1974 in the US, by requiring mandatory pension contributions (as a means to guarantee appropriate funding of DB pension schemes), causes firms to downsize their capital investment policy. “The system of required contributions thus creates an incentive to limit risk taking in pension plans, as large mandatory contributions may affect the ability to invest in attractive projects” (Rauh, 2009). In contrast, another strand of the financial theory advocates that asset allocation should be determined by pension funds’ characteristics. In particular Andonov, Bauer and Cremers (2013) argue that “theoretical models imply that the optimal asset allocation should be function of fund maturity, salary growth and promised inflation protection. In principle, these variables should have similar effects across all funds, regardless of geographical region, regulatory requirements and plan type (public or corporate), which obviously contrasts with results of the Towers Watson study discussed previously. In this section, we briefly review the main points and issues explored by researchers.

Lucas and Zeldes (2009) uncover a crucial issue when they state “how public pension plan assets should be invested is an important but unsettled question.” In addressing this question, the researchers elaborate and empirically test a model illustrating the asset allocation policy pursued by a public pension fund seeking to minimize cost and taxes under specific funding requirements. In their literature review, they first recall a simple but important fact: because of the time differential between inflows and outflows, “optimal asset allocation will depend on the risks and returns of the asset-liability gap, rather than on the properties of assets alone” (Lucas and Zeldes, 2009). Second, the researchers explain that asset allocation is not only by pension plans’ characteristics (inflation, indexation, payment of annuity or lump sum, etc...) but also by accounting rules as “measured liabilities are sensitive to the assumed discount rate” (Lucas and Zeldes, 2009). Indeed, they argue that “the accounting rules for public pensions create a perverse incentive to invest in stocks.” Due to the importance of this topic, we treat the accounting factor in the next section. Interestingly, Lucas and Zeldes find theoretical grounds for greater allocation of pension assets to fixed income on the one hand and equities on the other hand. Referring to their own prior findings (2006), Lucas and Zeldes “show that when labor earnings growth and stock returns are positively correlated over longer horizons, obligations to older workers and retirees are more like bonds and can be valued and hedged as such, but because of future salary risk, obligations to younger workers have risk and return characteristics that are more like stocks.” The role that plays both equities and bonds is again emphasized when the researchers state that “stocks may be a better long-run hedge against inflation than nominal bonds, although they are not as good as inflation-indexed bonds” (Lucas and Zeldes, 2009). From their experiment, Lucas and Zeldes find that in 2006 on average US state and local funds held 60% of pension assets in equities vs. 24% in fixed income securities. The researchers explain that this phenomenon has to do primarily with “tax smoothing” since “in the presence of distortionary taxes, the equity premium produces higher average returns that reduce the need to raise revenues in the future through distortionary taxes” (Lucas and Zeldes, 2009).

Also concerned with the strategy pursued by public entities, Andonov et al. (2013) rely on an international pension fund database to compare the asset allocation and discount rates used to value pension liabilities in public and private pension funds in the US, Canada and Europe. Adopting various regression methodologies to perform their analysis, the researchers find that “U.S. public funds exploit the opaque incentives provided by their distinct regulatory environment and behave very differently from U.S. corporate funds and both public and non-public pension funds in Canada and Europe” (Andonov et al., 2013). Over time, “U.S. public funds uniquely increased their allocation to riskier investment strategies in order to maintain high discount rates and present lower liabilities, especially if their proportion of retired members increased more.” In contrast and “in line with economic theory, all other groups of pension funds reduced their allocation to risky assets as they mature, and lowered discount rates as riskless interest rates declined.” Consequently, this phenomenon allows the researcher to argue that “camouflaging and risky behavior of U.S. public

pension plans seems driven by the conflict of interest between current and future stakeholders, and could result in significant costs to future workers and taxpayers” (Andonov *et al.*, 2013).

A larger strand of the literature is devoted to private pension funds but is still dominated by studies focused on the US. We discuss here the studies that we feel representative of this strand of the literature. First, Rauh (2009) demonstrates that risk management policies influence asset allocation in the context of defined benefit pension schemes and finds notably that “firms with poorly funded pension plans and weak credit ratings allocate a greater share of pension fund assets to safer securities such as government debt and cash, whereas firms with well-funded pension plans and strong credit ratings invest more heavily in equity” (Rauh, 2009). In addition to this important result, Rauh performs a remarkable review of the prior literature on pension investment. For example, Rauh refers to the work of Sharpe (1976) and Treynor (1977) who have evidenced that “the contract between plan sponsors and pension beneficiaries is essentially a put option exercisable in bankruptcy and written on the assets of the pension plan with a strike price equal to the value pension liabilities” (Rauh, 2009). This so-called moral hazard (which has been reinforced by the introduction of the Pension Benefit Guaranty Corporation or PBGC) stems from the fact that if the value of pension assets falls and that sponsor asks for bankruptcy protection, the sponsor can offload the responsibility for pension obligations to the PBGC. Seeking to beyond the insurance-like guarantee offered by the PBGC, Rauh explores alternative approaches to explain why entities invest in equity securities. Rauh identifies performance generation as a crucial reason. Referring to studies performed by Sundaresan and Zapatero (1997) and Lucas and Zeldes (2006), Rauh argues that “firms may invest in equity to hedge against increases in projected benefits owed to employees” (Rauh, 2009). Moreover, Rauh considers research treating contribution policies but is disenchanted since empirical findings often led to conflicting conclusions. For instance, “Bodie *et al.* (1987) find a negative correlation between risk taking and funding, consistent with risk shifting, whereas Petersen (1996) finds a positive correlation” (Rauh, 2009).

Similarly to Rauh, Phan and Hedge (2013) are interested in risk taking behavior in the context of defined benefit pension schemes in the US. However, the researchers link corporate governance to asset allocation. Using various proxies for corporate governance (including blockholder or institutional ownership, and antitakeover mechanisms) and adopting regression methodologies, Phan and Hedge (2013) find that “firms with good external and internal corporate governance take more risk by investing heavily in equities and allocating a smaller share of the plan assets to cash, government debt, and insurance company accounts” (Phan and Hedge, 2013). Lastly, this result allows the researchers to advance that governing bodies “should consider strengthening external and internal governance mechanisms to improve the financial health of private DB plans,” which would parallel somehow Waitzer and Sarro’s (2013) recommendation for broadening the concept of pension fund fiduciary duty to encompass intergenerational issues.

Accounting rules

As suggested in the preceding section, Andonov et al. (2013) explicitly demonstrate why the accounting parameter does matter for US public pension funds:

In the U.S., significant differences in regulation exist between corporate and public pension plans. U.S. public pension funds are subject to the Government Accounting Standards Board (GASB) guidelines for discounting liabilities. These guidelines allow U.S. public funds to base their liability discount rates on the expected rate of returns on their assets. As U.S. public fund boards are largely unconstrained in the proportion of their assets that can be invested in risky assets and in their assumptions on the expected rate of return in the various asset classes, this gives these boards very significant latitude to choose their liability discount rate.

Specifically, Novy-Marx and Rauh (2011) empirically explain why GASB's ruling 25 "creates a major potential bias in the measurement of public pension liabilities." First, discounting pension liabilities at the higher expected rate of return of pension assets goes against financial theory (as demonstrated by Modigliani and Miller, 1958; Treynor, 1961; Sharpe, 1964; or Lintner, 1965). Second, because discount rate and pension liabilities are inversely proportional, using higher discount rates lower the perceived level of public pension obligations. In their experiment, Novy-Marx and Rauh (2011) rely on data released by the US largest state DB pension funds to recalculate pension liabilities under different definitions of pension liabilities (from ABO to PVB, PBO and EAN) and various discount rate assumptions (those used by US states and those in line with financial theory). Their results are stunning: using taxable muni rate yields the researchers find pension liabilities are 15% to 68% higher than state-reported figures (equivalent to amounts ranging from \$3.62 trillion to \$5.28 trillion).

In another paper, Novy-Marx (2013) attempts to explain the rationale behind the GASB approach. The professor of finance at the University of Rochester first argues that the GASB approach is not a valuation methodology since it fails to attribute "a unique value to a given set of assets and liabilities" (Novy-Marx, 2013). This peculiarity stems from the fact that under GASB funding status can be improved by simply reallocating pension assets and liabilities across multiple funds. Furthermore, the researcher advances that the GASB methodology allows funds to improve funding status by "burning money." This statement is made possible because discounting pension at the higher expected rate of return of pension assets implies that the methodology breaches the concept of "coherent risk" (advocated by Artzner et al., 1999). In short, adding a dollar's worth of risk-free asset does not improve the portfolio's funding status by a dollar. Lastly, Novy-Marx (2013) stresses on the distorting view that creates the GASB approach since it is "economically equivalent to accounting for pension liabilities in generally the same manner that states account for their long-term liabilities, but it calls for booking stocks at roughly twice their market prices and further crediting a plan an additional dollar for each dollar of stock it *intends* to buy in the future."

Similarly to Novy-Marx and Rauh, Brown and Wilcox (2009) are fully aware of issues brought by the GASB approach since the method permits to lower pension obligations, “encourage sponsors to invest in riskier portfolios than they would otherwise choose,” and potentially engage in “fiscal gaming in the form of pension obligation bonds” (by capturing the spread between risky assets and bonds). As Novy-Marx does, Brown and Wilcox attempts to justify the GASB’s rationale and explain that “GASB interprets a “long-term view” as consistent with using a discount rate derived from risky assets to discount pension benefits, presumably on the notion that if the plan sponsor is guaranteed to survive the ups and downs of the business cycle and the stock market, then betting on a returns is good enough.” Brown and Wilcox, however, warn that this idea is foreign to most economists who have studied the issue” (2009). In the final section of their paper, Brown and Wilcox provide an interesting discussion about what the appropriate discount rates that state and local authorities should use. Indeed, they explain that “the ideal set of discount rates would be derived from securities that deliver fully taxable cash flows; that deliver those cash flows with a very high degree of assurance; that trade in markets without extraordinary liquidity characteristics; and that are and free of flight-to-quality effects” (Brown and Wilcox, 2009). The researchers even provide practical solutions to help circumvent imperfections brought by Treasury securities: “One way to balance these concerns— Treasury rates being driven down by crisis-related concerns and swap rates driven up—would be to adjust the Treasury rates for the exemption from state and local taxation, and then to average the resulting proxy for fully taxable Treasury discount rates with the swap-derived discount rates” (Brown and Wilcox, 2009).

To conclude this section which compares public and private funds, we find pertinent to mention the work of Easterday and Eaton (2012) who contrast accounting rules applicable to public entities (GASB) to those private firms are subject to (FASB). The researchers retrieve public pension fund data from the Public Fund Survey and corporate data from Compustat in order to “compare funding status, actuarial assumptions and asset investment allocations of defined benefit pension plans” (Easterday and Eaton, 2012). Notably, the researchers explain that public pension funds use the expected rate of return of pension assets to discount pension liabilities whereas corporations are required to perform the same task using lower market yields. Easterday and Eaton find that public pension funds’ liabilities “were significantly larger than those reported by companies,” “underfunding is widespread in both sectors,” “reported actuarial assumptions for public employee pensions tend to be more optimistic than for companies’ pensions,” and “evidence on asset allocations shows that corporate pension assets tend to be allocated more to equities than are public pension assets” (Easterday and Eaton, 2012).

In this section, we have specifically discussed the differences between US public and private pension funds because the analysis helps better understands the context in which evolve European public and private pension funds. In any case, we recall that across Europe Pillar I pension schemes are predominantly offered by public pension funds which are regulated by national governments. In

addition, as previously mentioned, Andonov et al. (2013) show that in contrast with practices employed by US public funds, “all other groups of pension funds reduced their allocation to risky assets as they mature, and lowered discount rates as riskless interest rates declined.”

To conclude our overview of the European pension fund industry, we discuss in the next section the regulatory pressures that pension funds are exposed to.

1.4: Pan-European regulatory pressures and prospects for the pension fund industry

According to Towers Watson, the European pension fund industry had nearly \$4.0 trillion worth of assets under management at the end of 2012 (or 28.5% of the global pension assets). Over the 2007-2012 period, the region experienced annualized growth rate of 5.5% which compares with 5.6% for the global pension industry. These figures, however, do not reveal the extent at which the industry has been impacted by the global financial crisis which erupted at the end of 2007. In response to the crisis, industry players and regulators have sought to change their strategy, improve transparency and strengthen the industry's operations, solvency and reporting procedures. In this section, we describe the regulatory environment at the European level and discuss prospects for the industry as a whole.

Regulatory environment

In this section, we overview the characteristics and roles of the main regulatory bodies (such as the European Commission and EIOPA) that oversee pension funds across Europe. Because we have described retirement systems (e.g. Pillar system) and pension funds in previous sections, we focus here on European regulation (such as IORP) encompassing solvency and disclosure in particular. Pension schemes, by their nature, encompass long-term promises. The assets supporting such promises should be invested with this long-term horizon in mind, with due consideration to the risk profile and liquidity requirements of beneficiaries. Management of liabilities and assets cannot, however, be made solely based on economic factors, but is subject to regulatory, tax and accounting constraints. As discussed previously, the financial stakes are significant for national governments, corporations, and individuals. To ensure that the interest of stakeholders are protected, several institutions and mechanisms have been established while keeping in mind that regulation at the European level did not seek to supersede national authorities but such regulation corresponds to the efforts made to construct an integrated European Union.

At the pinnacle of the European Union resides the European Commission. Composed of a college of 28 commissioners (elected for a 5-year term and representing each EU member state, including recently joined Latvia), under the presidency of Portugal's José Manuel Barroso since 2004 (as his tenure was prolonged in 2009), the European Commission acts primarily as a legislative organ by proposing new texts to the European Parliament and the Council of the European Union. After having reviewed existing legislation and performed "an impact assessment" in order to measure the potential economic, social and environmental effects of any new text, the Commission runs wide consultations with stakeholders (*Source: <http://ec.europa.eu>*). Once new legislation has been adopted together by the European Parliament and the Council of the European Union, the European Commission makes sure that laws are applied by all member states or may otherwise take legal action to enforce regulation (if a member state persistently fails to enact European laws, the Commission may initiate

“infringement proceedings,” request the European Court of Justice to deliberate, or impose financial penalties (Source: <http://ec.europa.eu>). Currently, the Commission primarily focuses on “Europe 2020 Strategy” aimed at lifting the EU out of the economic crisis but also seeks to enhance the rights and security of European citizens, spearhead climate change and foster the role of the EU in the world (Source: <http://ec.europa.eu>). In the context of pension regulation, the European Insurance and Occupational Pensions Committee (or EIOPC) was established under EU Directive 2004/9/EC to assist the Commission in matters concerning insurance and occupational pensions. The EIOPC is comprised of representatives from member states’ supervisory authorities. Lastly, it is noteworthy to know that EU law is categorized into primary (such as treaties) and secondary legislation (encompassing regulations, directives and decisions which are derived from treaties). While regulations and decisions are more prescriptive by nature, directives define a desired outcome, granting member state some flexibility in terms of the way legislation is implemented (though by a specified deadline).

Speaking of directive, the European Commission promulgated on June 3rd, 2003 Directive 2003/41/EC to govern the activities of occupational pensions and to “ensure a high level of protection for members and beneficiaries of pension funds” (Source: http://europa.eu/legislation_summaries). A prescriptive body of rules has been established for Institutions for Occupational Retirement Provision or IORP according to three requirements (Source: http://europa.eu/legislation_summaries):

- *Strict prudential rules to protect the beneficiaries and members of IORPs, who must have sufficient information on the rules of the pension scheme, on the institution's financial situation and on their rights*
- *Investment rules adapted to the characteristics of IORPs and to an efficient management of savings since IORPs invest on a long-term basis and have to diversify their assets by taking full advantage of the benefits offered by the single market and the euro. If each institution is to establish the safest and most efficient investment policy, the investment rules, and in particular the rules for investing in shares, must not be too restrictive*
- *Rules permitting cross-border management of occupational pension schemes*

In essence, the overarching ambition behind IORP is to protect members and beneficiaries by in particular fostering proper disclosure of financial information, stimulate cross-border activities (and thus facilitate members’ mobility across the EU), and allow pension institutions to implement sound and prudent investment strategies (which need theoretically to align with both national and EU rules, especially in regards to solvency and asset allocation). Obviously, Directive IORP prescribes the proper functioning of occupational pension plans while social security schemes (i.e. Pillar I) remain the prerogative of national governments. Issued in 2003, Directive IORP needed to be implemented by member states by September 2005. However, the implementation phase took more time than

expected prompting the Commission to review progress in 2009: despite overall positive achievements across the EU, the Commission noted several issues that needed to be addressed. These included the relatively poor level of cross-border activities, the difficulty to reconcile EU and national rules in regards to investment rules (especially those relating to asset allocation), and the need to speed up the adaptation of national supervisory bodies to EU legislation and the cooperation between pension supervisory authorities. In order to address these issues among others, the European Commission enacted successive amendments in 2009 (2009/138/EC), 2010 (2010/78/EU) and 2011 (2011/61/EU). These amendments also reflected the fact that the Union was going through a challenging period due to the global financial crisis.

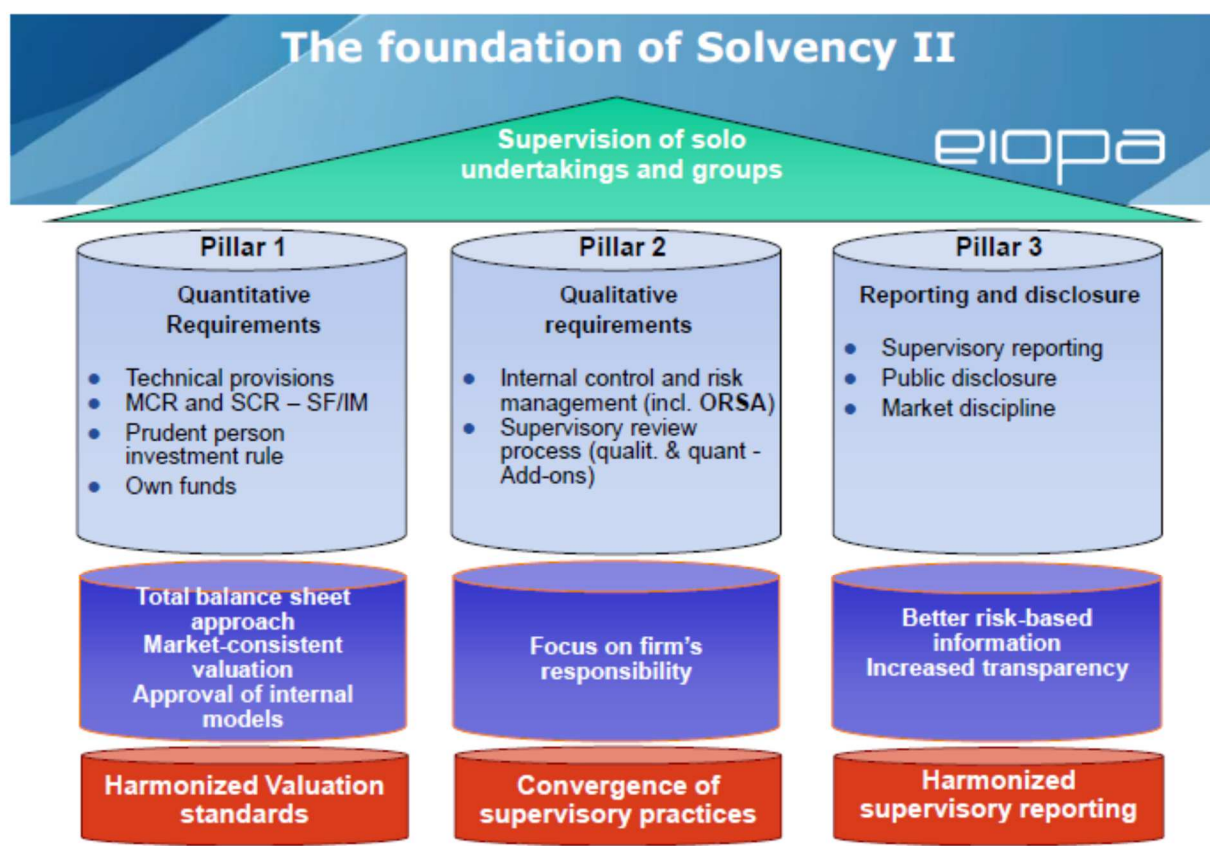
In the aftermath of the global financial crisis, the European Insurance and Occupational Pensions Authority or EIOPA was created in 2010 by the European Commission in relation to the broad ambition to restructure the supervision of the financial sector across the EU. As a result, EIOPA became one of the three pan-European supervisory agencies (others oversee the banking sector and the securities sector). Being an advisory body to the European Parliament, the Council of the European Union and the European Commission, the EIOPA seeks to foster the stability in the pension sector, stimulate transparency and confidence in financial products and institutions, enhance harmonization and application of EU rules by member states, strengthen the oversight of cross-border activities and promote coordinated response by EU supervisory authorities. Lastly, the EIOPA is made up of several committees including a Board of Supervisors, which mainly enjoys decision-making power, a Management Board (executive power), a Board of Appeal (whose main role is to challenge rulings by other European Supervisory Authorities), Stakeholder Groups (gathering representatives from the financial industry, consumers, beneficiaries and academics), a Review Panel (which assess the implementation of EU or EIOPA pronouncements) and Working Groups (comprised of experts acting as advisors).

The final organization that we present in this section does not enjoy legislative powers such as European Union's agencies do but fosters cooperation, exchange of information and dialogue among members (representing around 60 countries). Indeed, the International Organization of Pension Supervisors or IOPS was created in 2004 under the initiative of the OECD and the International Network of Pension Regulators and Supervisors (or INPRS). Cooperating notably with the OECD, World Bank or IMF, the IOPS seeks primarily "to improve the quality and effectiveness of the supervision of private pension systems throughout the world" (*Source: <http://www.oecd.org/site/iops/about>*). The IOPS is organized around an Executive committee (which enjoys executive powers) and a Technical committee whose main responsibility is the elaboration of principles, standards and good practices on pension supervisory issues (as previously mentioned in the section treating risks faced by pension funds). Lastly, the IOPS currently supervises various projects

or initiatives including a study of the cost structure of pension funds in member states, a stress test study of DC funds, a review of annuity products, and other similar research and good practice guides.

Most of the agencies and mechanisms described above have been responses to the global economic downturn which started in late 2007. A major concern of financial industry participants has been in fact the need to strengthen the ability of financial institutions (including banks, insurers and pension funds) to absorb exogenous shocks. From a practical standpoint, such a concern translated into requirements for institutions to hold larger amount of capital in order to mitigate the risk of insolvency. European initiatives to strengthen and harmonize solvency rules date back as early as 1973 with Directive 73/239/EEC (so-called Solvency I) which sought to update solvency requirements. A more ambitious (and thus prescriptive) body of rules was adopted in 2009 through Directive 2009/138/EC in order to improve solvency, better protect end-users and consumers, and establish a more efficient control system. In October 2013, the European Commission announced that Solvency II would not become effective prior to January 1st, 2016 (Lex, 2013) since the European legislative and supervisory authorities were in the process of amending Solvency II (through the so-called Omnibus II Directive). Similarly to banking regulations enacted under the so-called Basel II, Solvency II applies to insurers and builds on three main pillars including Pillar 1 (which establishes quantitative requirements), Pillar 2 (stipulates qualitative requirements such as governance and risk management) and Pillar 3 (sets out disclosure and reporting requirements). Note that EIOPA plays a central role in this framework since it elaborates recommendations and drafts that are submitted to the European Commission. The below diagram illustrates the underlying requirements that define Solvency II.

Exhibit XXIII: Pillars under Solvency II



Source: EIOPA in Severinson and Yermo, 2012, p. 29

Although Solvency II was designed primarily to govern insurers' activities, the directive also impacts occupational pension schemes (which can be managed by pension funds or insurers) since they may involve benefits that are similar to insurance products, guarantees or promises (notably annuity schemes). Indeed, this is the case for DB pension plans (since the sponsor assumes responsibility for any underfunding) and DC pension plans (in which pension funds may assume some guarantees beyond the fixed contribution paid by the sponsor). Although pension funds solvency requirements are not as prescriptive as for insurers, several member states including Denmark, Finland, Germany and the Netherlands have enacted some forms of risk-based solvency supervision or funding regulations. For instance, the Dutch solvency regime employs a value-at-risk approach and requires pension funds to carry funding levels in which liabilities need to be funded with at least a 97.5% probability over the next year. If funds fall short of this requirement, they have a 15-year grace period to meet the minimum level of funding (i.e. 105% funding ratio). Overall, it appears that there is a rift between members that support a harmonized pan-European risk-based solvency approach applicable to IORP (in fact countries where industry-wide pension funds and insurers predominate including Denmark or France) and states where occupational funds sponsored by individual employers prevail such as the Netherlands or the United Kingdom.

Although solvency regulation continues to be discussed by European authorities, the effects of changes in solvency and funding rules have already been measured. In particular, Severinson and Yermo (2012) review the empirical evidence on the possible impact of EU rules on the investment policies of insurers and pension funds. First, they note that the requirement to use discount rates based on market yields (in fact AA-rated corporate bonds; this rule is further discussed in the later section treating specifically IAS 19) causes increased sensitivity of pension obligations to market happenings. To mitigate such volatility, insurers and pension funds “may shift their investment portfolios towards fixed income securities and engage in transactions to hedge interest rate risk such as swaps and other derivatives” (Severinson and Yermo, 2012). In addition, financial institutions may circumvent this market-induced volatility by reducing their exposure to assets that require specific capital charges under solvency rules. In other words, risk-based solvency regimes may cause insurers and pension funds to review their asset allocation strategy. In their study of asset allocation policies across OECD countries, Severinson and Yermo noticed some derisking of investment portfolios as institutions have reduced their exposure to equities in favor of fixed income securities between 2001 and 2010. However, the researchers temper this overall phenomenon and explain that factors other than solvency requirements may have influenced investment strategies. In fact, volatile and poor-performing equity markets combined with changes in accounting rules may have also impacted practices. Moreover, the advent of LDI and RCI approaches has encouraged pension funds to further rely on interest rate swaps or similar derivatives. In the final section of their paper, Severinson and Yermo (2012) broaden their analysis and consider future development for the insurance and pension fund industries. They first highlight the increasing trend toward higher allocation to alternative investments (such as real estate or private equity at some extent). Infrastructure investment has become popular in the Netherlands and the United Kingdom notably in response to political pressures exerted by national governments (Cumbo, 2011). Second, the researchers explain that “another potential side effect of risk-based solvency regulations is that they may aggravate procyclical investment behaviour such as the forced sale of assets during market downturns, especially if market valuation is used to calculate assets and liabilities” (Severinson and Yermo, 2012). For instance, declining financial markets performance forced Danish insurers and pension funds to drastically reduce their equity exposure in 2008 in order to remain compliant to solvency rules. Lastly, the researchers argue that accounting and prudential rules may ultimately lead financial institutions to alter the products they offer. Recall that “under risk-based solvency rules, additional capital requirements are applied to institutions depending on their asset allocation and other risks they face. By contrast, unit-linked insurance products and DC pension plans do not normally carry any guarantee, effectively removing insolvency risk. They also have much lower capital requirements under a risk-based framework” (Severinson and Yermo, 2012). As such, the researchers account in their study for a decline of guaranteed products in favor of unit-linked products (a phenomenon observed in Denmark and the United Kingdom). Lastly, Severinson and Yermo reveal that the shift from DB to DC pension schemes parallels a shift in asset allocation.

Indeed, DC funds tend to invest more heavily in equities compared to DB funds. This trend has been measured in several countries including Australia, Israel, Sweden, the United Kingdom and the United States.

Prospects for the European pension fund industry

In addition to issues and phenomena highlighted by Severinson and Yermo, the European pension fund industry faces various other challenges including adverse demographics, changes in pension systems, and the enduring impacts of the global economic downturn. As previously discussed, populations across Europe are rapidly ageing as people live longer (in fact some studies have shown that life expectancy has improved by roughly five years in the EU over the past 50 years). This trend is further exacerbated by low fertility rates which will inevitably lead to a rise of the old-age dependency ratio¹⁵. Other demographic trends further provoke the erosion of pension systems: individuals pursue their education for longer periods, begin full-time working lives later, and seek to retire before the traditional pensionable age of 65. Moreover, changes in the family model, with the rise of single-parent households, same-sex unions, older and isolated parents, require the financing of health care, long-term care or other services that would otherwise be ensured within the family. Disparities between sexes still exist since women are likely to earn less than men and tend to take career breaks in order to support family life.

Demographic trends lead to structural problems that pension systems across Europe can absorb only with great difficulty. Member states run chronic budget deficits which further weaken the prospects for traditional PAYG and unfunded Pillar I pension schemes. Despite vulgarization, financial literacy (Larson et al., 2009) and auto-enrolment campaigns across Europe, access to pensions for vulnerable individuals remains limited, causing a larger number of retired individuals to live in precarious conditions. Another issue has to do with the lack of coordinated efforts between member states to reform national pension system and contribute to a better integrated European Union. The lack of cross-border activities (so-called portability) notably epitomizes this issue. Furthermore, imposing Solvency II (which has been designed for insurers) onto pension funds may turn catastrophic. The business model and risk profile of insurers and pension funds are fundamentally different with the latter group being in theory long-term investors (this contrasts sharply with recent focus of accounting and prudential rule-setters on fair value and short-term approaches).

Finally, the global economic crisis has severely impacted member states. Beyond the much debated contraction of financial markets, European debt crises, or the collapse or bailout of too-big-to-fail institutions, the crisis has profoundly affected the confidence of industry players and has nurtured the general public's distrust for the financial industry. The global economy also suffers from a lack of

¹⁵ The dependency ratio is traditionally defined as the ratio of non-active age to those of active age in a given population (OECD, 2005, p. 43). In practice, the metric is calculated as the ratio of number of people aged over 65 to the number of people of working age.

growth opportunities and faces inflationary (or deflationary) pressures. In particular, the economic downturn significantly jeopardizes the PAYG and underfunded pension model. Private pension plans could alleviate the burden on Pillar I pension plans. Yet, further reliance on Pillar II pension schemes comes with a larger fiscal bill since pension incentives commonly include favorable taxation. Moreover, a poor global economy and lack of growth opportunities force central banks to focus on curtailing inflation and maintaining historically low-interest rate environments. Persistent low interest rates can significantly weaken recovery and, worst, can prolong the downturn. In the context of insurers and pension funds, Antolin, Schich and Yermo (2011) have studied the economic impact of protracted low interests on these institutions and came up with a staggering but realistic conclusion: *Lower interest rates will impact pension funds and insurance companies on both the asset and the liability side of their balance sheets. While lower interest rates increase the value of fixed-income securities, they increase the liabilities of pension funds and insurance companies, with the extent of the impact depending on: (1) whether future cash flows are fixed; and (2) to what extent benefits to be paid in the future are being adjusted to reflect the new economic environment. Protracted low interest rates reflective of lower-growth economic environment will reduce the returns on portfolio investments. Thus, lower long-term interest rates could lead to pressure to adjust pension promises or guarantees downwards, or to adjust contributions and premiums upwards in order to pay for the pension and insurance promises that become more expensive to provide in a protracted low-interest-rate environment.*

Broadly speaking, it appears that pension systems across the European Union experience numerous challenges. Given that the stakes are high for a large number of interest parties the proper functioning of pension systems is an outcome which is pursued by many including European authorities. To safeguard the interest of the general public, solvency rules have been established. Similarly, as a means to promote transparency and enhance the disclosure of financial information, accounting rules have and continue to be improved. In the second part of chapter 2, we discuss in details the accounting for defined benefit pension plans.

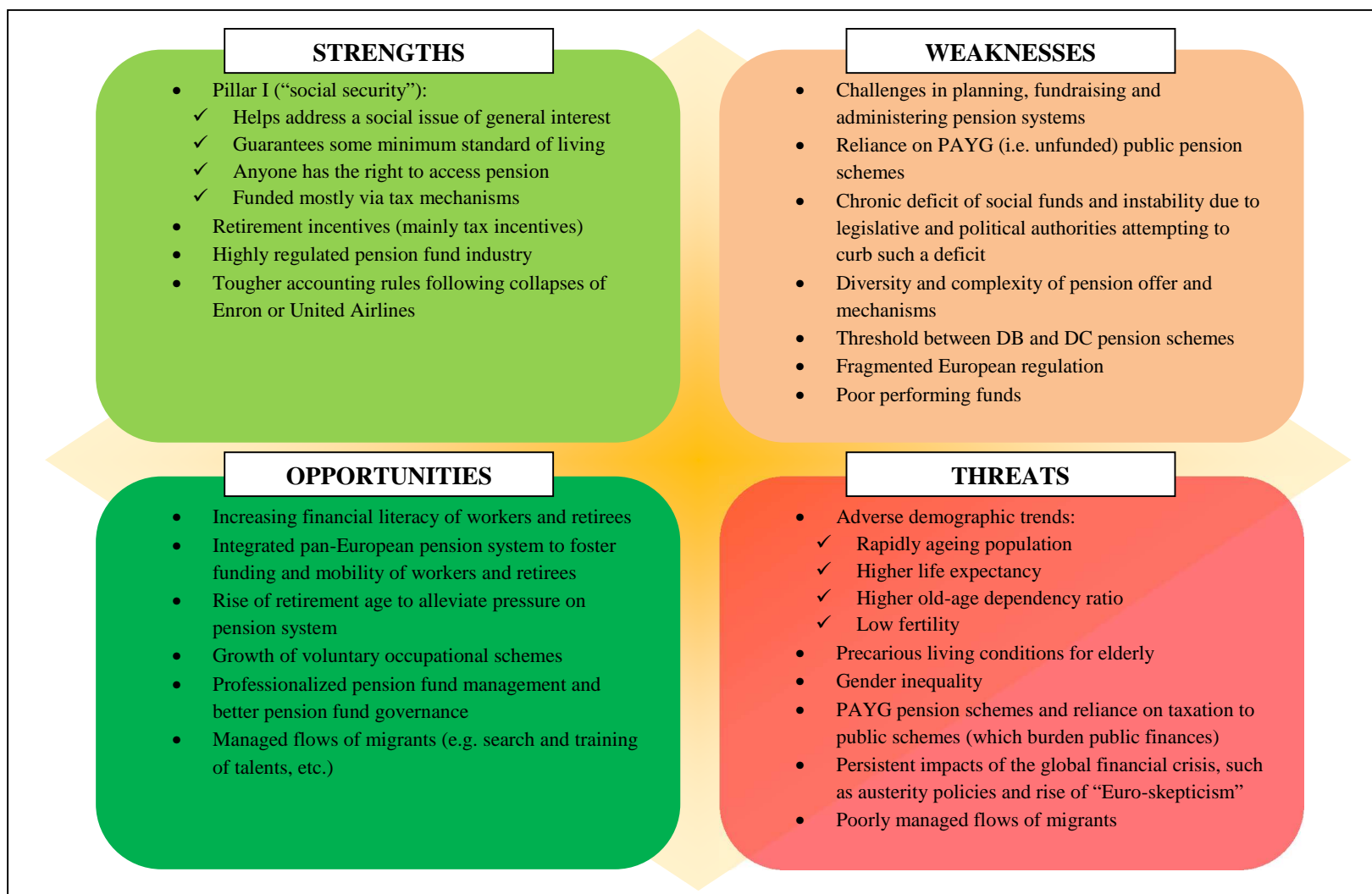
1.5: Current state of the European pension system

To conclude this section devoted to the European pension fund industry, we use a SWOT analysis as a means of highlighting strengths, weaknesses, opportunities, and threats. We therefore briefly rephrase the main facts previously analyzed and illustrate our examination with the below diagram that represents our SWOT Matrix. Before discussing the rationale of our SWOT analysis, we do acknowledge that it is a daunting task to try to produce a single and unifying description of the European pension system since the European context is fundamentally diverse in terms of legislation, economics, politics, culture or demographics. As a result, we attempt with this SWOT analysis to highlight what we believe are common features or issues across Europe. In addition, we have taken the liberty here to relax the definition of a SWOT analysis because internal and external factors are not evident characteristics that can be conceptualized in the context of the European pension system. First of all, the European pension landscape is characterized by several elements that constitute strengths. Most importantly, the pension system structured around the pillar system aims at addressing a social issue of general interest (i.e. the provision of adequate pension income). Moreover, the public pension system across EU countries seeks to guarantee some minimum standard of living. Governments essentially rely on payroll taxes and other forms of levy to fund public pension schemes. Policy-makers have also taken steps to regulate the pension fund industry and safeguard the interests of the public at large. Nonetheless, the current system suffers several weaknesses including the challenges that pose the management and reform of pension systems across Europe, PAYG schemes, or the chronic deficit of social insurance funds.

In addition to these factors, the European pension system faces both opportunities and threats. We believe that the rising level in financial literacy of workers and retirees, improving pension fund governance, professionalized pension fund management, or a better-integrated pan-European pension system to help improve funding and mobility of workers and retirees represent significant opportunities. In contrast, we posit that the sustainability of the European pension system is jeopardized by adverse demographics (especially a rapidly ageing population), poor financial markets performance, the reliance on PAYG (i.e. unfunded) pension schemes, and the relatively high degree of instability in legislative and political realms across Europe.

In the next section, we overview the pension accounting regulatory environment and discuss important issues (especially IFRS and US GAAP's precepts).

Exhibit XXIV: SWOT Analysis of the European pension system



Source: Moïse LOUISY-LOUIS, June 2014

2: PENSION ACCOUNTING: REGULATORY ENVIRONMENT

The field of financial accounting is concerned with the preparation of financial information aimed at external users and therefore contrasts with managerial accounting which focuses on information tailored for the needs of internal users. In order to ensure the reliability and relevance of the financial accounting information prepared by public firms (which in fact have a legal obligation to prepare and disclose information on a regular basis), this information must be standardized.

Throughout history two accounting frameworks have evolved to become predominant: the accounting standards established by the international accounting standards collectively envisioned by international experts (or IFRS) and the United States (or US GAAP). In this section of the dissertation, we present i) the main principles that govern IFRS and US GAAP, and ii) thoroughly review the accounting for defined benefit pension plans.

2.1: IFRS: Authoritative bodies and key principles

The European accounting context

Since the 1950s, European states have sought to create a political and economic space capable of challenging the US hegemony. Although early initiatives failed due to inadequate and rigid systems, first signs of hope came in March 1957 with the signature of the Treaty of Rome by six European countries, setting the stage for a single market. In addition to political and economic cooperation, the new-born European Union clearly indicated the need for greater harmonization in the field of accounting. As mentioned in a previous section, European legislative bodies employ primary and secondary legislation to enact new texts. Within secondary legislation, regulations and decisions are more prescriptive by nature, whereas directives define a desired outcome, granting member state some flexibility in terms of the way legislation is implemented. In order to harmonize accounting rules, the European Union enacted Fourth Council Directive (4th Directive thereafter) and Seventh Council Directive (7th Directive) respectively on July 24th, 1978 and June 13th, 1983 (note that these two directives were recently amended and superseded by Directive 2013/34/EU dated July 20th, 2013 and will become effective as of July 20th, 2015).

Published in August 1978 in the Official Journal of the European Union, the 4th Directive describes financial reporting and disclosure of annual accounts by limited liability companies. Aimed at safeguarding the interest of all stakeholders, the directive required that annual financial statements include a balance sheet, an income statement and accompanying footnotes describing assumptions and methodologies used in the preparation of financial statements. Nevertheless, the 4th Directive did not seek to impose accounting rules but to foster comparability through the use of similar accounting methods across European countries. As a result, the 4th Directive led to some homogeneity in financial disclosure but did not provoke homogeneity in accounting practices.

Released in July 1983, the 7th Directive established the rules for the preparation of consolidated accounts. The text in fact stipulated that group companies needed to prepare financial statements under a consolidated basis for users to appreciate the performance of a single entity. The 7th Directive also had some weaknesses since it granted significant discretionary power to preparers (through a large number of accounting methods) and time prior its application.

About 10 years after the publication of the 7th Directive, acknowledging the difficulties to move the cumbersome legal process behind directives and to reach consensus in the context of standard-setting, the European Union handed the responsibility for standard-setting to the IASC. In 1973, the International Accounting Standards Committee was created under the initiative of Henry Benson, an associate at Coopers & Lybrand in London. Benson convinced fellow members of the Institute of Chartered Accountants of England and Wales that it was necessary to invite foreign accounting professional organizations to join the IASC. Indeed, Walton (2002) argues that the IASC was created under the influence of the United Kingdom to counterbalance the influence of Continental Europe on

accounting matters. British representatives feared that the continental accounting approach based notably on the French and German wealth and tax vision would prevail across Europe. In contrast, the British tradition, enrooted in Common Law, grants more power to accounting professionals. In line with Walton, Raffournier (2009) relies on a classification established by Nobes (1983) to explain that the pragmatic Anglo-Saxon view of accounting differs from the continental approach. In particular, Raffournier argues that several factors justify such a dichotomy, including legal system, public companies' financial strategy, taxation, and political and economic relationships between countries. Organized around several committees including a Board which could handle technical questions, prepare and publish new standards, the IASC was mainly made up of accounting professionals and members of the financial community. During its first decade, the IASC produced International Accounting Standards (or IAS) that mainly reflected accounting practices used by member states. As such, standards were still rigid and offered little reconciliation. From the late 1980s to the mid-1990s, the IASC focused its efforts on reducing the number of accounting methods to enhance comparability. In fact, around the same period, the European Commission proclaimed its desire to promote international harmonization of accounting standards to allow European companies to raise capital on international markets. In a communication released on November 14th, 1995, the European Commission, under the leadership of Mario Monti, acknowledged the difficulties met by European companies to raise capital on international markets (especially the US), argued for the need to develop “a broader international harmonization of accounting standards,” (rather than developing European accounting standards), and to associate the efforts made by the EU in this domain with the IASC and IOSCO (which stands for International Organization of Securities Commissions and whose members regulate the world's securities and futures markets) (*Source: http://europa.eu/rapid/press-release_IP-95-1234_en.htm?locale=en*).

Since its inception, the IASC released 41 IAS and 25 interpretations. However, this productivity did not hide the weaknesses that hindered the organization including inefficient board meetings (which gathered at times nearly 80 participants) or the lack of involvement of national standard-setters. In order to address these issues, restructure the organization, separate technical work from promotional activities, professionalize the standard-setting process and become independent from the accounting profession (and thus be identified as an independent body), the IASC structure was abandoned and the IASB (or International Accounting Standard Board) was created on January 1st, 2001.

The responsibility of the IASB became larger when a year later (on July 19th, 2002) the European Union made official the adoption of member states to international accounting standards by granting standard-setting power to the IASB. Indeed, Regulation 1606/2002/EC required listed companies to prepare consolidated accounts in accordance with IAS from 2005 onwards. Additionally, the European Commission appointed the European Financial Reporting Advisory Group (or EFRAG) for its technical expertise to help the Commission assess the impact of IAS. EFRAG mainly make recommendations to the Commission after having held consultations with various interest groups. In

addition to EFRAG, the European Commission interacts with various other authorities including SARG (or Standards Advice Review Group), ARC (or Accounting Regulatory Committee), the European Parliament and the Council of the European Union (*Source: IAS and Interpretations endorsement process*). In order to foster the international harmonization envisioned by Mario Monti in 1995, the IASB and its US counterpart, the FASB, signed in September 2002 the Norwalk Agreement (Connecticut, USA) and agreed to work together towards the convergence of US GAAP and IFRS. Before discussing the convergence of accounting standards in a later section, we first detail the accounting standard process and discuss the vision behind IFRS.

Standard-setting process

The IFRS Foundation is the authoritative body that spearheads the development of the International Financial Reporting Standards. Furthermore, the IFRS Foundation is organized as an independent, not-for-profit private sector organization. As indicated on its corporate website, its stated principal objectives are to i) develop a single set of high quality, understandable, enforceable and globally accepted international financial reporting standards through its standard-setting body, the IASB, ii) promote the use and rigorous application of those standards, iii) take account of the financial reporting needs of emerging economies and small and medium-sized entities (or SMEs), and iv) bring about convergence of national accounting standards and IFRSs to high quality solutions. In order to promote this latter goal, the foundation actively works with the FASB in developing common standards and rules.

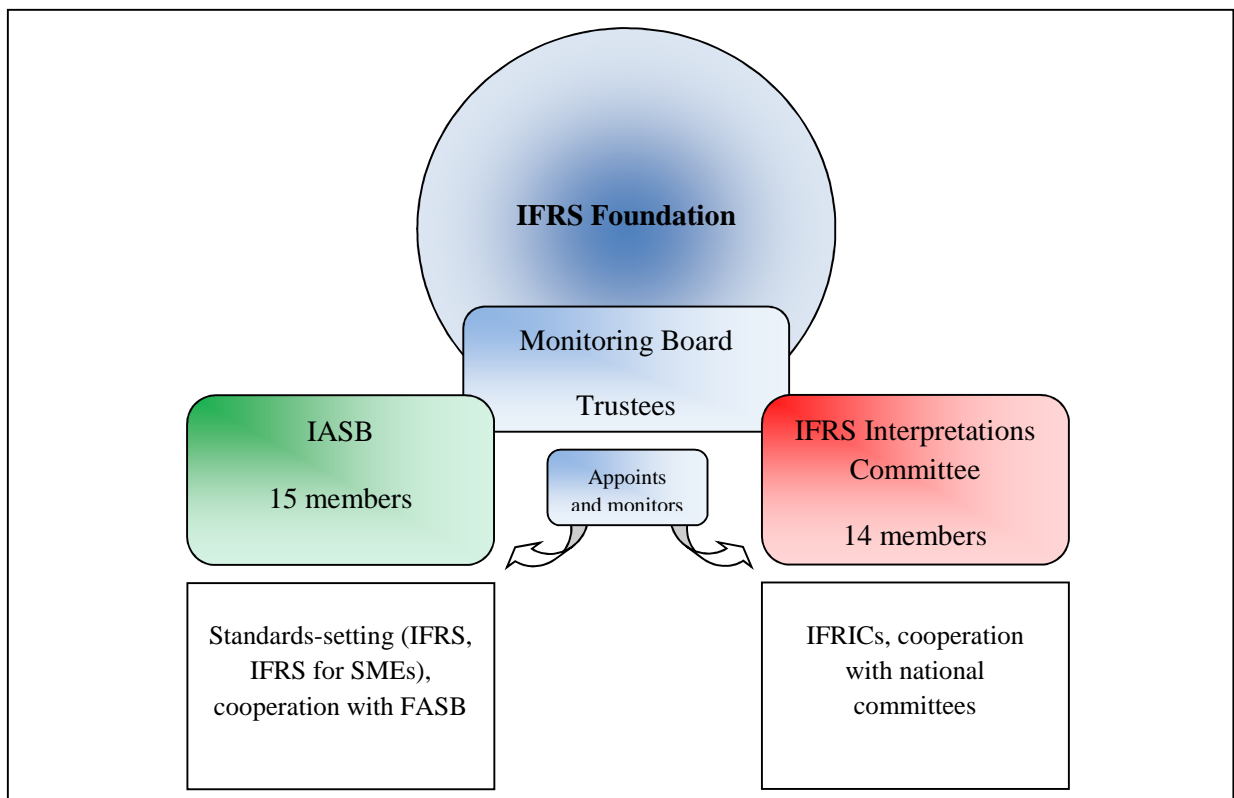
In addition, the IFRS Foundation indicates that the governance and oversight of its activities rests with its trustees, who are also responsible for safeguarding the independence of the IASB and ensuring the financing of the organization. The trustees are publicly accountable to a Monitoring Board of public authorities. The foundation's operating activities are allocated between the IASB and the IFRIC.

The IASB is structured as an independent standard-setting body. Its members (currently 15 full-time members) are responsible for the development and publication of IFRS, including the IFRS for SMEs and for approving Interpretations of IFRS as developed by the IFRIC. As a mark of transparency, all meetings of the IASB are held in public and broadcast live via Internet, and consultative documents, such as discussion papers and exposure drafts, are published for public comment. The IASB vows to engage constructively with stakeholders around the world, including investors, analysts, regulators, business leaders, accounting standard-setters and the accountancy profession.

The IFRS Interpretations Committee (or IFRIC) is the interpretative body of the IASB. The Interpretations Committee comprises 14 voting members appointed by the trustees and drawn from a variety of countries and professional backgrounds. The mandate of the Interpretations Committee is to review on a timely basis widespread accounting issues that have arisen within the context of current IFRS and to provide authoritative guidance (through the release of statements called IFRICs) on those

issues. Similarly to the IASB, Interpretation Committee meetings are open to the public and webcast. In developing interpretations, the Interpretations Committee works closely with similar national committees and follows a transparent, thorough and open “due process” (*Source: IFRS.org, 2010*). The figure shown below helps visualize the IFRS Foundation’s organizational structure.

Exhibit XXV: IFRS Foundation’s organizational structure

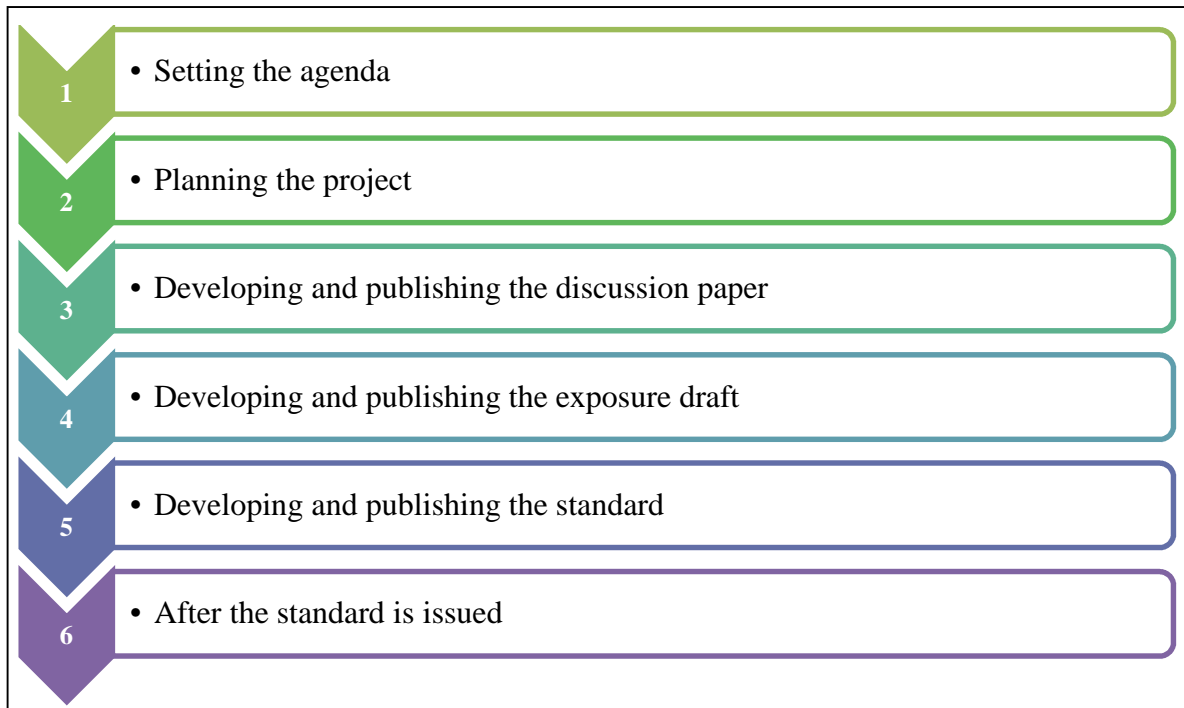


Source: Moïse LOUISY-LOUIS, based on IFRS.org, June 2014

To ensure its legitimacy and independence, the IFRS Foundation seeks to attract talented individuals. As a matter of fact, the Board of trustees is composed by a team of 15 high profile individuals who are for the most part retired top executives or active executives at prominent financial institutions. For example, the Chairman, Mr. Tommaso Padoa-Schioppa, is affiliated to Notre Europe and to Promontory Europe. The Vice-Chairman, Mr. Tsuguoki Fujinuma, is the President of the Japanese Institute of Certified Public Accountants. The second Vice-Chairman, Robert Glauber, is the retired Chairman and CEO of the NASD and former Under Secretary of the Treasury for Finance. Moreover, in order to effectively account for global accounting issues, trustees are appointed for a renewable term of three years according to a geographical distribution (presently, six of the trustees must be selected from the Asia/Oceania region, six from Europe, six from North America, one from Africa, one from South America and two from the rest of the world). Members of the IASB and IFRIC are also selected according to a rigorous process.

IFRS are formulated through an international consultation process referred to as the “due process.” This process includes six successive steps as illustrated below:

Exhibit XXVI: IFRS’ accounting standards-setting (due) process



Source: Moïse LOUISY-LOUIS, based on IFRS.org, Due Process Handbook, June 2014

The initial step in the due process requires the Board to evaluate the merits of adding a potential item to its agenda mainly by reference to the needs of investors. After having added an item to its active agenda, the IASB also decides whether to conduct the project alone, or jointly with another standard-setter. During the third stage, probably the most time consuming in the entire due process, the IASB normally releases its first publication (a discussion paper) on any major new topic to explain the issue and solicit early comment from constituents. Typically, a discussion paper includes i) a comprehensive overview of the issue, ii) possible approaches in addressing the issue, iii) the preliminary views of its authors or the IASB, and iv) an invitation to comment. The next stage requires the publication of an exposure which is mandatory. Irrespective of whether the IASB has published a discussion paper, an exposure draft is the IASB’s main vehicle for consulting the public. Unlike a discussion paper, an exposure draft sets out a specific proposal in the form of a proposed standard (or amendment to an existing standard). The next stage relates to the publication of a standard. The development of an IFRS is carried out during IASB meetings, when the IASB considers the comments received on the exposure draft. After having resolved issues arising from the exposure draft, the IASB considers whether it should expose its revised proposals for public comment, for example by publishing a second exposure draft. Lastly, after an IFRS is issued, the staff and the IASB members hold regular meetings with interested parties, including other standard-setting bodies, to

help understand unanticipated issues related to the practical implementation and potential impact of its proposals (Source: *IFRS.org*, 2010). Overall, this process appears well structured and systematic. Next, we highlight the principles and vision that characterize IFRS proceedings.

IFRS philosophy and vision

The 2002 Norwalk Agreement represents a cornerstone in the history of the IASB. Not only the signature of a MoU (or Memorandum of Understanding) meant that the IASB sought to raise IAS and IFRS to the international arena, but it also meant moving from accounting standards to financial reporting rules which sacred the notion of firm value and introduced the concept of usefulness of financial information (in particular in the decision-making process). Another element of particular importance for the international standard-setter has to do with the notion of fair value.

According to Cormier and Magnan (2009), the Anglo-Saxon vision of financial accounting places investors and creditors at the center of a system that is structured for their best interest. Specifically, Cormier and Magnan (2009) explain that “the goals of financial statements under US standards (SFAC No. 1, 1978) are to provide information that permits market efficiency and best allocate scarce economic resources. Investors and creditors are identified as the primary users of financial accounting information¹⁶.” This emphasis on investors (commonly called shareholders) has been engraved into the IASB’s conceptual framework, which was greatly influenced by the US vision (i.e. the FASB) as argues Colasse (2009, p. 109). However, Burlaud and Colasse (2010) vehemently criticize the IASB’s conceptual framework since it is employed to mask the IASB’s lack of legitimacy. The authors persuasively explain that the IASB’s conceptual framework is enrooted in Agency Theory (which reduces the firm to a nexus of contracts linking shareholders-investors to managers) and the Efficient Market Hypothesis (which Burlaud and Colasse see as an ideological tool used in promoting financial markets¹⁷). In addition to these conceptual flaws, an apparently democratic due process has allowed the IASC/IASB to mask its weaknesses and limitations thanks to shrewd rhetoric and the support of governments and international organizations¹⁸ (Burlaud and Colasse, 2010).

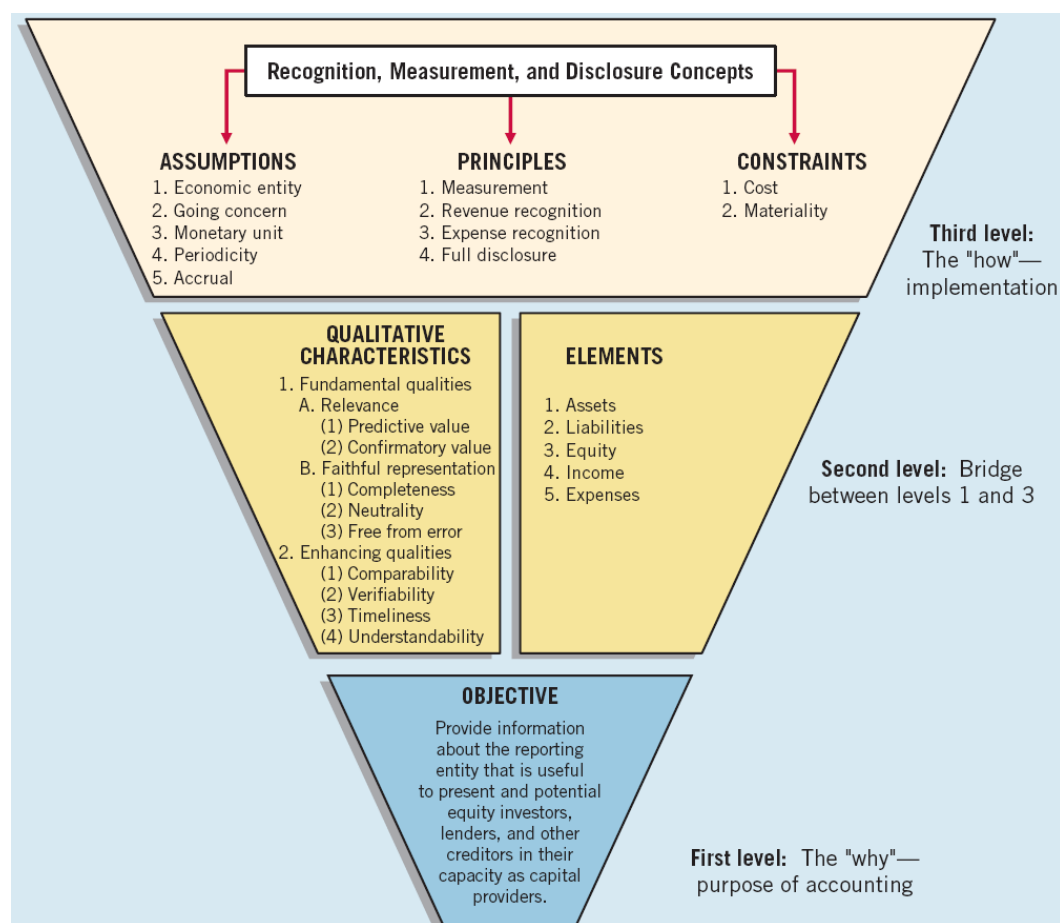
¹⁶ Translated from the French: “Les objectifs des états financiers selon la norme américaine (SFAC No. 1, 1978) sont de fournir des informations qui permettent l’efficacité des marchés et l’allocation optimale des ressources économiques. Les investisseurs et les créanciers sont reconnus comme étant les premiers utilisateurs de l’information comptable” (Cormier and Magnan, 2009, p. 176).

¹⁷ Translated from the French: “En ce qui concerne l’hypothèse d’efficacité des marchés, elle n’a reçu que des validations très partielles; la tenir pour « vraie » et en tirer des conséquences normatives revient donc à prendre ce qui n’est qu’une théorie pour la réalité ou à proposer une théorie comme substitut de la réalité présente, c’est-à-dire à en faire, en l’occurrence, le support d’un projet idéologique de promotion des marchés financiers” (Burlaud and Colasse, 2010, p. 171).

¹⁸ Translated from the French: “Tout en donnant l’illusion que les diverses parties prenantes peuvent participer à l’élaboration des normes, dans les faits, le *due process* réserve cette élaboration aux parties qui disposent d’importantes ressources financières et intellectuelles nécessaires pour une participation efficace. Ce n’est donc pas une procédure démocratique. [...] Néanmoins, une rhétorique habile de la neutralité, de la fidélité, de l’objectivité, voire de la justice, fondée en apparence sur une théorie contemplative de la comptabilité, a permis à l’IASB/IASB de masquer les faiblesses et les limites de cette double légitimité. [...] La passivité des organisations gouvernementales et intergouvernementales a sans doute servi ses desseins” (Burlaud and Colasse, 2010, p. 171).

On a more neutral tone, Kieso et al. (2011) believes that “a conceptual framework establishes the concepts that underlie financial reporting” (2011, p. 40). The authors explain that in order to ensure that accounting standards are consistent over time or that accounting professionals can rapidly address new and emerging issues, standard-setters need to refer to a guide which defines the overarching goal of financial reporting. As a matter of fact, the IASB’s conceptual framework is structured around three levels or layers, the first one precisely defines the objective of financial reporting as follows: “the objective of general-purpose financial reporting is to provide financial information about the reporting entity that is useful to present and potential equity investors, lenders, and other creditors in making decisions in their capacity as capital providers” (Kieso et al., 2011). The second level describes the qualitative characteristics expected from financial accounting information while the third level lists recognition, measurement and disclosure concepts. The below diagram shows the structure of the IASB’s conceptual framework.

Exhibit XXVII: IASB's conceptual framework



Source: Kieso, Warfield and Weygandt, 2011, p. 60

As shown above, the conceptual framework's first level defines the overarching goal of financial accounting whereas second and third levels indicate how this goal can be achieved. In particular, the IASB distinguishes good (and useful) information from poor (and less useful) information through qualitative characteristics, which are further subdivided into fundamental qualities and enhancing qualities. Decision-useful is fostered when financial information is relevant (i.e. it helps users make a difference in a decision). Relevant information helps users predict or confirm prior expectations. The second fundamental quality is faithful representation which questions whether the financial information relates actual facts. Faithful representation requires the information to be complete (i.e. the information in its entirety is disclosed otherwise omission can mislead users), neutral (i.e. the information disclosed is unbiased and is not selected to present a particular aspect of reality), and free from error (i.e. the information is accurate).

Complementary to fundamental qualities, enhancing qualities also contribute to the usefulness of financial information. Enhancing qualities encompass comparability (similarity in disclosure across time and between reporting entities allow users to identify trends and issues), verifiability (any third party using the same methodology should come up with similar results), timeliness (the information

should be made available to users early enough before “it loses its capacity to influence decisions”) and understandability (any reasonable users can perceive the significance of the information thanks notably to pertinent classifications) (Kieso et al., 2011). Final category within the second level, elements represent the common items found on financial statements. Asset, liability, equity, income (in fact revenue) and expenses are accounting vocabulary universally used.

The third level regroups assumptions, principles and constraints. These items in fact explicate how reporting entities should record, measure and report accounting elements and events. There are five basic assumptions that govern the preparation of financial information. The economic entity assumption stipulates that an entity’s activities must be kept separate from those of its owners. The going-concern assumption advances that an entity will operate for an indefinite period of time. It is necessary to assume a degree of continuity in order to justify for the application of depreciation or amortization policies. The monetary unit assumption denotes that accounting events can be measured in terms of units of a particular currency. The periodicity assumption presumes that a reporting entity can divide its fiscal year in pertinent (and comparable) time periods. Last but not the least, the accrual basis of accounting is probably the most important assumption. The accrual basis of accounting is based on two principles: the revenue principle which states that revenue is recognized when a product has been sold and a service has been performed while the expenses principles stipulates that expenses are recognized when incurred. And this regardless of the occurrence of cash flows. In fact, the cash basis of accounting is an alternative to accrual accounting and would lead to recognize accounting events based solely on cash flows. This alternative approach creates a distorted picture of a company’s activities because receipts and payments can in practice take place before or after the recognition of revenue or expenses. The third level includes also four principles, two of which relate to accrual accounting (revenue and expenses). The measurement principle is central to the vision developed by the IASB and will be further discussed at the end of this paragraph. The full disclosure principle requires reporting entities to provide all the information that is likely to “influence the judgment and decisions of an informed user” (Kieso et al., 2011). In practice, it means that reporting entities need to provide financial information via financial statements, footnotes and supplementary information. Lastly, there are two constraints in preparing financial information. The cost constraint epitomizes a cost-benefit trade-off in which the expected benefits derived from the disclosure of particular financial items must exceed the cost of preparing these items. The materiality constraint has to do with whether an item impacts overall financial performance. In other words, the materiality question suggests that if the inclusion of an item “would influence or change the judgment of a reasonable person,” such an item is deemed material and must be disclosed (Kieso et al., 2011). In their presentation of measurement principles, Kieso et al. (2011) describe a “mixed-attribute” system in which two approaches are used, the cost principle and the fair value principle. Basically, the cost or historical cost principle argues that companies’ assets and liabilities should be accounted for at their acquisition price. This method is thought to be a faithful representation of corporate assets and

liabilities. In contrast, the fair value principle advocates that companies' assets and liabilities should be accounted for at their fair or market value which is defined as "the amount for which an asset could be exchanged, a liability settled, or an equity instrument granted could be exchanged, between knowledgeable, willing parties in an arm's length transaction" (Kieso et al., 2011). Since users would want to know current market prices (in order to buy, hold or sell), one can argue that fair value information is relevant.

Recognizing the importance of fair value, the IASB has promoted the fair value option (i.e. fair value being used as the basis for measurement of financial assets and liabilities) and has in recent years become a passionate advocate of fair value (Casta and Colasse, 2001). As a matter of fact, Jeanjean (2009) realizes that FASB and IASB largely make reference to fair value with the IASB using the notion more than 4,000 times in its IAS and IFRS pronouncements¹⁹. Furthermore, Jeanjean (2009) explains that though the notion of fair value appeared unfrequently in IASB's pronouncements in the 1970s, it became rapidly an important element of its rhetoric. Despite of its perceived advantages, fair value brings some limitations notably due to the various methods used to estimate fair value and the inevitable trade-off between relevant and reliable information as discussed by Jeanjean (2009). We will further discuss the advantages and disadvantages of fair value in a later section devoted to the accounting of defined benefit pension plans and the revision of IAS 19.

To conclude this section dedicated to IFRS and before introducing the foundations of US GAAP, we would like once again to emphasize on two elements that are central to international accounting standards: the primacy of shareholders and the notion of fair value.

¹⁹ Translated from the French: "D'un côté, les normalisateurs américain (le FASB – Financial Accounting Standards Board) et international (l'IASB – International Accounting Standards Board) font largement référence à la notion de juste valeur (fair value): le normalisateur international utilise plus de 4 000 fois cette expression dans les normes (IAS/IFRS) et ces interprétations (Thouvenin, 2007)" (Jeanjean, 2009, p. 1025).

2.2: US GAAP: Authoritative bodies and key principles

According to its website, the Financial Accounting Standards Board has been, since 1973, the official organization in the private sector which has been made responsible for establishing standards of financial accounting that govern the preparation of financial reports by private entities. Those standards are officially recognized as authoritative by the Securities and Exchange Commission (Financial Reporting Release No. 1, Section 101, and reaffirmed in its April 2003 Policy Statement) and the American Institute of Certified Public Accountants (Rule 203, Rules of Professional Conduct, as amended May 1973 and May 1979). In contrast, the SEC has statutory authority to establish financial accounting and reporting standards for publicly held companies under the Securities Exchange Act of 1934. Throughout its history, however, the Commission's policy has relied on the private sector for this function to the extent that the private sector demonstrates ability to fulfill the responsibility in the public interest.

The accounting standard-setting protocol is orchestrated by the FASB and its peripheral entities. These entities, which include the Financial Accounting Foundation (or FAF), the Financial Accounting Standards Advisory Council (or FASAC), the Governmental Accounting Standards Board (or GASB), and the Governmental Accounting Standards Advisory Council (or GASAC) collaborate on the formulation of new rules and standards at different levels. For example, the FAF has operational responsibilities since it is the entity that oversees, administers, and finances the FASB. FAF also intervenes to guarantee "the independence and integrity of the standards-setting process" and appoints members of the FASB and its peripheral entities (*Source: FASB.org, 2010*).

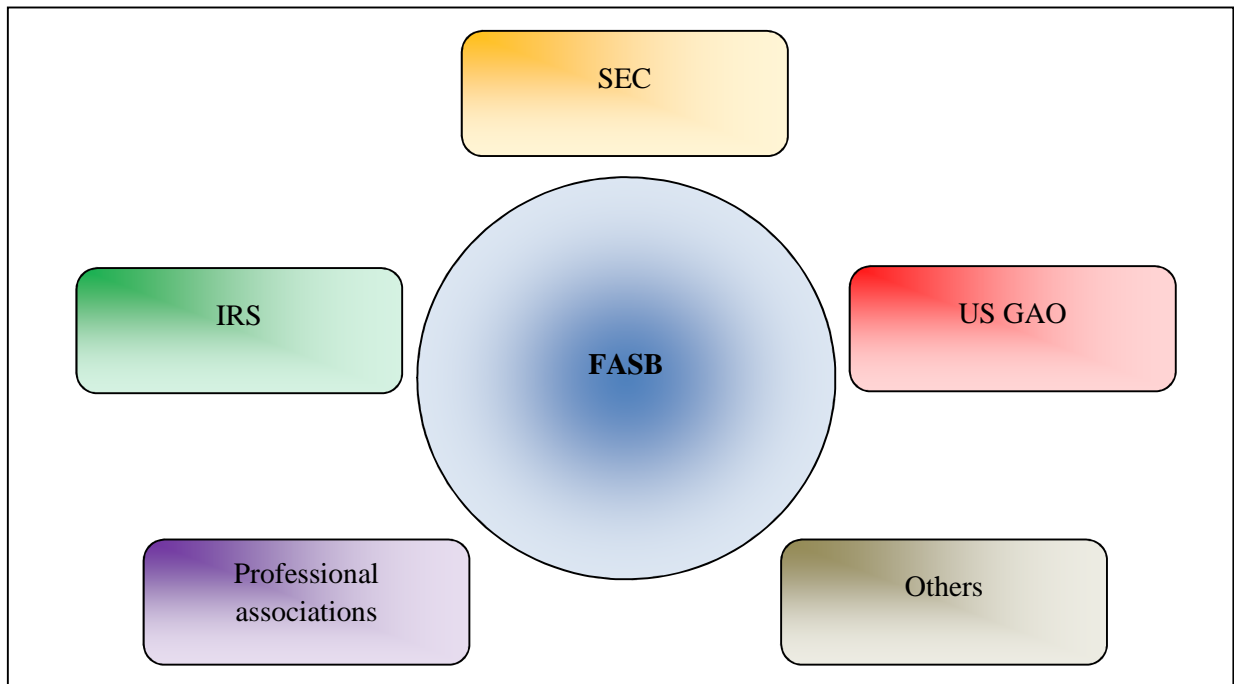
In addition to the FASB, the literature published by the United States' most active governmental agencies in shaping the country's accounting landscape (including the Securities and Exchange Commission or SEC, the Internal Revenue Service²⁰ or IRS, and the US Government Accountability Office²¹ or GAO), as well as by pertinent specialized press (such as the Financial Times or the Wall Street Journal) offers additional insight over the issues discussed here. The GAO has since 2002 held numerous seminars and published resourceful material as a means to raise public awareness, to brainstorm on specific issues and to foster changes within the regulatory environment (GAO, 2002 and 2003). Numerous accounting associations and press entities have published works that share similar goals. In particular, the work of Gore and Zimmerman offered substance for profoundly reshaping the accounting framework (Gore and Zimmerman, 2007). These scholars (Gore is an associate professor and Zimmerman is a CPA) have sought to reconcile academia with business

²⁰ The IRS is a bureau of the Department of the Treasury. In fiscal year 2009, the IRS collected more than \$2.3 trillion in revenue and processed more than 236 million tax returns. The IRS has full authority to administer and enforce the internal revenue laws and has the power to create an agency to enforce these laws (IRS.gov, 2010).

²¹ The U.S. Government Accountability Office (GAO) is an independent, nonpartisan agency that works for Congress. Often called the "congressional watchdog," GAO investigates how the federal government spends taxpayer dollars. The head of GAO, the Comptroller General of the United States, is appointed to a 15-year term by the President from a slate of candidates Congress proposes (GAO.gov, 2010).

practices. They have released their views with the *CPA Journal*, perhaps the most recognized business publication for Certified Public Accountants (or CPA) in the United States. The figure shown below summarizes and illustrates the topics discussed above.

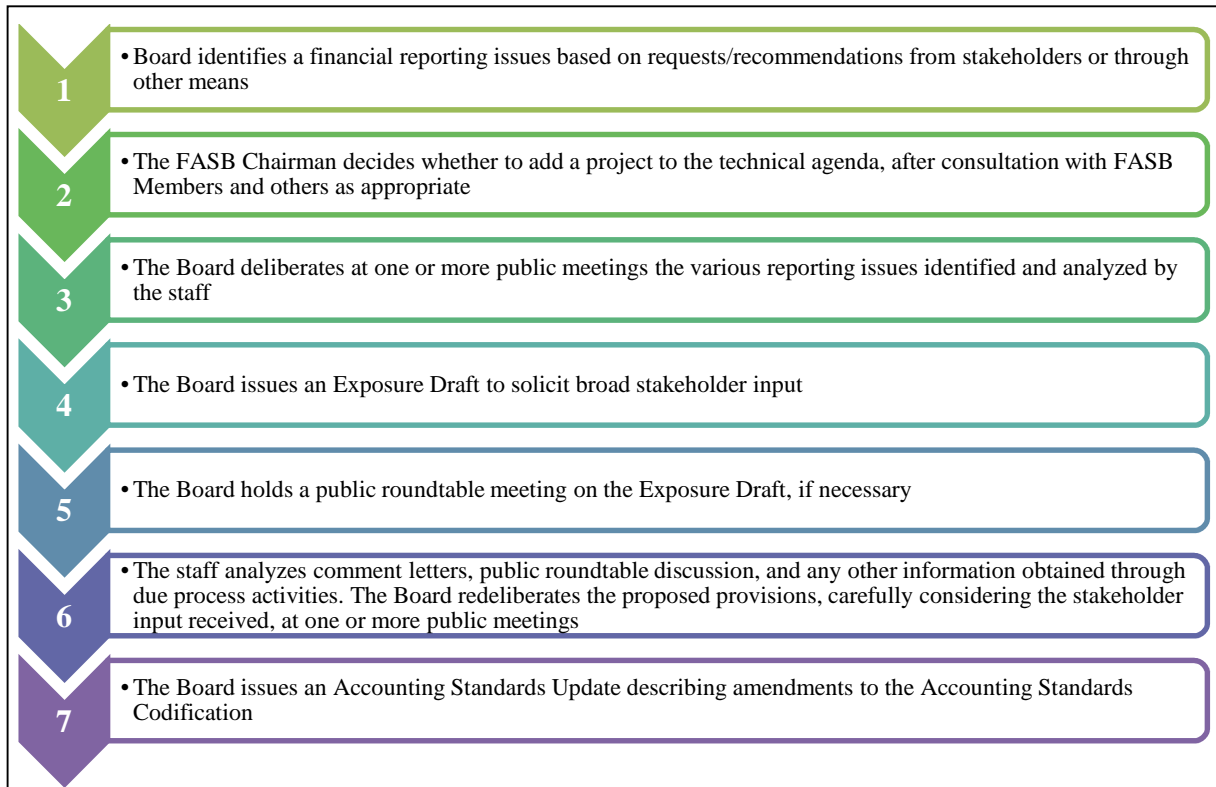
Exhibit XXVIII: United States' accounting landscape



Source: Moïse LOUISY-LOUIS, June 2014

The above figure permits to make the following remarks about the US accounting standard-setting framework. First, it appears clearly that, by being at the center of this framework, the FASB remains the pivotal and authoritative organization. Second, such a structure permits to create synergies between institutions (as certain may develop specialized competencies on particular issues or particular industries or sectors) and establish a collaborative system. However, the main drawback of such a structure is that it slows down significantly the FASB. The process of elaborating new standards or amending existing ones requires several months or years. Although the FASB appears to communicate extensively (via press releases, newsletters, updates, and so on), the organization's ability to respond to particular issues appears to be lengthy. For example, the SEC published in June 2005 a sizeable report about off-balance sheet practices. The FASB only came up with a "response" via a press release in February 2006. In other words, more than six months later, the FASB acknowledged the study performed by the SEC and merely reaffirmed its commitment to address the issues that the SEC had highlighted in its report. Similarly, the standard-setting process obeys to a strict protocol, which is mainly designed to safeguard the independence and integrity of the standard-setting process. The standard-setting process can be lengthy as illustrated below (steps 5 and 6 can especially consume significant amounts of time):

Exhibit XXIX: FASB's accounting standards-setting process



Source: Moïse LOUISY-LOUIS, based on FASB.org, *Rules of Procedure*, June 2014

Many of the concerns raised by the SEC relate to the off-balance sheet categories. The following paragraphs specifically address the statements released by the FASB in relation to pension accounting and off-balance sheet practices.

In the April 2007 edition of the *Financial Analysts Journal*, the academic journal sponsored by the CFA Institute, Grant, Grant and Ortega (2007) made a blunt statement: “hidden liabilities, understated expenses, and discretionary management assumptions make pension accounting controversial.” Furthermore, the authors insisted that “previous accounting standards allowed companies with underfunded pension plans to accumulate pension liabilities off the balance sheet while frequently reporting a net pension asset on the balance sheet” (Grant et al., 2007). Although this view may seem inflated, it does have some elements of truth. Despite the FASB’s commitment to improving regulation since the 1970’s, the accounting for retirement arrangements remains extremely complex and opaque.

As explained previously, there are two primary types of pension benefit plans: defined contribution and defined benefit. The accounting treatment for defined benefit plans is more sophisticated than for defined contribution plans. This degree of complexity arises from the fact that accounting standards

require that reporting entities prepare financial statements using the accrual basis of accounting²²: liability for pension-related costs must be recognized by the employer when its employees provide service to the firm, not when pension benefits are paid. Because a pension plan policy represents long-term planning, changes in actuarial assumptions and estimates create significant volatility in pension-related cost and liability. By deferring the recognition of pension gains and losses, reporting entities may artificially spread pension-related costs over time. As a result, accounting standards give reporting entities discretion about the deferral of gains and losses. Off-balance sheet issues arise as deferrals and pension obligation can be structured as off-balance sheet schemes. The FASB has sought to both educate reporting entities and control accounting practices for about thirty years. APB No. 8, *Accounting for the Cost of Pension Plans*, was issued in 1966 and had been the reference standard for a substantial period of time. Issued in March 1980, SFAS No. 35, *Accounting and Reporting by Defined Benefit Pension Plans*, superseded APB No. 8 and established standards of financial accounting and reporting for the annual financial statements of a defined benefit pension plan (the primary benefit of such statements is to be helpful in assessing the plan's present and future ability to pay benefits when due). Prior to the implementation in 1985 of a substantial amendment with SFAS No. 87, *Employers' Accounting for Pensions*, a series of minor amendments would be implemented, through SFAS No. 36 (1980) to improve the disclosure of pension assumptions, No. 59 (1982) to postpone application of SFAS No. 35 for plans sponsored by state and local governments, No. 74 (1983) to account for special termination benefits offered to employees over a limited period of time, and No. 81 (1984) to improve the disclosure of postretirement health care and life insurance benefits.

SFAS No. 87 was released in 1985 amid an environment marked by substantial controversy. After 1966, the importance of information about pensions grew with increases in the number of plans and amounts of pension assets and obligations. There were significant changes in both the legal environment (for example, the enactment of ERISA²³) and the economic environment (for example, higher inflation and interest rates). Critics of prior accounting requirements, including users of financial statements, became aware that reported pension cost was not comparable from one company to another and often was not consistent from period to period for the same company. They also became aware that significant pension-related obligations and assets were not recognized in financial statements. SFAS No. 87 had several goals. Most notably the FASB sought to i) reaffirm the usefulness of information prepared in accordance with accrual accounting, ii) institute a standardized

²² The accrual basis of accounting is an expansion of the realization principle and the matching principle. The former principle requires entities to record revenues when goods have been transferred or services have been performed for a client. The latter principle requires to record costs and expenses necessary to generate revenues in the period they have helped these revenues (which explains the notion of matching).

²³ The Employee Retirement Income Security Act of 1974 is a federal statute that establishes minimum standards for pension plans in private industry. Inspired by President John F. Kennedy, ERISA was enacted to protect the interests of employee benefit plan participants and their beneficiaries by requiring the disclosure to them of financial and other information concerning the plan. Note that ERISA does not require employers to establish pension plans but regulates the operation of a pension plan once it has been established.

method for measuring annual pension cost and recognizing that cost over employees' approximate service periods and iii) (re)define the notion of "minimum liability²⁴" (FASB SFAS No. 87, p. 2-4). Subsequently to SFAS N.87, the FASB released SFAS No. 88 (December 1985) to clarify the accounting for settlement of defined benefit pension obligations, for curtailment of a defined benefit pension plan, and for termination benefits, SFAS No. 106 (1990) to apply similar precepts as established by SFAS No. 87 to the treatment of postretirement benefits. SFAS No. 132 (1998) superseded SFAS No. 87, standardized the disclosure requirements for pensions and other postretirement benefits to the extent practicable, required additional information on changes in the benefit obligations and fair values of plan assets, and eliminated certain disclosures that were no longer useful. In particular, the most significant changes required footnote disclosure showing a reconciliation of beginning and ending balances of the pension benefit obligation (or PBO), a reconciliation of beginning and ending balances of the fair value of plan assets, and the funded status of the plan. Additionally, footnote disclosure of three rate assumptions was required: the expected return on plan assets, the discount rate, and the expected rate of employee compensation increase (Grant et al., 2007). In 2003, "In response to concerns expressed by users of financial statements about their need for more information about pension plan assets, obligations, benefit payments, contributions, and net benefit cost," the FASB released a revised version of the 1998 statement, called SFAS No. 132 (R), which essentially required additional footnote disclosure and stipulated that the information for pension plans and for other postretirement benefit plans needed to be provided separately to enhance comprehension (FASB SFAS No. 132 (R), p. 2).

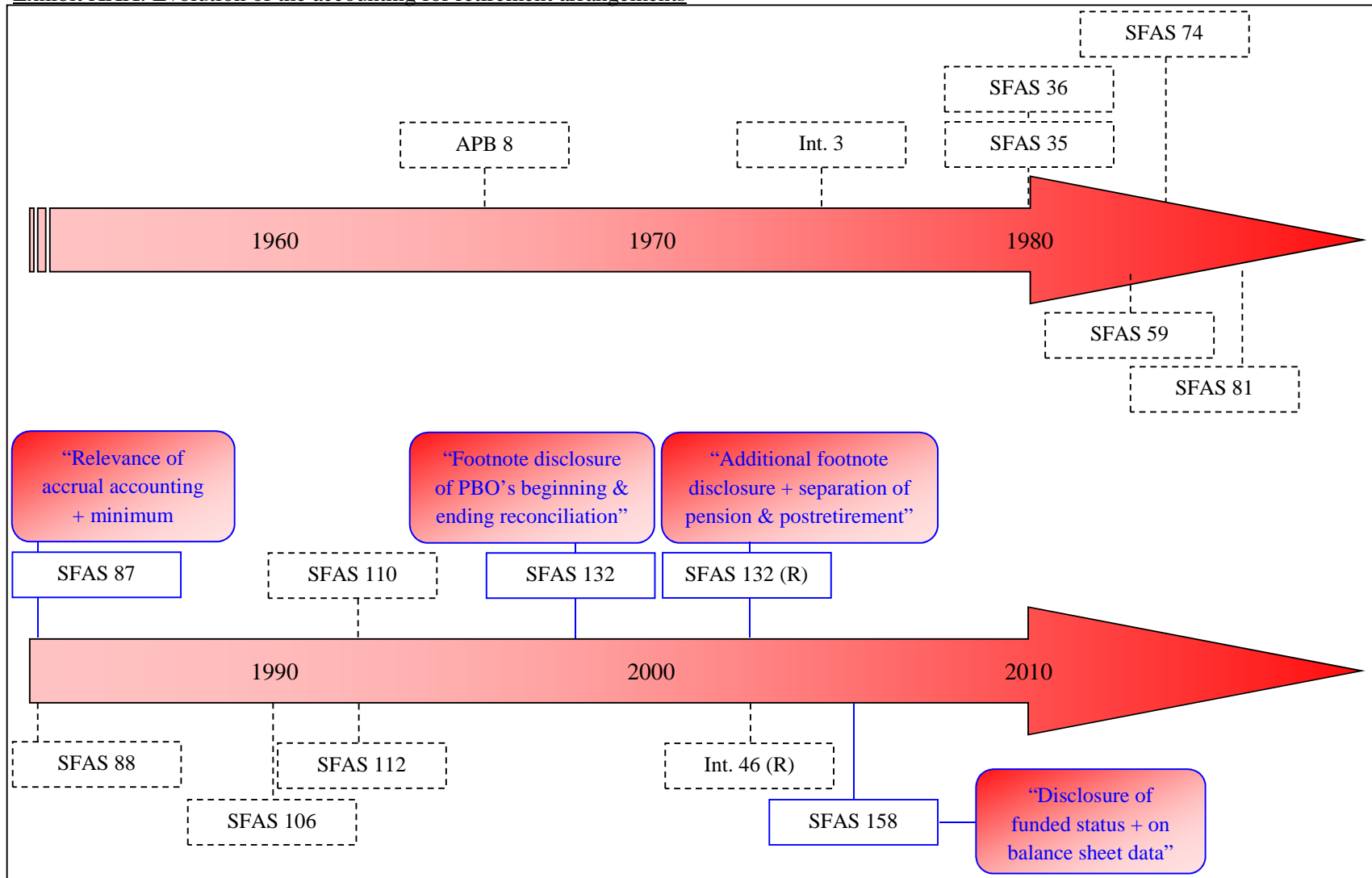
Lastly, in an attempt to overhaul the accounting for defined benefit plans and drastically improve the disclosure about the funded status of pension and postretirement plans, SFAS No. 158 required reporting entities to take the information previously disclosed in the footnotes into the financial statements (meaning that the balance sheet would then fully reflect the firm's funded status). As a result, the statement immediately addressed and limited the scope of off-balance sheet practices that were allowed by previous pronouncements. Writing for the *Journal of Accountancy*, Paul Miller and Paul Bahnson (2007) acknowledged the advantages of the new statement but also warned about its limitations. In particular, Miller and Bahnson (2007) explained that "basically, statement no. 158 requires companies to take information out of the footnotes and put it into the body of the financial statements. Despite its significant changes, statement no. 158 is only FASB's interim solution for improving users' access to pension-related information." Furthermore, Miller and Bahnson argued that "while statement no. 158 will provide more transparent information about companies' postretirement benefit obligations, influential bodies including the SEC, the CFA Institute, and the Financial Accounting Standards Advisory Council have called for a more complete reformation of

²⁴ SFAS No. 87 required the immediate recognition of a (minimum) liability when the accumulated benefit obligation exceeds the fair value of plan assets (giving rise to an unfunded pension obligation) (FASB SFAS No. 87, p. 3). The intent of this requirement was to ensure recognition of at least a portion of a company's pension obligation in the balance sheet.

GAAP; even to the point of calling for consolidating the financial statements of the parent and the pension plan” (Bahnsen and Miller, 2007). Similarly, in an article published with the *Financial Analysts Journal*, Grant et al. indicated that the FASB’s task is far from being done: “as a result, total pension reform is far from a reality. For example, the controversial smoothing mechanisms created by FAS No. 87 to amortize unexpected gains and losses into pension cost remain under FAS No. 158” (Grant et al., 2007).

The analysis of the rules and standards in relation to retirement arrangements that have been enacted by the accounting standards-setters has highlighted several important facts. As businesses grow and increasingly engage in more sophisticated financial transactions, life expectancy has increased, environmental factors evolved rapidly, the accounting for pension and other postretirement benefits can only continue becoming more complex. As a conclusion to this section on the US regulatory environment, the illustration shown below summarizes the discussion about the accounting for retirement arrangements.

Exhibit XXX: Evolution of the accounting for retirement arrangements



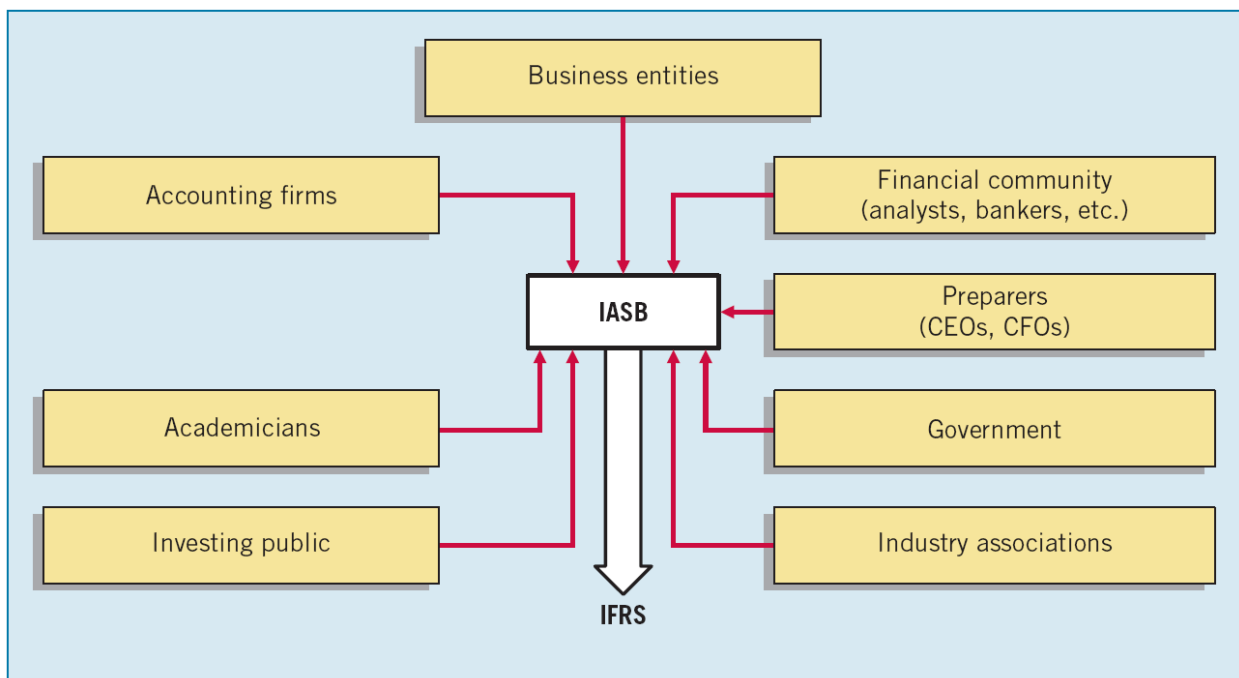
Source: Moise LOUISY-LOUIS, based on FASB.org data, "2005 SEC Report," June 2014

2.3: Issues and challenges with financial reporting

In the next paragraphs, we overview weaknesses and limitations that are common to both IFRS and US GAAP frameworks (though the analysis will mostly focus on the IASB). Despite multiple mechanisms to ensure the usefulness of the financial information released by reporting entities, several issues hinder the development of financial reporting of superior quality. These issues include the “politicization” of the standard-setting process, the so-called expectation gap, specific financial reporting problems, and ethics.

For Kieso *et al.* (2011) the international standard-setting process takes place amidst political pressure. The scholars explain that user groups (habitually made of a great variety of interest parties) “often target the IASB, to pressure it to influence changes in the existing rules and the development of new ones” (Kieso *et al.*, 2011). The below diagram provides a simplified vision of the diversity of these groups.

Exhibit XXXI: User groups that influence the IASB



Source: Kieso, Warfield and Weygandt, 2011, p. 15

Although “these pressures have been multiplying,” Kieso *et al.* (2011) do not perceive “politics in establishing IFRS is a negative force.” In fact, because the impacts of accounting rules can be significant, it appears appropriate for user groups to voice their concerns in a transparent and democratic manner.

Chantiri (2012) not only shows that the literature treating the due process is plethoric but also reveals the depth of lobbying, marketing, and persuasion techniques employed by interest parties involved in the due process. Although it is daunting to establish a detailed classification, we can argue that there are two main strands of the literature. On the one hand, prior studies have sought to analyze the behavior and characteristics of the interest parties that participate in the due process. Scholars have notably tried to explain behavior through the lenses of the Positive Accounting Theory or through some cost-benefit analysis. On the other hand, researchers have in contrast focused on better understanding the functioning of standard-setting organizations and have frequently relied on the Neo-Institutionalism Theory. The work of Chee, Kwok and Sharp (2005) fits in the former group and perfectly illustrates the diversity and contrasting influence that enjoy user groups. Adopting an empirical strategy based on in-depth interviews and content analysis of publicly-available information, the researchers find that “each of the four stakeholder groups – users, preparers, accountants, and regulators – possesses unique abilities or resources integral to the promulgation of IAS. Nonetheless, the IASC Framework and the interviewees explicitly stated that the IASC process serves the needs of users who provide capital to enterprises” (Chee et al., 2005). Interestingly, the researchers also demonstrate that “while the IASC process is for the needs of users, the study showed that, in reality, it is difficult for the process to promulgate a standard adverse to the preferences of preparers.” In the end, the “IASC process includes the possibility that actual outcomes may be an imperfect match with the underlying intentions and motivations. The strategic consensus was arrived at through a series of negotiations, compromises, and consideration of both technical and political issues” (Chee et al., 2005).

Others, however, do not share this idealistic view. As previously indicated, Burlaud and Colasse (2010) question the IASC/IASB legitimacy in light of the political pressure the organization is exposed to. They virulently criticize the due process through which the IASB attempts to earn procedural legitimacy. Burlaud and Colasse argue that the due process is neither transparent nor universal because the general public does not vote to elect Board members and the exposure draft is not a survey built on a sample that is statistically representative of the population of users of financial information. Worst, participation in the due process requires significant resources in terms of technical competencies while it does not constrain the IASB and issues or questions raised may end up being ignored²⁵. Furthermore, the scholars are horrified by the influence that the European Union, G20 or other prominent intergovernmental authorities exert on the IASB. In response to the global financial crisis, both the EU and G20 have clearly stated their desires (even specifying roadmaps) which Burlaud and Colasse (2010) viewed as the transition from recommendation to prescription and

²⁵ Translated from the French: “Rédiger des commentaires sur un mémoire préliminaire ou un exposé-sondage mobilise des ressources considérables en compétences techniques et en temps du fait de la complexité des normes et, pour beaucoup, du fait de la barrière de la langue puisque les réponses doivent être faites en anglais. [...] Bref, le *due process* peut être comparé à un vote sur des questions d’une grande technicité avec une participation payante au scrutin et sans que le résultat de ce vote ait une valeur contraignante pour celui qui l’organise” (Burlaud and Colasse, 2010, p. 160).

desire to request²⁶. In the end, the international standard-setter is portrayed as a body which is under supervision²⁷. Lastly, Colasse (2011) argues that the international standard-setter is engulfed in “a real intellectual crisis that calls for a complete re-think of its conceptual framework through reference to an enhanced vision of the company.” Accepting such a change of ideology would pave the way for much needed “new opportunities for theoretical research on accounting concepts and principles” Colasse (2011).

In addition to politics, the quality and usefulness of financial information have been and continue to be adversely impacted by accounting scandals. In recent years, deceptive gimmicks have reached incredible proportions in terms of size (e.g. Enron or Madoff) or creativity (e.g. Lehman Brothers). Authorities and the accounting profession have sought to reduce the so-called expectation gap which Kieso *et al.* (2011) define as the difference between “what the public thinks accountants should do and what accountants think they can do.” Efforts made to close such a gap have concentrated mainly on regulation. For example, the promulgation of the Sarbanes-Oxley Act of 2002 in the USA clearly opened the door on tougher regulation which would be emulated worldwide. The Sarbanes-Oxley Act stipulates strict rules or recommendations in relation to auditor independence, Board membership and responsibilities, improved financial disclosure, and stakeholders’ conflicts of interest. Despite the support of personalities including Alan Greenspan, former Federal Reserve Chairman, the results of Sarbanes-Oxley Act are contrasted since studies have not clearly demonstrated the enhanced transparency or usefulness of financial information. Worst, some market participants (e.g. Michael Bloomberg and Charles Schumer in December 2006) and researchers (e.g. Piotroski and Srinivasan, 2008) have argued that Sarbanes-Oxley Act has deterred corporations from floating in the USA due to the costs associated with greater compliance requirements. Moreover, independently or not of regulation, corporations have sought to strengthen their internal rules through better recruitment and training of personnel or stricter control and compliance mechanisms. Reports about misbehavior attributed to individuals have not dwindled however (e.g. France’s Société Générale has blamed Jérôme Kerviel for unauthorized risk-taking market transactions that caused billions of euros in losses). Lately, the disclosure of astronomical pay package of executives affiliated to institutions that have been bailed out during the financial crisis has fueled public outcry.

Although it would not be fair to mix failures of the corporate accounting and reporting systems with failures of individuals, corporate history is littered by examples that reveal a strong correlation between corporate and human failures. This observation inevitably raises a question about ethics: when exposed to ethical dilemmas, how to make sure that individuals make the right decisions? A

²⁶ Translated from the French: “ Nous voyons que l’on passe du prescriptif à l’incitatif, de l’ordre au souhait” (Burlaud and Colasse, 2010, p. 170).

²⁷ Translated from the French: “Toutes ces initiatives tendent implicitement vers un contrôle accru sinon vers une mise sous tutelle politique de l’IASB tout en préservant les apparences, c’est-à-dire en lui reconnaissant tout de même une certaine légitimité” (Burlaud and Colasse, 2010, p. 171).

simple answer to this question is highly unlikely as human kind is characterized by a great diversity of traits, cultures, religions, or experiences that shape a personality. For example, having business students follow the most rigorous training does not guarantee ethically conscious and driven professionals. As a matter of fact, Kieso, Kimmel and Weygandt (2011) explain through the concept of fraud triangle that fraud is rendered possible when there is opportunity (e.g. weak internal control systems), financial pressure (e.g. an individual experiences difficulty to maintain his or her life style) and rationalization (e.g. a wrongdoer would commit fraud on the belief that he or she is underestimated and underpaid). Consequently, it appears that closing the expectations gap while addressing ethical issues remains a challenge. Proper regulation, training and reward policies, communication and transparency systems, and internal control mechanisms are today the best tools that firms can employ to enhance the quality and efficiency of financial reporting.

Lastly, it appears appropriate to briefly describe some of the most critical financial reporting issues including the use of non-financial measurements, forward-looking information, and intangible assets. Reporting entities typically disclose in their financial reports, along with financial data, non-financial measurements such as key performance indicators (commonly called KPIs), customer satisfaction, employee-related information, and so on. This information was loosely regulated or formatted until a decade ago. Now, with the rise of corporate social responsibility, non-financial measures have become popular since this information allows users to have a broader understanding of the internal and external factors that affect a business. Because this information is typically disclosed on a voluntary basis, management enjoys discretionary power, which may lead to the release of biased information. In contrast to non-financial measurements, forward-looking information is tightly supervised. Indeed, reporting entities clearly refrain from making predictions (typically through the use of disclaimers) passing this exercise to users. To obviously avoid any responsibility for predictions that would fail to materialize, reporting entities ought to prepare financial information that is relevant: as discussed previously, relevant information carries both predictive value and confirmatory value. Therefore, without making explicit forward-looking statements, reporting entities should theoretically release information that allows users to form reasonable predictions and confirm or correct such predictions. Unfortunately, corporate failures have and continue to show that the use of forward-looking information still needs to be improved. Another important financial reporting issue relates to intangibles. Also referred to as soft assets, intangibles have no physical substance, are non-monetary, noncurrent and typically difficult-to-value assets. Importantly, intangibles ought to generate future economic benefits. Intangibles can be classified based on maturity (i.e. either definite or indefinite life, in the latter case intangibles are not amortized but tested annually for impairment) or use (e.g. marketing-related such as trademark or artistic-related such as copyright). Nowadays, corporations rely heavily on intellectual properties which sometimes guarantee exclusivity or market share and consequently can represent enormous value. For instance, Walliser (2009) demonstrates

how strategic intangibles are and how controversial the accounting treatment of intangibles is²⁸. Interestingly, Walliser also explains that the development of IAS 38 (which stipulates the accounting of intangible assets) required a significant amount of time to reconcile practices across Europe. Although the global convergence toward the adoption of IFRS is the responsibility of only two protagonists, this process appears quite challenging and lengthy since the completion of this project has already been postponed at several occasions. In the next section, we discuss the global convergence toward the adoption of IFRS.

²⁸ Translated from the French: “C’est un point très controversé au sein des pays de l’Union Européenne parmi lesquels la France a affiché sa spécificité du fait du poids des marques dans les grandes entreprises cotées” (Walliser, 2009, p. 329).

2.4: Global convergence towards IFRS

The IASB and its counterpart, the FASB, agreed in 2002, through the signature of the Norwalk Agreement, to attain convergence of IFRS and US GAAP. In particular, IASB and FASB “pledged to use their best efforts to (1) make their existing financial reporting standards fully compatible as soon as is practicable, and (2) coordinate their future work programs to ensure that once achieved, compatibility is maintained” (Kieso et al., 2011). This was a major step and an important signal sent to the world about their common desire to formulate a unique framework of high quality accounting standards.

Since 2002, the IASB and FASB have continuously reaffirmed their commitment despite contrasting evidence that disparities in opinion still remained, which further prolonged the project (Hughes, 2008; Chung and Hughes, 2009; Cearns, 2012; Jones, 2012; Pacter, 2014). However, important cornerstones were achieved over more than a decade of cooperation between IASB and FASB. For instance, as early as 2006, the standard-setters reaffirmed their ambitions through the release of a roadmap for convergence for the 2006-2008 period. This roadmap indicated specific targets to be reached by 2008. In fact, significant improvements were attained in 2007 which prompted the Securities and Exchange Commission (or SEC) to remove for non-US entities listed in the US the obligation to reconcile their financial reports with US GAAP provided that these reports complied with IFRS. A year later, in 2008, IASB and FASB released an updated MoU to acknowledge achievements but also identify priorities and upcoming tasks. From 2008, the SEC set up its implication in the project by releasing its roadmap (2008) and a “work plan” (2010) through which the SEC sought to “enhance both the understanding of the SEC’s purpose and public transparency” in the area of financial reporting (Kieso et al., 2011). Under some pressure from the G20 asking for faster results, the IASB and FASB disclosed a progress report in late 2009 detailing achievements and upcoming activities (and clear goals to be attained by June 2011). In April 2012, the standard-setters released a progress report presenting successes made in relation to the accounting of financial instruments and loss impairment. In early 2013, the accounting authorities again discussed achievements made to date including loan loss provisioning, insurance contracts, hedge accounting, or revenue recognition. Lastly, in January 2014, Pacter (2014), former IASB board member, described in the *CPA Journal* the global adoption of IFRS. In particular, Pacter emphasizes on the adoption of IFRS by 122 jurisdictions (or countries), which translates into 83% of these jurisdictions having rendered IFRS mandatory for domestic listed entities. These results permit Pacter to advance that “the first 122 profiles of jurisdictions regarding their adoption or consideration of IFRS provide solid evidence that IFRS has already become the de facto global language for financial reporting” (Pacter, 2014).

To sum up ideas presented in this section, we have sought to briefly highlight the characteristics that determine IFRS and US GAAP, the world’s predominant accounting frameworks. We have discussed

the structure and functioning of the IASB and FASB, the entities which are responsible for the development of these standards. We have purposefully refrained from delving into the traditional debate about principles-based vs. rules-based approaches that are attributed respectively to IFRS and IASB. We, however, demonstrated that IFRS intrinsically advocates for the primacy of shareholders and the benefits of fair value. In the next section we specifically treat the accounting for pension obligations.

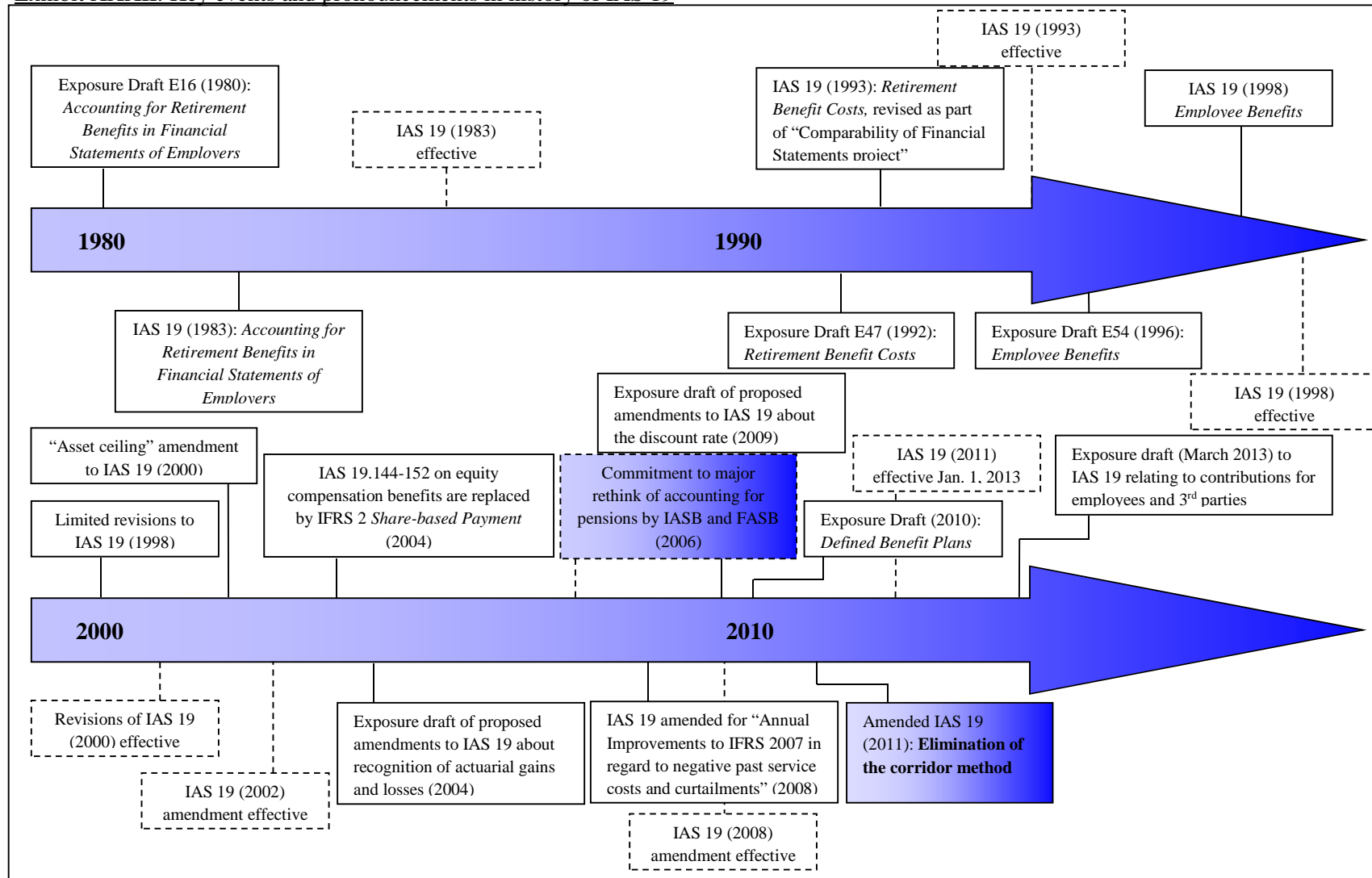
3: PENSION ACCOUNTING: RULES AND PRACTICES

Compared to previous sections, we specifically address here technical issues. We provide an historical perspective to our analysis by first discussing the evolution of accounting standards from the 1980s to 2013. Next, we introduce the accounting of defined pension plans through the detailed analysis of IAS 19. We contrast pension accounting rules before and after 2011 as a means to highlight the importance of the current debate about the determination of rate assumptions.

3.1: Historical perspective

The first official text, Exposure draft E16 entitled *Accounting for Retirement Benefits in Financial Statements of Employers*, was released in April 1980 by the International Accounting Standards Committee (IASC). Shortly after, the first version of IAS 19 was published as IAS 19, *Accounting for Retirement Benefits in Financial Statements of Employers*. The below exhibit shows the main events and pronouncements, that have influenced the development of the accounting treatment of pension obligations since 1980. The exhibit has been greatly inspired by data compiled by Deloitte (*Source: iasplus.com, 2011*).

Exhibit XXXII: Key events and pronouncements in history of IAS 19



Source: Moïse LOUISY-LOUIS, based on iasplus.com, June 2014

Over the past thirty years, the IASB has sought to refine and improve the accounting for employee related pension obligations. Despite being transparent, such a process is time-consuming (as it requires the IASB to dialogue and exchange with key stakeholders).

Following the release of Exposure Draft E16 in April 1980, the IASC issued in January 1983 IAS 19 *Accounting for Retirement Benefits in the Financial Statements of Enterprises* which required employers to disclose “accounting policies adopted for retirement benefit plan costs,” “any other significant matters relating to retirement benefits that affect comparability with the prior period,” and any changes in the funded liability (Journal of Accountancy, 1983). Napier (2009) has extensively documented the historical technical and conceptual amendments brought to the standard. As such, Napier indicates that the “original International Accounting Standard on pensions, IAS 19 *Accounting for Retirement Benefits in the Financial Statements of Enterprises* was oriented towards measuring costs for the income statement, and was flexible enough to permit companies the choice of whether or not to use salary projections in measuring the regular pension expense.”

Ten years later, the standard was renamed IAS 19 *Retirement Benefit Costs* and was revised as part of the “Comparability of Financial Statements” project (Source: *iasplus.com*, 2011). Furthermore, Napier states that “as part of the IASC’s project (Camfferman and Zeff, 2006, p. 285), the revised version of IAS 19, *Retirement Benefit Costs* made the use of salary projections the ‘benchmark’ treatment, but continued to follow the orientation towards the income statement of the earlier document.

Shortly after, in 1996, the standard was referred to as IAS 19 *Employee Benefits* and reflected primarily the Committee’s desire to eliminate projected benefit valuation methods. In fact, the IASC envisioned the use of a single accrued benefit valuation method, namely the “10% corridor” approach for actuarial gains and losses on underlying benefit obligations and any related plan assets. Gains and losses exceeding the 10% corridor triggered immediate recognition (Clark, 1996; Journal of Accountancy, 1997). The pronouncement also required the measurement of defined obligations at each balance sheet date and the use of discount rates for both funded and unfunded obligations at the market yield for high-quality, fixed-rate corporate bonds (otherwise the yield of government bonds). Just a year later, the 1998 revision of IAS 19, *Employee Benefits* revealed the Committee’s shift towards a balance sheet approach, with a requirement to recognize i) a liability when an employee has provided service in exchange for employee benefits to be paid in the future, and ii) an expense when the entity consumes the economic benefit arising from service provided by an employee in exchange for employee benefits. As such, the standard demanded enhanced disclosure by requiring “an analysis of the costs of pension benefits in the balance sheet and income statement, a reconciliation of changes in balance sheet amounts and a summary of main actuarial assumptions.” In addition, IAS 19 asked reporting entities to “determine the present value of defined benefit obligations and the fair value of

any plan asset on a regular basis to avoid large discrepancies between the financial statement amounts and the amounts determined at the balance sheet date” (Journal of Accountancy, 1998).

The next two years brought limited changes to the standard including the “recognition of defined-contribution-plan contributions and defined-benefit-plan current service costs as expenses” (Journal of Accountancy, 2002). In May 2002, new amendments concerning the “asset recognition ceiling test” were proposed. In fact, the change dealt with “the interaction between the ceiling test for asset recognition on a defined benefit plan and the optional requirements for the deferral and amortization of actuarial gains and losses and past service costs.” As such, “the change precludes recognition of a gain when the amount of unrecognized asset has declined and the resulting actuarial loss is deferred and amortized” (Journal of Accountancy, 2002). In February 2004, IAS 19’s paragraphs 144 to 152 regarding equity compensation were replaced by a separate and dedicated text (IFRS 2 *Share-based Payment*). In April 2004, the Board’s proposed amendments to IAS 19 sought to make the same approach used in UK standard, FRS 17 *Retirement Benefits* available to IFRS preparers. Therefore, the amendments introduced an option for an entity to recognize actuarial gains and losses in full as they arise, outside profit or loss, in a statement of changes in equity that shows total recognized gains and losses (sometimes called comprehensive income). The standard would, however, continue to permit recognition of actuarial gains and losses in profit or loss, either in the period in which they occur or spread over the service lives of the employees (Source: *iasplus.com*, 2011). These amendments, allowing actuarial gains and losses to bypass earnings and smooth their impacts over time, were adopted in December 2004.

In 2006, the IASB (which replaced the IASC on April 1, 2001) became more ambitious in its review of pension accounting. Indeed the Board “closely coordinated with the FASB a project with the purpose to fundamentally review all aspects of its current rules for post-employment benefit (pension) accounting” (Glaum, 2009). The FASB launched a “two-phased project” in 2006 with the release of Statement of Financial Accounting Standards (SFAS) No. 158²⁹ (Stickel and Tucker, 2007). “Phase one focused primarily on moving the funded status of defined-benefit plans from the footnotes to the balance sheet,” leaving more controversial issues such as “income smoothing” to be addressed later on. The IASB has adopted similar changes in parallel. Between 2007 and 2010, the Board carried on with its traditional transparent and systematic “due process” and decided early on to address i) the accounting of past service costs, interest costs and related items (2008), ii), the choice of relevant discount rate(s) (2009), and iii) the corridor method (2010). Lastly, IAS 19 amended as of June 16, 2011 requires in addition to enhanced disclosures the “recognition of changes in the net defined

²⁹ SFAS No. 158, *Employers’ Accounting for Defined Benefit Pension and Other Postretirement Plans*, improved financial reporting by requiring an employer to recognize the overfunded or underfunded status of a defined benefit postretirement plan (other than a multiemployer plan) as an asset or liability in its statement of financial position and to recognize changes in that funded status in the year in which the changes occur through comprehensive income of a business entity or changes in unrestricted net assets of a not-for-profit organization. SFAS No. 158 superseded SFAS No. 87, 88, 106, and 132(R) (FASB SFAS No. 158, p. 3).

benefit liability (asset) including immediate recognition of defined benefit cost, disaggregation of defined benefit cost into components, recognition of remeasurements in other comprehensive income, plan amendments, curtailments and settlements,” which make official the termination of the corridor method (IFRS Foundation, 2011). The next section discusses in further details the accounting of pension obligations as prescribed by IAS 19.

3.2: Introduction to IAS 19

As previously discussed, pension schemes are commonly classified into defined contribution, defined benefit or hybrid. In particular, Glaum (2009) explains that “pension arrangements between companies and employers can take many forms,” with defined contribution and defined benefit plans being the most popular schemes. On the one hand, a defined contribution plan calls for a firm to pay specific amounts into accounts held for participating employees. “The amount accrued in a pension account at retirement is then usually used to pay a lifelong annuity to the employee, possibly followed by payments to surviving relatives.” According to Barbara and Nicholas Apostolou, writing for the November 2009 edition of the *CFA Journal*, “in this type of plan, no explicit promise is made about the size of the periodic payments the employee will receive upon retirement” (Apostolou and Apostolou, 2009). As a result, an employer faces no additional liability beyond the paid defined contribution. Furthermore, Glaum indicates that “in practice, defined contribution plans often involve arrangements with external pension providers such as insurance companies. The employing company sponsors the pension plan, i.e. it commits itself to regular contributions, but the obligation for the future pension payments lies with the insurance company who manages the fund. In such schemes, it thus is the insurance company who has a liability towards the employees, not the employer” (Glaum, 2009).

On the other hand, “in a defined benefit plan, the company promises to make pension payments to employees after their retirement. The amounts of the promised future pension payments depend on the precise contractual arrangement between the company and the employees, the benefit formula” (Glaum, 2009). As a result, the risk in these plans remains with the employer, which needs to precisely determine the amount that must be allocated to fund the pension scheme. This renders the accounting for defined benefit plans much more sophisticated and complex than for defined contribution plans since reporting entities must estimate the following factors over long periods of time:

- The size of the workforce (which calls for the formulation of actuarial assumptions)
- The evolution of employees’ remuneration
- The expectancy life of employees
- The expected rate of return on plan assets, and
- The discount rate used to calculate the present value of pension obligations

In practice, pension arrangements can be the combination of defined contribution and defined benefit pension arrangements, also referred to as hybrid pension plans (Wesbroom and Reay, 2005). For example, defined contribution pension plans often require minimum guarantees on the investment returns on the contributions. In recent years, major US reporting entities have frozen, closed or converted defined benefit plans and have preferred hybrid plans or so-called cash balance plans in response to adverse macro-economic conditions. The phenomenon has and continues to draw the

attention of researchers. For instance, McFarland, Pang and Warshawsky (2009) have found little evidence that supports “the hypothesis that freezing or closing a DB plan increases company value.” In contrast, Hatem, Johnston and Scott (2010) have demonstrated the benefits of cash balance plans. They advance that the conversion to a cash balance “presents a real option” and allows a reporting entity to liquidate the “surplus assets of the pension plan without a tax penalty,” pass on a portion of the investment and actuarial risks onto employees, and “improve recruitment and employee retention” (Hatem, Johnston and Scott, 2010).

As stated in the introductory chapter, the objective of IAS 19 is to “prescribe the accounting and disclosure for employee benefits. The Standard requires an entity to recognize i) a liability when an employee has provided service in exchange for employee benefits to be paid in the future; and ii) an expense when the entity consumes the economic benefit arising from service provided by an employee in exchange for employee benefits” (IFRS Foundation, IAS 19, p. A494). These two requirements, which build on the notions of accrual accounting and the matching principle, are the foundations on which IAS 19 is structured.

Moreover, IAS 19 applies to various forms of employee benefits including among others i) short-term employee benefits such as wages and salaries, compensated absences (paid annual leave or sick leave), profit sharing and bonuses, or non-monetary benefits (medical care, housing, cars, etc), ii) post-employment benefits such as pensions, other retirement benefits, post-employment life insurance or medical care, iii) other long-term employee benefits, including long-service leave or sabbatical leave, and iv) termination benefits.

The standard is structured in chapters, divided in sections which are further subdivided in paragraphs which are identified by a unique number. More specifically, the standard is organized in eight chapters namely the introduction, key definitions, short-term employee benefits, post-employment benefits: distinction between defined contribution plans and defined benefit plans, other long-term employee benefits, termination benefits, transitional provisions and the final chapter discusses the standard’s effective date. Before addressing the more sensible subjects (esp. the accounting for defined benefit plans) in the next chapter of this paper, it is appropriate to discuss how the standard-setter defines the main pension parameters and differentiates defined contribution plans from defined benefit plans.

According to IAS 19, “employee benefits are all forms of consideration given by an entity in exchange for service rendered by employees” (IFRS Foundation, IAS 19, p. A589). These forms of consideration include short-term employee benefits (which need to be settled within twelve months), post-employment benefits (which are payable after the completion of employment), and post-employment benefit plans (which are formal or informal arrangements designed to provide benefits to one or more employees). Such plans include obviously i) defined contribution plans under which an

employer “pays fixed contribution into a separate entity (a fund) and will have no legal or constructive obligation to pay further contributions if the fund does not hold sufficient assets to pay all employee benefits,” and ii) defined benefit plans which are succinctly viewed as “plans other than defined contributions.”

Other important definitions to consider include key recognition and measurement parameters. The present value of a defined benefit obligation is defined as “the present value, without deducting any plan assets, of expected future payments required to settle the obligation resulting from employee service in the current and prior periods” (IFRS Foundation, IAS 19, p. A590). It is worthy to note that plan assets consist of “assets held by a long-term employee benefit fund and qualifying insurance policies” and the return on plan assets is the net of ‘interest, dividends and other revenue” offset by “realized and unrealized gains and losses,” costs necessary to administer the plan and taxation levied on the plan. Moreover, the various obligation-related costs include the current service cost (viewed as the increase in the present value of the obligation resulting from employee service rendered in the current period), the interest cost (relates to the concept of time value of money and is defined as the increase in the present value of the obligation because the benefits due are one period closer to settlement), and the past service cost (which represents the change in the present value of the obligation for employee service rendered in prior periods, resulting from the introduction of or changes to post-employment benefits or other long-term employee benefits). Lastly, actuarial gains and losses encompass “experience adjustments (i.e. the effects of differences between the previous actuarial assumptions and what has actually occurred), and the effects of changes in actuarial assumptions” (IFRS Foundation, IAS 19, p. A591). The accounting for actuarial gains or losses, the corridor method and other critical issues are discussed in further details in the next section.

3.3: Conceptual and technical issues (IAS 19 including amendments up to December 31 2010)

IAS 19's paragraphs 24 to 27 and 43 to 48 reveal the extent of the differences that characterize defined contribution plans and defined benefit plans. The former plans present the following two features:

- a) The employer's legal³⁰ or constructive³¹ obligation is limited to the amount that it has agreed to contribute to the fund. The consequence of this is that the post-employment benefits received by employees are function of the performance of the fund (primarily measured in terms of return on plan assets), and
- b) Therefore, both the investment risk (return on plan assets may not be sufficient to meet expected benefits) and the actuarial risk (arises when benefits fall short of expected needs) no longer reside with the employer but fall on the employee

These features render the accounting for defined contribution plans rather straightforward because the employer's obligation for each period is limited to the amounts contributed for that period. As such, the employer has no requirement to make actuarial assumptions to estimate the obligation or the expense (in addition there is no actuarial gain or loss).

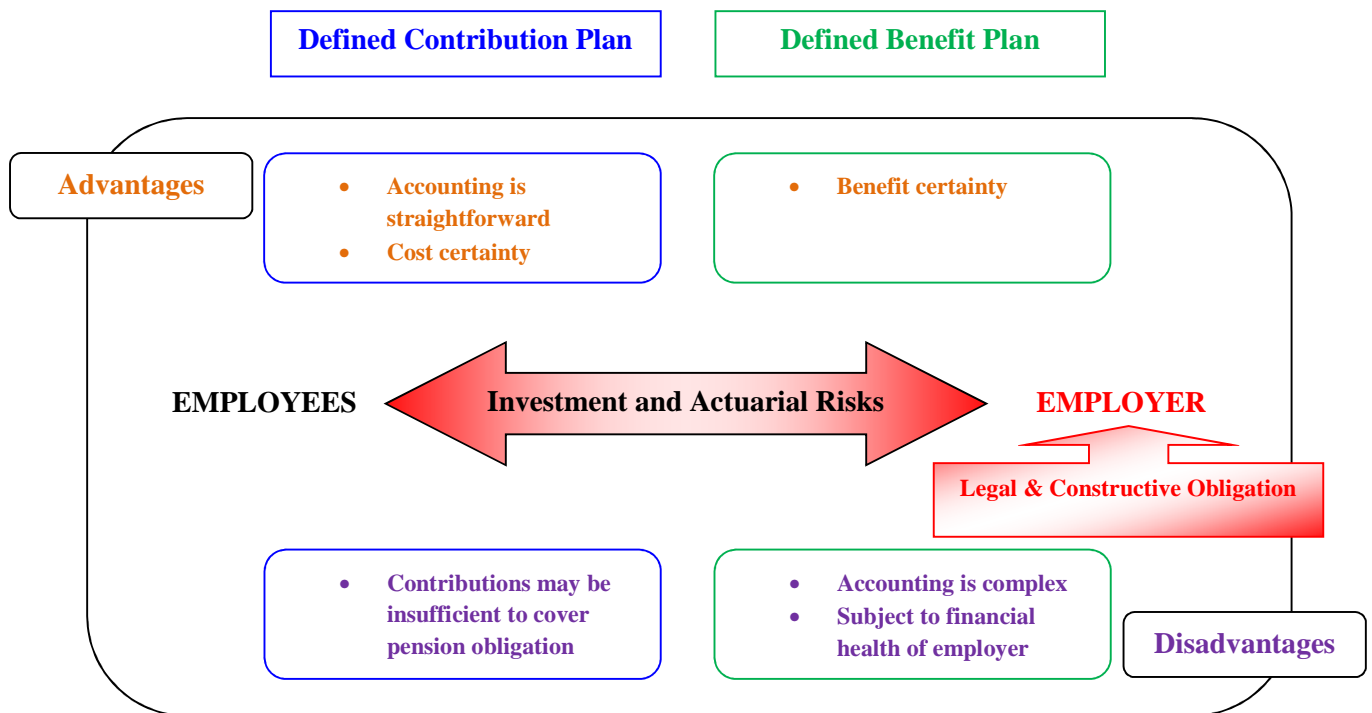
In contrast the accounting for defined benefit plans is more complex. Not only the employer has the obligation to provide the agreed benefits to current and former employees but also the entity retains actuarial and investment risks. An additional layer of complexity has to do with the fact that the "expense recognized for a defined benefit plan is not necessarily the amount of the contribution due for the period" (IFRS Foundation, IAS 19, p. A601). The main reason for this is that defined benefit plans can be unfunded, wholly or partly funded by the employer's contributions and the payment of benefits to employees depends on the financial position and performance of the fund and on the employer's "ability and willingness to make good any shortfall in the fund's assets." Furthermore, the standard describes precisely the procedure necessary to measure defined benefit obligations. Such a procedure requires to i) determine the amount of benefit earned for current and prior periods and to establish actuarial assumptions about demographic variables (such as employee turnover or life expectancy) and financial variables (such as rate of increase of salaries), ii) discount this benefit using the projected unit credit method, iii) determine the fair value of plan assets, and iv) determine the amount of actuarial gains or losses, past service cost, and the amount of gain or loss resulting respectively from changes in the estimated benefit and/or plan assets, the introduction or change of a plan, or the curtailment or settlement of a plan. Prior to discussing in further details the procedure

³⁰ As defined by explicit or implicit terms of a contract or those derived from authoritative texts or ruling.

³¹ A constructive obligation arises from informal practices that lead knowledgeable parties to expect the occurrence of certain events. For instance, if a firm has had the practice of paying post-employment benefits, this practice becomes a constructive obligation in the case the termination of these benefits "would cause unacceptable damage to its relationship with employees" (IFRS Foundation, IAS 19, p. A602). Consequently, informal practices are viewed as constructive obligation when the "entity has no realistic alternative but to pay employee benefits."

prescribed by IAS 19, the below exhibit highlights the differences that characterize defined contribution and benefit plans.

Exhibit XXXIII: Comparison of defined contribution and defined benefit plans



Source: Moïse LOUISY-LOUIS, June 2014

In terms of disclosure, IAS 19 requires a firm to determine the present value of the defined benefit obligation and the fair value of plan assets (and to disclose in its balance sheet the net amount³²) on a regular basis as a means of avoiding significant discrepancies between the estimation date and the balance sheet date. This is not a difficulty since entities design a financial reporting strategy and carefully plan the release of operating and financial data. A more interesting question to consider would be to require or not entities to release detailed pension information in interim reports. The pros would welcome this as it would allow investors and creditors to assess an entity's pension obligation more frequently. The cons would certainly question the relevance of having information prepared over interim periods while relying on the necessity to make long-term assumptions. In addition, it is not certain that the benefits from presenting this information would exceed the cost to prepare it.

In addition to the balance sheet, IAS 19 affects the income statement as it requires the following items to be recognized in earnings: i) current service cost, ii) interest cost, iii) the expected return on plan

³² Paragraph 54 stipulates that the amount to be recognized in the balance sheet should be the net of i) the present value of the defined benefit obligation, plus/minus ii) any unrecognized actuarial gains or losses, minus iii) unrecognized past service cost, and minus iv) the fair value of plan assets at the balance sheet date (IFRS Foundation, IAS 19, p. A602)

assets, iv) actuarial gains or losses, v) past service cost, and vi) the effect of curtailments or settlements. The standard explains that “the ultimate cost of a defined benefit plan may be influenced by many variables” (including employee turnover, mortality, medical cost and so on) and is henceforth uncertain “over a long period of time.” Estimating the service cost is rather straightforward (note that the application of the projected unit credit method permits to identify the amount – or unit – of benefit earned for the period and then adds it to the accumulated benefit balance) since the recognition of service cost is in essence an extension of the matching principle (for further details about the actuarial valuation method and its related disclosure, please refer to the Definitions and Notes section at the end of this paper^A). In contrast, the choice of actuarial assumptions introduces some leeway in the accounting for defined benefit plans and renders the standard somehow controversial.

The standard-setter indicates that “actuarial assumptions shall be unbiased and mutually comparable” and explains that unbiased means “neither imprudent nor excessively conservative.” In practice, there is little that can be said about an entity’s choice of mortality rate, turnover, or other demographic variables (which should reflect the opinion of actuarial expert(s)). Of course, there should be some consistency over time and with assumptions made by similar entities evolving in comparable conditions. Discrepancies are even more flagrant when entities make financial assumptions, especially regarding the discount rate. Paragraph 78 prescribes that the discount rate should be “determined by reference to market yields at the end of the reporting period on high quality corporate bond,” otherwise “the market yields on government bonds shall be used” (IFRS Foundation, IAS 19, p. A611). The most important weakness in such a method is that the discount rate is used to merely reflect the concept of time value of money³³ but fails to account for an entity’s credit risk (which renders the choice of discount rate even more questionable since yields on government bonds can be used as proxies). As a matter of fact, Napier (2009) rightly argues that “the appropriate discount rate to use has been a major issue of controversy in pension accounting over the past 25 years.” More specifically, Napier reveals the limitations in relying on corporate bond rates: “the bond rate could be considered as the aggregate of: (i) the real risk-free rate (the pure time value of money); (ii) expected inflation; and (iii) the average expected rate of default. Although the first two components are relevant, there is no obvious link between the probability of default on corporate bonds and the measurement uncertainties relating to pension liabilities” (Napier, 2009, p. 243). Similarly, Beechy (2009) thoroughly identified in a paper appropriately entitled *The Many Challenges of Pension Accounting* the issues relating to the choice of interest rate assumptions. Beechy advances that the estimation of the defined benefit obligation “is highly sensitive” to the discount rate, the expected

³³ The definition of interest cost is in fact based on this notion of time value of money as interest cost both captures and quantifies somehow the annual opportunity cost of carrying defined benefit plans. Paragraph 82 stipulates that interest cost is computed by multiplying the discount rate as determined at the start of the period by the present value of the defined benefit obligation throughout that period, taking account of any material changes in the obligation (IFRS Foundation, IAS 19, p. A611)

return on plan assets, and key actuarial assumptions, especially the expected annual increase in salaries and inflation. To substantiate his claim the author relies on work published by Por and Iannucci (2006) and a UK pension survey run by Lane Clark & Peacock (2007). Beechy notes that “a significant increase in the discount rate will cause a substantial decrease in the accrued pension obligation because of the long average period of discounting,” whereas an increase in the expected return on plan assets inflates the funding obligation (Beechy, 2009, p. 101). Furthermore, Beechy discusses the limitations of taking high quality corporate yields as a proxy for the discount rate. In particular, by making reference to the *CICA Handbook*³⁴, Beechy argues that “the rate should be on investments that reflect the same amount and maturity as the pension obligations themselves” (in practice this requires fund managers to consider the duration of the pension obligation and plan assets when determining the fund’s asset allocation strategy). As such, the “implicit rate that an insurance company would demand to settle the accrued pension obligation” appears to be a reasonable alternative to market yields for the researcher. In 2006, Michael Beprestis and Yin Xu had persuasively demonstrated the issues relating to the choice of the discount rate. In their paper, the scholars compared expected and actual pension fund returns based on data extracted from the 2001 annual reports of General Motors, Verizon Communications, General Electric Corporation, and Boeing Company. The difference was striking and ranged from \$7.2 to \$11.9 billion for 2001 alone. The researchers therefore noted that “what appear on the surface to be strong returns on assets are actually expected or assumed gains that mask significant pension asset losses” (Beprestis and Xu, 2006).

The standard-setter appears to be aware of these limitations and recommends the use of “a single weighted average discount rate” or to rely on “current market rates of the appropriate term to discount shorter term payments, and estimates the discount rate for longer maturities by extrapolating current market rates along the yield curve” (IFRS Foundation, IAS 19, p. A611). Such wording provides, however, significant discretion to entities and therefore may not produce relevant and comparable information for investors and creditors. As a matter of fact, IAS 19 is even less detailed when it comes to the choice of the expected return on plan assets which “is based on market expectations, at the beginning of the period, for returns over the entire life of the related obligation” (IFRS Foundation, IAS 19, p. A618).

Paragraphs 92 to 95 of IAS 19 describe the measurement of actuarial gains and losses and introduce the so-called corridor method. Beechy (2009) criticizes the method and explains the rationale for standard-setters for initially implementing such a controversial approach. Beechy remarks that accounting standards “treat the discount rate and the return on plan assets as largely independent

³⁴ The Canadian Institute of Chartered Accountants sponsors and prepares a comprehensive collection (called the Handbook) of up-to-date information on the changes to the accounting and assurance standards, and the transition to IFRS, standards for private enterprises and auditing standards (*Source: CICA.ca, 2011*)

variables” (Beechy, 2009, p. 102), a view that the SEC does not share since plan assets are deemed to generate cash flows to pay pension benefits when due (which implies a necessary relationship between the discount rate and the return on plan assets). As such, Beechy notices that “current standards require low-risk measures for the liability while companies invest in higher-risk equities,” a practice which “introduces higher volatility” and “causes the experience gains and losses that accounting standards historically have attempted to smooth out.” The researcher concludes his analysis very persuasively by arguing that “accounting standards have been complicit in attempting to cover up the mismatch between investment strategy and liability structure” (Beechy, 2009, p. 102). In addition to conceptual issues, the application of the corridor method brings a layer of technical complexity that may appear puzzling to non-practitioners. Before considering the technicality of the corridor, it is appropriate to recall that actuarial gains and losses are defined as increases or decreases in either the present value of the defined benefit obligation or the fair value of plan assets. Paragraphs 92 to 95 explain that reporting entities are in fact allowed to choose between three differing strategies in the way they treat actuarial gains and losses: immediate recognition of actuarial gains and losses on the face of the income statement, or in equity (i.e. in other comprehensive income), and deferred recognition of actuarial gains or losses (i.e. the corridor method). These three methods are graphically shown below. The illustration reveals in fact the main issues caused by the fact that IAS 19 allows several options: gains and losses being recognized either in earnings or equity, and gains or losses being recognized either immediately or over time. Consequently, these options render any comparison between companies with similar obligations daunting.

Exhibit XXXIV: Three methods to account for actuarial gains and losses

	Balance Sheet	Income Statement
IMMEDIATE RECOGNITION	Net Liability ⁽¹⁾	Earnings ⁽²⁾
EQUITY METHOD	Net Liability ⁽¹⁾ & OCI ⁽³⁾	-
CORRIDOR METHOD	Net Liability ⁽⁴⁾	Earnings ⁽⁵⁾

Notes:

⁽¹⁾ Net liability = Present value of defined benefit obligation – Fair value of plan assets;

⁽²⁾ Earnings = Actuarial gains – Actuarial losses;

⁽³⁾ Other Comprehensive Income = Actuarial gains – Actuarial losses;

⁽⁴⁾ If the Unrecognized actuarial gains or losses = 0, then Net liability = Present value of defined benefit plan – Fair value of plan assets + Actuarial gains – Actuarial losses, in contrast if the Unrecognized actuarial gains or losses ≠ 0, then Net liability = Present value of defined benefit plan – Fair value of plan assets + Unrecognized actuarial gains or losses + Actuarial gains – Actuarial losses – Recognized actuarial gains or losses;

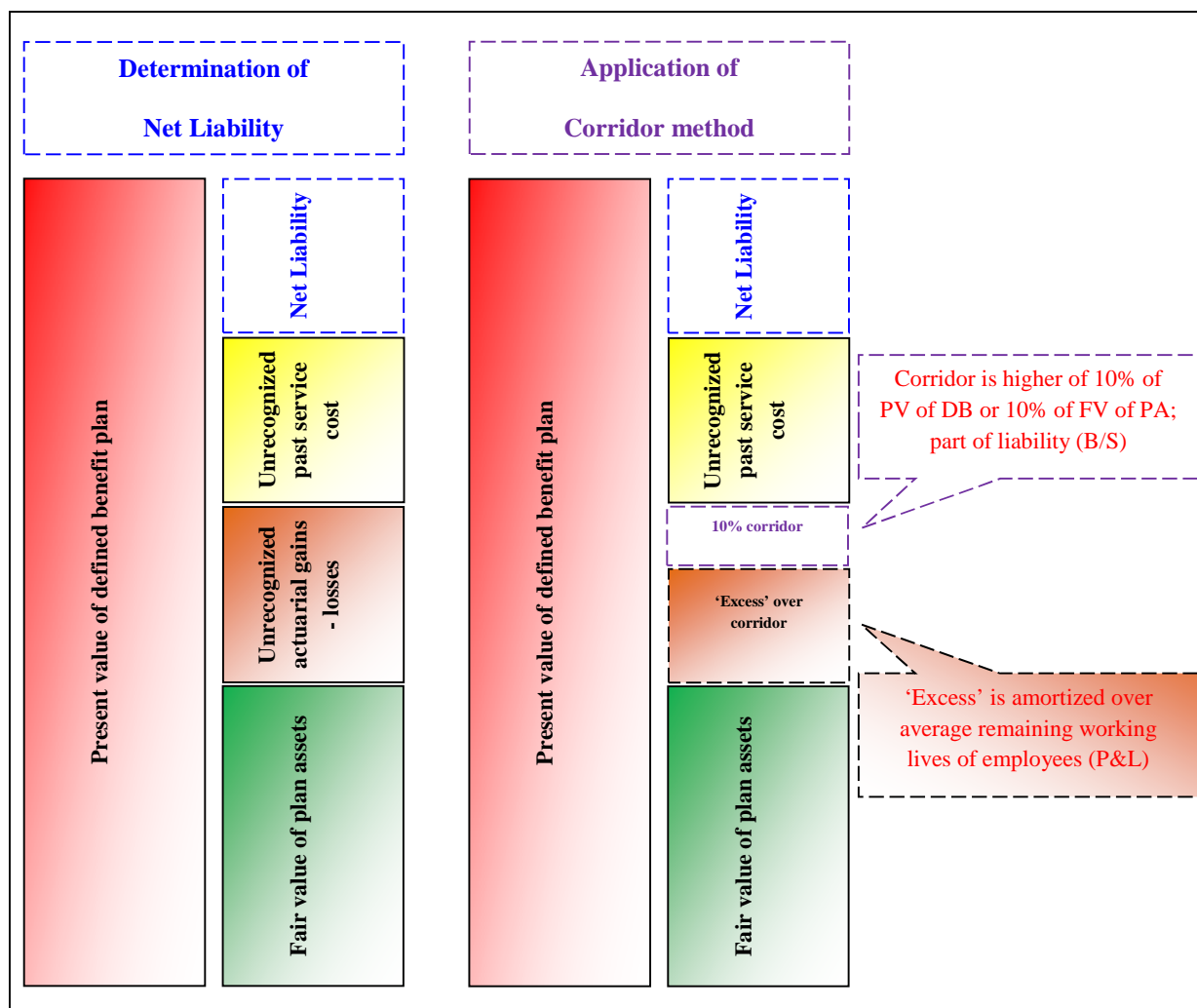
⁽⁵⁾ If the Unrecognized actuarial gains or losses = 0, then no impact on earnings, in contrast, if the Unrecognized actuarial gains or losses ≠ 0, then Earnings = Recognized actuarial gains or losses

Source: Moïse LOUISY-LOUIS, June 2014

Under the first alternative, all actuarial gains and losses are accounted for in the income statement in the period in which they occurred. As discussed in the previous section, the recognition of actuarial gains and losses as a component of equity was introduced in 2004 as a means to reproduce UK accounting practices (prescribed by FRS 17). The equity approach allows the immediate recognition of actuarial gains and losses in equity (provided these items are disclosed separately within the statement of comprehensive income) and prevents these items “to be reclassified to profit or loss in a subsequent period” (IFRS Foundation, IAS 19, p. A614). Lastly, the corridor method is a subtle mechanism that permits to i) recognize actuarial gains and losses in earnings provided that a threshold is met and ii) to spread or smooth the impact of these items over time. Specifically, paragraphs 92 and 93 of IAS 19 allow reporting entities to recognize a portion of actuarial gains and losses in earnings “if the net cumulative unrecognized actuarial gains or losses at the end of the previous reporting period exceeded the greater of i) 10% of the present value of the defined benefit obligation at that date, and ii) 10% of the fair value of any plan assets at that date” (IFRS Foundation, IAS 19, p. A613). In other words, only a portion of actuarial gains and losses exceeding a threshold (or corridor) needs

to be recognized in the income statement. Furthermore, this portion to be recognized in earnings is the excess or surplus “divided by the expected average remaining working lives of the employees participating in that plan” (paragraph 93). The surplus is determined by the difference between the net cumulative unrecognized actuarial gains and losses and the greater of 10% of the present value of the defined benefit obligation and 10% of the fair value of plan assets. In contrast, the portion of actuarial gains and losses not accounted for in earnings is recognized as a liability in the statement of financial position. According to the IASB, the main rationale for this approach is that “in the long term, actuarial gains and losses may offset one another” (paragraph 95). The implicit weakness in this view is that it fails to consider the time component: even though actuarial gains and losses may reverse or offset each other over time, reporting entities are concerned about their immediate financial position and financial performance. Before addressing past service cost in the next section, the below chart summarizes and helps visualize the issues inherent to the corridor method.

Exhibit XXXV: Description of the corridor method



Source: Moise LOUISY-LOUIS, June 2014

The concept of past service cost is relatively straightforward as past service cost “arises when an entity introduces a defined benefit plan that attributes benefits to past service or changes the benefits payable to past service under an existing defined benefit plan” (IFRS Foundation, IAS 19, p. A615). Yet, the accounting for past service cost results in a slight deviation from the matching principle since the recognition of past service cost is conditional to whether “the benefits concerned are vested.” As a result, an entity may recognize in the current period past service cost that relates to employee service performed in prior periods. The next section concentrates on the amendments to IAS 19 that were proposed during the 2008-2011 period and deemed to become effective as of January 2013.

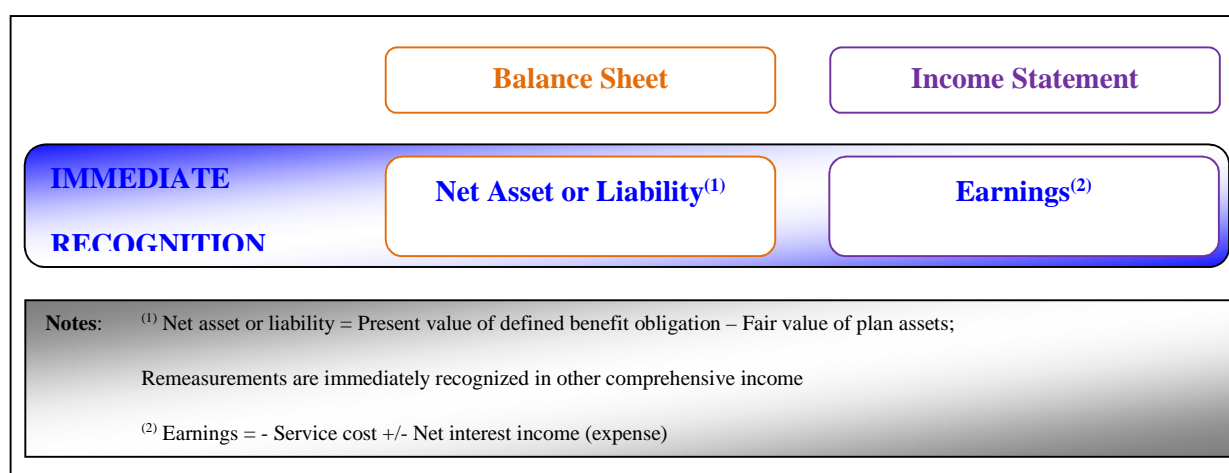
3.4: Conceptual and technical issues (IAS 19 revised as of June 2011)

The main conceptual changes to IAS 19 envisioned by the IASB since 2006 include three crucial elements. These are the elimination of the corridor method (which would be replaced by the immediate recognition of actuarial gains and losses in earnings), the disaggregation of the defined benefit cost into three components (i.e. service cost, finance cost and remeasurement), and improved disclosure requirements.

The elimination of the corridor method has important advantages. It first abolishes the discretion that reporting entities had in choosing between three methods to account for actuarial gains and losses (as discussed in the previous section). Entities are now required to immediately recognize actuarial gains and losses, referred to as remeasurements, in other comprehensive income. Service cost and net interest income (or expense) are also immediately recognized in earnings. As a result, this approach i) avoids spilling an unnecessary amount of volatility into earnings, ii) better reconciles with the matching principle, and iii) produces a more faithful representation of the reporting entity's pension obligation for the period. It is worthy to note that the Board has fine-tuned its definition of interest expense and now favors a net approach which parallels the recognition in the balance sheet of a net defined benefit liability (giving rise to interest expense) or a net defined benefit asset (interest income).

The Board expects that “the elimination of the corridor approach will greatly improve the comparability and understandability of amounts reported by companies” (IFRS Foundation, 2011, p. 15). Prior to this change, the Board explains that the deferred recognition option resulted in reported amounts being “confusing or misleading.” For instance, confusion could arise when companies recognized an asset, even when a plan was in deficit or when “two companies might have identical defined benefit obligations but report different amounts because gains and losses have arisen in different sequences.” Separately, the revised standard has addressed concerns about “period-to-period fluctuations” since the volatility due to remeasurements bypasses the income statement and is booked in equity, in particular within other comprehensive income. The below diagram illustrates the changes discussed above and contrasts sharply with the equivalent exhibit shown previously.

Exhibit XXXVI: A single method to account for defined benefit costs



Source: Moïse LOUISY-LOUIS, June 2014

The disaggregation of the components of defined benefit costs is another important step implemented by the Board in order to enhance transparency and comparability. In fact, disaggregation (of service cost and interest cost) was already required under IAS 19. The difference arises from the redefinition of net interest cost as explained previously. To enhance transparency, reporting entities typically disclose on the face of the income statement (or in the footnotes) service cost as part of the “other operating income and expenses” section and net interest cost as part of the “financial income and expenses” section. Separately, remeasurement items are recognized in other comprehensive income and thus disclosed in the equity section of the balance sheet.

The Board supports these changes on the ground of increased comparability and justifies such a treatment based on the fact that the components of defined benefit costs have “different predictive values” (IFRS Foundation, 2011, p. 100). A large number of practitioners or entities which have submitted comment letters share this view. For instance, Bozena Hinton, President of the Institute of Actuaries of Australia, indicated in a comment letter dated August 6, 2010 that “the disaggregation of defined benefit cost into the three components of service cost, finance cost and remeasurements provides useful information to users of financial statements, and also provides some guidance to analysts seeking to estimate the impact of employee benefits on future profits” (Hinton, 2010). In addition, Hinton acknowledges the predictive values of components of defined benefit costs when he stated that “the service cost and finance cost items contain information which can be used in estimating future costs, whereas the remeasurements item will be more volatile from period to period and thus harder to accurately predict for future periods.” It is worthy to note that Hinton’s testimony also echoes the views of those who advocate for the recognition of remeasurements in OCI since this method permits to avoid spilling excessive volatility onto the income statement.

Another important change brought by the Board concerns the discount rate. The application of a unique discount rate to the net defined benefit liability or asset eliminates the need for presenting in

the income statement the expected return on plan assets. This obviously enhances comparability between firms since it abolishes the discretion and subjectivity previously given to reporting entities in determining the expected rate of return. In addition, proponents praise the change for its simplicity. For example, UK's Accounting Standards Board agrees "that using the same rate to calculate interest income on plan assets as the rate used to discount the liabilities is an acceptable practical expedient" (Mackintosh, 2010).

Yet, critics identified various issues to the revised IAS 19 and regret the Board's haste in adopting the standard without spearheading a fundamental review of the accounting for pensions. In particular, Klumpes, Whittington and Li (2009) study and find "an association between the use of managerial discretion over changes in UK firms' expected rate of return on pension assets assumptions, and subsequent decisions to curtail future defined benefit pension obligations." Klumpes et al. (2009) explain why pension liabilities and assets cannot be simply offset: "This means that the corporate pension liability can be viewed, at least partially, as a complex implicit contingent claim of the employees on the pension plan sponsor. This alternative risk management theory implies that the pension-related liabilities and assets cannot be simply offset as 'legal' contracts, but additionally involve complex implicit contingent claims both by and on the sponsoring corporation" (2009). Similarly, in a working paper, Demaria, Dufour, Louisy-Louis and Luu (2012) reviewed in details the 227 comment letters received by the IASB during the due process (after having released the exposure draft in April 2010, the Board invited accounting practitioners to comment for a period of five months). Demaria et al. (2012) focused on question 5 of the exposure draft since it addressed specifically the determination of the discount rate. The authors evidence various valid points raised by respondents.

- Applying a common discount rate to both the defined benefit obligation and plan assets the standard would in substance take away entities' ability to design a competitive and effective investment strategy. This view is echoed in the following citation: "*even if the assets and obligations are presented on a net basis in the statement of financial position, they do not share the same characteristics nor are they measured on the same basis; entities do not invest in assets only to be rewarded by the time value of money.*" (CL26)
- By applying a discount rate based on market yields of high quality corporate bond rates, the standard eliminates the superior return expected from mixed investment portfolios that contain assets riskier than debt securities and thus ignores the fact that defined benefit obligations and plan assets are inherently different and therefore managed accordingly. In addition, respondents have on several instances indicated that such a discount rate would likely force asset managers to shift their investment strategy and favour lower-return assets (such as government bonds). For example, this view is shared by the Vice President in Finance of a large US mobile phone company: "*requiring the use of a discount rate that is based on the current yield for high quality*

corporate bonds seems inconsistent with the nature of the investment portfolios that we see in current benefit plan disclosures.” (CL188)

- Adopting the ED proposal without spearheading a fundamental review of IAS 19 would cause disruption and potentially produce misleading information for financial statement users. For instance, the Belgian Accounting Standards Board has formally called for such a review and further guidance regarding the determination of the discount rate: “*given the fact that the current ED is an answer to short-term improvement needs of the Standard, we would have expected that the Board also included more guidance on the determination of the related discount rate.*” (CL1)

In their analysis, Demaria et al. (2012) find that the determination of the discount rate is a major concern for both preparers and users. In fact, the researchers find that a weak majority of preparers in their sample disapprove the proposal for a single rate whereas users are mostly undecided between support and disapproval. Additionally, the researchers examine the semantics used by those who approve or disapprove the proposal and evidence that terms such as simplicity, useful information or comparability are employed by the pros whereas the cons argue for a fundamental review, in other words a qualitative debate. As such, the researchers highlight a recurring dilemma that surfaces in financial accounting research: the trade-off between relevance and reliability. We believe that such a trade-off represents the core of the issue for standard-setters who have across time attempted to fix or improve pension accounting rules via gradual amendments (to arguably limit disruptions for both preparers and users) or calculated compromises (to arguably preserve political ties with both preparers and users). We also believe that such a compromise between relevance and reliability could encompass the notion of comparability. In fact, Demaria et al. (2012) cleverly rely on the work of Gordon and Gallery (2012) who contrast “deep comparability” and “surface comparability.” In the first instance, “an economic reality is described through the lens of a unique accounting method,” whereas in the second instance, “a unique accounting method is used to describe different economic realities” (Demaria et al., 2012). As a result, the debate about what the appropriate discount rate ought to be in the context of the accounting of defined benefit pension plans appears more subtle than what the non-expert could anticipate.

Similarly to Demaria et al. (2012), in a recent study about the “economic consequences of pension accounting,” Sandu (2012) provides a compelling description of the two main weaknesses in the “unique interest rate” approach:

So although not intended, the revised version of IAS 19 creates a difference in treatment between assets and liabilities: the liabilities are allowed to include expectations (through the actuarial assumptions made in determining the value of the projected liabilities) while the assets are assumed to grow in a deterministic manner (expected rates of return for assets are replaced by currently known interest rates). This makes assets and liabilities incomparable and a net interest income (interest cost minus asset growth) calculation unreliable. Furthermore, if accounting standards impose the use of the same

interest rate for assets and liabilities, then it should not matter anymore if the investments are shared between stocks and fixed instruments as both will grow with the same rate in the profit and loss account of the company sponsoring DBs (although any extra return can be recognized in the other comprehensive income).

The analysis of Sandu (2012) is also quite compelling. The proposal for the single interest would i) lead to unbalanced treatment between pension liabilities and pension assets (since the ability to form expectations would be constrained in one case), ii) assume that pension liabilities and pension assets are by nature similar, and iii) remove some of the advantages of designing an investment strategy and arguably investing in risky assets. As such, it appears that the author points at the same compromise that we have uncovered previously: standard-setters somehow seek to find the right balance between relevance and reliability. This is obviously not an easy task.

Moving forward, as shown in this section, the accounting of defined benefit pension plans is both complex and controversial. Pension accounting is complex because it requires the formulation of an extensive set of assumptions (actuarial and financial) and controversial because theoretical or conceptual ideas do not entirely reconcile with practical questions. Conscious of these issues, the IASB has spearheaded between 2006 and 2011 a due process which led to the termination of the corridor method replaced by the immediate recognition of actuarial gains or losses and the advent of the net interest approach. Market participants and accounting professionals, however, expressed mixed feelings at the conclusion of the due process. Similarly to participating in the due process, empirical research seeks to nurture the debate about what the most appropriate pension accounting should be. However, in contrast to participating in the due process, empirical research attempts to establish facts through a rigorous scientific approach. In the next section (and final section of chapter 2), we review the prior literature treating pension accounting.

4: REVIEW OF ACADEMIC LITERATURE

4.1: Overview

This final section of chapter 2 is dedicated to a review of prior empirical research. This analysis will allow us to elaborate our empirical strategy and justify some of our choices (such as methodology and variables).

As mentioned previously, the research treating pension accounting is plethoric. Because we specifically focus on the determinants of rates used in defined benefit pension plans, we classify prior research in two categories. The first category regroups studies that treat the determinants of accounting choices (i.e. rate assumptions and other issues) whereas the second category encompasses other research that considers other aspects of pension accounting that are indirectly useful to us in this dissertation. To best perform this analysis, we rely notably on an extensive literature review conducted by Glaum (2009). It is worthy to note that Glaum makes two interesting statements. First, “empirical research on pension accounting has focused mainly on two issues, the value-relevance of pension accounting information and earnings management in pension accounting” (Glaum, 2009). Our present study of the determinants of accounting choices would therefore be included in the earnings management category and would parallel Glaum’s classification. Second, the researcher reveals that “almost all existing studies on pension accounting are based on US accounting and capital market data,” which further justifies our ambition to address such a gap in the literature. Lastly, in the final part of our review of prior empirical research, we consider research focused on the off-balance-sheet dilemma. Although standard-setters have overall addressed this issue over the past decade, we believe this analysis is useful as it demonstrates how complex pension accounting is and how significant the stakes are.

4.2: Research treating the determinants of pension accounting choices

Broadly speaking, researchers including Glaum (2009), recognize that “pension liabilities are highly sensitive to changes in actuarial assumptions,” and [...] “the potential impact of actuarial assumptions on companies’ balance sheet and income figures is economically significant.” The determination of actuarial assumptions is typically the prerogative of an expert, the actuary, whose expertise is not the concern of our analysis. In place, we focus on financial assumptions in particular the choice of the discount rate and the expected rate of return on pension assets. Prior to 2011, reporting entities enjoyed a reasonable amount of discretion in formulating rates assumptions. It appears therefore that professional judgment had potentially significant repercussions on firms’ financial position and performance. For instance, Royal Dutch Shell, a global oil company with market capitalization amounting to \$169.5 billion (at the end of 2011), disclosed in its 2011 annual report that one percentage point increase or decrease in its discount rate would cause a \$9.1 billion decrease (i.e. 5.3% of market cap.) or \$11.3 billion increase (6.7%) in defined benefit obligations (2011 Annual Report, p. 129). In other words, a one percentage point change in the discount rate would have caused pension obligations to decrease 13.0% or increase 16.2%. In line with this observation relating to a single entity, Elwin and Gupta (2012), research analysts affiliated to J.P. Morgan Cazenove, have anticipated similar financial impacts of the recently revised IAS 19 on a sample of UK companies. For Elwin and Gupta, “the new discount rate assumptions are expected to negatively impact reported earnings and equity, which could be equivalent to at least of 5% of market capitalization” for certain companies (2012). In light of these colossal financial stakes, we acknowledge, in line with Glaum (2009), that early research dedicated to earnings management has focused on US reporting entities and determinants of actuarial assumptions. We present below, in chronological order, the studies that are influential to our dissertation.

We first consider the seminal work published in *Issues in Pension Economics* by Bodie, Light, Morck, and Taggart (1987). The researchers state that their “paper contrasts and empirically tests two different views of corporate pension policy: the traditional view that pension funds are managed without regard to either corporate financial policy or the interests of the corporation and its shareholders, and the corporate financial perspective represented by the recent theoretical work of Black (1980), Sharpe (1976), Tepper (1981), and Treynor (1977), which stresses the potential effects of a firm's financial condition on its pension funding and asset allocation decisions” (Bodie et al., 1987). The researchers explain that according to the “traditional perspective” define benefit pension funds “are segregated pools of capital” independently managed from the corporations and its shareholders. As such, funding strategy should be influenced by “expected future stream of employee pension liabilities,” regardless of corporate financial strategy. In contrast, the “corporate financial perspective” argues for an integrated approach in which pension liabilities and assets belong to the

firm. This view has several merits including tax issues (as demonstrated by Black (1980) and Tepper (1981)), the so-called “pension put” rendered possible thanks to the insurance protection offered by the PBGC (studied by Sharpe (1976) and Treynor (1977)), and the financial slack³⁵ (analyzed by Myers and Majluf (1983)). In addition to this contrast between traditional and corporate financial perspectives, the researchers discuss the characteristics of an appropriate discount rate. Bodie et al. (1987) in fact demonstrate that “whether changes in the discount rate are aimed at real funding constraints, then, or simply investors’ and/or employees’ perceptions of the firm, we might expect an inverse relationship between the rate chosen and the firm’s profitability.” To test this hypothesis, the authors use figures from 1980 SEC filings (relating to FASB statement N° 36) for 939 firms. They use regressions to assess the strength of relationships between the discount rate and funding status (set as independent variables) vs. profitability (measured in terms of inflation-adjusted ROA), tax-paying status and risk. They also investigate the asset allocation of observed companies. The research first estimate correlation patterns and second regress asset allocation (measured in terms of allocation to fixed income instruments) vs. funding (i.e. plan assets / vested pension liabilities), risk (i.e. credit rating), and tax (tax expense / total assets). Bodie et al. (1987) produce very interesting results. The researchers find a significant positive relationship between firm profitability and the degree of pension funding. They also find some evidence that firms facing higher risk and lower tax liabilities are less inclined to fully fund their pension plans. On the asset allocation question, they find that the distribution of plan assets invested in bonds is bi-modal, but that it does not tend to cluster around extreme portfolio configurations to the extent predicted by the corporate financial perspective. Lastly, they also find that the percentage of plan assets invested in bonds is negatively related to both total size of plan and the proportion of unfunded liabilities.

A year later, in 1988, Thomas “critically examined” the rationale advocated by Tepper-Black (in 1980 and 1981) in relation to tax-arbitrage opportunities (1988). As such, Thomas sought to evaluate the relationship between tax status and corporate funding policy and test the Tepper-Black view that argued that taxpaying firms would run overfunded defined benefit pension plans in order to take advantage of tax and pension regulations. Thomas improved Tepper and Black’s methodology and introduced time-series and cross-sectional analyses of tax rates disclosed by 677 US firms over the 1975-1984 study period (data was retrieved from Compustat thanks to information from Form 5500 filed with the IRS). Using both univariate and multivariate protocols, the author regressed tax status vs. pension expense / total assets, pension expense / number of employees, or funds from operations (i.e. working capital) / total assets. Additionally, the researcher regressed funding vs. profitability (i.e. average of operating profit / total assets over the study period), debt, and tax (proxied via a dummy

³⁵ Bodie et al. (1987) explain that a firm would maintain in the form of either liquid assets, unused debt capacity, or pension assets, “some financial slack as a source of corporate liquidity or as a store of temporarily excess corporate funds” (Bodie et al., 1987)

variable equal to 0 if the firm had at least one carryforward over the study period). Overall, Thomas (1988) confirms the tax benefits of overfunding and shows that in fact “tax status is an important determinant of pension funding.” As concluding remarks, the researcher indicates that “the popularity of defined benefit plans should be positively related to corporate tax rates,” which makes defined benefit plans unattractive for tax-exempt firms.

In the late 1980s, an important event affected the US pension accounting landscape: the FASB introduced SFAS 87. The pronouncement brought two important changes. First, it promoted accrual accounting which forced unfunded entities to report a pension liability. Second, SFAS 87 required firms to use the projected-credit-unit method to calculate pension liabilities whereas previous regulation allowed firms to use various methods. In fact, prior to SFAS 87, firms could implement cost-allocation methods which “typically arrived at conservative estimates of pension costs and contributions, because they aimed for a high degree of security for pension beneficiaries” (Glaum, 2009). As a result, pension costs and funding requirement were likely to be higher than under benefit-allocation methods recommended by SFAS 87. Because accounting authorities granted an extended adoption period, reporting entities could adopt SFAS 87 early or wait until it became mandatory. Ghicas (1990) publish in the renowned *Accounting Review* an interesting study of the factors influencing the early adoption of the benefit-allocation method (i.e. the projected-credit-unit method) at the expense of the cost-allocation approach. Relying on previous literature treating tax, contracting costs, political visibility costs, capital expenditures, and funding status among others, Ghicas formulate several hypotheses to predict which firms are likely to switch. First, Ghicas posits that firms dealing with liquidity and financing difficulties would likely switch to the benefit-allocation method to enjoy lower pension costs associated with SFAS 87. Because liquidity affects corporate capital expenditure policy, Ghicas predicts that firms adopting the new rule are likely to undertake new investment projects. Relying on the work of Watts and Zimmerman relating to political costs, Ghicas expects smaller firms to switch from cost-allocation to benefit-allocation because they attract a lower degree of public and regulatory attention than larger firms do. Next, Ghicas believes that early adopters of SFAS 87 have lower effective tax rates than firms that do not adopt the new rule. This rationale is based on the fact that defined benefit pension plans can generate tax benefits as advocated by Tepper (1981). Furthermore, the researcher envisages that the cost-saving associated with the benefit-allocation method will seduce companies contemplating low earnings growth and low cash flows from operations. Lastly, Ghicas considers that SFAS 87 will require lower funding therefore he expects firms with high funding status to adopt the new rule as a means of lowering future pension contributions. Following similar rationale, Ghicas also predicts that firms using higher discount rates (to calculate pension liabilities) are more prone to adopt SFAS 87. To test these hypotheses, Ghicas employs pairs of switching and nonswitching firms “in an attempt to control for some industry-related omitted variables that affect pension liabilities” (1990). To do so, the researcher examines the annual

reports of all NYSE firms for the period spanning from 1979 to 1983 and select 134 firms from which 45 match his empirical criteria. In addition to traditional descriptive statistics and univariate analyses, Ghicas (1990) performed “multivariate logit models for the year prior to the switch, the year of the switch, and the year following it.” The decision to switch (measured as 1 for switch and 0 for nonswitch) is regressed against leverage (measured as long-term debt / (total assets – intangible assets)), current ratio, capex intensity ((capital expenditures + acquisitions + advertising + R&D) / total assets), effective tax rate ((tax expense – change in deferred taxes) / funds flow from operations), income prior to the switch, FFO (funds flow from operations / sales), funding ratio (pension assets / pension liabilities), and discount rate. Overall, Ghicas validates several of his presumptions: high funding status and leverage and low working capital significantly predict the decision to adopt the benefit-allocation method. In the end, his findings confirm prior literature “except for the tax-paying status.”

“In response to allegations of widespread abuse in the business press,” Blaney and Swanson (1995) examine “the reliability of the three rate estimates required under SFAS 87 – the discount rate, expected rate of return on plan assets, and expected rate of future compensation – over the seven-year period 1987-1993.” To do so, the researchers compare reported discount rates and expected rates of return on plan assets to benchmark rates (notably “annuity rates published by the PBGC, rates implicit in current prices of annuity contracts, or rates available for high-quality, fixed-income investments for guidance” such as the 30-year Treasury Bond or the Merrill Lynch index of 10+ year AA to AAA corporate bonds). The sample was comprised of 350 firms sponsoring DB pension plans whose data was retrieved from the Compact Disclosure database. After elimination, 306 firms were retained as they disclosed the necessary footnote information about the three rates in question. Blaney and Swanson (1995) initially run extensive descriptive statistics to evaluate dispersion, central tendency but also the frequency at which rates have changed over the study period. They notice that discount rates are overall in line with benchmark rates though “discount rate declines have lagged behind declining yields of high-quality corporate bonds.” In other words, the choice of discount rate appears conservative but reporting entities have slowly incorporated the drop of market yields since it obviously causes pension liabilities to rise. In addition, the researchers investigate whether or not expected rates of return are overstated by comparing reported rates to a synthetic benchmark calculated as the cumulative, weighted, actual rates of return. They observe that reported rates and benchmark converge over time which contradicts the business press’ presumption of earnings management. The scholars also find that firms change expected rates of return relatively infrequently, which is consistent with SFAS 87’s requirements. Lastly, in order to test the business press’ suggestion that firms selected pension rates to reduce cash contributions, Blaney and Swanson (1995) perform an OLS regression analysis in which cash contributions are regressed against the three

pension rates and two variables controlling for funding level. Overall, they find weak relationship between cash contributions and pension rates.

In line with our dissertation's overarching goal, Gopalakrishnan and Sugrue (1995) study specifically the factors that influence the choice of the discount rate (and the rate of salary progression). In fact, the researchers wonder what factors affect the choice of these actuarial assumptions and whether the choice of these assumptions are dependent on each other. Based on requirements imposed by SFAS 87 and prior literature, Gopalakrishnan and Sugrue (1995) posit that "the choice of the discount rate and the salary progression rate is influenced by leverage and the funding status of the pension plan of a firm." In order to test their presumptions, they formulate four hypotheses and employ a methodology based on linear regression. Their sample is made up of 150 US firms for which footnote information is extracted from annual reports for the years 1986 and 1987. Supplementary information is obtained from the Compustat database. Interestingly, their correlation analysis reveals "a strong positive relationship between discount rate and salary progression rate, leverage and funding" (Gopalakrishnan and Sugrue, 1995). Note that the researchers have defined funding as the ratio of projected benefit obligation (or PBO) to pension plan assets in which PBO has been standardized using a standard discount rate of 8.6% (though standardization is common, funding status is, however, typically measured as pension assets / pension liabilities). Next, the researchers run two regression models, one for each the discount rate and the rate of salary progression, which are both regressed against leverage (measured as $(\text{book value of debt} + \text{UPBO}(1-T)) / (\text{market value of debt} - \text{UPBO}(1-T))^{36}$), funding (PBO / pension assets), and two control variables (ROA and industry) since the researchers acknowledge the fact that "there could be some other unknown factors that could influence the choice of the discount rate and the salary progression rate" (Gopalakrishnan and Sugrue, 1995). They find that leverage and funding are positive and highly significant explanatory variables for the choice of the discount rate whereas profitability and industry affiliation do not affect this choice. Furthermore, to test whether the choices of discount rate and salary progression rate are dependent on each other, the researchers introduce the actuarial assumptions as explanatory variables in each regression model. Their results indicate that the choice of the discount rate is influenced by leverage, funding and salary progression rate (which is also true for salary progression rate when set as the dependent variable). Overall, these findings lead the scholars to conclude that "the choice of discount rate is driven by the magnitude of leverage and funding whereas the choice of the salary progression rate is driven only by the level pension plan funding" (Gopalakrishnan and Sugrue, 1995). Ultimately, based on their final regression models, the researchers advance that "firms choose a 'package' of actuarial assumptions that 'are favorable' to them."

³⁶ Gopalakrishnan and Sugrue (1995) adjust book value and market value of debt with the Unfunded Projected Pension Liability (or UPBO) calculated as PBO – Plan Assets and adjusted for tax. Data is retrieved from Compustat

Amir and Benartzi (1998) are also interested in the factors influencing actuarial assumptions; in their case they focus on the expected rate of return on pension assets. Indeed, the researchers “examine the correlation between the expected rate of return on pension assets [...] and the composition of the pension portfolio, measured as the percent invested in equities” (Amir and Benartzi, 1998). Their empirical motive was nurtured by the recent publications of i) SFAS 87 (1985) which required firms to disclose “their long-term expected rate of return on pension assets (ERR) and the type of assets held in the pension portfolio,” and ii) SFAS 132 (1998) which eliminated “the requirement to disclose asset composition” on the grounds that such disclosure “provide only limited useful information to users of financial statements” (Amir and Benartzi, 1998). Dissatisfied with this regulatory change, Amir and Benartzi (1998) “examine the relevance of disclosures of pension asset composition and of the ERR” as a means to investigate whether this information is predictive of the return on pension assets. They further define relevant information and predictability in line with principles formulated by the FASB’s conceptual framework. Based on this theoretical standpoint, the researchers assess the correlation between pension allocation (measured in terms of percentage allocated to equity or %Equity) and ERR by studying “cross-sectional differences in the ERR.” The rationale behind this is that if reporting entities apply unbiased assumptions, cross-sectional differences in ERR can only be corroborated by differences in the “riskiness of the pension portfolio” (Amir and Benartzi, 1998). To assess this idea, the researchers extract from i) Compustat corporate data for the years 1991 to 1994, and ii) *Pensions and Investments*, a private industry database, asset allocation information for the years 1988 to 1994. Data is retrieved for about 300 firms yielding 2,263 firm-year observations (down to 1,961 firm-year observations after eliminations). Interestingly, the descriptive statistics show that “most firms maintain a stable ERR over time” and “on average US pension funds invest about half their funds in domestic equities and an additional one-third in domestic fixed-income securities” (Amir and Benartzi, 1998). Next, Amir and Benartzi run several tests to evaluate the relationship between %Equity and ERR. Via a nonparametric portfolio analysis, they slice annual data into deciles based on %Equity in order to calculate average ERR per decile and then derive the implied equity risk premium³⁷ for each year and for the entire sample. Results reveal that the difference in average ERR across the first and tenth decile is meagre and the same difference in %Equity is 58%, which are in line with prior literature. In addition, Pearson and Spearman correlation analyses overall indicate weak and insignificant relationship between %Equity and ERR. Lastly, the researchers employ a “multivariate regression model to investigate the cross-sectional variance in the ERR” on the belief that firms allocate pension assets to the traditional equity and bonds categories but also a wide range of other asset classes (Amir and Benartzi, 1998). As such, ERR is regressed against %Equity, %Risky (which encompasses investment in risky assets such as venture capital, LBOs, or private equity), and

³⁷ Amir and Benartzi (1998) define the implied equity risk premium as the difference between ERR of the top and bottom deciles, divided by the difference between %Equity of the top and bottom deciles.

the actual return on plan assets. The researchers predict that slope coefficients for %Equity and %Risky respectively represent “the consensus equity risk premium and consensus risk premium on risky investments.” Contrary to these predictions, regression coefficients are significantly lower than those “observed on financial markets over the last seven decades,” which brings Amir and Benartzi (1998) to admit that “past pension returns and pension asset allocation composition explain a very modest portion of the variation in ERR.” In their final set of experiments, the researchers divide their sample into quintiles and calculate actual return on pension assets as a means to determine which disclosure between asset allocation and ERR better predicts future pension returns. Their findings clearly shows that “asset composition is a better predictor of returns on the pension portfolio than the ERR” (Amir and Benartzi, 1998). To conclude this review of the work of Amir and Benartzi, it appears that the researchers demonstrate i) a weak correlation between %Equity and ERR, and ii) ERR is a poor predictor of future returns on pension assets compared to asset allocation. Consequently, these findings contrast with those of Blankey and Swanson (1995) and arguably “suggest that managers use the expected rate of return on plan assets in biased and possibly opportunistic ways” (Glaum, 2009).

In a context similar to Bodie et al. (1987), Thomas (1988), and Ghicas (1990), Asthana studies “the effects of firms’ financial and pension profiles on their funding strategies and actuarial choices” (Asthana, 1999). Specifically, the researcher evaluates “the determinants of three actuarial choices: interest rate [i.e. discount rate], cost method, and salary growth rate.” Based on the prior literature mentioned above, Asthana hypothesizes that “overfunded firms (pension liabilities less than pension assets) are likely to make conservative actuarial choices that increase their pension liabilities and decrease the perceived overfunding, and that underfunded firms (pension liabilities more than pension assets) are likely to make liberal actuarial choices which decrease their pension liabilities and the perceived underfunding” (1999). This prediction finds grounds on evidences but also limitations in prior research. Asthana explains, that unlike prior research, her study evaluates pension accounting practices post-SFAS 87 because the new rule has predominantly cash flow implications. Furthermore, Asthana recognizes that some “confounding factors make it difficult to directly measure funding management,” notably “extraneous reasons beyond the control of the firms, such as investment performance and unexpected inflation” (Asthana, 1999). The researcher also realizes that there is potentially significant interaction between actuarial assumptions (as anticipated by Daley (1984) and Ghicas (1990)). To control ‘for interdependence,’ Asthana estimates “a system of cross-sectional simultaneous equations using interest rates, cost methods, and salary growth rates as jointly determined endogenous variables” (1999). Moreover, in contrast to most prior research which relies on data aggregated at a firm-level (i.e. at the sponsor’s level), Asthana retrieves data collected at the plan-level using “reports filed by individual pension plans with the US Department of Labor (or DOL) under requirements of ERISA.” Finally, Asthana remarks that in prior research the discount rate is

often adjusted when scholars “prorate the reported pension liabilities” in comparison to some benchmarks (such as PBGC’s reported discount rates or Treasury bonds yields) whereas other variables of interest are not adjusted. In her experiments, the researcher “allows for simultaneous corrections (debiasing) for the effects of possible management of all three actuarial choices” (Asthana, 1999). In light of these empirical constraints, Asthana formulates six hypotheses which find justification in firms’ desire to manage visibility costs. As such, Asthana posits that actuarial assumptions are influenced by funding status, annual contribution, size, cash flows, marginal tax rate, and indebtedness. To test her presumptions, Asthana constructs an enlarged sample made of 6,040 observations for 2,419 pension plans sponsored by 1,813 firms (whose information is retrieved from the DOL system). Additional financial information about profitability, cash flow patterns and taxation is retrieved from the Compact Disclosure database. However, due to mismatches between these two sources of information, the sample is reduced to 500 observations for 221 plans sponsored by 68 firms. Asthana performs a series of regression analyses in which discount rate, actuarial cost methods³⁸, and salary growth rate (measured as the ratio of salary at normal retirement age to salary at age of 40) are regressed against firm’s funding ratio (ratio of current pension liabilities to pension assets), contribution (calculated as employer’s contribution minus the minimum required contribution divided by the permissible contribution range), profitability (net income to total assets), cash flow pattern (cash flows from operations to total assets), indebtedness (total debt to total assets), and taxation (a dummy variable taking value of 1 if sponsor’s income tax is greater than zero and 0 otherwise). Lastly, the researcher controls for year-specific effects, size and industry affiliation. Asthana’s experiments yield results that are significant across the board. Empirical findings support Asthana’s initial presumption and allow the researcher to advance that “sponsoring firms’ financial and pension characteristics are determinants” of management of funding and actuarial choices (Asthana, 1999).

In the same year as Asthana, Godwin published a study in which he examines “the trends over the past decade in the three major actuarial assumptions disclosed by pension sponsors in their annual reports: the discount rate, the salary progression rate, and the expected rate of return on plan assets” (Godwin, 1999). Specifically, Godwin evaluates the actuarial assumptions formulated from 1987 to 1996 by 214 US firms reporting a pension plan subject to SFAS 87 reporting requirements. Data was collected from Compustat, Compact Disclosure and Lexis/Nexis. Over the study period, Godwin notices that discount rates declined steadily between 1987 and 1992 and exhibited much more volatility between 1993 and 1996 (potentially due to a public statement from the Chief Accountant of

³⁸ Asthana (1999) defines the actuarial cost method (AM) as “a multilevel variable that measures the liberalness of the actuarial cost method chosen. It takes the values three for unit credit, two for entry age normal, zero for individual level premium, and one for all others. Three signifies maximum liberalness and zero signifies maximum conservativeness. This variable is defined on the basis of rankings of actuarial cost methods provided by Thomas and Tung (1992) and by Winklevoss (1993). Logit estimation is used in the regression, since the dependent variable is a multilevel variable.”

the SEC in 1993). In contrast, salary progression rates fell steadily over the same period and expected rates of return on pension assets “showed little movement throughout the decade” (Godwin, 1999). In addition to trend analyses, Godwin regressed the change in salary progression rates against the change in discount rate and other control variables in order to assess the impact of the SEC’s sudden and assertive stance of the early 1990s. Godwin finds that the SEC pronouncement significantly influenced firms’ choices of the discount rate after 1993. At that time and following questions raised by the financial press, the SEC was concerned by “whether firms were choosing discount rates to inflate their funded status.” To assess the degree of funding, Godwin divided his sample in two groups based on funding status (measured as the ratio of pension assets to projected benefit obligation) and discount rates were compared accordingly. The researcher computed an adjusted obligation metric by scaling pension obligation with the ratio of reported discount rate to the average sample discount rate. Surprisingly, contrary to Blankey and Swanson (1995), Godwin discovers proofs that reporting entities formulate assumptions in order to enhance earnings. Indeed, Godwin explains that “discount rates for underfunders were statistically greater than discount rates for overfunders at less than the 0.1 level (using *t*-tests) in nine of ten years. Because higher discount rates result in lower liabilities, such a difference is consistent with firms using discount rates to help inflate their funded status” (Godwin, 1999).

Bergstresser, Desai and Rauh (2006) share Amir and Benartzi’s (1998) interest for managers’ opportunistic use of the expected rate of return on pension assets. Nevertheless, Bergstresser et al. (2006) add a new dimension to the research by thoroughly describing the manipulations made possible with the ERR. The researchers’ fundamental logic builds on the following statements. Bergstresser et al. (2006) argue that “managers are more aggressive with assumed long-term rates of return when their assumptions have a greater impact on reported earnings.” As a consequence, “firms use higher assumed rates of return when they prepare to acquire other firms, when they are near critical earnings thresholds, and when their managers exercise stock options.” Lastly, “changes in assumed returns, in turn, influence pension plan asset allocations” (Bergstresser et al., 2006). To build their case, the researchers first identify the central issue with the accounting treatment of the ERR: *The final component of pension expense, the assumed return on plan assets, offsets the interest and service costs. This return is an assumed return rather than the realized rate of return on the plan’s assets. A desire to insulate annual earnings from year-to-year fluctuations in the market performance of pension assets motivates the use of an assumption rather than realized returns. Managers enjoy significant discretion in setting the assumed return used for the calculation of pension cost on the income statement. The reconciliation between the assumed and actual rates of return happens over time, with potentially very long amortization periods.*

Consequently, firms enjoy leeway to manage both financial position and financial performance through various opportunistic mechanisms. In order to describe these mechanisms and substantiate

their presumptions, the researchers perform a comprehensive study based on 20,598 firm-year observations accounting for 3,350 US firms for the period spanning from 1991 to 2002. They retrieve financial data from Compustat, pension data from *Pensions and Investments*, firms' acquisition and SEO (secondary equity offerings) data from the Securities Data Company (or SDC), and executive compensation data from the Compustat Executive Compensation dataset. Bergstresser et al. (2006) initiate their analysis by observing the distribution of assumed (i.e. expected) rates of return over the study period. The researchers note that in order to maintain the median ERR constant at 9% while yields on Treasury securities declined steadily, firms had to assume overly optimistic returns on equity securities held in the pension portfolio (as much as 16% return on equity securities in 2002). Next, the researchers perform a series of regression analyses in which ERR is regressed against various variables while controlling for industry and year fixed effects. Explanatory variables include the log ratio of pension assets to operating income, ratio of pension liabilities to operating income, ratio of pension assets to 3-year average of operating income, or ratio of pension assets to operating assets. Their findings reveal that expected rates of return are correlated with realized, or lagged realized, returns. Yet, this relationship remains small. When controlling for actual returns, the researchers can partially explicate the cross-sectional variation in ERR with firms' pension "sensitivities;" notably, firms holding large amounts of pension assets tend to report higher ERRs. Based on the belief that "assumed returns should be higher when managers are more interested in inflating reported profits," Bergstresser et al. (2006) furthermore study the relationships between ERR and acquisition activity, SEO activity, executive compensation (measured via CEO option activity), and earnings announcement. Overall, empirical results support the idea that reporting entities adopt more aggressive expected rates of return on plan assets i) in years before and in years in which they take part of M&A activities, ii) when they engage in SEO activities, iii) when CEOs exercise stock options, and iv) when they are unlikely to meet earnings expectations (Glaum, 2009). Next, the researchers argue that, since higher ERR should be rationalized by higher pension assets allocation to equities then it is reasonable to investigate "the possibility that managers shift pension assets toward equity in order to justify the higher assumed returns they report." Findings based on OLS regression analyses indicate a modest positive "correlation between asset allocations and return assumptions" but Bergstresser et al. (2006) warn that such a phenomenon may not yield a causal interpretation since "a number of potential factors" may affect return assumptions. Again, when controlling for realized actual pension fund returns, the researchers discover a firmer relationship between asset allocation (measured as percentage of pension assets allocated to equity securities) and ERR. In fact, they realize that "if a 5 percentage point increase in the fund's equity allocation justifies a 25 basis point increase in the expected return on fund assets, then a single percentage point increase in equity allocation would justify a 5 basis point increase in expected returns" (Bergstresser et al., 2006). In the final stage of their experiments, the researchers investigate the relationship between pension assumptions and corporate governance based on the belief that "if current shareholders are the beneficiaries of

managerial opportunism in setting pension return assumptions, then aggressive assumptions will be more prevalent in firms where managers are more constrained to behave in the interest of shareholders.” Using a corporate index based on a method developed by Gompers, Ishii and Metrick (2003), Bergstresser et al. (2006) demonstrate that “assumed returns on pension assets are substantially higher at firms where current shareholders have weaker control over managers.” As a concluding remark, it appears that the work of Bergstresser et al. (2006) contributes to prior research (such as Amir and Benartzi, 1998) and details several mechanisms implemented by firms in order to benefit from optimistic ERR assumptions.

The studies previously discussed in this section represent a sample of the most pertinent research treating the determinants of rates used in the accounting of defined benefit pension schemes. As explained in the introductory chapter, we seek to study in particular the discount rate and the expected rate of return on plan assets and therefore we disregard actuarial assumptions such as mortality, turnover, salary growth rate and so on. Before extending the literature review to other strands of accounting research that indirectly relates to our empirical strategy, we summarize in the next table the main characteristics of the studies discussed so far.

Exhibit XXXVII: Studies of the determinants of rates used in defined benefit pension plans

Authors	Central Theme	Sample	Data / Study Period	Variables	Main Results
<p>Bodie, Light, Morck, and Taggart (1987) in <i>Issues in Pension Economics</i></p>	<p>Researchers contrast and empirically test two different views of corporate pension policy: the traditional view that pension funds are managed without regard to either corporate financial policy or the interests of the corporation and its shareholders, and the corporate financial perspective represented by the recent theoretical work of Black (1980), Sharpe (1916),Tepper (1981), and Treynor (1971), which stresses the potential effects of a firm's financial condition on its pension funding and asset allocation decisions</p>	<p>939 US firms</p>	<p>Figures from 1980 SEC filings (relating to FASB statement N° 36). Researchers use regression analyses to assess the strength of relationships between the discount rate, and profitability, tax-paying status and risk. Also investigate the asset allocation practices (note that researchers adjust reported pension liabilities to a common 10% discount rate to eliminate differences in corporate strategies)</p>	<p>• DR • % of pension assets in fixed income vs. • Pension liabilities • Vested PL • Total non-pension assets • Inflation-adjusted ROA (= inflation-adjusted operating income / TA) • Reported total taxes – change in deferred tax liabilities • Risk = Bond credit rating (10 = AAA, 1 = D) or Unlevered beta</p>	<p>• Significant positive relationship between firm profitability and the degree of pension funding • Evidence that firms facing higher risk and lower tax liabilities are less inclined to fully fund their pension plans • The distribution of plan assets invested in bonds is bi-modal, but that it does not tend to cluster around extreme portfolio configurations to the extent predicted by the corporate financial perspective • % of plan assets invested in bonds is negatively related to both total size of plan and the proportion of unfunded liabilities</p>

<p>Thomas (1988) in <i>Journal of Accounting and Economics</i></p>	<p>The researcher examines and proposes modifications for the Tepper-Black arguments about tax-arbitrage opportunities from overfunding pension plans</p>	<p>677 US firms</p>	<p>Author studies firms over 1975-1984 using data extracted from Compustat (Form 5500 filled with IRS). Also runs four tests (including time-series focusing on tax status changes) and cross-sectional regressions</p>	<ul style="list-style-type: none"> • Funding = PA / (PL x (Rep. DR / Standard DR)) • Average profitability over the study period = Operating profit / TA • Pension expense / TA • Pension expense / # employees • Funds from operations / TA • Interest expense / TA • Total debt • Tax = DV with value of 0 if firm had at least one carryforward during study period 	<ul style="list-style-type: none"> • Tax and changes in tax are positively associated with pension contributions and changes in contributions • Tax status is an important determinant of pension funding
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<p>Ghicas (1990) in <i>Accounting Review</i></p>	<p>The researcher identifies and evaluates some possible determinants of the switch from a cost-allocation actuarial cost method to a benefit-allocation actuarial cost method (such as the projected-credit-unit method allowed by SFAS 87)</p>	<p>Researcher studies all NYSE-listed firms for 1979 through 1983 and select 134 firms</p>	<p>1979 to 1983; data is extracted from Compustat. Author uses a multivariate logit model</p>	<ul style="list-style-type: none"> • Decision to switch (measured as 1 for switch and 0 for nonswitch) <p>vs.</p> <ul style="list-style-type: none"> • Leverage (= long-term debt / (total assets – intangible assets)) • Current ratio • Capex intensity (= (capital expenditures + acquisitions + advertising + R&D) / total assets) • Effective tax rate (= (tax expense – change in deferred taxes) / funds flow from operations) • Income prior to the switch • FFO (= funds flow from operations / sales) • Funding ratio (pension assets / pension liabilities) • DR 	<ul style="list-style-type: none"> • Financial statement considerations and reduction in pension funding are found to be highly significant explanatory variables of the switch in actuarial cost methods • The reduction in pension funding is accomplished first by the use of higher interest rates that decrease pension liabilities, and then by the switch into a benefit-allocation method
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<p>Blankey and Swanson (1995) in <i>Accounting Horizons</i></p>	<p>The researchers investigate the reliability of the three rate estimates required under SFAS 87: the discount rate, expected rate of return on plan assets, and expected rate of future compensation</p>	<p>From 350 firms having DB pension plans 306 firms were selected</p>	<p>Data for 1987-1993 was provided by Compact Disclosure database. Authors run descriptive statistics, correlation and OLS regression approaches. Notably run extensive descriptive statistics to evaluate dispersion, central tendency but also the frequency at which rates have changed over the study period. In addition, they investigate whether or not ERRs are overstated by comparing reported rates to a synthetic benchmark calculated as the cumulative, weighted, actual rates of return</p>	<ul style="list-style-type: none"> • Cash contribution <p>vs.</p> <ul style="list-style-type: none"> • DR • ERR • Expected rate of future compensation 	<ul style="list-style-type: none"> • Discount rate declines have lagged behind declining yields of high-quality corporate bonds, PBGC rates, or the 30-year (benchmark) government bond • Expected rates of return are changed infrequently (consistent with the SFAS 87 requirement that they reflect long-run investment expectations)
<p>Gopalakrishnan and Sugrue (1995) in <i>Journal of Financial and Strategic Decisions</i></p>	<p>The researchers evaluate factors that influence managers' assumptions when choosing the discount rate and the rate of salary progression</p>	<p>150 US firms (representing 300 firm-year observations in total)</p>	<p>Authors examine the annual reports (esp. footnotes) for the years 1986 and 1987. Authors use regression analyses to test four hypotheses</p>	<ul style="list-style-type: none"> • DR • $\text{Leverage} = (\text{book value of debt} + \text{UPBO}) / (\text{market value of debt} - \text{UPBO})$ <p>vs.</p> <ul style="list-style-type: none"> • $\text{Funding} = \text{PBO} / \text{pension assets}$ • Control variables are ROA and Industry groups 	<ul style="list-style-type: none"> • The choice of discount rate is driven by the magnitude of leverage and funding whereas the choice of the salary progression rate is driven only by the level pension plan funding • The choice of the discount rate and the salary progression rate are not independent of each other. It appears that firms choose a 'package' of actuarial assumptions that are 'favorable' to them

<p>Amir and Benartzi (1998) in <i>Accounting Review</i></p>	<p>The researchers examine the correlation between the expected rate of return on pension assets and the composition of the pension portfolio, measured as the percentage of pension assets invested in equities</p>	<p>300 US firms</p>	<p>Authors rely on Compustat data for 1991-1994 and <i>Pensions and Investments</i> data for 1988-1994. Authors run descriptive statistics, Pearson and Spearman correlations tests, nonparametric portfolio analysis with sample divided into deciles, and multivariate regression model</p>	<ul style="list-style-type: none"> • ERR <p>vs.</p> <ul style="list-style-type: none"> • %Equity • %Risky • Ac_Ret 	<ul style="list-style-type: none"> • Evidence indicates that ERR and % Equity are related, but the relation is rather weak • % Equity is correlated with future pension returns
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<p>Asthana (1999) in <i>Contemporary Accounting Research</i></p>	<p>The researcher examines the determinants of three actuarial choices: interest (i.e. discount) rate, cost method, and salary growth rate</p>	<p>6,040 observations for 2,419 pension plans sponsored by 1,813 firms and reduced sample to 500 observations for 221 plans sponsored by 68 firms</p>	<p>Author relies on data from Compact Disclosure and DOL database for 1990-1992. The researcher uses logit regression protocol and tests hypotheses in which dependent variables are interest rate, actuarial cost method, and salary growth rate</p>	<ul style="list-style-type: none"> • DR • AM (multilevel variable that measures the liberalness of the actuarial cost method chosen) • Salary growth rate <p>vs.</p> <ul style="list-style-type: none"> • Firm's funding ratio (= ratio of current pension liabilities to pension assets) • Contribution (= employer's contribution minus the minimum required contribution divided by the permissible contribution range) • Profitability (= net income to total assets) • Cash flow pattern (= cash flows from operations to total assets) • Indebtedness = (total debt to total assets) • Taxation (a dummy variable taking value of 1 if sponsor's income tax is greater than zero and 0 otherwise) • Controls for year-specific effects, size and industry 	<ul style="list-style-type: none"> • Evidence shows that as firms become overfunded, they make conservative actuarial choices to avoid visibility costs, and that as firms become underfunded, they make liberal actuarial choices to avoid visibility costs • The larger the profitability, cash flow from operations, and tax liability, and the smaller the debt of a firm, the higher the likelihood that the firm's managers will make conservative actuarial choices to maximize contributions
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<p>Godwin (1999) in <i>Journal of Pension Planning & Compliance</i></p>	<p>The researcher examines the trends over the past decade in the discount rate, the salary progression rate, and the expected rate of return on plan assets</p>	<p>214 US firms</p>	<p>Author uses Compustat PC data over 1987-1996. Change in salary rate is regressed against change in the discount rate and other dummy variables. Author divides his sample in two groups based on funding status (PA/PBO) Adjusted obligation = PL x (reported DR / Average sample DR)</p>	$\Delta SR_{i,t} = \alpha_{i,t} + \beta_1 \Delta DR_{i,t} + \beta_2 D_{1993} + \beta_3 \Delta DR_{i,t} \times D_{1993} + \epsilon_{i,t}$	<ul style="list-style-type: none"> • Discount rates, though potentially much more volatile, are more predictable and comparable across firms • Yet, salary rates fell continuously over the ten-year study period and ERR changed infrequently.
<p>Bergstresser, Desai, and Rauh (2006) in <i>The Quarterly Journal of Economics</i></p>	<p>Researchers describe thoroughly the manipulations made possible with the ERR</p>	<p>3,661 firms yielding 24,604 observations (but sample size varies based on data availability and methods used)</p>	<p>Authors use 1991-2002 Compustat data and IRS data. Authors run linear regressions of expected rates of return on various pension sensitivity measures</p>	<ul style="list-style-type: none"> • ERR vs. log of ratio of PA/Operating income • PL/OI • PA/3-yr avg. OI • PA/Operating assets • ERR vs. M&A activity • SEO activity • Executive compensation (= CEO option activity) • Corporate governance • %Equity vs. ERR • Log of ratio of PA/Operating income, actual returns on pension assets 	<ul style="list-style-type: none"> • Managers facing large incentives to manipulate earnings through pension decisions (either because of the sensitivity of firm earnings to changed assumptions, impending merger activity, declining operating performance, or large incentive compensation contracts) appear to alter their assumed returns significantly in response to these incentives

Source: Moïse LOUISY-LOUIS, June 2014

4.3: Other research treating pension accounting

In the below paragraphs we succinctly present prior research considering some aspects of pension accounting. We believe these studies to be pertinent because i) they confirm or contradict prior findings, ii) they present results based on more recent data, or iii) they introduce elements that specifically apply to the European context.

Recent studies extending prior research treating the determinants of rates used in DB pension plans

Similarly to Bergstresser et al. (2006), Adams, Frank and Perry (2011) are concerned about the potential for earnings management that enjoys reporting entities when setting the expected rate of return on pension assets. Taking into account recent changes in the US regulatory environment (such as SFAS 87 and ASC 715-30³⁹), IASB and FASB's common ambition to address the issues inherent to the ERR, and prior research (including in particular Blankey and Swanson (1995), Amir and Benartzi (1998) and Bergstresser et al. (2006)), Adams et al. (2011) seek to "provide information relevant for assessing the opportunity and potential for pervasive and materially inflated earnings due to the ERR assumption." To do so, the researchers compile a sample of 22,050 firm-year observations representing 2,997 US firms whose pension and financial information is extracted from the Compustat database for the years 1991 to 2005. Data is also hand-collected for the 1998-2002 period to address data limitations on the actual return on plan assets. Next, the researchers perform a series of comparative analyses in which reported ERRs are compared to three benchmarks: contemporaneous actual rates of return (ARR), annualized historical actual rates of return (HARR), and future estimated rates of return (FERR). Preliminary descriptive statistics indicate that the distributions of ERR remained fairly constant over the period with mean and median ERRs approximating 8.70%. Managers' assumptions also appear to have evolved in line with equity and bond markets during the study period. To evaluate "the potential for a positive bias associated with the ERRs," Adams et al. (2011) compute the difference between ARR⁴⁰ and ERR for each firm-year and the impact of such a difference on a firm's operating income⁴¹. Statistics generated under both methods "suggest that the average firm is not systematically overestimating the ERR relative to the actual return performance of the pension plans." In the next stage of their empirical strategy, the researchers rely on cumulative historical actual rates of return as a means to mitigate the impact of any single year. As such, Adams

³⁹ FASB's Accounting Standards Codification (or ASC) became effective in late September 2009. Details about SFAS 87 are found within ASC 715-30 entitled Compensation-Retirement Benefits, Defined Benefit Plans-Pensions (Adams et al., 2011).

⁴⁰ Adams et al. (2011) "calculate the ARR as the actual dollar return on pension assets divided by average pension assets for the year. Average pension assets for the year are calculated as (Beginning of year value of pension assets plus End of year value of pension assets less Actual dollar return on pension assets) divided by two."

⁴¹ The Median Impact on Operating Income is calculated as (ARR - ERR) multiplied by the average pension assets for the year and divided by the absolute value of operating income" (Adams et al., 2011).

et al. (2011) calculate the mean and median differences between HARR⁴² over three-year, seven-year, and ten-year rolling periods and the ERR. The rationale behind this approach is that “if firms boost earnings through an inflated ERR relative to historical returns, then the spread between HARR and ERR will be negative.” Additionally, the impact on operating income of the difference between HARR and ERR is derived as previously for the ARR. Across the board, results are statistically significant and are “consistent with the smoothing mechanism provided in ASC 715-30, as the ERR will exceed historical and actual returns in some years, while lagging those returns in periods of poorer performance” (Adams et al., 2011). Next, the researchers compare ERR to future estimated returns based on pensions’ asset allocation by defining the FERR⁴³ and implementing the same as previously described. Again, findings “suggest that ERRs are generally not inflated relative to future expected returns and, on average, there does not appear to be a systematic upward bias in reported earnings for firms due to the choice of ERR” (Adams et al., 2011). Finally, the researchers supplement the previous univariate analyses by meticulously examining “the frequency, magnitude, and materiality of actual and hypothetical changes in the ERR.” These final tests confirm results obtained from the univariate analyses and more importantly contradict outcomes achieved by Amir and Benartzi (1998) and Bergstresser et al. (2006). Indeed, Adams et al. (2011) “find ERRs, on average, do not systematically bias upward or overstate earnings relative to benchmark rates of return [...] and changes in the ERR are infrequent and have limited impact on operating income for most firms.” After having exclusively discussed prior literature treating the US context, we next introduce studies describing the European context.

Pension accounting in the European context

In parallel with Ghicas (1990) who questions the motives behind the early adoption of SFAS 87 (which allowed reporting entities to switch from a cost to a benefit allocation method), Klumpes and Whittington (2003) study the impacts of SSAP 24⁴⁴ and FRS 17⁴⁵ in the UK context. In fact, the researchers “investigate whether UK companies sponsoring defined benefit pension funds exercise discretion over the choice of actuarial valuation methods” (or AVM) and notably examine the extent

⁴² The HARR is calculated as the cumulative actual return over the preceding three-year, seven-year, and ten-year windows and then annualized over the corresponding horizon” (Adams et al., 2011).

⁴³ “FERR is calculated as the expected return for equity, bonds, and cash multiplied by the percentage of assets allocated to each asset class. For expected equity returns, we use the S&P 500 annual total return averaged over the prior ten years. For expected bond returns, we use the monthly ten-year Treasury Bond yield averaged over the given year. For expected returns to cash, we use the monthly three-month Treasury Bill yield averaged over the given year. The Implied Equity Return is calculated as [ERR - (% allocated to bonds X expected bond return) - (% allocated to cash X expected cash return)] divided by the percent allocated to equity. Also calculated are the median difference between FERR and the ERR and the median impact of FERR - ERR on operating income” (Adams et al., 2011).

⁴⁴ “Statement of Standard Accounting Practice 24 entitled *Accounting for Pension Costs*, issued in 1988, permitted considerable diversity in the choice of long-term actuarial assumptions and methods used to estimate defined benefit pension fund assets and liabilities” (Klumpes and Whittington, 2003).

⁴⁵ “Financial Reporting Standard No 17 requires companies to report on their balance sheet the annually updated difference between the fair value of the assets and liabilities of their sponsored pension fund, and to immediately write off any unexpected actuarial gains and losses to the Statement of Realized Gains and Losses” (Klumpes and Whittington, 2003).

to which pension valuation is influenced by “the characteristics of the pension scheme itself (traditional view) or by financial needs of the sponsoring company (corporate perspective)” (Klumpes and Whittington, 2003). The researchers anticipate that the recent introduction of a minimum funding requirement (or MFR) will reduce managers’ discretionary power in choosing “long-term conservative actuarial assumptions” and will force firms to review pension reporting strategy in order to meet new funding rules. Specifically, Klumpes and Whittington (2003) build on the work of Ghicas (1990) and recent regulatory changes to hypothesize that indebtedness, funding status, capex intensity, proportion of retired workers, size, profitability, and discount rate are influential in firms adopting a market-based AVM approach. Mimicking Ghicas (1990), the researchers study UK companies over the 1994-1998 period and isolate 45 firms matching research criteria. Financial and actuarial data is extracted from Datastream and pension funds data and footnote information are hand collected by the authors. Similarly to the US study, they use industry-matched pairs and employ multivariate logistic methods to explain firms’ accounting policy changes. As such the decision to switch AVM (a dummy variable) is regressed against leverage (measured as the ratio of long-term debt to tangible assets), funding ratio (3-year average ratio of pension assets to pension liabilities), flow-based funding ratio (annual pension fund contributions / annual pension fund expenditures), capex intensity ((capital expenditures + acquisitions + advertising + R&D) / total assets), profitability (EBIT and annual net income of pension fund), proportion of retired employees participating in the pension scheme, size (log of total net assets of pension fund and log of total firm sales) and discount rate. Overall, the researchers find support for the traditional perspective since cash flows, flow funding and pension fund size appear influential in the decision to switch AVM. Only the use of higher discount rates by switching firms provides some support to the corporate perspective. Last but not least, these findings were appraised by Forker (2003) who identifies several theoretical and empirical limitations in the work of Klumpes and Whittington. In particular, Forker questions the sampling policy (selection of only 45 switching firms) whereas Ghicas (1990) examined all NYSE-listed firms.

In the context of IFRS, Amen (2007) and Morais (2008) study the accounting treatment of actuarial gains and losses. As discussed previously, prior to 2011, IAS 19 permitted reporting entities to i) recognize all actuarial gains and losses in the income statement in the period in which they occurred, ii) recognize actuarial gains and losses as a component of equity (provided these items are disclosed separately within the statement of comprehensive income), or iii) spread or smooth the impact of these items over time using the corridor method. Similarly to Ghicas, Amen and Morais examine motives behind the choice of actuarial methods. Amen (2007) compares the choice of the equity method and the corridor method. “Due to the complexity and the probabilistic elements,” Amen performs a sophisticated Monte-Carlo-simulation study using publicly available German official statistical data. In contrast to the belief that actuarial gains and losses offset over time, Amen finds that in the case of a regenerating workforce (i.e. “the replacement of employees who leave the

company due to fluctuation or death”) both the corridor method and the equity approach yield cumulated actuarial net-gain whereas in the case of degenerating workforce (i.e. “an initial workforce that continuously declines”) regardless of the method implemented there is a tendency for a cumulated actuarial net-loss (Amen, 2007).

In contrast to Amen, Morais (2008) selects a larger sample which comprises “523 European listed companies that were included in STOXX 600 in 2005, that have defined benefit plans and that disclosed information about the method of recognizing actuarial gains and losses, and includes Swiss companies as well as those from EU member states.” The information is hand collected from annual reports. Based on a review of accounting rules and prior scientific literature, Morais (2008) postulates that “in the first year that IAS/IFRS became mandatory” (i.e. 2005) reporting entities’ choice of method to account for actuarial gains and losses would be influenced by sector regulation. Indeed, Morais performs an analysis based on descriptive statistics and finds that i) UK and Irish firms have the tendency to employ the equity recognition method (which was in line with the accounting treatment stipulated by FRS 17), and ii) “financial entities tend to adopt the corridor method while non-financial entities tend to adopt the corridor method and the equity recognition method” (Morais, 2008). Lastly, the author notes that “companies that adopt the corridor method of recognizing actuarial gains and losses tend to be larger companies, with lower leverage and showing less profitability in terms of the level of income. In contrast, companies that adopt the equity recognition method tend to have higher ratio of net income/total assets.”

Building on Ghicas (1990) and Klumpes and Whittington (2003), Klumpes, Whittington and Li (2009) study “the strength of the inter-relationship between UK firms’ discretion over the long-term expected rate of return [of pension assets] and their subsequent decisions of curtailing sponsored DB pension plans.” Using an industry-match pair design sample to study firms that adjusted their ERR assumptions on a market-to-market basis between 1997 and 1999, the researchers employ multivariate logistic methods to assess the relationship between the decision to close the DB pension scheme and similar variables used in prior experiments. The authors find that i) ERR assumptions driven by a risk management rationale are influential to the decision to curtail DB pension schemes, ii) managers employ “discretion over apparently cosmetic pension ERR assumptions,” and iii) “the failure of corporate management to adapt to a changing regulatory environment [...] is associated with pension curtailments and ultimately with subsequent corporate restructuring decisions” (Klumpes, Whittington and Li, 2009).

Billings, O’Brien and Woods (2009) are also concerned about pension accounting assumptions used by UK listed companies. As a matter of fact, the researchers retrieve financial data for the years 2004 and 2005 for 239 firms that were in the FTSE 100 and FTSE 250 at February 28, 2006 and examine the IAS 19 or FRS 17 disclosure to collect “assumptions for price inflation, salary inflation and

discount rates” (Billings et al., 2009). In light of prior research and comments in the financial press, Billings et al. (2009) posit that managers would exercise discretion in selecting actuarial assumptions in order to manipulate accounting figures. This presumption finds theoretical grounds in the Positive Accounting Theory as described by Watts and Zimmermann (1990). The researchers formulate four hypotheses which are tested through correlation analyses and linear regression models in which the variables of interest (i.e. price inflation, salary inflation and discount rate) are regressed against FTSE 100 membership (using a dummy variable), the CFS⁴⁶ metric, and the firm’s auditors (using three dummy variables taking the value of 1 respectively for KPMG, Deloitte, Ernst & Young or 0 otherwise). Overall, the researchers “confirm the results of US based research (Blankley and Swanson, 1995; Godwin, 1999; Asthana, 1999; and Eaton and Nofsinger, 2004) that there is evidence of accounting manipulation in the selection of the actuarial assumptions.” As a result, the researchers recommend regulatory authorities to tighten accounting rules and provide further guidance in “the setting of acceptable parameters for relevant assumptions” (Billings et al., 2009).

Similarly to Billings et al. (2009) Amir, Guan and Oswald (2010) “examine the impact of new pension disclosures and subsequent full pension recognition under FRS 17 and IAS 19 in the United Kingdom.” However, they broaden their analysis by considering the impact of “SFAS 158 in the United States on pension asset allocation.” Because FRS 17 and IAS 19 altered pension accounting practices by respectively “introducing new market-based pension disclosures” and “requiring full balance sheet recognition of the pension surplus/deficit” (a requirement which also applied to US companies from 2006 with the release of SFAS 158), Amir et al. (2010) expect these rules to increase volatility in shareholders’ equity and comprehensive income. In order to mitigate this volatility, the researchers anticipate “a shift from equity to debt securities by UK companies during the disclosure period due to the higher visibility of pensions in the United Kingdom and the anticipation of full recognition and a similar shift during the full recognition period, around the adoption of FRS 17/IAS 19 in the United Kingdom and SFAS 158 in the United States” (Amir et al., 2010). To assess their predictions, the researchers rely on pension asset allocation data for 1,829 and 2,611 firm-year observations for UK and US companies for the years 2000 to 2007. To build this sample, data for 243 UK firms (members of the FTSE 350 index) is obtained from Datastream while data for about 300 US firms is retrieved from *Pensions and Investments* and Compustat for the 2005-2007 period. Descriptive statistics reveal that on average UK and US firms allocated 62% of pension assets to equity securities over the study period. In addition, a longitudinal analysis indicates that UK firms decreased equity allocation by 19.8% while increasing bonds allocation by 12.7% between 2000 and

⁴⁶ Billings et al. (2009) create the common financial strength (or CFS) metric as a means to adjust reported pension liabilities (to eradicate distortions relating to the choices of inflation, salary inflation and discount rate assumptions). To do so, the researchers build on the work of Bozewicz (2004), Record (2006), Glaum (2008) and correct reported pension liabilities “by 18% for each percentage point difference between the reported discount rate and the average for all firms with the same balance sheet date” (Billings et al., 2009).

2007. Though initially maintaining stable allocation to equities, US firms reduced their equity exposure between 2005 and 2007 by a lower extent. Additionally, in order to account for the impact of changes in funding status and plan coverage, shorter investment horizons, and increased financial leverage, the researchers perform multivariate cross-sectional analyses. To carry out their experiment, Amir et al. (2010) define two dependent variables, “the change in the percentage of assets allocated to equities by UK companies during the disclosure period” (i.e. 2001 to 2004) noted $rDISCLOSE$ and “the change in percentage of assets allocated to equities during the full recognition period” (i.e. the period spanning from 1 year before the adoption of FRS17/IAS 19 or SFAS 158 and 1 year after the adoption) noted $rADOPT$. The percentage of assets allocated to equities is referred to as $rEQUITY$ and is regressed against the potential impact of the new accounting standards on reporting entities (either fair value of pension assets / shareholders’ equity or PBO / shareholders’ equity), funding status (fair value of pension assets / accumulated benefit obligation or ABO), investment horizon (natural logarithm of the ratio of PBO to current service cost), closure of the DB plan to new entrants (a dummy variable), financial leverage (long-term debt / (long-term debt + market value of equity)), dividend payout ratio (dividends per share / retained earnings per share), and effective tax rate (tax expense / pre-tax income). Overall, Amir et al. (2010) find that “the shift from equity to debt securities [...] is positively associated with increases in funding levels, effective tax rates, and financial leverage and negatively associated with increases in investment horizons.” As results are consistent for both the UK and US samples, the researchers explain that “the potential impact of the new pension accounting standards on the volatility of shareholders’ equity incrementally explains the cross-sectional variation in the shift away from equities in both the United Kingdom and the United States.” With this analysis we complete our review of research addressing pension accounting in the European context. We next consider research that discusses why financial accounting practices differ across Europe.

Financial accounting in the European context

Prior research presenting the diversity of accounting practices at an international level is plethoric. For instance, Glaum (2009) recognizes that “national accounting standards diverge with respect to recognition, valuation and disclosure rules, and this is likely to be reflected in the relationship between accounting data and share prices.” Through a review of prior literature, we find evidence that such diversity existed before and persisted after 2005, the year when IFRS became mandatory. We briefly consider below studies that account for this phenomenon. First, Joos and Lang (1994) provide “evidence of significant differences in financial ratios and the stock market valuation of accounting data,” by studying practices in France, Germany and the United Kingdom. The researchers justify the choice of these countries by explaining that Europe is “a relevant context to examine” partly because the world’s two predominant “accounting philosophies” cohabit there: the Anglo-Saxon model historically focused on shareholders and the Continental model centered on debtholders. Additionally,

the researchers question the efficacy of the EU's Fourth and Seventh Directives in fostering an integrated accounting system across Europe. Joos and Lang (1994) indicate that "because the directives required the unanimous consent of member countries, they tended to develop slowly and allowed member states substantial flexibility in the implementation of the directives into national law." To test their presumption, the researchers retrieved annual financial data and monthly prices and dividends for the 1982-1990 period from the *Global Vantage Industrial Commercial* database for 172 German, 228 French and 675 UK firms. They perform univariate analyses (in which the authors focus on ROE, earnings/price ratio, and book-to-market ratio) and regression models (in which the return and price of common share are regressed against net income before extraordinary items, dividends and/or book value of equity). Overall, their findings imply that "significant differences in reported profitability and the multiples applied to accounting data did exist prior to the directives" [...] and "the directives did little to reduce them" (Joos and Lang, 1994).

Next, we contrast the work of Joos and Lang (1994) to a pan-European study performed by Ding, Hope, Jeanjean and Stolowy (2007), therefore released after the adoption of IFRS. Interestingly, Ding et al. (2007) seek to understand the determinants and effects of differences between domestic accounting standards (or DAS) and IAS. To do so, the authors rely on an exhaustive survey⁴⁷ of international accounting practices developed in 2001 by seven large audit firms and they create two indices, *absence*⁴⁸ and *divergence*⁴⁹. Using data for a sample of 30 countries for the year 2001 and findings from prior literature, Ding et al. (2007) predict that absence and divergence may be associated with country's legal system, ownership concentration, economic development, accounting profession and equity markets. In addition to descriptive statistics and correlation analyses, the researchers perform OLS stepwise regressions and find that "variation in DAS from IAS is positively affected by economic development and the importance of the accounting profession and negatively affected by the capital market development in the country." Furthermore, the researchers examine the economic consequences of differences between DAS and IAS. Ultimately, Ding et al. (2007) demonstrate that "a higher level of absence implies more opportunities for more earnings management and for decreases in firm-specific information to investors" whereas "a larger divergence from IAS is associated with richer firm-specific information in capital markets."

In this brief section devoted to prior literature describing financial reporting in the pan-European context, we sought to point out that despite the adoption of IFRS by European countries in 2005, "there are serious reasons to expect that the very different institutional environments across Europe will continue to bring about country-specific accounting practices" (Glaum, 2009). Because we seek

⁴⁷ A survey entitled "GAAP 2001: A survey of National Accounting Rules Benchmarked against International Accounting Standards," jointly published by Andersen, BDO, Deloitte Touche Tohmatsu, Ernst & Young, Grant Thornton, KPMG, and PricewaterhouseCoopers.

⁴⁸ *Absence* index "measures extent to which the rules regarding certain accounting issues are missing in DAS but covered in IAS" (Ding et al., 2007).

⁴⁹ *Divergence* index "applies in circumstances where the rules regarding the same accounting issue differ in DAS and IAS" (Ding et al., 2007).

to understand the determinants of rates used in defined benefit pension plans in a pan-European context, we must acknowledge the specificities of the Old Continent. Before discussing the limitations of prior literature and concluding chapter 2, we summarize in the next table the main characteristics of the studies presented in this section.

Exhibit XXXVIII: Prior literature treating pension and financial reporting in the US and pan-European contexts

Authors	Central Theme	Sample	Data / Study Period	Variables	Main Results
Adams, Frank, and Perry (2011) in <i>Accounting Horizons</i>	Researchers examine the opportunity that exists for firms to inflate earnings through the ERR assumption associated with defined benefit pension plans	22,050 firm-year observations representing 2,997 US firms	Pension and financial information is extracted from the Compustat database for the years 1991 to 2005. Data is also hand-collected for the 1998-2002 period to address data limitations	<ul style="list-style-type: none"> • Researchers perform a series of comparative analyses in which reported ERRs are compared to three benchmarks: contemporaneous actual rates of return (ARR), annualized historical actual rates of return (HARR), and future estimated rates of return (FERR) • Researchers compare ERR to future estimated returns based on pensions' asset allocation • Lastly, researchers examine "the frequency, magnitude, and materiality of actual and hypothetical changes in the ERR" 	<ul style="list-style-type: none"> • Researchers find that ERRs, on average, do not systematically bias upward or overstate earnings relative to benchmark rates of return [...] and changes in the ERR are infrequent and have limited impact on operating income for most firms"

<p>Klumpes and Whittington (2003) in <i>Journal of Business Finance and Accounting</i></p>	<p>Authors study the impacts of SSAP 24 and FRS 17 in the UK context. In particular, they “investigate whether UK companies sponsoring defined benefit pension funds exercise discretion over the choice of actuarial valuation methods” (or AVM) and notably examine the extent to which pension valuation is influenced by “the characteristics of the pension scheme itself (traditional view) or by financial needs of the sponsoring company (corporate perspective)”</p>	<p>45 UK firms</p>	<p>Authors select UK companies over the 1994-1998 period and isolate 45 firms matching research criteria. Financial and actuarial data is extracted from Datastream and pension funds data and footnote information are hand collected by the authors. Similarly to Ghicas (1990), they use industry-matched pairs and employ multivariate logistic methods to explain firms’ accounting policy changes</p>	<ul style="list-style-type: none"> • Decision to switch AVM (measured as 1 for switch and 0 for nonswitch) <p>vs.</p> <ul style="list-style-type: none"> • Leverage (= long-term debt / (total assets – intangible assets)) • Capex intensity (= (capital expenditures + acquisitions + advertising + R&D) / total assets) • Profitability (= EBIT and annual net income of pension fund) • Funding ratio (= 3-year average of (pension assets / pension liabilities)) • Flow-based funding ratio (= annual pension fund contributions / annual pension fund expenditures) • Proportion of retired employees participating in the pension scheme • Size (= log of total net assets of pension fund and log of total firm sales) • DR 	<ul style="list-style-type: none"> • The researchers find support for the traditional perspective since cash flows, flow funding and pension fund size appear influential in the decision to switch AVM • Only the use of higher discount rates by switching firms provides some support to the corporate perspective • Note that these results were criticized by Forker (2003) who identifies several theoretical and empirical limitations
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<p>Amen (2007) in <i>European Accounting Review</i></p>	<p>Similarly to Ghicas (1990), Amen examines motives behind the choice of actuarial methods in the context of IAS 19 (which gives the choice between three methods to account for actuarial gains and losses). The author compares the choice of the equity method and the corridor method</p>	<p>Publicly available German official statistical data</p>	<p>“Due to the complexity and the probabilistic elements,” Amen performs a sophisticated Monte-Carlo-simulation study using publicly available German official statistical data. Amen uses data available at the end of 2003 and builds simulations for periods stretching until 2078</p>	<ul style="list-style-type: none"> • Monte-Carlo-simulation study 	<ul style="list-style-type: none"> • In contrast to the belief that actuarial gains and losses offset over time, Amen finds that in the case of a regenerating workforce both the corridor method and the equity approach yield cumulated actuarial net-gain, • whereas in the case of degenerating workforce regardless of the method implemented there is a tendency for a cumulated actuarial net-loss
<p>Morais (2008) in <i>Accounting in Europe</i></p>	<p>Similarly to Ghicas (1990), Morais examines motives behind the choice of actuarial methods in the context of IAS 19 (which gives the choice between three methods to account for actuarial gains and losses). The author seeks to identify the accounting method followed by companies after the mandatory adoption of IAS/IFRS in 2005</p>	<p>“523 European listed companies that were included in STOXX 600 in 2005, that have defined benefit plans and that disclosed information about the method of recognizing actuarial gains and losses, and includes Swiss companies as well as those from EU member states”</p>	<p>The information is hand collected from annual reports for the year 2005</p>	<ul style="list-style-type: none"> • Descriptive statistics 	<ul style="list-style-type: none"> • The author finds that i) UK and Irish firms have the tendency to employ the equity recognition method (which was in line with the accounting treatment stipulated by FRS 17), and • ii) “financial entities tend to adopt the corridor method while non-financial entities tend to adopt the corridor method and the equity recognition method”

<p>Klumpes, Whittington and Li (2009) in <i>Journal of Business Finance and Accounting</i></p>	<p>The authors study “the strength of the inter-relationship between UK firms’ discretion over the long-term expected rate of return [of pension assets] and their subsequent decisions of curtailing sponsored DB pension plans”</p>	<p>80 UK firms including 40 firms that switched to using mark-to-market ERR assumptions</p>	<p>Using an industry-match pair design sample to study firms that adjusted their ERR assumptions on a market-to-market basis between 1997 and 1999 (financial data retrieved from Datastream and pension fund data was hand collected), the researchers employ multivariate logistic methods to assess the relationship between the decision to close the DB pension scheme and similar variables used in prior experiments</p>	<ul style="list-style-type: none"> • Decision to CLOSE (measured as 1 for curtailers and 0 for maintainers) <p>vs.</p> <ul style="list-style-type: none"> • PRET (= retired workers / current active members) • FFUND (= pension fund contributions / the pension fund expenditures) • SFUND (= stock funding ratio disclosed under SSAP 24) • LEV (= (short-term debt + long-term debt) / total tangible assets) • RUNI (= (capital expenditure + acquisitions + R&D) / total assets) • EXP (= pension expense / total tangible assets) • SPD (= ERR- SGR) • SWITCH (coded 1 for firms that switched to using marked-to-market ERR assumptions and 0 for firms using ‘sticky’ ERR assumptions) 	<ul style="list-style-type: none"> • The authors find that <ul style="list-style-type: none"> i) ERR assumptions driven by a risk management rationale are influential to the decision to curtail DB pension schemes, ii) managers employ “discretion over apparently cosmetic pension ERR assumptions,” and iii) “the failure of corporate management to adapt to a changing regulatory environment [...] is associated with pension curtailments and ultimately with subsequent corporate restructuring decisions”
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<p>Billings, O'Brien and Woods (2009) in <i>Center for Risk & Insurance Studies</i>, Discussion Paper series</p>	<p>The researchers are concerned about pension accounting assumptions used by UK listed companies and hypothesize that managers would exercise discretion in selecting actuarial assumptions in order to manipulate accounting figures</p>	<p>239 firms that were in the FTSE 100 and FTSE 250 at February 28, 2006</p>	<p>The researchers retrieve financial data for the years 2004 and 2005 and examine the IAS 19 or FRS 17 disclosure to collect “assumptions for price inflation, salary inflation and discount rates.” The researchers formulate four hypotheses which are tested through correlation analyses and linear regression models</p>	<ul style="list-style-type: none"> • Variables of interest (i.e. price inflation, salary inflation and discount rate) <p>vs.</p> <ul style="list-style-type: none"> • FTSE 100 membership (using a dummy variable) • The CFS metric, and • Firm’s auditors (using three dummy variables taking the value of 1 respectively for KPMG, Deloitte, Ernst & Young or 0 otherwise) 	<ul style="list-style-type: none"> • Overall, the researchers “confirm the results of US based research (Blankley and Swanson, 1995; Godwin, 1999; Asthana, 1999; and Eaton and Nofsinger, 2004) that there is evidence of accounting manipulation in the selection of the actuarial assumptions”
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<p>Amir, Guan and Oswald (2010) in <i>Contemporary Accounting Research</i></p>	<p>The researchers “examine the impact of new pension disclosures and subsequent full pension recognition under FRS 17 and IAS 19 in the United Kingdom” and broaden their analysis by considering the impact of “SFAS 158 in the United States on pension asset allocation.” Because FRS 17 and IAS 19 altered pension accounting practices by respectively “introducing new market-based pension disclosures” and “requiring full balance sheet recognition of the pension surplus/deficit,” Amir et al. (2010) expect these rules to increase volatility in shareholders’ equity and comprehensive income</p>	<p>Pension asset allocation data for 1,829 and 2,611 firm-year observations for 243 UK and about 300 US companies</p>	<p>Data for 243 UK firms (members of the FTSE 350 index) for the years 2000 to 2007 is obtained from Datastream while data for about 300 US firms is retrieved from <i>Pensions and Investments</i> and Compustat for the 2005-2007 period. To account for the impact of various factors, the researchers perform multivariate cross-sectional analyses</p>	<p>vs.</p> <ul style="list-style-type: none"> • % of assets allocated to equities • Potential impact of the new accounting standards on reporting entities (= fair value of pension assets / shareholders’ equity or PBO / shareholders’ equity) • Funding status (= fair value of pension assets / accumulated benefit obligation or ABO) • Investment horizon (= natural logarithm of the ratio of PBO to current service cost) • Closure of the DB plan to new entrants (a dummy variable) • Financial leverage (= long-term debt / (long-term debt + market value of equity)) • Dividend payout ratio (= dividends per share / retained earnings per share) • Effective tax rate (= tax expense / pre-tax income) 	<ul style="list-style-type: none"> • On average UK and US firms allocated 62% of pension assets to equity securities over the study period • UK firms decreased equity allocation by 19.8% while increasing bonds allocation by 12.7% between 2000 and 2007 • US firms reduced their equity exposure between 2005 and 2007 by a lower extent • The authors find that “the shift from equity to debt securities [...] is positively associated with increases in funding levels, effective tax rates, and financial leverage and negatively associated with increases in investment horizons”
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<p>Joos and Lang (1994) in <i>Journal of Accounting Research</i></p>	<p>The researchers provide “evidence of significant differences in financial ratios and the stock market valuation of accounting data,” by studying practices in France, Germany and the United Kingdom. They justify the choice of these countries by explaining that Europe is “a relevant context to examine” partly because the world’s two predominant “accounting philosophies” cohabit there: the Anglo-Saxon model historically focused on shareholders and the Continental model centered on debtholders</p>	<p>172 German, 228 French and 675 UK firms</p>	<p>Annual financial data and monthly prices and dividends for the 1982-1990 period extracted from the <i>Global Vantage Industrial Commercial</i> database. The researchers perform univariate analyses (in which the authors focus on ROE, earnings/price ratio, and book-to-market ratio) and regression models</p>	<p>• Return and price of common share vs. • Net income before extraordinary items • Dividends • Book value of equity</p>	<p>• Overall, their findings imply that “significant differences in reported profitability and • the multiples applied to accounting data did exist prior to the directives” [...] and • “the directives did little to reduce them” (Joos and Lang, 1994)</p>
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<p>Ding, Hope, Jeanjean and Stolowy (2007) in <i>Journal of Accounting and Public Policy</i></p>	<p>The researchers seek to understand the determinants and effects of differences between domestic accounting standards (or DAS) and IAS. To do so, the authors rely on an exhaustive survey of international accounting practices developed in 2001 by seven large audit firms and they create two indices, <i>absence</i> and <i>divergence</i></p>	<p>Data for a sample of 30 countries</p>	<p>Data for a sample of 30 countries for the year 2001 and findings from prior literature. In addition to descriptive statistics and correlation analyses, the researchers perform OLS stepwise regressions</p>	<ul style="list-style-type: none"> • <i>absence</i> and <i>divergence</i> vs. • Country's legal system • Ownership concentration • Economic development • Importance of accounting profession • Importance of equity markets 	<ul style="list-style-type: none"> • The researchers find that “variation in DAS from IAS is positively affected by economic development and the importance of the accounting profession and negatively affected by the capital market development in the country.” • The researchers also examine the economic consequences of differences between DAS and IAS and demonstrate that “a higher level of absence implies more opportunities for more earnings management and for decreases in firm-specific information to investors” whereas “a larger divergence from IAS is associated with richer firm-specific information in capital markets”
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Source: Moïse LOUISY-LOUIS, June 2014

4.4: Limitations of prior research and research opportunities

In this section, we discuss several limitations in prior research and the steps considered to address them. In light of the research presented in previous sections, we build our arguments on six distinctive points: complexity of pension accounting, conceptual issues remaining in the revised IAS 19, prior studies mainly based on US/UK market data released prior to 2005, research focused on determinants of assumptions used in the accounting of DB pension schemes, research treating the potential for earnings management, and pan-European studies mainly examining the choices of methods used to account for actuarial gains or losses.

First, prior research treating the accounting of defined benefit pension schemes is plethora because DB pension schemes are complex financial products. As previously demonstrated, pensions represent significant financial stakes for individuals, corporations, and nations. In addition, unfavorable demographic changes (e.g. ageing populations or weakening birth rate) coupled with fast-evolving geopolitical conditions (e.g. uncertain regulatory environment, fast-changing government fiscal policies, or poor performing financial markets) render the administration of pension plans challenging. As a result, we believe this study to be appropriate since it thoroughly describes the factors that influence the accounting of defined benefit pension plans.

Second, another corollary of this complexity is that practices evolve faster than regulation. As illustrated by Exhibit XXXII showing the various stages that led to IAS 19, the accounting of defined benefit pension plans is a major unfinished task. The latest attempt to restructure IAS 19 (between 2006 and 2011) has brought significant improvements but also more challenges. In fact, the 2011 revised IAS 19 arguably addressed some of the discretionary power that reporting entities had in determining the ERR. As discussed previously, we would even argue that the international standard-setter continuously strives in attempting to reconcile the need for pension accounting information to be both relevant and reliable. We do recognize that this is a difficult task. Yet, the revised accounting standard leaves several questions unanswered. The present dissertation explores these questions and proposes ideas on how to address interrogations such as what the appropriate DR and ERR should be.

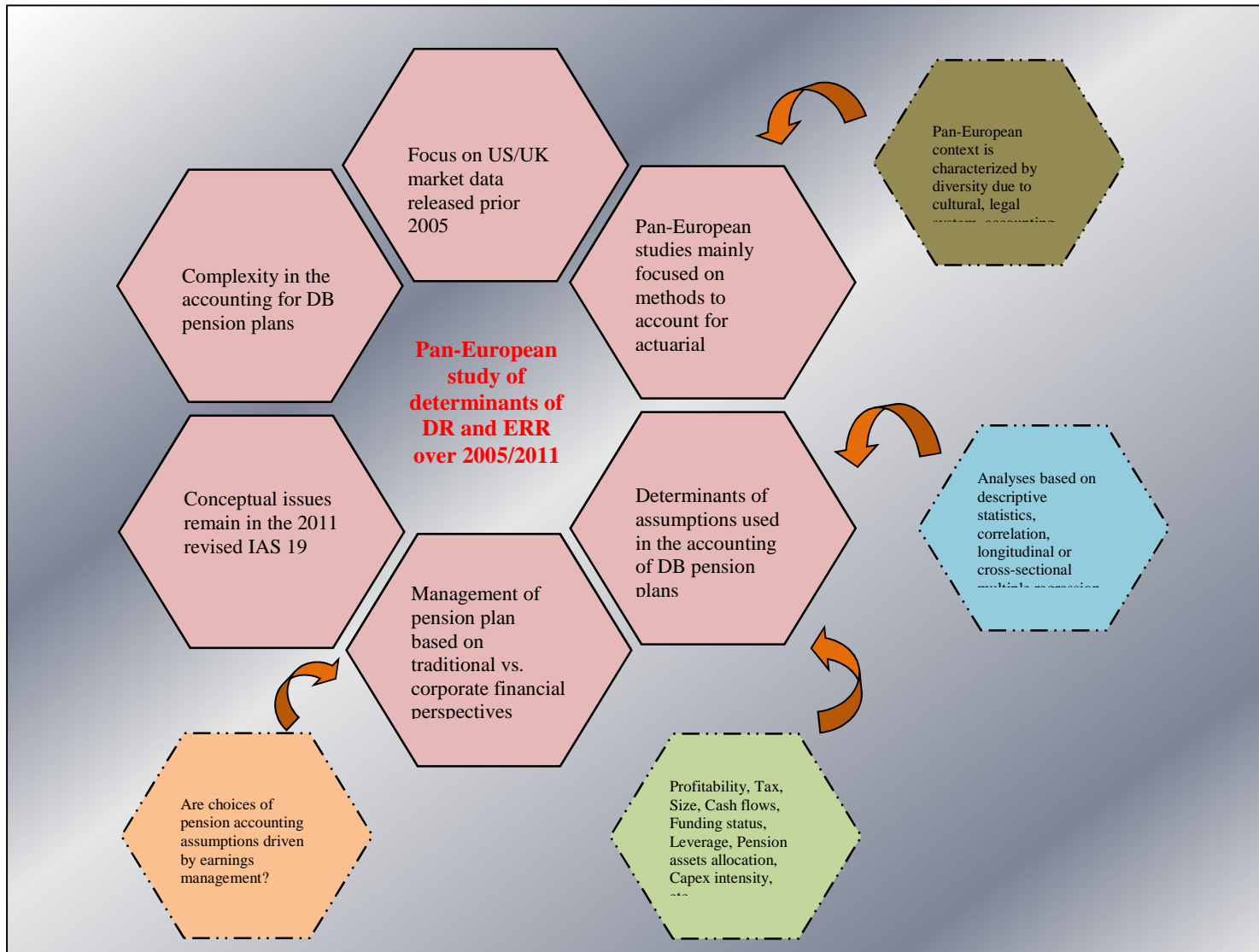
Third, several prior studies including Bodie *et al.* (1987), Thomas (1988), Ghicas (1990), or Gopalakrishnan and Sugrue (1995) examine the impacts of firms' characteristics on the choice of accounting assumptions. Early on Bodie *et al.* (1987) find evidence that firms may adopt the corporate perspective which advances that firms' corporate financial position influences pension policy and pension asset allocation. The present dissertation builds on this presumption and other related studies in order to identify and measure the effects of firms' characteristics on the accounting of defined benefit pension schemes. In light of prior research, we in particular examine the effects of profitability, cash flows, size, funding status, pension asset allocation among others.

Fourth, if we assume that firms adopt the corporate perspective to manage pension plans, it may be difficult to reconcile shareholders' interests with those of pension stakeholders. Given that accounting rules and finance theory appear to proclaim the primacy of shareholders, we anticipate this conflict of interest to provide opportunity for earnings management. However, previous studies offer contrasting findings since Blankey and Swanson (1995), and Adams *et al.* (2011) show that managers do not necessarily employ discretion in choosing assumptions whereas Amir and Benartzi (1998), Asthana (1999), Godwin (1999), and Bergstresser *et al.* (2006) find evidence of opportunistic behavior. As such, we also seek to address this issue by assessing whether current practices are influenced by aggressive assumptions.

Fifth, in line with Glaum (2009), most prior studies treating the determinants of DB pension accounting rely on US market data and UK data to some extent (Klumpes and Whittington, 2003; Klumpes, Whittington and Li, 2009; Billings, O'Brien and Woods, 2009; or Amir, Guan and Oswald, 2010). In addition, these studies by and large show data for years prior to 2005. We seek to address these two gaps in the literature by examining financial data released for the 2005-2011 period by pan-European companies. We believe this is a significant and novel contribution because Europe is a rich and complex region (Joos and Lang, 1994; Glaum, 2009) and appears ripe for a thorough analysis (as financial data prepared under IFRS is now available for nearly a decade).

Finally, as evidenced by Amen (2007) or Morais (2008), most prior studies which build on a sample of pan-European firms treat the methods to account for actuarial gains and losses. In line with Picconi (2006), we believe that the discount rate and the expected rate of return on pension assets are central to the accounting of DB pension schemes. In addition, as discussed previously, we consider that the latest revision of IAS 19 has not fully addressed issues relating to DR and ERR whereas it eliminated the choice of three different methods to account for actuarial gains and losses. Consequently, we trust that a pan-European study of determinants of rates assumptions to be a pertinent contribution as illustrated in the next diagram.

Exhibit XXXIX: Gaps in prior literature and research opportunity



Source: Moise LOUISY-LOUIS, June 2014

5: CHAPTER CONCLUSION

Chapter 2 plays an important role in our research. In fact, the chapter allowed us to precisely set the context and explain the purpose of the present dissertation. For instance, we introduced what a pension plan is, how it is administrated, what the differences between private and public pension funds are, how pensions are regulated, and what the main findings of prior literature are. As a matter fact, we want to emphasize on the following points.

Pensions typically represent an important element of deferred compensation for individuals and are classified according to the Pillar system. Pillar I is commonly referred to as “social security” (i.e. public pension), whereas Pillars II and III respectively represent employment-related and voluntary pension systems. The administration and financing of pension systems represent a major challenge for governments and corporations alike. Rapid ageing of populations, weakening fertility rates, and rise of pensionable age are factors that further burden the task of decision-makers.

Among those, pension fund administrators must act in the best interest of pension beneficiaries. The investment strategy is often seen as the apex of fund managers’ responsibilities. Important forces influence the role of pension fund professionals: the rapid evolution of management techniques (such as ALM or LDI), the growth of investment portfolios as illustrated by the Towers Watson survey and the effects of regulatory changes (enacted by the European Commission or EIOPA for instance) and affecting both public and private pension schemes.

We also demonstrated that the accounting of defined benefit pension plans is extremely complex as it requires the formulation of sophisticated assumptions over future periods. International standard-setters, IASB and FASB, have combined their efforts in order to address issues raised by various interest parties despite the fact that standard-setters face a difficult task in attempting to manage longstanding issues (as pension accounting rules have been evolving since the 1980s), reconcile the need to have pension accounting information which is both relevant and reliable, and address the gap between practices and rules. Lastly, the scientific literature released over the past thirty years clearly epitomizes the complexity and controversy in pension accounting.

In the next chapter, we explain how we build our empirical strategy on precepts stipulated by Positive Accounting Theory and Neo-Institutionalism Theory. This analysis is necessary in order to elaborate our empirical strategy and justify some of our choices (such as the selection of methodology and variables).

CHAPTER III
THEORETICAL FRAMEWORK

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Chapter 3 establishes the theoretical framework on which the dissertation is structured. The chapter presents and discusses the two theories, Positive Accounting Theory and Neo-Institutionalism Theory, which appear the most adequate to explain the choice of rates assumptions. For each theory, we provide historical perspective, present main precepts and discuss key limitations. Additionally, we overview other theoretical frameworks which are frequently referred to in studies of accounting choices and we explain why we did not retain those in our model.

Table of contents

CHAPTER III: THEORETICAL FRAMEWORK.....	178
1: POSITIVE ACCOUNTING THEORY	179
1.1: Historical perspective and founding principles.....	179
1.2: Criticisms of PAT	187
1.3: Research opportunity(ies)	192
2: NEO-INSTITUTIONALISM THEORY	203
2.1: Historical perspective and founding principles.....	203
2.2: Criticisms of NIT	217
2.3: Research opportunity(ies)	221
3: OTHER THEORETICAL CONSIDERATIONS	231
3.1: Agency Theory	231
3.2: Conventions Theory	236
4: CHAPTER CONCLUSION.....	241

1: POSITIVE ACCOUNTING THEORY

1.1: Historical perspective and founding principles

Often viewed as the founding fathers of Positive Accounting Theory (or PAT), Watts and Zimmerman (1990) consider in fact that “modern positive accounting research flourished in the 1960s when Ball and Brown (1968), Beaver (1968), and others introduced empirical finance methods to financial accounting.” Driven by the desire to move away from an era dominated by normative currents, precursors of PAT have sought to provide scientific roots to accounting research, paving the way for rigorous empirical research. From the 1960s, PAT became a prominent perspective to explain accounting practices. According to Jeanjean and Ramirez (2009), the formidable rise of PAT is caused by “normative theorists [who] had already distanced themselves from accounting practice.” Fundamentally, proponents of PAT were interested in establishing a body of knowledge based on a positive stance (focused on what accounting is), sharply contrasting with a normative view (concerned with how accounting should be). As a result, PAT has sought to infer, based on the observation of practices, a body of empirically tested behavioral rules governing the preparation of financial statements by reporting entities (Casta, 2009). Similarly, Scott (2012) explains that PAT “is concerned with predicting such actions as the choices of accounting policies by firms managers and how managers will respond to proposed new accounting standards,” a view which matches with the objectives of the present study.

In order to justify accounting choice, PAT sustains that the economic consequences of the accounting choice explain the motivation behind the choice (Watts and Zimmerman, 1990). Furthermore, the researchers assume that accounting is structured around a contract between a principal and an agent (thus leading to the firm being viewed as a “nexus of contracts” (Jensen, 1983) when considering corporate stakeholders at large). It is worthy to note therefore that the existence of various contracts implies that PAT finds inspiration in the Agency Theory (which is further discussed in a later section). Watts and Zimmerman posit in 1978 that “individuals act to maximize their own utility” and that the agent is influenced by at least three factors, namely compensation, corporate lending policy and political costs. In other words, PAT predicts that the agent (in fact managers) would favor accounting choices that i) increase remuneration (linked for instance to the achievement of certain accounting ratios), ii) increase earnings (as a means to reduce the likelihood of default), and iii) decrease earnings (to avoid attracting too much attention in response to superior or suspicious profitability). Watts and Zimmerman (1990) and more recently Collin, S.O., Tagesson, T., Andersson, A., Cato, J. and Hansson, K. (2009) have found diverging and/or weak empirical support for the bonus parameter, debt covenants or political visibility.

However, in contrast to the rhetoric in favor of PAT, critics have been acid (even virulent) since the 1980s. For instance, Christenson (1983) argues that PAT should focus on financial facts not on human behavior, Whittington (1987) argues that Watts and Zimmerman are single-minded and wrong to dismiss normative theories, Jeanjean (1999) shows that PAT suffers three important limitations (on epistemological, theoretical and empirical grounds) or Casta (2009) explains that PAT appears more suitable for the North American environment and therefore may be difficult to replicate elsewhere. Although these criticisms appear compelling, Watts and Zimmerman have refuted most of them (1990). Before addressing these criticisms and justifying our choice to build our empirical strategy on PAT, we detail in the next paragraphs the literature that we believe best describe what PAT is and what its limitations are.

According to Casta (2009), research in financial accounting experienced profound changes in the 1960s when the hegemony of normative currents started to erode. Furthermore, Ball and Brown (2014) state that “the literature in the mid-1960s was predominantly *a priori* in nature” as the period was seen by Nelson (1973) as “the golden age in history of *a priori* research⁵⁰ in accounting.” Scholars essentially studied the usefulness of financial accounting information through a normative lens. For example, Dyckman and Zeff (1984) shows that between 37% and 74% of all articles published in *The Accounting Review* (a reference journal in financial accounting research) between 1954 and 1970 advocated some normative precepts.

In reaction, the emergence of the positive stance follows the introduction of novel ideas in economics in the 1950s with the work of Milton Friedman (1953) and the impact left by John Neville Keynes on the University of Chicago. Under the influence of other great pioneers including Fama, Fisher, or Jensen, a current of change swept through the University of Chicago whose “atmosphere [...] was electric” (Ball and Brown, 2014). This new era was marked by the desire to establish scientific foundations in accounting research. Indeed, this new approach was based on the observation of phenomena (or a reality to be discovered), leading to the formulation of a theory which requires an empirical protocol to be validated. The expected outcome from such a positive approach is therefore the production of rules that explain behaviors. Another consequence of such a change of paradigm is the shift of research focus from accounting objects such as financial statements or accounting principles to accounting choices made actors such as managers or standard-setters.

⁵⁰ In epistemology, *a priori* knowledge is independent of all particular experiences which contrasts with *a posteriori* (or empirical) knowledge which is based on experience. In the context of financial accounting research, Ball and Brown (1968) find a compelling explanation. “Accounting theorists have generally evaluated the usefulness of accounting practices by the extent of their agreement with a particular analytic model. The model may consist of only a few assertions or it may be a rigorously developed argument. In each case, the method of evaluation has been to compare existing practices with the more preferable practices implied by the model or with some standard which the model implies all practices should possess. The shortcoming of this method is that it ignores a significant source of knowledge of the world, namely, the extent to which the predictions of the model conform to observed behavior” (Ball and Brown, 1968).

In this context, the work of Ball and Brown (1968) and Beaver (1968), all affiliated to the Rochester school of Accounting, is considered as foundations of PAT. Assuming that “capital markets are both efficient and unbiased in that if information is useful in forming capital asset prices,” Ball and Brown (1968) predict that the release of firms’ net income would cause market prices to adjust quickly “without leaving any opportunity for further abnormal gain.” In other words, the scholars, considering that the Efficient Market Hypothesis (or EMH) is true, wanted to address a fundamental research question: “are accounting income numbers useful?” To test their presumption, Ball and Brown “construct two alternative models of what the market expects income to be and then investigate the market’s reactions when its expectations prove false” (1968). As such, the researchers retrieved i) annual financial data (in particular net income and EPS figures) for the years 1946 to 1966 for 261 US companies (listed on the NYSE) from Compustat (yielding 2,349 firm-year observations over 9 years used in practice), ii) annual report announcement dates from *The Wall Street Journal*, and iii) monthly closing prices from the Center for Research in Security Prices (or CRSP) located at the University of Chicago. Using OLS regression models, the researchers regress the year-to-year changes in a firm’s income vs. the change in the average income of all firms in the market. A regression model is also employed to derive a firm’s expected income which is compared to actual income. Any difference between actual and expected incomes generates the unexpected income change or forecast error which the authors assume to embody new information conveyed by the income figure. Additionally, the authors estimate the forecast errors through two other OLS regression models using changes in EPS and “by assuming EPS could be sufficiently well described by a random walk (which requires a firm’s earnings changes to be uncorrelated with the earnings changes of other firms)” (Ball and Brown, 2014). Next, the researchers define the “Abnormal Performance Index” (or API) to capture the value of one dollar invested in all securities 12 months prior to the release of the annual net income figure. Using the three variables described above, they calculate income forecast errors and compare the sign of these errors to the API results. They find “a marked, positive association between the sign of the error in forecasting income and the Abnormal Performance Index,” which in other words means that “the information contained in the annual income number is useful in that if actual income differs from expected income, the market typically has reacted in the same direction” (Ball and Brown, 1968). Similarly to Ball and Brown (1968), Beaver (1968) is concerned about the “informational value” of accounting measures of income and studies “the volume and price movements of common stocks in the weeks surrounding the announcement date.” In his analysis Beaver explains that informational value exists provided that earnings can change the investor’s perception about future earnings or change his/her decision-making by altering his/her investment portfolio. This presumption finds theoretical justification in finance theory such as the work of Miller and Modigliani (who believe that the value of common stock can be derived from the product of earnings and the right earnings multiplier) or Fama (who studied the behavior of stock market prices). To test his assumption, Beaver (1968) collect a sample of annual earnings announcements published by 143 firms between 1961 and

1965. Financial data for NYSE-listed firms is retrieved from Compustat, price, volume and transaction information is provided by CRSP and announcements were published in the *Wall Street Journal*. This information allowed the researcher to compute i) weekly average of the daily percentage of shares traded, ii) trading volume for all NYSE firms, and iii) common stock's rate of return. Results confirmed the author's hypothesis. Indeed, findings reveal "a rather dramatic increase in volume in the announcement week," which suggests that "investors do shift portfolio positions," confirming that "earnings reports have information content" (Beaver, 1968). Furthermore, in order to understand whether abnormally high volumes are caused by market-wide events, the researcher runs linear regressions by regressing volume of sample firms vs. the market index. Such a test also yielded confirmatory results. Additionally, Beaver runs similar analysis by regressing price change of common stock of sample firms vs. the market index using prior findings by Sharpe, Fama and Scholes. Overall, Beaver (1968) demonstrates that "reported earnings are associated with underlying events that are perceived by investors to affect the market price," a statement which is consistent with prior research, notably Ball and Brown (1968).

The work of Ball and Brown (1968) and Beaver (1968) has proved to be highly influential since a plethora of research replicating the event study approach has been released in the 1970s (Dumontier and Raffournier, 1999; Casta, 2009). Fundamental reasons for this are that the researchers have empirically evidenced i) that market participants view the net income measure as the primary source of informational value and ii) the importance of finance theory (in particular the EMH) in accounting research. In the late 1970s, this paradigmatic change brought by Ball, Brown, Beaver and others finds further corroboration through the work of Watts and Zimmerman.

In light of the difficulties of traditional accounting research in explaining accounting practices, Watts and Zimmerman (1978) have formulated their positive theory "to understand better the source of the pressures driving the accounting standard-setting process, the effects of various accounting standards on different groups of individuals and the allocation of resources." Although Watts had "started to develop such a theory" on his own (with papers released in 1974 and 1977), Watts and Zimmerman (1978) specifically study the "factors influencing management's attitudes on accounting standards which are likely to affect corporate lobbying." Because these factors are taxes, regulation, management's compensation, bookkeeping costs and political costs (and based on economic theory), the researchers develop a model which essentially "assumes that individuals act to maximize their own utility," which implies that "management lobbies on accounting standards based on its own self-interest." In the context of the FASB's 1974 General Price Level Adjustment (or GPLA) consultation, Watts and Zimmerman (1978) presume that management's view on the new accounting standard would depend on the size of the company (thus affecting political costs) and the impact on reported earnings. Out of the 133 organizations that submitted comment letters, 53 were listed entities for which financial data was retrieved from Compustat and Moody Manual for the years 1972 and 1973.

In addition, information about compensation policy was obtained via a questionnaire mailed to firms' CFOs and/or annual filings. Relying on prior research (especially Davidson and Weil, 1975; Davidson et al., 1976), the researchers predicted the impact of GPLA on income and studied the relation between size, impact on income and decision to adopt or not the GPLA. Findings confirmed their presumption and were further substantiated via regression analyses in which the proportion of firms supporting/opposing the GPLA is regressed vs. size of net monetary assets and depreciation expense (both terms are divided by the market value of equity), political costs proxied with firms, sector and market share of sales, management compensation schemes (dummy variable), and whether sample firms are regulated businesses (dummy variable). Overall, results confirm Watts and Zimmerman's prediction about the rationale for firms to influence the determination of accounting standards. Notably, "large firms which experience reduced earnings due to changed accounting standards favor the change," whereas "all other firms oppose the change if the additional bookkeeping costs justify the cost of lobbying" (Watts and Zimmerman, 1978).

In addition to this idea of the contractual utility of the accounting information, Watts and Zimmerman have criticized traditional normative accounting research for its lack of scientific rigor. In their highly controversial paper entitled *The Market for Excuses* (released in 1979), the economists consider the products of normative research (e.g. articles, books, etc...) as commodities (in fact "economic goods") being exchanged on a market where supply meets demand. On the one hand, the demand side is comprised of those impacted by accounting rules. For example, this group includes reporting entities, accounting professionals, users of financial accounting information, and so on. On the other hand, the supply side is characterized by researchers, notably those behind normative theories which are used to justify and safeguard the interests of demand side participants, for instance in the context of the formulation of new accounting rules (i.e. in the course of "political lobbying"). Watts and Zimmerman (1979) henceforth consider that normative theories are no more than "excuses for political action." Instead, Watts and Zimmerman argue that the researcher should promote scientific research which seeks to describe and explain. As a result, Watts and Zimmerman contrast normative with positive theory. In light of this semantic, there is little doubt that *The Market for Excuses* has triggered a flurry of criticisms (the main arguments are considered in a later section). Next, we overview the goals and theoretical foundations of PAT as described in Watts and Zimmerman's 1986 book judiciously entitled *Positive Accounting Theory*.

In this manuscript, Watts and Zimmerman (1986) review "the theory and methodology underlying the economics-based empirical literature in accounting," [...] "then review accounting theories involved in empirical studies of the use of accounting in capital markets, contracting and the political process." For instance, the authors discuss the influence of the EMH and CAPM on the research performed by Ball and Brown (1968) and Beaver (1968). Lastly, the authors provide "a discussion of the role of accounting research and a summary and evaluation of the research up until the mid-1980s." From this analysis, the reader learns that PAT fundamentally seeks to develop, in light of observed practices, a

corpus of behavioral rules that are empirically validated and that constitute the pillars of a theory describing the preparation of financial statements by reporting entities. As such, in contrast to normative theories which are prescriptive by nature, PAT seeks to observe and explain practices in order to predict the behavior of preparers and users of financial accounting information. Specifically, PAT formulates a set of hypotheses in order to i) identify factors influencing the choice of accounting methods, ii) highlight the motives behind the accounting policy implemented by managers, iii) predict managers' accounting choices in light of company's characteristics, and iv) explain the standard-setting process.

In order to explain and predict behaviors, Casta (2009) and Colasse (2009) advance that PAT builds on both the Agency Theory (or AT) and the Economic Theory of Regulation (or ETR) also called regulatory capture theory. Because we discuss AT in thorough details in a later section, we provide here a concise overview of the theory. Stemming from neo-classical ideology, AT conceives the firm as a nexus of contracts linking various interest parties or stakeholders (such as shareholders, managers, employees, debtholders, suppliers or clients) who act to maximize their own interest (Jensen and Meckling, 1976). The theory stipulates that corporate activities are organized through delegation and implicit or explicit agency relationships between contracting parties. Due to information asymmetry, financial clauses are inserted in contracts as a means to reducing agency costs and mitigating agents' opportunistic behavior. Since incentives and compensation policy (often used to align the interests of principal and agents) is commonly linked to financial performance, accounting plays a central role in the principal-agent relationship. As a result, the choice of accounting methods can be viewed as crucial for managers (i.e. agents) who seek to maximize their own interests.

The Economic Theory of Regulation originates from the public choice field of economics and portrays the political process as a competition between individuals seeking to maximize their own interests. Benefitting from the work of Stigler and Posner since the 1950s, ETR argues that the purpose of regulation is to allow the transfer of public wealth or resources to private parties. In doing so, politics, when addressing taxpayers, use the technicality of accounting measures to justify their acts. Consequently, larger firms, which enjoy political visibility, are likely to be impacted by new regulation.

Building on the one hand on the contractual relationship that links principal and agents and on the other hand on firms' political vulnerability in face of new regulation, Watts and Zimmerman formulate a set of hypotheses to explain the behavior of interest parties in the context of accounting. The three main hypotheses are the compensation/bonus hypothesis, the debt covenant hypothesis, and the political cost hypothesis. In order to mitigate the conflict of interest between shareholders and managers, firms offer various incentives (such as deferred compensation, bonus plan, or stock-options) to managers which are awarded upon the achievement of certain key performance indicators (or KPIs), often defined as accounting metrics. This leads to the compensation/bonus hypothesis which predicts that managers would choose accounting methods that increase current period profits.

Similarly, as a means to reduce the conflict of interest between debtholders and managers, debt contracts often include covenants that limit managers' ability to transfer corporate wealth at the expense of creditors. Covenants are commonly defined as accounting ratios including balance sheet and income statement items (e.g. debt, equity and/or interest expense). As a result, the debt covenant hypothesis anticipates that managers would choose accounting methods that increase current period profits. Lastly, in order to mitigate their exposure to adverse new regulation or deter the entry of new competitors, large companies would seek to minimize their political visibility while managing their relationships with politics and the public at large. The political cost hypothesis expects that managers would therefore choose accounting methods that decrease profits.

The theoretical framework defined by Watts and Zimmerman has over time proved to be highly influential since the above hypotheses have been used in numerous empirical studies to explain various accounting decisions (Dumontier and Raffournier, 1999). Before we overview this plethora of research, it is noteworthy to mention that some researchers argue that research devoted to the determinants of accounting choices represents a branch of PAT called Politico-Contractual Theory (used by Raffournier, 1990), also called Contractual Theory (by Tremblay et al., 1994). Jeanjean and Ramirez (2009) indicate, however, that "there is some confusion between positive theory and politico-contractual theory, and this confusion is maintained by Watts and Zimmerman, who called their 1986 book *Positive Accounting Theory*." In light of the previous discussion about Watts and Zimmerman (1978, 1979, 1986) and the influence of AT and ETR, we believe that PAT as defined by Watts and Zimmerman corresponds to the needs of our present study. Some researchers argue that PAT, as originally envisioned by Watts and Zimmerman, was first an attempt to challenge the hegemony of normative currents and second a research approach based on empirically constructed theories. As such, PAT was deemed to enrich the research devoted to i) the usefulness of financial accounting information (e.g. Ball and Brown, 1968 or Beaver, 1968) and ii) the determinants of accounting choices (e.g. Dumontier and Raffournier, 1999). In the context of our present study of the rates used in the accounting of defined benefit pension plans, we believe that the line between these two categories is blurred. Although primarily concerned with the determinants of these rates, we understand that the choice of rates assumptions spill over the field of corporate finance (since the choice of the discount rate affects a firm's indebtedness) and the rationale behind these rates is arguably value-relevant for investors who seek to understand the parameters that impact valuation. Furthermore, we believe that the empirical methodology defined by PAT to be appropriate in our case. According to Casta (2009) PAT has introduced an empirical protocol structured around the observation of practices, followed by the formulation of a model, hypotheses, experiment to test those hypotheses and lastly the validation (or not) of the researcher's predictions. Note as well that Watts and Zimmerman (1986) recommend the use of large samples and corresponding statistical methods (which we do in our study). Our opinion about the ability of PAT to explain accounting choices is further reinforced when considering Dumontier and Raffournier's (1999) review of empirical studies

based on PAT. In fact, the scholars indicate that PAT has been employed in studies to explain the choice of accounting methods, changes of accounting methods, standard-setting process, adoption of accounting rules, earnings management, voluntary disclosure, choice of auditors, and others. For example, the scholars cite the work of Ghicas (1990) that we previously described in the literature review section. In the context of pension accounting research, Billings, O'Brien and Woods (2009) also rely on PAT to justify their empirical strategy (also previously discussed). Overall, it appears that PAT provides the foundations and logic necessary to explain the choice of accounting methods. However, the theory includes several limitations and has fueled numerous criticisms that we discuss in the next section.

1.2: Criticisms of PAT

Despite its undeniable strengths, PAT suffers several limitations that critics have forcefully proclaimed since the 1980s. We consider below the criticisms most frequently formulated against PAT. For instance, Harvard University professor of business administration Charles Christenson builds a case against the theory promoted by the members of the Rochester School of Accounting (in particular Jensen, Watts and Zimmerman). First, Christenson (1983) argues that “the program of the Rochester School is concerned with describing, predicting, and explaining the behavior of accountants and managers, not that of accounting entities.” As such, for Christenson PAT (notably Jensen) confuses accountants and accounting entities and PAT should thus be renamed “sociology of accounting” in line with Pareto (1935). Christenson also builds on the work of Popper (1966) to advance that PAT proponents further confuse proposition and proposal which are characterized by “two distinct logical forms: observational and theoretical.” Second, Christenson advances that the followers of the “guru of the Chicago School of Economics, Milton Friedman,” himself influenced by J. N. Keynes, have established PAT on the concept of positive science, which derives from an “obsolete philosophical school called positivism.” Christenson believes that the use of positive science or positive theory is misleading because the propositions formulated by the Rochester School are “neither positive nor normative in Keynes’ sense, neither statements of the *actual* nor the *ideal*. Rather, they are statements of the *possible*.” As a result, contrary to the claims of its proponents, PAT fails to fully account for “what is.” Third, Christenson contends that the empirical methodology promoted by the Rochester School is flawed. Relying on ideas promoted by Popper, Christenson explains that normative reasoning is better than the positive approach because normative reasoning, like explanatory reasoning, employs a logic which is “reverse of the deductive direction,” and permits to find “laws and initial conditions that we likewise accept as true on the basis of observation.” As such, Christenson (1983) claims that “the method of analysis, which reasons backward from the phenomena to premises which are acceptable on the basis of independent evidence, is the appropriate method for constructing explanatory theories.” Lastly, Christenson contends that the ideas promoted by the Rochester School lacks of scientific rigor as claimed by Popper because when facing exceptions (i.e. theoretical propositions cannot be generalized), “the Rochester School introduces *ad hoc* arguments to excuse the failures of their theories.”

Similarly to Christenson (1983), Schreuder (1983) refutes the ideas promoted by the proponents of PAT which in fact “refers not to what is but to what can be.” Schreuder reveals to be an unconditional supporter of normative theory which “does tell us what ought to be but in a specific sense.” The inclusion of a value judgment creates a fundamental distinction between normative and positive theories. However, Schreuder contends that though “value judgments hamper empirical testing of the theory,” normative theories cannot be rejected since they allow the formulation of conditional prescriptions (which positive theories cannot) as do explanatory reasoning. Because of this inability to

“yield such prescriptions,” positive theories “would seem to be restricted to descriptions.” Lastly, Schreuder (1983) advances that “the practical and political usefulness of accounting theories” should not be limited only to methodological considerations but should include “the social circumstances in which knowledge is generated and used.” We find this final argument about “social circumstances” particularly compelling as it is frequently cited as one of the main limitations of PAT. In a subsequent section we acknowledge this fact and discuss why we believe that NIT is also an appropriate theoretical framework to explain pension accounting choices.

Whittington (1987) also denounces Watts and Zimmerman’s “ostracism and systematic denigration of rival approaches” (Jeanjean and Ramirez, 2009) and identifies methodology as the central issue in PAT. In fact, Whittington (1987) states that “Watts and Zimmerman’s strident advocacy of the methodology of positive accounting is the most controversial aspect of their work in general.” In particular, Whittington rebuts the claim that “positive theory is somehow value-free and ‘scientific,’ whereas normative theory was highly value-laden [...] and therefore ‘unscientific.’” By performing a detailed review of Watts and Zimmerman’s 1986 book, Whittington explains that the formulation of any question or hypothesis “implies a prior view of what is an interesting question” (in fact Watts and Zimmerman appear to be influenced by strong prior beliefs including the EMH and the CAPM). Furthermore, Whittington argues that Watts and Zimmerman’s “narrowness” in rejecting prescriptive reasoning is wrong because “in practice, Watts and Zimmerman’s work is entirely consistent with a sensible combination of *a priori* reasoning and empirical testing.” Ultimately, Whittington (1987) regrets Watts and Zimmerman’s “enthusiasm” in promoting PAT which “creates the danger that they may never explore the full potential of studies of choice of accounting method.”

In 1990, Sterling released his assessment of PAT and, similarly to Christenson and Whittington, argues that PAT has failed to win legitimacy because its claims to be value-free study and based on accounting practices “are found to be insubstantial.” Sterling (1990) even recommends to “classify positive accounting theory as a ‘cottage industry’ at the periphery of accounting thought.” The same year, in response to a plethora of criticisms following the release of their work in 1978, 1979 and 1986, Watts and Zimmerman published *Positive Accounting Theory: A Ten Year Perspective*. In doing so, the scholars sought to address criticisms, remove some “misconceptions about methodology,” and discuss endogeneity and measurement errors in variables used in regression analyses. In the first half of their article, Watts and Zimmerman (1990) provides detailed accounts about the foundations, evolution, and empirical findings of PAT since the 1960s. In particular, they show that scholars have relied heavily on the agency costs associated with debt and management compensation contracts as well as ETR-derived political cost to explain “organizational choice (including accounting choice).” The authors further argue that combinations of variables relating to the compensation/bonus, debt covenant and political cost hypotheses are mainly used in two types of experiments (“stock price tests and accounting choice tests”). Overall, studies find evidence which is

generally consistent with these three hypotheses despite some specific empirical concerns (especially for the political cost hypothesis).

In the second half of their 1990 article, Watts and Zimmerman address criticisms which are classified in two categories: “those concerning research methods [...] and those concerning methodology (including the philosophy of science).” Research method issues relate primarily to tests’ lack of power and the possibility for results to be due to alternative hypotheses (other than the ones tested). Watts and Zimmerman explain that the lack of power in tests is caused by errors in modeling hypotheses, selecting dependent and/or independent variables or omitting variables. Additionally, the authors argue that accounting metrics may reveal to be imprecise measure such as the debt/equity ratio commonly used as a proxy of the impact of debt covenant. The authors note that researchers often underestimate the relationships between variables and tend to consider the three hypotheses in isolation. For example, Watts and Zimmerman contend that “if the accounting system is part of the firm’s efficient set of implicit and explicit contracts, accounting choice is endogenous. Contracting, investment, and production decisions are determined jointly.” In response to criticisms relating to the philosophy of science, Watts and Zimmerman first admit that positive theory is value-laden (as virtually all research in which the researcher’s values influence the research design) but considers that the usefulness of a theory in predicting and explaining phenomena should mitigate this bias. To Christenson’s analogy to “sociology of accounting,” the authors also concede that “an accounting theory that seeks to explain and predict accounting cannot divorce accounting research from the study of people” (Watts and Zimmerman, 1990). To the claim that PAT employs inappropriate methods to construct explanatory theories, the authors reply that they “apply traditional, generally accepted research methods and methodology from accounting, finance, and economics,” and contend that PAT has yielded unquestionable benefits that should not be discarded because “it may not work in every circumstances.” Regarding the use of the term “positive,” the authors acknowledge that they sought to differentiate their ideas from prior “traditional normative theories” but did not anticipate “the considerable debate over philosophical issues.” Lastly, Watts and Zimmerman (1990) dismiss the “debate over what constitutes ‘proper’ methodology” (as argued by Christenson or Whittington) because critics’ demands are indeed irreconcilable: “debating methodology is a no win situation because each side argues from a different paradigm with different rules and no common ground.” In conclusion, Watts and Zimmerman invite scholars to go beyond the theoretical divide and consider the potential that PAT offers in terms of future research, especially in “improving the linkage between the theory and empirical tests,” or in “investigating inter- and intra-industry variations in accounting methods and other organizational choices.”

Neu (1992), like predecessors, recognizes the limitations of positive studies. As such, Neu (1992) advances that “managers are assumed to trade-off the expected impact of compensation, debt and political influences when selecting an accounting method. Since the selection of a particular accounting method often has opposing effects on compensation variables versus debt/political

variables [...] managers are assumed to choose the accounting practice that best balances these conflicting influences.” In contrast to other critics, Neu proposes to go beyond positive studies’ tendency to describe managers as “rational, atomistic individuals” and to consider “the embeddedness of managers in individual, institutional and societal webs of relations.” The work of Neu is therefore greatly innovative and represents a significant step toward establishing a link between positive and neo-institutionalism perspectives. Indeed, Neu’s (1992) empirical example treating the disclosure of earnings forecasts in the Canadian context suggests that the association of positive and neo-institutionalism ideas “provides a richer, more inclusive explanation of behavior than is provided by positive approaches” solely. Because we discuss NIT in the next section, we will as well review the work of Neu in further details.

Nearly a decade after Watts and Zimmerman’s 1990 response to criticisms, Dumontier and Raffournier (1999) provide a concise discussion of limitations of studies enrooted in PAT. Dumontier and Raffournier ignore the debate about philosophical issues and focus on empirical concerns. The authors first note the simplification of hypotheses especially when researchers test the impact of debt covenants or firm size on the choice of accounting methods. Second, the authors advance that researchers tend to underestimate the complexity of contractual relationships. For example, corporate compensation/bonus policy is often conditional to the achievement of some level of profitability and award is capped beyond this level. Similarly, the impact of indebtedness is even more difficult to analyze since debt contracts typically stipulate covenants measured in terms of a combination of profitability, leverage, equity, liquidity, working capital and so on. Third, Dumontier and Raffournier claim that research based on PAT assumes a certain degree of naivety of contractual parties since managers are expected to adopt favorable accounting methods (and thus raise compensation or relax stringent covenants) without triggering adjustments in contracts (which are typically stipulated in debt contracts). Fourth, the authors indicate that agency relations other than the traditional shareholders-managers and debtholders-managers may influence the choice of accounting methods. Other stakeholders including clients, suppliers, or employees may influence the decision-making process. For instance, the authors cite the work of Liberty and Zimmerman (1984) and Cullinan and Knoblett (1994) who have studied the influence of employees and unions. Lastly, Dumontier and Raffournier (1999) argue that the formulation of the three main hypotheses tend to mask the potential of alternative hypotheses in explaining accounting choices. In addition to the literature that has studied non-financial factors, Dumontier and Raffournier refer to the research which has focused on the possibility for firms to emulate peers affiliated to same sector (e.g. Neu, 1992).

Finally, we consider Casta’s (2009) argument about the fact that PAT appears more suitable for the North American environment as an important limitation of PAT. In line with Casta, others have found that the ability to generalize PAT hypotheses is constrained by accounting environments and circumstances. For instance, Sunder (1999) or Sawabe and Yamaji (1999) find that the three commonly tested hypotheses carry specific institutional environment characteristics that may be

difficult to replicate elsewhere. Likewise, Ali and Hwang (2000) who have examined the value relevance of earnings and book value of equity find evidence that country-specific factors influence accounting choices.

After having reviewed both the strengths and weaknesses of PAT, we discuss in the next section why we believe PAT is an appropriate theoretical framework for our research.

1.3: Research opportunity(ies)

In the previous sections we have examined the foundations, evolution, main empirical contributions, and limitations of PAT. Below, we summarize our key findings.

First, Watts and Zimmerman, often considered as the founding fathers of PAT, have significantly influenced the genesis of PAT with the publication of their work in 1978, 1979, 1986 and 1990. Nevertheless, the economists attribute the first influential literature to Ball and Brown (1968), Beaver (1968), and others who, in the 1960s, introduced empirical finance methods to financial accounting. Second, driven by the desire to move away from an era dominated by normative currents, proponents of PAT have sought to provide scientific roots to accounting research, paving the way for rigorous empirical research. Their ideology was greatly influenced by neo-classical precepts, in particular by the work of Friedman, Keynes, Fama and others. These prolific scholars have also influenced the so-called Rochester School of Accounting to which Watts, Zimmerman and PAT pioneers are affiliated. Third, fundamentally, proponents of PAT were interested in establishing a body of knowledge based on a positive stance (focused on what accounting is), sharply contrasting with a normative view (concerned with how accounting should be). As a result, PAT has sought to infer, based on the observation of practices, a body of empirically tested behavioral rules governing the preparation of financial statements by reporting entities (Casta, 2009). Indeed, PAT has introduced an empirical protocol structured around the observation of practices, followed by the formulation of a model, hypotheses, experiment(s) to test those hypotheses and lastly the validation (or not) of the researcher's predictions.

Fourth, in order to explain and predict behaviors, Watts and Zimmerman establish the theoretical foundations of PAT on both the Agency Theory (or AT) and the Economic Theory of Regulation (or ETR). AT envisions the firm as a nexus of contracts linking various interest parties or stakeholders who act to maximize their own interest (Jensen and Meckling, 1976) whereas ETR originates from the public choice field of economics and portrays the political process as a competition between individuals seeking to maximize their own interests. From these precepts, Watts and Zimmerman formulate a set of three (i.e. the compensation/bonus, the debt covenant, and the political cost) hypotheses to explain the behavior of interest parties in the context of accounting.

Fifth, the theoretical framework defined by Watts and Zimmerman has over time proved to be highly influential since the above hypotheses have been used in numerous empirical studies to explain various (organizational and) accounting decisions (Dumontier and Raffournier, 1999) giving rise to a current of research devoted to the determinants of accounting choices and referred to as Politico-Contractual Theory. Furthermore, Dumontier and Raffournier's analysis of prior empirical studies reveals the great variety of topics or issues for which PAT has provided a cohesive theoretical and explanatory framework.

Finally, PAT has generated numerous criticisms from scholars who have predominantly argued against three types of limitations: epistemological (e.g. criticisms about the philosophy of science), theoretical (e.g. criticisms about the formulation of hypotheses, propositions, or alternative hypotheses), and methodological (e.g. criticisms about variables and limitations of statistical models). As a final comment, we point out again the work of Schreuder (1983) who advances that “the practical and political usefulness of accounting theories” should not be limited only to methodological considerations but should include “the social circumstances in which knowledge is generated and used.” Likewise, Neu (1992) perceived the potential of studies devoted to “the social construction of a manager’s choices.” We find these ideas compelling and convincing enough for us to consider (in the next section) a theoretical framework other than PAT to explain pension accounting choices.

In light of the previous discussion about Watts and Zimmerman (1978, 1979, 1986, and 1990) and taking into account both the contributions and the limitations of PAT, we believe that PAT corresponds to the needs of our present study and can explain pension accounting choices. Furthermore, in line with Watts and Zimmerman’s (1986 and 1990) methodological recommendations, we plan to use a large sample and address correspondingly statistical issues (especially for the choice of variables). Lastly, we summarize in the below table the main literature we refer to in our discussion of PAT.

Exhibit XL: Prior literature treating Positive Accounting Theory

Authors	Central Theme	Sample	Data / Study Period	Variables	Main Results
<p>Ball and Brown (1968) in <i>Journal of Accounting Research</i></p>	<p>Researchers assess the usefulness of financial accounting information through event studies. Assuming that capital markets are both efficient and unbiased, they examine abnormal stock price returns following the release of firms' net income data</p>	<p>2,349 firm-year observations representing 261 US firms</p>	<p>Researchers retrieved i) annual financial data (in particular net income and EPS figures) for the years 1946 to 1966 for 261 US companies (listed on the NYSE) from Compustat, ii) annual report announcement dates from <i>The Wall Street Journal</i>, and iii) monthly closing prices from the Center for Research in Security Prices (or CRSP) located at the University of Chicago</p>	<ul style="list-style-type: none"> • Using OLS regression models, the researchers regress the year-to-year changes in a firm's income vs. the change in the average income of all firms in the market (using net income and EPS) • Researchers define the "Abnormal Performance Index" (or API) to capture the value of one dollar invested in all securities 12 months prior to the release of the annual net income figure • Lastly, researchers calculate income forecast errors and compare the sign of these errors to the API results 	<ul style="list-style-type: none"> • Researchers find "a marked, positive association between the sign of the error in forecasting income and the Abnormal Performance Index," which in other words means that "the information contained in the annual income number is useful in that if actual income differs from expected income, the market typically has reacted in the same direction"

<p>Beaver (1968) in <i>Journal of Accounting Research</i></p>	<p>Author is concerned about the “informational value” of accounting measures of income and studies “the volume and price movements of common stocks in the weeks surrounding the announcement date”</p>	<p>Author collects a sample of annual earnings announcements published by 143 US firms between 1961 and 1965</p>	<p>Financial data for NYSE-listed firms is retrieved from Compustat, price, volume and transaction information is provided by CRSP and announcements were published in the <i>Wall Street Journal</i></p>	<ul style="list-style-type: none"> • Researcher computes: <ul style="list-style-type: none"> i. Weekly average of the daily percentage of shares traded i. Trading volume for all NYSE firms i. Common stock’s rate of return • To understand whether abnormally high volumes are caused by market-wide events, the researcher runs linear regressions by regressing volume of sample firms vs. the market index 	<ul style="list-style-type: none"> • Findings reveal “a rather dramatic increase in volume in the announcement week,” which suggests that “investors do shift portfolio positions,” confirming that “earnings reports have information content” • Author demonstrates that “reported earnings are associated with underlying events that are perceived by investors to affect the market price”
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<p>Watts and Zimmerman (1978) in <i>The Accounting Review</i></p>	<p>Authors study the “factors influencing management’s attitudes on accounting standards which are likely to affect corporate lobbying.” Watts and Zimmerman (1978) develop a model which essentially “assumes that individuals act to maximize their own utility.” In the context of the FASB’s 1974 General Price Level Adjustment (or GPLA) consultation, the researchers presume that management’s view on the new accounting standard would depend on the size of the company and the impact on reported earnings</p>	<p>53 listed US firms</p>	<p>Financial data was retrieved from Compustat and Moody Manual for the years 1972 and 1973 and information about compensation policy was obtained via a questionnaire mailed to firms’ CFOs and/or annual filings</p>	<ul style="list-style-type: none"> • Researchers predicted the impact of GPLA on income and studied the relation between size, impact on income and decision to adopt or not the GPLA • Proportion of firms supporting/opposing the GPLA is regressed vs. size of net monetary assets and depreciation expense (both terms are divided by the market value of equity), political costs proxied with firms, sector and market share of sales, management compensation schemes (dummy variable), and whether sample firms are regulated businesses (dummy variable) 	<ul style="list-style-type: none"> • Results confirm researchers’ presumption about the rationale for firms to influence the determination of accounting standards • Notably, “large firms which experience reduced earnings due to changed accounting standards favor the change,” whereas “all other firms oppose the change if the additional bookkeeping costs justify the cost of lobbying”
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<p>Watts and Zimmerman (1979) in <i>The Accounting Review</i></p>	<p>Watts and Zimmerman criticize traditional normative accounting research for its lack of scientific rigor. In <i>The Market for Excuses</i> the economists consider the products of normative research (e.g. articles, books, etc...) as commodities (in fact “economic goods”) being exchanged on a market where supply meets demand. The demand side is comprised of those impacted by accounting rules (such as reporting entities, accounting professionals, or users of financial accounting information) whereas the supply side is characterized by researchers, notably those behind normative theories which are used to justify and safeguard the interests of demand side participants</p>	<p>N/A</p>	<p>N/A</p>	<p>N/A</p>	<ul style="list-style-type: none"> Watts and Zimmerman (1979) henceforth consider that normative theories are no more than “excuses for political action.” Instead, Watts and Zimmerman argue that the researcher should promote scientific research which seeks to describe and explain
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<p>Watts and Zimmerman (1986) in <i>Positive Accounting Theory</i></p>	<p>Watts and Zimmerman (1986) review “the theory and methodology underlying the economics-based empirical literature in accounting,” [...] “then review accounting theories involved in empirical studies of the use of accounting in capital markets, contracting and the political process.” Lastly, the authors provide “a discussion of the role of accounting research and a summary and evaluation of the research up until the mid-1980s.”</p>	<p>N/A</p>	<p>N/A</p>	<p>N/A</p>	<ul style="list-style-type: none"> • PAT seeks to observe and explain practices in order to predict the behavior of preparers and users of financial accounting information • PAT builds on both the Agency Theory (or AT) and the Economic Theory of Regulation (or ETR) also called regulatory capture theory • Watts and Zimmerman formulate a set of hypotheses to explain the behavior of interest parties in the context of accounting. The three main hypotheses are the compensation/bonus, the debt covenant, and the political cost hypotheses
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<p>Watts and Zimmerman (1990) in <i>The Accounting Review</i></p>	<p>In response to numerous criticisms following the release of their work in 1978, 1979 and 1986, Watts and Zimmerman address criticisms and methodological issues</p>	<p>N/A</p>	<p>N/A</p>	<p>N/A</p>	<ul style="list-style-type: none"> • Researchers provide detailed accounts about the foundations, evolution, and empirical findings of PAT since the 1960s (and mention that studies find evidence which is generally consistent with the three main hypotheses) • Researchers concede that tests' lack of power and the possibility for results to be due to alternative hypotheses, positive theory is value-laden, but reject debate about philosophical questions • Authors invite research community to embrace PAT for its potential and provide direction for further research
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<p>Christenson (1983) in <i>The Accounting Review</i></p>	<p>Author builds a case against the theory promoted by the members of the Rochester School of Accounting (in particular Jensen, Watts and Zimmerman)</p>	<p>N/A</p>	<p>N/A</p>	<p>N/A</p>	<ul style="list-style-type: none"> • Because PAT is so much concerned about individuals (rather than organizations), the author argues that PAT should be renamed “sociology of accounting” • PAT suffers from methodological weaknesses since proponents confuse proposition with proposal, which contrasts with good practices advocated by Popper • PAT derives from an “obsolete philosophical school called positivism” • Christenson contends that the ideas promoted by the Rochester School lacks of scientific rigor as claimed by Popper because when facing exceptions, “the Rochester School introduces <i>ad hoc</i> arguments to excuse the failures of their theories.”
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<p>Schreuder (1983) in <i>Serie Research Memoranda</i> sponsored by Vrije Universiteit Amsterdam</p>	<p>The researcher refutes the ideas promoted by the proponents of PAT</p>	<p>N/A</p>	<p>N/A</p>	<p>N/A</p>	<ul style="list-style-type: none"> • PAT “refers not to what is but to what can be” whereas normative theory “does tell us what ought to be but in a specific sense” • Normative theories cannot be rejected since they allow the formulation of conditional prescriptions (which positive theories cannot) as do explanatory reasoning • Schreuder (1983) advances that “the practical and political usefulness of accounting theories” should not be limited only to methodological considerations but should include “the social circumstances in which knowledge is generated and used”
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<p>Whittington (1987) in <i>Accounting and Business Research</i></p>	<p>The author rejects the precepts of PAT and demonstrates that its major weakness has to do with its methodology</p>	<p>N/A</p>	<p>N/A</p>	<p>N/A</p>	<ul style="list-style-type: none"> • The author rejects the claim that normative theory is unscientific because as any theory PAT is also value-laden because “Watts and Zimmerman’s work is entirely consistent with a sensible combination of <i>a priori</i> reasoning and empirical testing” • Whittington (1987) regrets Watts and Zimmerman’s “enthusiasm” in promoting PAT which “creates the danger that they may never explore the full potential of studies of choice of accounting method
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Source: Moise LOUISY-LOUIS, June 2014

In the next section we overview the founding principles, major contributions and limitations of Neo-Institutionalism Theory. We will demonstrate that likewise PAT, NIT provides a theoretical framework appropriate to explain pension accounting choices.

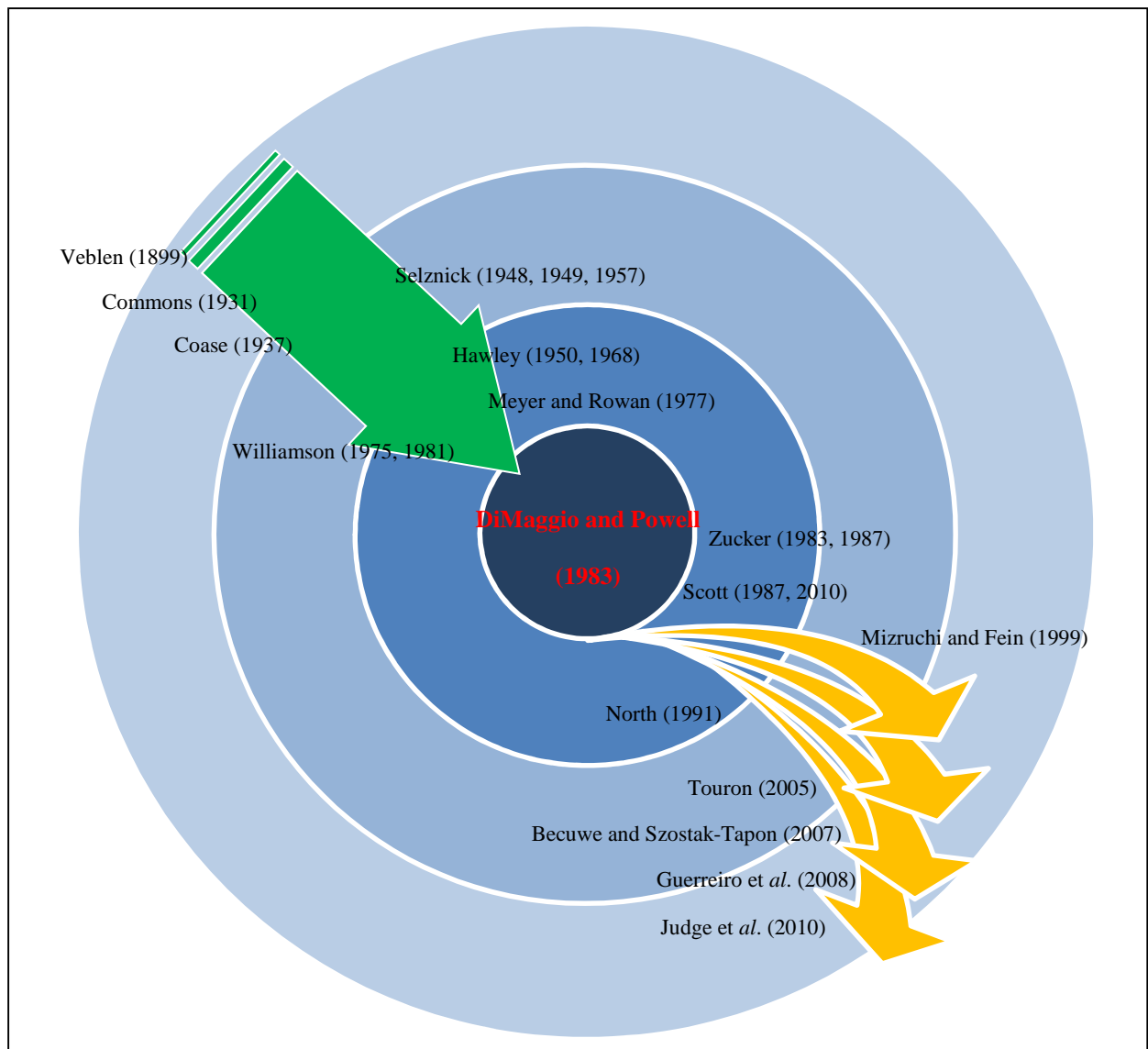
2: NEO-INSTITUTIONALISM THEORY

2.1: Historical perspective and founding principles

As Watts and Zimmerman are viewed as the founding fathers of PAT, DiMaggio and Powell are considered as central to the dissemination of Neo-Institutionalism Theory (or NIT). Similarly to PAT, it is expected that NIT will provide additional or complimentary rationale in predicting accounting choices. However, in contrast to PAT which provides an explanatory framework focused on the actor (though admitting the influence of the firm and its environment), NIT specifically emphasizes on the importance or impact of the institutional environment on the behavior of organizations. Indeed, NIT perceives organizations as interconnected organisms (in reference to Hawley's ideology) and entities that are molded by their environment. In the below sub-sections, foundations, major contributions and limitations of NIT will be discussed.

Unlike our discussion of PAT which was mostly linear as we followed an historical perspective originating in the 1960s with the emergence of neo-classical ideas, our analysis of NIT will be somehow concentric: the work of DiMaggio and Powell (1983) undoubtedly represents the center of our analysis. Our investigation will bring us back as far as to the 1880s (when the new institutional economics movement finds its roots) to modern days (as researchers continue to find abundant empirical applications of NIT in very diverse fields). First, we consider ideologies that have explicitly influenced DiMaggio and Powell (such as Hawley and Meyer & Rowan), then scholars who have implicitly influenced DiMaggio and Powell (especially Selznick), and the scholars who played a central role in disseminating neo-institutional ideas since the 1880s. Second, we will meticulously review the precepts formulated by DiMaggio and Powell. Third, we will discuss the literature that has been influenced by DiMaggio and Powell (including contemporaneous and subsequent literature). The below diagram illustrates the structure of our analysis.

Exhibit XLI: Analysis of the most influential literature treating the neo-institutional current



Source: Moïse LOUISY-LOUIS, June 2014

Literature which has explicitly influenced DiMaggio and Powell

Analogously to Watts and Zimmerman, DiMaggio and Powell acknowledged specifically in their most recognized publication (*The Iron Cage Revisited* [...]), the influence of the ideas of predecessors, notably Hawley (1968) and Meyer and Rowan (1977). In particular, Amos Hawley, an American sociologist, greatly influenced from the 1950s the literature on population studies and human interaction with the environment. Hawley expanded ideas that had been formulated by Roderick McKenzie, Robert Park and E.W. Burgess who were affiliated to the Chicago School of Sociology. Hawley formulated the central tenets of his philosophy in his 1950's book entitled *Human Ecology* which was republished and adapted in several subsequent publications (including Hawley's 1968 article). Essentially, Hawley (1950) advances that individuals, groups, and organizations are

interdependent, struggle and adapt to changes in their environment. For instance, Hawley (1950) argues that “the human group and, in fact, society in its entirety is analogous to an organism: it is an organization of specialized functioning parts each of which is essential to the survival of the whole.” Consequently, members of such an ecosystem are interconnected via complex relationships and “the survival of the whole” requires a symbiotic bond with the environment which Hawley refers to as “symbiosis” that [...] draws “the threads of interrelationship in the living world into a tight and complex fabric.” In his analysis, Hawley furthermore develops the concept of isomorphism. In order to cope with environmental diversity and changes, organizations need to adopt an optimal structure. By moving toward equilibrium, organizations and other members of an ecosystem adapt in response to constraints imposed by the environment.

Nearly a decade later, Meyer and Rowan (1977) are also concerned about the relationships between organizations and their environment. In particular, the scholars formulate the idea that organizations are increasingly more complex and gain legitimacy by incorporating institutional rules that are perceived as “institutionalized myths.” To substantiate their presumptions, the authors first examine the prior literature which explains how and why organizations adopt formal structures and become bureaucratic entities. Meyer and Rowan (1977) builds in particular on the work of Weber⁵¹ (1930, 1946, and 1947) who has been influential in the formulation of organization theories. According to these principles, a formal structure describes the role(s) and position(s) of members of an organization and shows “goals and policies that make up a rational theory of how, and to what end, activities are to be fitted together.” As organizations become larger and rely on complex technology, “organizations with rationalized formal structures tend to develop.” Yet, like scholars who have perceived “a great gap between the formal and informal organization,” Meyer and Rowan (1977) believe that the search for corporate efficiency is not the only factor explaining the development of “rationalized formal structures.” In fact, Meyer and Rowan (1977) argue that constituents of rationalized formal structures “are deeply ingrained” in social reality as “many of positions, policies, programs, and procedures of modern organizations are enforced by public opinion, by the views of important constituents, by knowledge legitimated through the educational system, by social prestige, by the laws, and by the definitions of negligence and prudence used by the courts.” In consequence, Meyer and Rowan (1977) see those elements “as powerful myths” that organizations adopt “ceremonially” without really questioning them. Such corporate behavior has important implications. First, “conformity to institutionalized rules” (also referred to as “ceremonial conformity”) may conflict with the need for efficiency and second organizations seeking to adapt to environmental changes tend to become

⁵¹ Karl Emil Maximilian “Max” Weber (1864 – 1920) was a German sociologist, philosopher and economist whose ideas greatly influenced developments in the field of social theory. Weber sought in particular to better understand individuals and the rationale behind their actions. Weber is in particular renowned for having coined the expression “iron cage” to illustrate the fact that social actors are trapped in systems defined by rationalization, efficiency, calculation and control. Bureaucratization especially epitomizes such imprisonment.

isomorphic (as predicted by Hawley). Furthermore, Meyer and Rowan (1977) explain that “isomorphism with environmental institutions” causes organizations to adopt rules that are “legitimated externally, rather than in terms of efficiency,” to rely on “external or ceremonial assessment criteria,” and to promote stability over time.

Literature which has implicitly influenced DiMaggio and Powell

Overall, these concepts of environmental isomorphism and institutionalized rules as described by Hawley (1950, 1968) and by Meyer and Rowan (1977) combine into an influential ideology. Nevertheless, other strands of the NIT literature indicate that the precepts developed by DiMaggio and Powell also find roots in Selznick (1948, 1949, and 1957). Philip Selznick, a professor of sociology and law at the University of California, Berkeley, is considered as a major advocate of the neo-classical organizational theory current initiated in the 1930s. Selznick is often cited for his precepts formulated in *Foundations of The Theory of Organization* (1948), *TVA and The Grass Roots: A Study in The Sociology of Formal Organization* (1949), and *Leadership in Administration* (1957). Selznick (1948) posits that a formal organization is structured in a rational manner in order to achieve some specific goals. For example the integration of “technical and managerial skills” allows Selznick to see “any concrete organization system as an economy.” However, formal organizations are also characterized by some “non-rational dimensions” that Selznick explains by the fact that i) individuals are not solely employees or members of an organization and ii) an organization is exposed to “the pressure of an institutional environment” which requires the organization to adapt. As a result, Selznick (1948) envisions the organization as both “an economy” and “an adaptive social structure.” Such a duality automatically causes some managerial issues. For instance, managers need to find the right balance between “the legitimacy of authority” and individuals’ aspiration “to participate as wholes,” in other words individuals’ desire to fulfill their expected organizational roles while preserving their identity. Selznick therefore emphasizes on the fact that informal structures (in particular “unwritten rules” which have become institutionalized) require formal organizations to really act as “cooperative systems.”

In addition to this dual concept of economy/adaptive social structure, Selznick (1948) advances that a “structural-functional analysis” permits to show how formal organizations maintain “the integrity and continuity” of their systems. For instance, organizations institutionalize mechanisms that permit to ensure “stability of the lines of authority and communication.” Lastly, Selznick (1948) describes a particular mechanism that he refers to as “cooptation” which “is the process of absorbing new leadership or policy-determining structure of an organization as a means of averting threats to its stability or existence.” The scholar uses several examples of how cooptation would be implanted in practice (e.g. “winning consent” by co-opting into the leadership individuals that enjoy “the confidence of the relevant public or mass”). This final illustration epitomizes Selznick’s main argument: in order to adapt to pressure from the institutional environment, formal organizations need

to take into account both internal and external factors and best reconcile the requirements for being simultaneously an economy and an adaptive social structure.

A year later, in 1949, Selznick published a book in which he furthers his ideas about organizations using the Tennessee Valley Authority (or TVA) as a case study. In response to the Great Depression that erupted in 1929 and to spur economic revival, the US Congress enacted in 1933 the TVA as a formal authority enjoying the powers to design and implement the construction of major electric and navigation projects located in the Appalachian and Cumberland Mountains regions. Using the TVA's difficulties to cope with a demanding external environment, Selznick demonstrates in particular the limitations of organizational life based on the bureaucracy model. Making reference to a 1942 article published in the *Times*, Selznick ironically perceived the TVA as an instrument of "democratic planning," an entity which was more than its stated goal (the construction of major water infrastructure). Indeed, Selznick (1949) views the TVA as "a living organization in a concrete social environment." The author thus recognizes the friction between stated goal and social responsibility. In fact, Selznick builds on the trade-off between the formal and informal or the technical and the non-rational dimensions that he introduced in 1948. Illustrating the TVA's difficulties to reconcile the organization's political, economic, social, and moral goals, Selznick (1949) argues that "all formal organizations are molded by forces tangential to their rationally ordered structures and stated goals [...] As a result, the organization may be significantly viewed as an adaptive structure, facing problems which arise because it exists as an organization in an institutional environment."

Selznick extends findings from the TVA analysis in another book released in 1957 in which the author emphasizes on the role of leaders. In particular, Selznick develops several interesting points about leadership. Firstly, Selznick argues that, despite the significance of technical matters (e.g. achievement of corporate goals and the need of efficiency) leaders should not underestimate the importance of values and symbols. Indeed, Selznick (1957) indicates that one of leaders' primary responsibilities is to formulate and instill values that are meaningful and supersede the mere aspiration for efficiency: "we shall stress that the task of building special values and a distinctive competence into the organization is a prime function of leadership." Secondly, Selznick believes that leaders must personally embody and defend these values or symbols otherwise they dilute, become meaningless and leaders may lose legitimacy. As such, Selznick (1957) advocates for an integrity of words and acts and invites leaders to act for "the defense of institutional integrity – the persistence of an organization's distinctive values, competence and role." Furthermore, Selznick explains that maintaining such an organizational integrity requires the achievement of both technical and social goals.

Thirdly, the author explicates that leaders cannot solely establish a vision but also need to mold a culture of adaptation (especially to a changing institutional environment). Proper recruitment,

training, delegation, or organizational structures are means to do so. Moreover, Selznick emphasizes on another technique used to maintain or defend organizational values. Leaders must infuse “day-to-day behavior with long-run meaning and purpose” and elaborate “socially integrating myths.” As a result, Selznick (1957) anticipates that “emotional identification with the organization creates sources of energy that may increase day-to-day effort and, especially, be summoned in times of crisis or threat.” Yet, Selznick explains that leaders formulate and use narratives, values and symbols (i.e. “socially integrating myths”) that are proper and intimate to the organization in order to create “a unified sense of mission and thereby to the harmony of the whole.” We note here an important contrast between Selznick’s (1948) discussion of “institutionalized rules” (which were influenced by Dickson, 1941 or Moore, 1946), or (1957) “socially integrating myths” and Meyer and Rowan’s (1977) description of “institutionalized myths.” In contrast to Selznick’s view in which myths are internally-conceived, integrative and highly symbolic, Meyer and Rowan (1977) argue that myths are externally-defined, imposed upon, ceremonial and cause fragmentation and decoupling (as organizations attempt to “maintain standardized, legitimating, formal structures”). Consequently, Selznick urges leaders not to merely comply with externally-pressured rationales but to elaborate and instill values that are meaningful and fuel a sense of belonging.

Early precursors who championed neo-institutional ideas

In his subsequent publications, Selznick make references to precepts introduced by Commons which allows Rojot (2005) to argue that Commons is one of the first and most influential theorists in the field of institutional research. His central ideology is based on the belief that formal institutions managed by the government and the state, through the enactment of laws, represent the ideal institutional model. This ideology forms a current sometimes called “old institutionalism” and contrasts with neo-institutionalism which seeks to explain the creation and development of institutions through the lenses of economics, sociology, political science or international relations. Notably, John Commons (1862 – 1945) tried during his lifetime to reconcile his Christian morals with social sciences and economics. In fact, Commons believed that legislation promulgated by the state could foster social change. In his *Institutional Economics* published in 1931, Commons views an institution as “collective action, in control, liberation and expansion of individual action,” and argues that because individuals’ acts can result in gains or losses for others, the state through various bodies (e.g. unions, associations, treaties, etc.) can create and safeguard economic relations that are beneficial to the group. Moreover, as Commons (1931) perceives that “individual actions are really trans-actions instead of either individual behavior or exchange of commodities,” he formulates his idea of institutional economics by bridging concepts including transactions, economics and psychology.

In addition to Commons, the new institutionalism literature is arguably marked by ideas articulated by several scholars since the 1880s. It appears as well that new institutionalism ideas were defined across

multiple fields. Over time, these ideas found application in numerous domains in the manner of a fabric weaved from highly intertwined precepts (i.e. materials). Based on work by Demaria (2008) and Le Manh-Bena (2010), the new institutionalism current has evolved over three subsequent periods.

From 1880 to 1940, new institutionalism ideas emerged sporadically without advocating a central theme. Yet, the main protagonists of this period, Schmoller (1904), Veblen (1899) and Commons (1931) share common ideas. Notably, they challenge traditional models and propose to consider economics as a permanently evolving field. Economics should aim at studying the inter-relationships between actions performed by individuals and by organizations. In *Grundriss der allgemeinen Volkswirtschaftslehre*⁵² Schmoller (1904) critically reviews economics theories and argues that economics should not be considered in isolation in the formulation of theories but should be considered along with other social sciences. In *The Theory of the Leisure Class*, Veblen (1899), like Commons (1931), is sympathetic to the role of a strong state and also suggests that economic behavior finds substance in social realms and that organizations are vowed to continuously evolve. During the same period, advances in sociology were made possible thanks to a review of constitutional, political, and religious systems through various approaches used by Marx⁵³, Durkheim⁵⁴, or Weber.

From 1940 to 1970, proponents of new institutionalism ideas concentrate their efforts on the functioning of institutions and organizations. As discussed previously, Selznick (1948) advocates early about a duality in organizations (between the formal and informal) and recognizes “the pressure of the institutional environment.” Simon (1947) and Cyert and March (1963) are precursors in the analysis of the firm through a behavioral perspective. In particular, Simon develops the concepts of bounded rationality and satisficing which relate to the idea that individuals, when facing a decision and when lacking the skills and resources to achieve an optimal outcome, apply rationality and resolve to a simplified or satisfactory outcome. In *A Behavioral Theory of the Firm*, Cyert and March (1963) explore the parameters that affect decision-making in individuals, groups, or organizations. Since 1970, new institutionalism precepts have evolved in two related currents: the economics perspective (also called new institutional economics) whose main supporters are Coase (1937), Williamson (1975, 1981) or North (1991) and the sociologic perspective mainly championed by Meyer and Rowan (1977), DiMaggio and Powell (1983), Scott (1987, 2010) or Zucker (1983, 1987). It is worthy to note that Scott (2010) refers to the above two categories as “regulative” and “cultural-cognitive” and identifies a third category called “normative.” Because Scott (2010) describes the

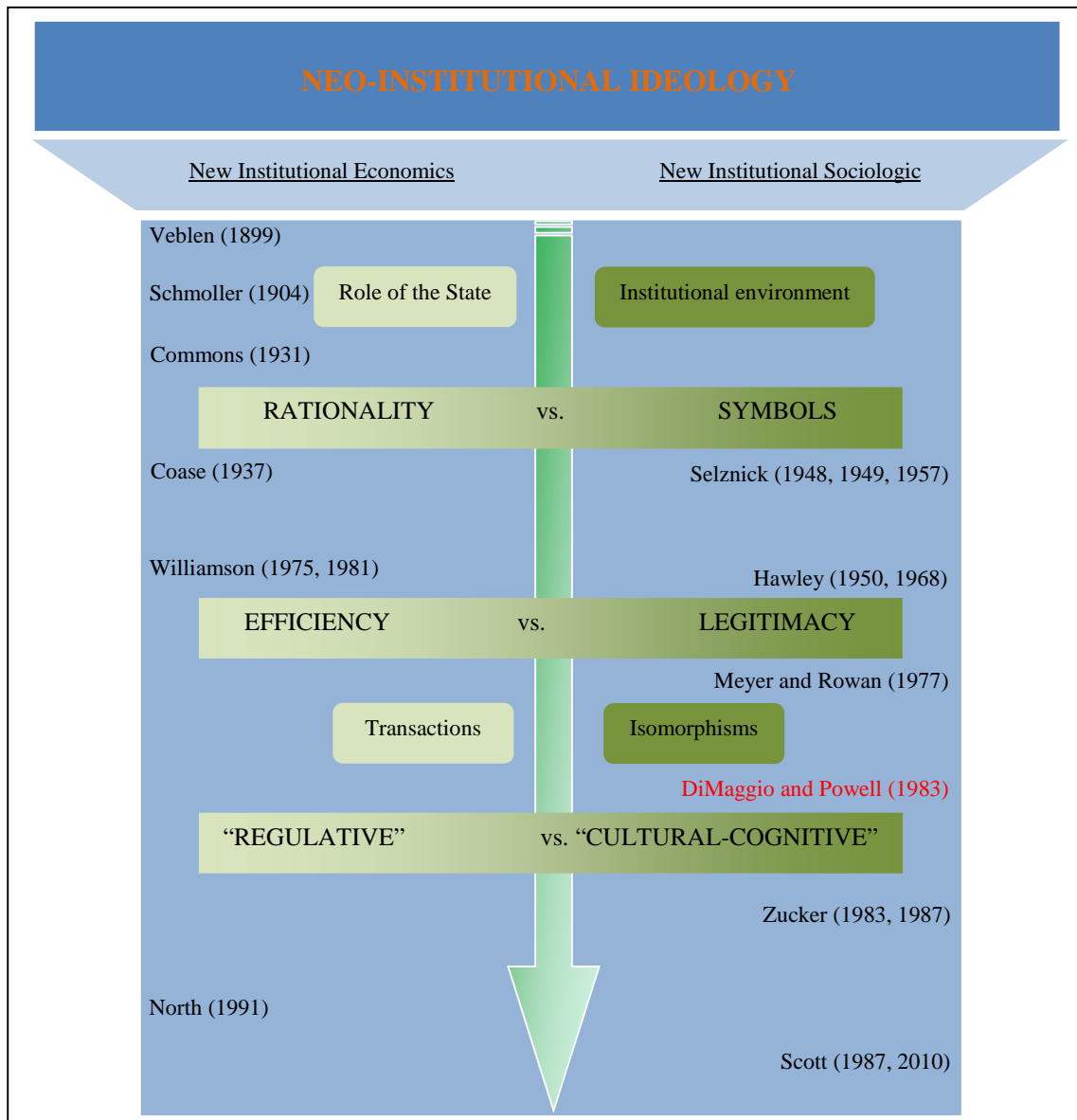
⁵² Translated as *Layout of General Economics*.

⁵³ The ideology of Karl Marx (1818-1883) disseminated through its two most important publications, *The Communist Manifesto* (1848) and *Das Kapital* (1867-1894) profoundly influenced generations of scholars.

⁵⁴ French sociologist, social psychologist and philosopher, David Durkheim (1858-1917) devoted his career to raising sociology to the status of an academic discipline, to elucidate how society could reconcile political, religious, or social dogmas, and to develop scientific knowledge. In *The Divisions of Labour in Society* (1893), Durkheim is concerned about the notion of “collective or common consciousness,” a substance made of norms, beliefs and values that permits society to hold together. In *The Rules of Sociological Method* (1895) Durkheim studies “social facts” and seeks to establish rigorous scientific protocol based on observations and testable hypotheses (indeed he improves the hypothetico-deductive model).

normative actors as “social persons who care deeply about their relations to others and adherence to the guidelines provided by their own identity,” we include the normative category into the larger sociologic perspective. In *The Nature of the Firm*, Coase (1937) distances himself from traditional economic theory as suggested by Adam Smith (who argued that markets are efficient) by arguing that firms face transaction costs. In his analysis Coase (1937) substitutes firms for the “entrepreneur-coordinator” and explains that in the search for profits the entrepreneur faces transaction costs that are inherent to “the factors of production” (e.g. costs of sourcing goods and services, information, contracts, etc.). Furthermore, Coase (1937) posits that firms will grow provided that they can internally assume certain production costs. These ideas are extended by Williamson (1981) who contends that “an understanding of transaction cost economizing is central to the study of organizations.” In line with the new institutional economics current, the author further stresses on the fact that “economic approaches to the study of organization, transaction cost analysis included, generally focus on efficiency.” Using examples based on the production of goods, Williamson (1981) describes the elements that characterize transactions (i.e. uncertainty, frequency, and investment) and focuses on frequency in the form of “asset specificity.” Essentially, Williamson advances that the more specialized, specific (or “idiosyncratic”) are transactions, the more committed are parties to the transactions and important are the potential “cost-bearing consequences.” Lastly, North (1991) elaborates a compelling view of institutions which greatly reminds the duality envisioned by Selznick (1948). Indeed, North (1991) asserts that “institutions are the humanly devised constraints that structure political, economic and social interaction. They consist of both informal constraints (sanctions, taboos, customs, traditions, and codes of conduct), and formal rules (constitutions, laws, property rights).” However, likewise Williamson and Coase, North (1991) is primarily concerned about efficiency, “economic constraints or property rights,” and “the evolution of political and economic institutions that create an economic environment that induces increasing productivity.” In contrast to the new institutional economics’ belief that individuals and decision-makers are rational, the new institutional sociologic perspective advances that organizations are shaped in their quest for legitimacy rather than a need for efficiency, as argued by Meyer and Rowan (1977) and extended by DiMaggio and Powell (1983). Before delving into the precepts envisioned by DiMaggio and Powell, the below chart summarizes and illustrates the main ideas that have influenced the new institutionalism current since the 1880s.

Exhibit XLII: Analysis of the most influential ideas that have shaped the neo-institutional current



Source: Moïse LOUISY-LOUIS, June 2014

It is worthy to point that in this sub-section, our analysis has focused on a classification that we believe is the most pertinent in relation to our study of rates assumptions used in the accounting of defined benefit pension plans. As a result, we disregard other currents such as historical institutionalism which advocates in particular the central role of the state through the concept of path dependency (Pierson and Skocpol, 2002).

DiMaggio and Powell (1983)

Building specifically on the ideas envisioned by Hawley (1950, 1968) and Meyer and Rowan (1977), DiMaggio and Powell notice that organizations are homogeneous in terms of organizational structure and seek to explain such a phenomenon. In their analysis, DiMaggio and Powell first depict

organizational structures that have evolved away from Weber's 1952 vision of the "iron cage" in which bureaucracy was seen as the "efficient and powerful" organizational model. The authors build on contemporaneous literature to advance that "the causes of bureaucratization and rationalization have changed." For instance, in contrast to the literature that "posits a diverse and differentiated world of organizations" (such as Woodward, 1965; Child and Kieser, 1981; or Hannan and Freeman, 1977), DiMaggio and Powell (1983) notice considerable degree of homogenization amongst entities once they pass the initial stages of their life cycle. The authors find in Hawley's (1968) description of isomorphism the best rationale to explain "a constraining process that forces one unit in a population to resemble other units that face the same set of environmental conditions." Although DiMaggio and Powell (1983) borrow from Meyer (1979) and Fennell (1980) the concepts of competitive and institutional isomorphism (representing respectively market competition forces and institutional forces), the authors demonstrate that organizations are structured in conformity with institutional environments and promote the concepts of coercive, mimetic and normative isomorphism. Fundamentally, DiMaggio and Powell find that organizations use formal structures in their quest for legitimacy and define three types of isomorphic behavior:

- "Coercive isomorphism stems from political influence and the problem of legitimacy." In other words, "coercive isomorphism results from both formal and informal pressures exerted on organizations by other organizations upon which they are dependent and by cultural expectations in the society within which organizations function;" (1983, p. 150)
- "Mimetic isomorphism results from standard responses to uncertainty." To illustrate this idea, DiMaggio and Powell draw a parallel with technology companies facing rapid technological obsolescence: "when goals are ambiguous, or when the environment creates symbolic uncertainty, organizations may model themselves on other organizations;" (1983, p. 151) and
- "Normative isomorphism stems primarily from professionalization," [...] which the authors interpret "as the collective struggle of members of an occupation to define the conditions and methods of their work, to control 'the production of producers,' and to establish a cognitive base and legitimation for their occupational autonomy" (1983, p. 152). Lastly, DiMaggio and Powell explain that "formal education" and the "filtering of personnel" are important sources of [normative] isomorphism (1983, p. 152)

In describing each category, the authors provide practical examples of how isomorphism affects organizational life. For instance, legislation, "standard operating procedures and legitimated rules and structures" exemplify explicit forms of coercive isomorphism. Additionally, DiMaggio and Powell (1983) derive from their analysis of isomorphic forces several hypotheses that can help researchers "predict empirically which organizational fields will be most homogeneous in structure, process, and behavior." Overall, the authors postulate higher degree of coercive, mimetic, or normative isomorphism when the institutional environment is characterized respectively by the centralization of

power (e.g. dependency of resources), uncertainty (e.g. ambiguous corporate goals or fast-evolving market conditions), and professionalization (e.g. reliance on academic credentials). Lastly, it appears that DiMaggio and Powell's approach of institutional theory contains distinctive features that set it apart from similar currents.

Literature contemporaneous to DiMaggio and Powell

In fact, in his comprehensive review of the institutional theory literature, Scott (1987) argues that “the concepts of institution and institutionalization have been defined in diverse ways, with substantial variation among approaches.” This led the author to classify institutional theory literature into four categories. Scott (1987) identifies a first current named “institutionalization as a process of instilling value,” in which institutionalization appears “as a means of instilling value, supplying intrinsic worth to a structure or process that, before institutionalization, had only instrumental utility.” This approach has been in particular championed by Selznick (1948, 1949, and 1957). Furthermore, Scott (1987) advances that the second and third categories are enrooted into “a shared social reality which, in turn is a human construction, being created in social interaction.” This strand of the institutional theory literature (referred to as “institutionalization as a process of creating reality”) is greatly indebted to Zucker, Meyer, Rowan, Luckmann and especially Berger who find inspirations in the philosophical ideas introduced by German idealists and phenomenologists as Dielthey, Husserl and Schutz. The work of DiMaggio and Powell falls in the third category called “institutional systems as a class of elements.” Scott (1987) explains that the emphasis on “institutionalized belief systems” sets this strand of the literature apart especially through the work of Meyer and Rowan (1977) who introduced amongst others the notion of “institutionalized myths” and DiMaggio and Powell (1983) who instigated the classification of isomorphic forces. At last, Scott (1987) shows that the approach (used by Meyer and Rowan or DiMaggio and Powell) contrasts with other currents since it does not focus on the process of institutionalization per se. Finally, Scott's (1987) fourth classification called “institutions as distinct societal spheres” is based on the traditional view that define social institutions as “relatively enduring systems of social beliefs and socially organized practices associated with varying functional arenas within societal systems, e.g., religion, work, the family, politics.” This literature has been influenced notably by Hughes (1939), Hertzler (1961), or Friedland and Alford (1987) who develop the concept of “institutional logics” (i.e. “a set of differentiated and specialized cognitive and normative systems”).

To sum up, it can be argued that, by extending prior literature, DiMaggio and Powell have rejuvenated the concept of isomorphism first introduced by Hawley (or even Selznick). DiMaggio and Powell (1983) enjoy great popularity as their taxonomy about isomorphic forces has been used in a plethora of research. As such, the main contribution of DiMaggio and Powell can arguably be their vision about the usefulness of NIT in the context of empirical studies.

Literature which finds empirical foundations in DiMaggio and Powell

Indeed, NIT research is plethoric and encompasses multiple fields as exemplified by Mizruchi and Fein (1999) and Becuwe and Szostak-Tapon (2007). For instance, Mizruchi and Fein (1999), in their attempt to demonstrate that “interpretation and uses of knowledge have a socially constructed character,” review as much as 160 articles treating the work of DiMaggio and Powell in various fields including sociology, management or organizational science.

Specifically, in the field of financial accounting, research focused on the adoption of accounting standards (especially IFRS) is rich and influential such as Al-Basteki (1995), Dumontier and Raffournier (1998), El-Gazzar, Finn, and Jacob (1999) or Murphy (1999). For instance, Guerreiro, Rodrigues and Craig (2008) assess the characteristics of firms listed in Portugal that were best equipped to adopt IFRS. Using ordinal regression, structural equation modeling and multivariate analysis tools, the researchers measure the influence of factors such as size (proxied via a synthetic metric based on number of employees, turnover and fixed assets), commercial internationalization (i.e. a synthetic metric based on the ratio of foreign sales to total sales, number of foreign subsidiary companies, and number of foreign geographic segments), auditor type (a dummy variable taking the value of 1 if the auditor is a Big 4 company, 0 otherwise), rate of profitability (ROE) or leverage (debt ratio) on the propensity of companies to adopt IFRS (a dummy variable). Guerreiro et al. (2008) collected data via a questionnaire survey that was submitted to 56 firms listed on the Euronext Lisbon Stock Exchange on 31 August 2003. From the answers provided, the researchers classified the 31 respondents into six groups based on the degree of their preparedness to adopt IFRS. Overall, the researchers find that size, commercial internationalization and auditor type influence the preparedness to adopt IFRS. Profitability and indebtedness were not influential. As a result, despite empirical limitations, Guerreiro et al. (2008) show that mimetic and normative forces are influential in the Portuguese context.

Similarly, Irvine (2008) examines the adoption of IFRS by United Arab Emirates (UAE) firms. The author argues that, in response to globalized institutional pressures, the adoption of IFRS became “a vital factor in the UAE’s ambitions to attract global capital.” Irvine (2008) further explains that “powerful institutional forces operate at an international level on individual nation states.” As a result, Irvine perceives the pressures to meet standards imposed by the World Bank and capital markets as formal coercive isomorphic forces. The dissemination of IFRS requiring the participation of trained professionals and the World Bank’s funding conditional to accounts “certified by internationally reputable firms of accountants” epitomize the impact of normative pressures. Lastly, forms of mimetic pressure are represented by the rise of trade partners and multinational corporations which are oil or non-oil related businesses and enjoy influential status (e.g. UAE firms seek to conform to “the practices both of multinational corporations and of nations’ trading partners”).

Likewise Irvine (2008) who acknowledges that “isomorphism occurs at the country level of analysis as well as at the level of the organizational field or the industry” (in reference to Guler et al. 2002),

Judge, Li and Pinsker (2010) examine the pace at which “national adoption of international accounting standards” took place across 132 countries. Using subsequently OLS regression, multinomial regression and logistic regression, the researchers study the “extent of adoption of IFRS” (i.e. the dependent variable is coded according to a scale that goes from 1 to 4 reflecting that IFRS goes from being forbidden to widely adopted) vs. coercive pressures (proxied via the level of foreign aids calculated as the ratio of foreign aid to GDP), mimetic forces (measured as import penetration corresponding to the “value of imported goods and services sold as a proportion of the GDP”), and normative factors (based on education level calculated as the ratio of enrollment in secondary school to the total population in the age group for secondary education). Additionally, the scholars controlled for capital markets size and economic growth using respectively variables for market capitalization and GDP growth. Data was provided by the 2008 Deloitte database and the World Bank’s World Development Indicators report. Overall, the experiments of Judge *et al.* (2010) yielded remarkable results since they find “empirical support for the three institutional isomorphic pressures” with normative forces being “the strongest predictor of IFRS adoption.” Specifically, mimetic and normative pressures displayed strong and positive effects on IFRS adoption while coercive factors were statistically significant in various instances.

In contrast to research discussed above, Touron (2005) examines the motives behind the “adoption of US GAAP by French firms” before the advent of IFRS in the 1970s. The author meticulously reviews the status of Saint-Gobain, Pechiney and Rhône-Poulenc, three prominent multinational companies, as case studies. Building on the precepts formulated by Meyer and Rowan (1977) and DiMaggio and Powell (1983), Touron (2005) advocates that institutional factors have influenced French firms’ decision to adopt US GAAP in the 1970s. As such, the researcher identifies the state (which can enact laws and impose penalties) and capital’s suppliers as stakeholders enjoying coercive powers. Through its agencies, the state influences nearly all aspects of social and economic lives (Fliegstein, 1990). The presence of institutional shareholders and the concentration of ownership are often used in empirical studies to proxy the coercive influence exerted by investors on companies in need of financial resources. Next, Touron (2005) argues that normative isomorphism requires the transmission of norms by professionals, a process which is greatly facilitated by auditors. Their role is to instill trust in the financial documents released by public firms. However, because auditors are appointed and remunerated by reporting entities an evident conflict of interest exists. Moreover, stock exchanges typically impose publication rules on their members, a practice which, in fact, is not a form of coercion because members, in search of recognition, “voluntarily seek the approval of the authorizing agent.” This process is called authorization and has been evidenced by Mezas (1995) or Scott (1995). Lastly, Touron (2005) links mimetic isomorphism with affiliation to an industry in line with prior literature. Touron (2005) builds his case studies by relying on information extracted from annual reports, press articles and archival documents. In conclusion, Touron (2005) finds support for normative pressures (especially via “Anglo-Saxon firms of auditors”) as well as mimetic pressures

(notably the need to reach “an international dimension” or “restore legitimacy in the US”) and argues that “the use of internationally accepted standards is not an innovation, simply an imitation.”

As a general conclusion to this sub-section, we have discussed the historical roots, foundations, and main currents that have influenced the NIT literature since the 1880s. We have also highlighted the abundance of empirical applications (especially accounting research) in which the NIT framework is justified. However, the theory has fueled numerous criticisms that we discuss in the next sub-section.

2.2: Criticisms of NIT

Similarly to PAT, NIT has fueled over the years numerous critiques. Although NIT is by and large criticized for the variety of its definitions, concepts, and approaches (as noted by Scott, 1987, 2010), criticisms also emphasize on conceptual, methodological and empirical issues. In the next paragraphs, we overview the main arguments used by critics.

Inevitably, Scott (1987, 2010) divulges the abundance of definitions formulated by scholars in regards to what NIT is. The diversity of definitions relating to the notions of institution and institutionalization epitomizes the dilemma. Scott (1987), though a fervent advocate of NIT, indicates that “the concepts of institution and institutionalization have been defined in diverse ways, with substantial variation among approaches.” Diversity by itself is not necessarily something wrong. However, the issue is more acute and arguably counterproductive when variations explored by scholars lack of coherence and are conceptually weak. Scott (1987) further recognizes that “some versions are much more carefully defined and explicit about their definitions and referents, while others are less clear in conceptualization. Although there seems to be an underlying similarity in the various approaches, there is little agreement on specifics.” More than two decades later, Scott (2010) reviews advances in “research on institutions and institutional change.” Although the institutional field has gained unparalleled recognition and still enjoys significant potential, Scott (2010) refers to more than a dozen of researchers who in recent years have advocated “a somewhat different view” of what institutions are. Scott does not perceive this diversity as a weakness but rather as a richness illustrating the fields and domains in which institutional studies find applicability. In contrast, critics view this plurality as a failure.

In a similar fashion, Lowndes regrets the multiplicity in semantics that characterizes NIT. As such, Lowndes (1996) explains that NIT is criticized in general for its “atomistic accounts of social process” since NIT attempts to break complex and interrelated social constructs into smaller parts. Worst, Lowndes claims that NIT is “not a single or coherent body of theory” due to “confusion over terminology and levels of analysis” (1996). In consequence, Lowndes proposes to capture such a variety of notions into “six vignettes: the mythic institution, the efficient institution, the stable institution, the manipulated institution, the disaggregated institution, and the appropriate institution.” Lowndes performs such an analysis by explaining or contrasting notions such as formal vs. informal, change vs. stability, or “rational action” vs. “norm-governed behavior.” Nevertheless, despite “a great variety of positions,” Lowndes (1996) recognizes that “the comparative critical assessment of different theories offers the most profitable way forward for the new institutionalism.” Likewise, Reich (2000) tempers the appraisals made around new institutionalism and its ability to help “develop generalizable social scientific theories of behavior.” In contrast to this general belief, Reich contends that new institutionalism ideas should be used to explain “specific kinds of problems.”

As a result, Reich formulates “four forms of new institutionalism” that are “best suited to the study of particular forms of public policy.” In doing so, Reich concedes that these four alternative categories do not overlap and do not provide the substance for a unifying general theory. Reich (2000) consequently breaks new institutionalism down into historical institutionalism (based on the view that the sequence of events impact the development of institutions as societal forces, institutional structure and processes are intertwined), new economic institutionalism (as described in a previous section, “this variant of institutionalism posits that actors are driven by rational cost/benefit assumptions”), cognitive conceptions of institutions (is associated with “the work of sociologists” who acknowledge “the role of symbols, myths, and rituals”), and institutions as actors (in which the “State” occupies the center stage of the institutional environment). Additionally, building on the work of Lowi (1964), Reich finds links between new institutionalism and the public policy literature. In the context of globalization, Reich (2000) proposes four policy domains as “redistribution, regulation, democratization/modernization, and liberalization.” To sum up, through this analysis, Reich (2000) arguably seeks to demonstrate that new institutionalism is too ambitious in its attempt to encompass the entire organizational field.

In addition to criticisms about the rich semantics that characterizes NIT’s main principles, opponents have uncovered conceptual issues. For example, NIT is criticized for being unclear on how institutions emerge and the institutionalization process is even seen as a black box (Colasse and Pochet, 2008). Moreover, NIT appears to poorly account for the notion of institutional change as illustrated by Hira and Hira (2000). In fact the authors argue that new institutionalism “contains ambiguous and contradictory notions of change” when specifically considering its economics perspective. Although acknowledging the advances made, in particular in the field of social sciences with the so-called “behavioral revolution,” the authors contend that “the new institutionalist perspective in economics only partially solves some of the problems of the rational choice perspective.” Stemming from scholars’ desire to distance themselves from the “utility-based neo-classical model,” proponents of new institutional economics (Coase, Williamson, and North amongst others) have introduced transaction costs in order to relax the zero-transactions costs environment envisioned by the neo-classical model. Building on prior literature, Hira and Hira (2000) recognize that “the new institutionalism gives economic (rational) reasons for the existence and role of institutions in society,” the central role that plays the state in providing and enforcing economic rules, and the impact of informal constraints (as those induced by culture). Nevertheless, the authors believe that the new institutionalism model cannot satisfactorily explain institutional change. In fact, mostly referring to the work of North, Hira and Hira (2000) point out several issues. While the authors recognize that “incentives to innovate [...] are critical to economic growth,” in line with North’s “example of property rights” which permits to incentivize innovation, Hira and Hira (2000) contend that institutionalists do not explain why some societies do not imitate more successful institutions.

Explanations based on the concept of path dependency also fall short of expectations. Additionally, the authors claim that “North’s gradualistic approach” fails to account for “sudden changes in economic welfare or in institutions.” Lastly, the authors argue that new institutionalism does not adequately “tackle the problem of technological change.” Although acknowledging a complex and interdependent relationship between technical and institutional change, the model does not account for “individual breakthroughs or inventions” that often materialize thanks to “luck and chance.” Consequently, Hira and Hira (2000) invite institutionalists to adjust their views: “future models should explicitly define and delineate the true ultimate sources of institutional change, namely changes in culture, ideas, and social practice.”

The conceptual issue is also a concern for Carruthers. In the context of accounting research, Carruthers (1995) is concerned about the tension that opposes on the one side rationality and efficiency (also viewed as the “technical”) and on the other side institutional factors (in fact “institutionalized myths”). Carruthers indeed explains that advances in new institutionalism ideas have been relevant and helpful in the development of accounting research. Carruthers (1995) finds such a trend beneficial since “new institutionalists view accounting practices as one of a larger set of features that can legitimize organizations through construction of an appearance of rationality and efficiency.” Nonetheless, referring to Meyer and Rowan’s (1977) concept of “decoupling,” Carruthers worries about “the problematic relationship between technical and institutional factors” and how scholars account for it in their research. As such, Carruthers (1995) fears that NIT is used to create an unrealistic perception of firms’ accounting practices and states that “new institutionalists wish to keep the technical and the institutional as analytically separable dimensions, but the real world keeps confusing the two.” The author further explains that “decoupling plays an important role in this process, for it allows an organization to maintain its institutionally prescribed appearances (via formal structure) without having to compromise actual operations.” Furthering this rationale, Carruthers illustrates his point by arguing that published accounts could reflect appearances rather than rationalized decision-making. Overall, despite emphasizing on the fact that “decoupling can endanger organizational appearances,” Carruthers (1995) believes that the accountancy literature and NIT literature had some “affinity” (in relation to “the core issues of power, legitimacy, and rationality”) and therefore both currents had potential for future developments.

Lastly, NIT has been exposed to criticisms relating to methodological and empirical matters. For instance, DiMaggio and Powell (1983) concede that in practice it may be quite challenging to distinguish between the three forms of isomorphism. Likewise, through their review of some 160 studies building on the work of DiMaggio and Powell, Mizuchi and Fein (1999) interestingly reveal that mimetic isomorphism has received disproportionate attention from researchers because it represents a dominant aspect in organizational theory.

Overall, it appears that the main weaknesses of neo-institutionalism theories relate to its rich semantics and particular conceptual, methodological and empirical issues. However, critics including Scott (1987, 2010), Carruthers (1995) or Lowndes (1996) acknowledge the potential that institutional studies have to offer in multiple fields. Criticisms about concepts and methods can be accommodated relatively easily by simply acknowledging these issues as limitations in an experiment (as we do in a later section of our study). In the next sub-section, we briefly review a handful of studies in which researchers have finely combined PAT and NIT precepts to justify their protocol.

2.3: Research opportunity(ies)

In this final sub-section devoted to NIT, we first summarize our discussion about NIT by emphasizing on why we believe the institutional approach is pertinent in the context of pension accounting.

Second, we briefly review the rare studies in which the authors remarkably associate PAT and NIT in order to establish a conceptual framework for their analyses. From this review we aim at proving that a combination of PAT and NIT is an appropriate strategy to implement in the context of our study.

In our examination of neo-institutionalism ideas, we have adopted a concentric approach in which the work of DiMaggio and Powell (1983) lays at the center since their isomorphic model of the institutional environment has profoundly influenced the institutional literature. Next, we considered ideologies that have explicitly influenced DiMaggio and Powell (such as Hawley and Meyer & Rowan), then scholars who have implicitly influenced DiMaggio and Powell (especially Selznick), and the scholars who played a central role in disseminating neo-institutional ideas since the 1880s. We noticed that several currents have been influential, especially the new institutional economics (with Coase, Williamson or North) and the sociologic perspective (with Meyer and Rowan, Scott, or Zucker). In particular, we did not attempt to favor a specific current because we believe that both economic and sociologic perspectives share common features and we believe that the study of rates assumptions in the context of defined benefit pension plans overlaps several fields and has repercussions in politics, economics and social matters.

In regards with our present study, we sought to demonstrate the reliability and usefulness of NIT in explaining the choice of accounting assumptions as previously done by Touron (2005), Guerreiro *et al.* (2008), Irvine (2009) or Judge *et al.* (2010) amongst others. According to NIT, organizations adopt formal structures to gain legitimacy rather than improve efficiency. The adoption of accounting practices represents a type of formal structure and can be envisioned as a symbol of legitimacy (Carruthers, 1995). Furthering both Carruthers' ideas and Meyer and Rowan's (1977) concept of "institutionalized myths," we argue that accounting practices embody a form of rationality imposed by actors outside the organization and such practices represent for the organization a legitimization instrument toward the environment. Consequently, organizations behave (or adopt accounting practices) in response to "unwritten" rules, norms or values "because they are socially legitimized, independently of considerations regarding efficiencies" (Touron, 2005). Organizational conformity with these values permits to provide much more than technical benefits (Irvine, 2008) but also gives access to resources (DiMaggio and Powell, 1983) and ensures survival in a complex and even competitive environment.

Three forms of isomorphic pressure are identified to explain this homogeneity in organizational forms. Coercive institutional pressures embody rules promulgated in regulatory systems to encourage a certain desired set of behaviors. Two institutional actors typically enjoy coercive influence. The

state and capital suppliers. Because it acts for the common good, the state, through its agencies, formulates laws and rules as a means of fostering the institutionalization of certain practices (Touron, 2005). Failure to abide to laws and rules exposes wrongdoers to penalties. In the context of pension accounting, state and EU regulatory agencies enjoy such coercive power over firms listed across Europe. Capital providers, both shareholders and debtholders, supply the necessary capital that firms need to start, grow and survive. Empirical studies have traditionally focused on the influence exerted by individual and institutional shareholders over management. In our case, we can examine the structure of the shareholder base of listed companies.

Professionalization, affiliation to professional or trade association and training represent forms of normative pressure. Managers who have followed similar training and adhere to the same networks are likely to adopt or transmit similar norms or practices. Auditors and stock exchanges help vehicle professional norms because auditors ensure a certain degree of confidence in financial statements produced by public firms and stock exchanges (embodied by markets supervisory authorities or so-called watchdogs) impose rules on their members.

Lastly, in situations of uncertainty, organizations tend to emulate entities that are perceived similar, larger or more successful. Mimetic isomorphism occurs when firms model themselves on entities sharing similar activity (thus affiliated to the same sector) and/or entities considered as the most successful (such as industry leaders).

Together, these three forms of isomorphism tend to weave into a complex social fabric which makes the task of the researcher more challenging (as acknowledged by DiMaggio and Powell, 1983 or Mizruchi and Fein, 1999). Nevertheless, despite certain limitations (previously discussed and that need to be accounted for in our model), we believe that NIT remains a pertinent framework to employ in our ambition to better understand the determinants of the rates used in the context of pension accounting.

We would like to extend the preceding statement by arguing that, together, PAT and NIT form a relevant framework to explain accounting choices. We next briefly review the rare studies in which such a combination was implemented. First, in the late 1980s, Mezias notices that, despite the dearth of research focused on organizations and invoking NIT, no research attempted to explain the adoption of reporting practices of for-profit firms through the lens of institutional models. Also seeking to challenge the hegemony of the “applied economics literature” (i.e. utility-based models), Mezias (1990) examines the financial reporting practices of Fortune 200 companies (i.e. US largest firms listed in 1969). Mezias focuses on the accounting for the investment tax credit (ITC) allowing firms that make qualified capital investments to enjoy a tax credit which can be either amortized or expensed. Relying on “applied economic models,” Mezias (1990) posits that firms would attempt to maximize reported net income while predicting that institutional pressures would require firms to comply with a certain set of accounting practices. The researcher then retrieves data from Compustat

and annual reports for the years 1962 to 1977 for 150 firms after eliminations. Mezas implements a logistic regression approach in which the dependent variable, the decision to amortize or expense the investment credit, is a dummy variable coded 0 or 1. The author identifies independent variables split into applied economics and institutional theory. In the first category, Mezas includes income statement and balance sheet metrics (to account for profitability and size), concentration of ownership, debt restrictions, and incentive-compensation schemes. In the second category are included variables representing supervisory authorities, years in which specific rules applied, auditors, variation in capital expenditures, and turnover in top management. Mezas first ran the model with the economics variable and second with the institutional variables as a means to assessing the incremental explanatory power of the institutional approach. Overall, Mezas (1990) finds that i) impact of net income and size were important variables influencing the decision to adopt or not the ITC and ii) most of the variance in the model was explained by institutional variables such as years of conformity of rules and supervisory authorities. The predominance of the institutional approach in explaining the accounting choice reminds Mezas (1990) that “organizations are embedded in social networks” and “organizational outcomes are affected by the actions at the level of the institutional environment, not by firm-level characteristics alone.”

As mentioned previously in the PAT section, Neu (1992) recognizes the limitations of positive studies when arguing that “managers are assumed to trade-off the expected impact of compensation, debt and political influences when selecting an accounting method. Since the selection of a particular accounting method often has opposing effects on compensation variables versus debt/political variables [...] managers are assumed to choose the accounting practice that best balances these conflicting influences.” As a result, Neu proposes to go beyond positive studies’ tendency to describe managers as “rational, atomistic individuals” and to consider “the embeddedness of managers in individual, institutional and societal webs of relations.” Neu therefore establishes a link between positive and neo-institutionalism perspectives by evaluating the disclosure of earnings forecasts in the Canadian context. From material published by the Toronto Stock Exchange, the author identified 261 firms that applied for listing. 112 firms matched study requirements as they disclosed earnings forecasts. Neu then labeled economic variables (including equity capital and options held by senior management, new shares issued to management, and size measured as the natural logarithm of total assets) and social variables (such as accountant seating on the Board, industry groups and “spread of forecasting over time”). Using a logistic regression methodology, Neu assesses whether or not firms applying for listing would disclose earnings forecasts. Although economic variables partially influence the decision to disclose earnings forecasts, Neu (1992) reveals that “the inclusion of measures of social influences results in a better (in a statistical sense) explanation of the decision to forecast than is provided by positive measures alone.”

Following Neu (1992), Neu and Simmons (1996) highlight certain limitations of positive accounting theory in explaining managerial behavior, reconsider the social relations in which managers

participate, and propose to analyze the accounting for site restoration costs implemented by Canadian firms through both PAT and NIT perspectives. Indeed, Neu and Simmons (1996) “think that the combination of these two types of evidence provides a ‘better’ approach to the study of managerial behaviour.” Using publicly available information, the researchers identified 125 oil and gas companies listed either on the Toronto Stock Exchange or Alberta Stock Exchange. The sample was reduced to the 95 firms that provided financial data and participated in interviews. Under the Canadian Institute of Chartered Accountants (or CICA) recommendation, firms that opt to defer site restoration costs could choose to apply the method retrospectively or prospectively. The researchers thus predict that such a decision was influenced by the nature of the internal, institutional and state relations in which they were involved. Independent variables include the existence of a bonus plan, percentage change in net income between 1991 and 1990, the influence of “external suppliers of capital” and of “professional advisors,” and a proxy for political visibility (calculated as membership in the top 20 firms in terms of net income or media coverage). Results of a logistic regression confirmed expectations enrooted in NIT.

Also interested in demonstrating the usefulness of economics and institutional models in explaining accounting choices, Touron (2004) examines through a case study the factors that led French company Saint-Gobain-Pont-à-Mousson (or SGPM) to adopt US GAAP in 1970. Recognizing that the agency theory (especially the signaling theory) would not suffice to explain SGPM’s decision to adopt US GAAP, Touron formulates a set of hypotheses based on the agency theory and the institutional perspective. In light of the agency theory, Touron posits that ownership (institutional and geographical breakdown) and cost of debt (measured in terms of indebtedness) are influential. In light with NIT, Touron predicts that coercive forces (state and stock exchange rules), normative pressures (financial reporting rules are prescribed by several governmental agencies in the US and the influence of international auditors), and mimetic influences (exerted by the sector and the US multinational firm) also impact the decision. The researcher then retrieves data from annual reports released between 1969 and 1978. Touron (2004) concludes that SGPM’s rationale to adopt US GAAP finds explanation in both economics and institutional models.

The final study that we consider examines accounting choices undertaken by Swedish municipal corporations that have the particularity of being both private and public entities. In particular, Collin, S.O., Tagesson, T., Andersson, A., Cato, J. and Hansson, K. (2009) studies the propensity of municipal corporations to adopt either SASB standards (based on local rules) or SFASC standards (in line with IFRS rules). Instead of opposing PAT and NIT, the researchers attempt to find complementary explanatory power in both models. They formulate several hypotheses and predict that the choice of accounting standards (the dependent variable being a dummy variable) would be influenced by overall tendency (observed behavior of municipal corporations), industry, size, ownership, auditor, and whether municipal corporations are located in big cities. The researchers identified 1,283 municipal corporations and retrieved data from the 2001 annual financial reports

through the database called Affärsdata. After eliminations, the analysis was performed for 545 corporations. Overall, Collin *et al.* (2009) notice that municipal corporations in Sweden generally adopt the SASB standards. Interestingly, the researchers “through an empirical test of the two theories, [...] can refute claims of theoretical supremacy since both theories offer explanations that cannot be falsified,” a result that extends and corroborates the work of Mezas (1990) and Neu and Simmons (1996). Lastly, building on solid empirical results and on several “points of contact between the theories,” Collin *et al.* (2009) argue for the “development towards EAT [or Eclectic Accounting Theory], an eclectic theory that mixes economic and institutional categories.”

We close this section devoted to NIT with a table showing the literature which has been the most pertinent in our review. In the following section we consider alternative theories that are occasionally used in the context of the study of accounting choices.

Exhibit XLIII: Prior literature treating Neo Institutionalism Theory

Authors	Central Theme	Sample	Data / Study Period	Variables	Main Results
<p>Selznick (1948) in <i>American Sociological Review</i></p>	<p>The author formulates his conception of organizations. Notably, he posits that a formal organization is structured in a rational manner in order to achieve some specific goals. He also perceives organizations as embodying the trade-off between formal structure and “non-rational dimensions”</p>	<p>N/A</p>	<p>N/A</p>	<p>N/A</p>	<ul style="list-style-type: none"> • The author envisions the organization as both “an economy” and “an adaptive social structure” • The author advances that a “structural-functional analysis” permits to show how formal organizations maintain “the integrity and continuity” of their systems • The author describes a particular mechanism that he refers to as “cooptation” which “is the process of absorbing new leadership or policy-determining structure of an organization as a means of averting threats to its stability or existence”

<p>Hawley (1950, 1968) in <i>Human Ecology</i></p>	<p>The author studies population and human interaction with the environment</p>	<p>N/A</p>	<p>N/A</p>	<p>N/A</p>	<ul style="list-style-type: none"> • The author argues in particular that collective life is an adaptive process consisting of an interaction between environment, population, and organization • The author believes that society in its entirety is analogous to an organism whose members are interconnected via complex relationships • The author introduces the concept of isomorphism explaining that in order to cope with environmental diversity and changes, organizations need to adopt an optimal structure
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<p>Selznick (1957) in <i>Leadership in Administration</i></p>	<p>The author extends findings from his 1948 and 1949 publications treating his model of organizational life by emphasizing on the role of leaders</p>	<p>N/A</p>	<p>N/A</p>	<p>N/A</p>	<ul style="list-style-type: none"> • The author argues that, despite the significance of technical matters (e.g. achievement of corporate goals and the need of efficiency) leaders should not underestimate the importance of values and symbols • The author advocates for an integrity of words and acts and invites leaders to act for “the defense of institutional integrity – the persistence of an organization’s distinctive values, competence and role” • The author believes that leaders must infuse “day-to-day behavior with long-run meaning and purpose” and elaborate “socially integrating myths.”
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<p>Meyer and Rowan (1977) in <i>The American Journal of Sociology</i></p>	<p>Meyer and Rowan formulate their own organizational model while introducing the notion of “institutionalized rules.” Indeed, organizations are increasingly more complex and gain legitimacy by incorporating institutional rules</p>	<p>N/A</p>	<p>N/A</p>	<p>N/A</p>	<ul style="list-style-type: none"> • The authors build on several strands of the literature, in particular Weber and advance that as organizations become larger and rely on complex technology, “organizations with rationalized formal structures tend to develop” • Meyer and Rowan contend that “conformity to institutionalized rules” (also referred to as “ceremonial conformity”) may conflict with the need for efficiency and second organizations seeking to adapt to environmental changes tend to become isomorphic • The authors explain that “isomorphism with environmental institutions” causes organizations to adopt rules that are “legitimated externally, rather than in terms of efficiency,” to rely on “external or ceremonial assessment criteria,” and to promote stability over time
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<p>DiMaggio and Powell (1983) in <i>American Sociological Review</i></p>	<p>In their analysis, DiMaggio and Powell first depict organizational structures that have evolved away from Weber’s 1952 vision of the “iron cage” in which bureaucracy was seen as the “efficient and powerful” organizational model. Noticing that organizations are homogeneous in terms of organizational structure, the authors demonstrate that organizations are structured in conformity with institutional environments and promote the concepts of coercive, mimetic and normative isomorphism</p>	<p>N/A</p>	<p>N/A</p>	<p>N/A</p>	<ul style="list-style-type: none"> • DiMaggio and Powell find that organizations use formal structures in their quest for legitimacy and define three types of isomorphic behavior: • “Coercive isomorphism stems from political influence and the problem of legitimacy” • “Mimetic isomorphism results from standard responses to uncertainty” • “Normative isomorphism stems primarily from professionalization,” but also from “formal education” and the “filtering of personnel”
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Source: Moïse LOUISY-LOUIS, June 2014

3: OTHER THEORETICAL CONSIDERATIONS

3.1: Agency Theory

Agency Theory (or AT) is traditionally used as an explanatory conceptual framework in the context of studies treating the dissemination of financial information and corporate governance mechanisms. However, AT finds empirical support in a wide range of other settings including economics (Spence and Zeckhauser, 1971), finance (Fama, 1980), marketing (Basu et al., 1985), or organizational behavior (Eisenhardt, 1985). The literature is plethora because AT provides a conceptual framework for explaining managers' decisions.

Although Agency Theory is rarely used in the context of pension accounting research, over the next paragraphs we will discuss its founding principles, main empirical contributions and limitations. In particular, we will i) show that AT finds its roots in various economics and organizational theories, ii) demonstrate the influence of the work of Jensen and Meckling (1976), iii) present empirical contributions, and iv) consider limitations and reasons why we have not retained the theory in our conceptual framework.

Origins of Agency Theory

According to Droege and Spiller (2009), Agency Theory “has expanded contingency theory, various economic theories (e.g. Ross, 1973) including transaction cost analysis (e.g. Williamson, 1975) as well as organizational control theories (e.g. Ouchi, 1979).” In fact, the literature indicates that the premises of Agency Theory are much older than the 1960s or 1970s period that Droege and Spiller (2009) refer to. Indeed, in the classical and neo-classical periods that precede the emergence of new institutional economics ideals, scholars had expressed little interest in the firm as an organization. Nonetheless, Adam Smith with his 1776's [*An Inquiry into the Nature and Causes of*] *the Wealth of Nations* is a remarkable exception. In particular, Smith is interested in the functioning of the firm through the deeds of individuals and the impacts of markets (commonly described through the image of “the invisible hand”). At the time the firm was viewed as a “black box” whose main prerogative is the maximization of profits (Jensen and Meckling, 1976). The status of the firm evolves rapidly since Adam Smith, is rejuvenated during the neo-classical era before being radically challenged by Coase (1937).

By rejecting Smith's belief that markets are efficient and by acknowledging the importance of market induced costs, such as search and information costs, negotiation costs, or bargaining costs, Coase (1937) argues that a firm would grow provided it can optimally manage transaction costs. These ideas reveal to be a breakthrough and are highly influential in the advent of the new institutional economics current. Coase's precepts will in particular influence Williamson, who is considered as the main

proponent of the transaction cost analysis literature (which has been discussed in a previous section) and other scholars including Jensen and Meckling who have formulated the Agency Theory⁵⁵.

Founding principles of Agency Theory

Building on Coase's (1937) definition of the firm and transaction costs, Jensen and Meckling (1976) identify agency costs as "monitoring and bonding costs" that arise in the context of an agency relationship (i.e. a contract in which the principal(s) delegate another party, the agent, to perform certain tasks). Agency costs arise essentially because of the conflict of interests between principal and agent and the existence of information asymmetry. If contractual parties seek to maximize their own utility, "there is good reason to believe that the agent will not always act in the best interests of the principal" (Jensen and Meckling, 1976). Information asymmetry occurs when principal and agent do not enjoy the same ease in accessing information. Typically, the agent has access to information which is limited in the case of the principal. As a result, the principal must incur "monitoring and bonding costs" in order to "limit divergences." In practice, the principal would limit the effects of this agency problem by instituting adequate contractual incentives, whether pecuniary or non-pecuniary. At the corporation level (which Jensen and Meckling perceives in fact as a "legal fiction"), the agency problem arises in numerous settings, between shareholders and managers, debtholders and managers, or managers and employees. The firm is then considered as "a nexus for a set of contracting relationships among individuals" (Jensen and Meckling, 1976). The scholars further emphasize on the existence of complex processes linking individuals who may pursue conflicting objectives: "the behavior of the firm is like the behavior of a market, that is, the outcome of a complex equilibrium process." Amongst these relationships, Jensen and Meckling (1976) focus notably on the relationship between shareholders and managers and find that the manager implements decisions aimed at maximizing his/her own utility. Others, such as Modigliani and Miller (1963) examine the agency costs borne by debtholders. Overall, the literature reveals that agency costs negatively impact the value of the firm. As a result, the central prerogative of Agency Theory is to identify the optimal set of contractual relationships between parties in order to mitigate agency costs.

Positive and normative currents

Eisenhardt (1989) argues that AT has developed in two lines. On the one hand, Positivist Agency Theory seeks i) to determine circumstances in which the principal and agent are likely to pursue diverging objectives and ii) describe governance mechanisms suitable to mitigate the agent's self-

⁵⁵ It is worthwhile to point that another strand of the literature considers that Agency Theory finds roots in Property Rights Theory. In fact, Jensen and Meckling (1976) acknowledge the ideas developed notably by Alchian and Demsetz (1972), themselves greatly inspired by Coase (1937). The scholars posit that exchanges between economic agents are governed by an exchange of the property rights of objects. Property rights provide individuals with incentives to create, manage and value corporate assets. As such, the firm's structure is viewed as "the contractual structure [that] arises as a means of enhancing efficient organization of team production" (Alchian and Demsetz, 1972).

serving behavior (Eisenhardt, 1989). As a result, positivist researchers have predominantly examined the case of the principal-agent relationship between shareholders and managers of public firms. For instance, the work of Jensen and Meckling (1976), Fama (1980) or Fama and Jensen (1983) is considered particularly influential. On the other hand, the normative or Principal-Agent current envisions “a general theory of the principal-agent relationship, a theory that can be applied” regardless of the context (and not necessarily within the traditional shareholders-managers case). Eisenhardt (1989) further explains that such a current of Agency Theory “involves careful specification of assumptions, which are followed by logical deduction and mathematical proof.” However, the scholar moderates the comparison between these two currents which in fact are complementary: “positivist theory identifies various contract alternatives, and principal-agent theory indicates which contract is the most efficient under varying levels of outcome uncertainty, risk aversion, information, and other variables” (Eisenhardt, 1989).

In addition to the comparison between positive and normative currents, Eisenhardt (1989) performs a remarkable review of the organizational literature and identifies the conceptual features that Agency Theory and organization theories have in common. As such, Eisenhardt (1989) draws a parallel between Agency Theory and political perspectives as championed by March (1962) or Pfeffer (1981), contingency perspectives as advocated by Chandler (1962) or Galbraith (1973), organizational control literature as supported by Thompson (1967) or Ouchi (1979), and transaction cost perspective notably championed by Williamson (1975). The below table summarizes the results of Eisenhardt’s analysis.

Exhibit XLIV: Comparison of Agency Theory assumptions and organizational perspectives

Assumption	Perspective				
	Political	Contingency	Organization Control	Transaction Cost	Agency
Self-interest	X			X	X
Goal conflict	X			X	X
Bounded rationality		X	X	X	X
Information asymmetry		X		X	X
Preeminence of efficiency		X	X	X	X
Risk aversion					X
Information as a commodity					X

Source: Eisenhardt, 1989, p.63

Contributions and limitations of Agency Theory

According to Eisenhardt (1989) who refers to Perrow (1986), “Agency theory reestablishes the importance of incentives and self-interest in organizational thinking.” As a result, Eisenhardt (1989) strikingly reminds us that “much of organizational life [...] is based on self-interest.” In terms of academic research, the author argues that Agency Theory makes two specific contributions. First, in AT, information is perceived as a commodity which can be purchased or sold. The consequence is

that the principal can invest in information systems as a means of controlling and monitoring the agent's behavior. Second, because organizations face some uncertainties (e.g. profitability, growth, sustainability of business model, litigation, technology, etc...), AT explores risk aspects of corporate life. The underlying rationale here is that "differences in willingness to accept risk should influence contracts between principal and agent" (Eisenhardt, 1989). Indeed, Eisenhardt (1989) demonstrates that agency theory predicts that risk-neutral managers are likely to choose the 'make' option (behavior-based contract), whereas risk-averse executives are likely to choose 'buy' (outcome-based contract)."

In terms of empirical research, as discussed previously, the positivist stream has mainly examined situations in which the interests of shareholders or debtholders conflict with those of managers. Typically, these studies based on historical data reveal that "information systems or outcome-based incentives solve the agency problem" (Eisenhardt, 1989). In contrast, "the normative stream indicates the most efficient contract alternative in a given situation." From this analysis, Eisenhardt (1989) draws five specific recommendations and identifies situations appropriate for the researcher to invoke Agency Theory. Most notably, the author explains that:

Agency theory is most relevant in situations in which contracting problems are difficult. These include situations in which there is (a) substantial goal conflict between principals and agents, such that agent opportunism is likely (e.g., owners and managers, managers and professionals, suppliers and buyers); (b) sufficient outcome uncertainty to trigger the risk implications of the theory (e.g., new product innovation, young and small firms, recently deregulated industries); (c) unprogrammed or team-oriented jobs in which evaluation of behaviors is difficult. By emphasizing these contexts, researchers can use agency theory where it can be most rigorously tested. Eisenhardt (1989)

Lastly, Agency Theory has been challenged in light of theoretical and empirical weaknesses. Some critics such as Perrow (1986) believe that AT does not contribute to organizational knowledge or even is obsessed with stock price as Hirsch and Friedman (1986). Furthermore, Perrow (1986) disapproves the focus on the shareholders-managers relationship: "Perrow (1986) criticized the theory for being unrealistically one-sided because of its neglect of potential exploitation of workers" (Eisenhardt, 1989). In a similar vein, Heath (2009) denounces "the uses and abuses of Agency Theory." Indeed, the author identifies "three potential problems with agency theory, from the perspective of the business ethicist: first, that it treats all motivation as self-interested; second, that it presupposes shareholder primacy; and third, that it encourages violation of the *nemo dat* principle (and thus, evasion of moral responsibility). Consequently, Heath (2009) deplores the fact that "agency theory can serve as a source of considerable inadvertent mischief when treated as an accurate representation of reality" and recommends to using agency theory to determine "instructive parables, allowing us to see more clearly what the world of business would be like in the absence of business ethics." Similarly to Perrow (1986), Lan and Heracleous (2010) propose to reconsider the primacy of

shareholders and argue for a perspective in which the principal is the corporation rather than shareholders. The researchers build their argument on the law literature. Finally, Droege and Spiller (2009) challenge a central tenet of Agency Theory and advance that the information being perceived as a commodity is inconsistent. In fact, the authors explain that accurate information may not be available at any price and thus the decision rule is contingent on information availability and the cost-benefit decision.

To sum up, we have briefly reviewed the founding principles, main contributions and limitations of Agency Theory. We have shown in particular that AT finds roots in multiple theoretical currents such as contingency theory, or economic theories including transaction cost analysis as well as organizational control theories. Additionally, we have evidenced that Agency Theory provides a conceptual framework for explaining the principal-agent relationship in the presence of agency costs (that arise when the interests of contractual parties diverge and in the occurrence of information asymmetry). Nonetheless, we have not retained Agency Theory in our model for two essential reasons. First, we believe that the context of our study of rates assumptions used in defined benefit pension plans do not match with the conditions described by Eisenhardt (1989). Although there could be a “substantial goal conflict between principals and agents,” it is unlikely that we can establish the existence of uncertainty and measure the behavior of agents as described by Eisenhardt. This exercise appears quite challenging in the context of a large quantitative study encompassing public firms across Europe. Second, we think that Positive Accounting Theory is a more appropriate framework than Agency Theory since the former theory has proven its reliability in numerous accounting studies and borrows its definition of political and contractual costs from Agency Theory.

In the next sub-section, we discuss another theory often invoked in the context of accounting research treating the determinants of accounting choices.

3.2: Conventions Theory

Conventions Theory or Economics of Conventions is another theoretical stream which is highly regarded by the research community in the context of accounting choices. Leibenstein (2000) skillfully describes the theory in his book entitled *Inside the firm* [...]. First, Leibenstein contrasts a norm (“some sort of a standard, without considering the extent to which others adhere to this standard”) and a convention (“a regularity of behavior that has a high degree of adherence locally, and high degree of expectation that others will adhere to it,” 2000, p. 60). Furthermore, Leibenstein explains that “conventions are social habits or socially agreed-upon regularities of behavior in certain contexts” and [...] “conventions may provide solutions in situations where markets do not exist” (Leibenstein, 2000, p. 75). In other words, the Conventions Theory states that organizational actors share common representational systems. In addition, the theory exhibits explanatory power over individual or corporate behavior in highly uncertain environments. This notion of uncertainty is recognized and further discussed by Amblard (2002). In situations of uncertainty (caused by men’s intellectual capacities, time and others), “an individual runs away from frustrations [...] by observing others [...] and implementing mimetism [...] as collective error is preferable to isolated reason⁵⁶” (Amblard, 2002, p. 190).

Over the next paragraphs we will discuss in further details Conventions Theory’s founding principles, main empirical contributions and limitations. From this analysis, we will highlight the reasons why we have not retained the theory in our conceptual framework.

Origins of Conventions Theory

Prior literature indicates that Conventions Theory (or CT) is more a theoretical stream influenced by multiple disciplines than a unified theory. However, the literature recognizes that the British economist John Maynard Keynes, the American philosopher David Kellogg Lewis, and members of the French School have played a significant role in promoting Conventions Theory.

Mostly renowned for his advocacy about state intervention and the use of fiscal and monetary mechanisms to allay the effects of recessions and depressions, Keynes was a brilliant theorist in the field of macroeconomics. In his greatest work published in 1936 and entitled *The General Theory of Employment, Interest and Money*, Keynes challenges neo-classical ideologies and develops theoretical evidence in favor of interventionist policies that Keynes believed are necessary to fight recessions.

Additionally, Keynes (1936) defines, in light of the observed behavior of financial markets participants, a convention as some kind of common practice: “in practice we have tacitly agreed, as a

⁵⁶ Translated from the French: “Dans ces conditions, comment l’individu réagit-il face à l’incertitude? Se replie-t-il sur lui-même, perclus et inhibé? Non, il agit, et le plus souvent en échappant totalement aux frustrations que la situation aurait dû engendrer. En observant le comportement d’autrui, il pourra tout de même surmonter cette situation de crise et décider. Le mimétisme devient alors la seule conduite rationnelle: s’il ne sait pas comment agir, les autres le savent peut-être; dans ce cas, l’individu en tirera alors profit, et s’ils ne savent pas, il pourra toujours justifier son action par celle des autres. L’erreur collective n’est-elle pas préférable à la raison isolée?” (Amblard, 2002, p. 190).

rule, to fall back on what is, in truth, a convention. The essence of this convention – though it does not, of course, work out quite so simply – lies in assuming that the existing state of affairs will continue indefinitely, except in so far as we have specific reasons to expect a change.” In observing the behavior of “those who deal on the Stock Exchange,” Keynes (1936) argues that market participants would mimic others in trying to predict share prices. The investment decision would be function of what others think rather than being based on a valuation strategy. Keynes (1936) illustrates such a mimetic behavior by describing “a conventional valuation which is established as the outcome of the mass psychology of a large number of ignorant individuals.” The author uses further examples to demonstrate that actors would prefer to relinquish their own judgment or views as it is considered safe to act as others: “worldly wisdom teaches that it is better for reputation to fail conventionally than to succeed unconventionally” (Keynes, 1936).

In contrast to Keynes who has treated conventions in the context of financial markets, Lewis (1969) is concerned about day-to-day social conventions. In his book released in 1969, *Convention: A Philosophical Study*, Lewis uses ideas developed in his doctoral dissertation and concepts borrowed from Game Theory to advance that conventions help solve “coordination problems.” In particular, Lewis (1969) is interested in identifying what is the originating event (or “precedent”) that generates a convention in the same way Schelling (1960) envisioned the concept of “salient.” Lewis therefore posits that, in the context of uncertainty, actors who share common interests will adopt the solution(s) based on each actor’s expectation of what the other expects (which borrows from Schelling’s focal point). As a result, for Lewis, this solution defines what a convention is. Indeed, a convention is a regularity in behavior, sustained by a system of preferences and expectations, and where everyone conforms to the behavior expected to be adopted by everyone else. Lewis formulates six criteria around the concept of convention: i) everyone conforms to the convention, ii) everyone expects everyone else to conform to the convention, iii) this belief that everyone else conform to the convention gives everyone the rationale to conform to the convention, iv) all prefer general conformity to the convention rather than conformity which is slightly less than general, v) there is at least one alternative to the convention, and vi) the points described above form what Lewis (1969) calls “common knowledge.” Defined in those terms, a convention would be sustainable. However, the convention as defined by Lewis concerns members of a population facing a recurrent situation. Potentially, this condition may not match our research context since firms choose rates assumptions in the context of a fast-evolving regulatory environment.

A final strand of the literature considers that the French School has greatly helped disseminate conventionalist thinking from the 1980s. Envisioned as a means of rejecting classical and neo-classical ideas, a group of French scholars including Dupuy, Eymard-Duverney, Favereau, Orléan, Salais, and Thévenot present main developments and criticisms at Conventions Theory in the 1989’s

special edition of *Revue Economique*. The authors attempt to demonstrate that conventionalist ideas do belong to traditional institutional economics currents notably through adjacent disciplines such as law, sociology or political science. In addition, the conventionalist stream, though parting away from market theory, seeks to bring novel ideas and methodologies⁵⁷. Other researchers including management scholar Gomez (1994, 1996, 1997) and economist Batifoulier (2001) became prolific advocates of conventionalist ideas. In addition, scholars identify two streams within Conventions Theory: a strategic approach which is enrooted in Lewis' ideology and an interpretative approach which is influenced by Keynes' precepts.

Founding principles of Conventions Theory

Essentially, the conventionalist stream seeks to better understand socio-economic mechanisms through the study of the genesis, the functioning and the meaning of conventions (Gensse, 2003). As such, Conventions Theory posits that the behavior of individuals is influenced by what is done within the organization and not solely by individual motives governed by contractual arrangements. That is why Gomez (1996) views a convention as a set of implicit or explicit criteria that an individual refers to during the decision-making process. Consequently, conventions provide some common guidance and appear somehow as a set of normal behaviors which individuals would mimic in order to justify their choices (in other words to earn legitimacy). Likewise, Rojot (2002) speaks of "rule-convention" which is described as "a collective cognitive device" that is based on "a commonly held conception of appropriate social behavior."

Furthermore, prior literature reveals that conventionalist precepts apply in specific context(s) and generate particular constraints for the researcher. First, conventions find justification in circumstances characterized by uncertainty. Gomez (1997) argues that in light of uncertainty, an individual's rational choice would be based not on personal criteria but rather on what others would likely decide. As such, mimetic behavior plays a central role in the conventionalist approach. Second, it appears that adopting a convention remains an individual act which is, however, enrooted in a collective realm. Indeed, as indicated by the authors of the 1989's special edition of *Revue Economique*, such a tension between individualism and holism needs to be carefully considered by the researcher. Eventually, the literature appears to argue that individualism is predominant during the genesis of a convention whereas holism seems adequate to explain its adoption and application. Third, according to Lewis (1969), a convention requires the multiplication of interaction between actors (i.e. recurring situation) in order

⁵⁷ Translated from the French: "La place occupée, parmi ces concepts, par la notion de convention, inciterait à replacer les recherches conventionnalistes réunies dans ce numéro dans une tradition d'économie institutionnaliste influencée notamment par des disciplines adjacentes (droit, sociologie, science politique). Il faut toutefois souligner que ces recherches s'en écartent ou, pour le moins, cherchent à renouveler cette tradition, parce qu'elles ne procèdent pas à une mise en cause globale de l'économie de marché [...]. Elles prennent en compte la réalité des relations marchandes, ce qui exige de traiter rigoureusement, en construisant un cadre d'analyse en partie original, la relation entre le modèle de marché et des notions qui lui sont à l'origine étrangères parce qu'elles trouvent leurs racines dans d'autres sciences de l'homme" (Dupuy et al., 1989).

for a convention to be instituted or adopted by a population. Fourth, in line with Rojot (2002) who argues that the contents [of conventions] are “arbitrary,” conventions provide guidance to actors by coordinating behavior. However, the set of normal behaviors is often viewed as a product of history rather than a product of efficiency or the outcome of rationality.

Contributions and limitations of Conventions Theory

The research community appears to recognize the potential, the freshness and the diversity of contributions that enjoy the conventionalist stream (especially in light of the work of Dupuy, Eymard-Duverney, Favereau, Orléan, Salais, and Thévenot). Interestingly, Amblard (2002, 2004) demonstrates the adequacy of conventionalist precepts in explaining accounting choices. Nonetheless, Conventions Theory suffers several limitations. First, CT is enrooted in various disciplines including logic, economics, sociology or management. Such diversity translates sometimes in the dissolution of the definition of convention which is refined according to the research context. Additionally, such diversity raises difficulties for researchers in terms of empirical analysis and methods. For instance, Maymo (2011) speaks of recurring difficulty in operationalizing the concept of convention⁵⁸. Second, CT as envisioned by Lewis (1969), in particular the notion of common knowledge, raises questions. Lewis (1969) appears to ignore information asymmetry and imply that collective thinking supersedes individual thinking since everyone conforms to the convention and everyone expects everyone else to conform to the convention. Moreover, Lewis’ definition requires the existence of recurrent situation, a criterion that may create methodological and empirical challenges for the researcher.

To sum up, Conventions Theory provides a theoretical framework to explain socio-economic mechanisms through the study of the genesis, the functioning and the meaning of conventions (Gense, 2003). Although the theory finds substance in multiple disciplines such as logic, economics, and others, scholars appear to agree on what conventions are. Conventions are therefore envisioned as some sort of regularity of behavior or a set of normal behaviors that is adopted and accepted by members of a group. Conventionalist ideas have been championed by Keynes, Lewis and members of the so-called French School.

Despite its potential to explain individual or corporate behavior, we have not retained Conventions Theory in our study of the rates assumptions used in defined benefit pension plans. The theory grants attention to convention which is somehow “locally” defined as indicated by Leibenstein (2000). Rojot (2002, 2005) somehow shares similar view about the theory since the author explains that conventions are accepted but are arbitrary, and more implicitly rather than explicitly accepted by actors. Lastly, Conventions Theory, whether defined by Keynes or Lewis, impose significant methodological and

⁵⁸ Translated from the French: “La lecture proposée de ce problème opérationnel est une proposition d’opérationnalisation de la théorie des conventions qui répond à une critique récurrente du concept” (Maymo, 2011).

empirical constraints. As such, these elements do not reconcile with our ambition to perform a large-scale study (encompassing entities that are located across Europe).

4: CHAPTER CONCLUSION

In chapter 3 we have established the theoretical framework on which the dissertation is enrooted. The chapter presents and discusses the two theories, Positive Accounting Theory and Neo-Institutionalism Theory, which appear the most adequate to explain the choice of rates assumptions. For each theory, we have provided historical perspective, presented main precepts and discussed key limitations. Additionally, we have overviewed other theoretical frameworks (i.e. Agency Theory and Conventions Theory) which are frequently referred to in studies of accounting choices and we explained why we did not retain those in our model.

First, we have considered Positive Accounting Theory as a reliable explanatory model for several reasons. Precursors including Watts and Zimmerman (1978, 1979, 1986, 1990), Ball and Brown (1968), Beaver (1968), and others have introduced influential empirical finance methods to financial accounting. Driven by the desire to move away from an era dominated by normative currents, proponents of PAT have sought to provide scientific roots to accounting research, paving the way for rigorous empirical research. Indeed, PAT has introduced an empirical protocol structured around the observation of practices, followed by the formulation of a model, hypotheses, experiment(s) to test those hypotheses and lastly the validation (or not) of the researcher's predictions. In order to explain and predict behaviors, Watts and Zimmerman establish the theoretical foundations of PAT on both the Agency Theory (or AT) and the Economic Theory of Regulation (or ETR). AT envisions the firm as a nexus of contracts linking various interest parties or stakeholders who act to maximize their own interest (Jensen and Meckling, 1976) whereas ETR originates from the public choice field of economics and portrays the political process as a competition between individuals seeking to maximize their own interests. Consequently, PAT has over time proved to be highly influential since used in numerous empirical studies to explain various (organizational and) accounting decisions (Dumontier and Raffournier, 1999). Despite numerous criticisms from scholars who have predominantly argued against epistemological, theoretical, and methodological limitations, we believe PAT precepts are appropriate to explain pension accounting choices.

Second, similarly to PAT, we have examined in details the principles that characterize Neo-Institutionalism Theory. In our analysis, we have adopted a concentric approach in which the work of DiMaggio and Powell (1983) lays at the center since their isomorphic model of the institutional environment has profoundly influenced the institutional literature. Next, we considered ideologies that have explicitly influenced DiMaggio and Powell (such as Hawley and Meyer & Rowan), then scholars who have implicitly influenced DiMaggio and Powell (especially Selznick), and the scholars who played a central role in disseminating neo-institutional ideas since the 1880s. We noticed that several currents have been influential, especially the new institutional economics (with Coase,

Williamson or North) and the sociologic perspective (with Meyer and Rowan, Scott, or Zucker). In particular, we did not attempt to favor a specific current because we believe that both economic and sociologic perspectives share common features and we believe that the study of rates assumptions in the context of defined benefit pension plans overlaps several fields and has repercussions in politics, economics and social matters.

In light of DiMaggio and Powell (1983) three forms of isomorphic pressure are identified to explain the homogeneity in organizational forms. Coercive institutional pressures embody rules promulgated in regulatory systems to encourage a certain desired set of behaviors. Professionalization, affiliation to professional or trade association and training represent forms of normative pressure. Lastly, in situations of uncertainty, mimetic isomorphism occurs when firms model themselves on entities sharing similar activity and/or entities considered as the most successful. Although these three forms of isomorphism tend to weave into a complex social fabric which renders the task of the researcher more challenging (as noticed by Mizruchi and Fein, 1999), we believe that NIT remains a pertinent framework to use in our study.

Finally, we extended the findings of our analysis by arguing that, together, PAT and NIT form a relevant framework to explain accounting choices. We reviewed the rare studies in which such a combination has been attempted. Indeed, in all instances, the researchers have demonstrated the pertinence and efficacy of such an approach. For instance, Mezias (1990) examines the financial reporting practices of Fortune 200 companies. Neu (1992) evaluates the disclosure of earnings forecasts in the Canadian context. Neu and Simmons (1996) analyze the accounting for site restoration costs implemented by Canadian firms. Touron (2004) examines through a case study the factors that led French company Saint-Gobain-Pont-à-Mousson (or SGPM) to adopt US GAAP in 1970. Lastly, Collin, et al. (2009) study the propensity of municipal corporations to adopt either SASB standards (based on local rules) or SFASC standards (in line with IFRS rules).

To conclude this chapter (and before addressing epistemological and empirical questions in the next chapter), we summarize in the below table the main concepts and features that characterize PAT and NIT. We believe that such a dual framework provides a comprehensive explanatory model to comprehend the choice of rates assumptions in the context of the accounting of defined benefit pension schemes.

Exhibit XLV: Dissertation theoretical framework

	Positive Accounting Theory	Neo-Institutionalism Theory
Underlying principle	Utility	Legitimacy
Main foundations or currents	Agency Theory and Economic Theory of Regulation	New Institutional Economics and Sociologic perspective
Factors	Internal Political and contractual costs	External Rules, norms, values, etc...
Main mechanisms	Managers maximizing own utility	Homogenization via isomorphism
Posture	Positive	Positive
Main empirical currents	Earnings management Value relevance Information usefulness	Symbolic role of formal structures Organizational behavior Institutional change
Hypothesis	The choice of rates assumptions is influenced by political and contractual costs	The choice of rates assumptions is influenced by isomorphic pressures exerted by the institutional environment

Source: Moïse LOUISY-LOUIS, June 2014

**PART II – EPISTEMOLOGICAL AND EMPIRICAL
FRAMEWORKS: STUDY OF THE DETERMINANTS
OF THE RATES ASSUMPTIONS**

CHAPTER IV
STUDY OF THE DETERMINANTS OF THE RATES
ASSUMPTIONS

CHAPTER IV: STUDY OF THE DETERMINANTS OF THE RATES ASSUMPTIONS

Chapter 4 details the aim and protocol established to carry out the study. Chapter 4 begins with a description of our research design, which is articulated around the research epistemological and empirical frameworks. In this section, we demonstrate why we adopt a post-positivist stance in order to perform a quantitative study. In particular, this analysis allows us to develop our research hypotheses, describe our population and sampling methodology as well as the econometrics that we employ.

Table of contents

CHAPTER IV: STUDY OF THE DETERMINANTS OF THE RATES ASSUMPTIONS	246
1: RESEARCH DESIGN	247
2: EPISTEMOLOGICAL PERSPECTIVES	248
2.1: Overview	248
2.2: Research topic	249
2.3: Main findings derived from our literature review	250
2.4: Research philosophy and approach	250
2.5: Research design	254
3: JUSTIFYING THE DISSERTATION’S RESEARCH HYPOTHESES	257
3.1: Predicting accounting choice through Positive Accounting Theory	257
3.2: Predicting accounting choice through Neo-Institutionalism Theory	258
4: RESEARCH METHODOLOGY	262
4.1: Overview	262
4.2: Methodology	262
4.3: Population and sampling / Data collection	269
5: CHAPTER CONCLUSION	271

1: RESEARCH DESIGN

Our empirical ambition is to perform the most rigorous and extensive statistical analysis possible. We employ an econometrics model to gauge whether the choice of the discount rate and the expected rate of return are influenced by key factors (previously identified by the literature) in light of Positive Accounting Theory (i.e. measured in terms political and contractual costs) and Neo-Institutionalism Theory (i.e. revealed through coercive, mimetic and normative isomorphic pressures).

In particular, we set discount rate and expected rate of return as dependent variables. We regress these variables against firms' financial metrics and descriptive information and against management's specific information. Our database is structured around information provided by Bloomberg. To insure the accuracy of the information, we performed random check by comparing downloaded data and reported data available in annual reports. It is worthy to point that we systematically checked data relative to our dependent variables against annual reports.

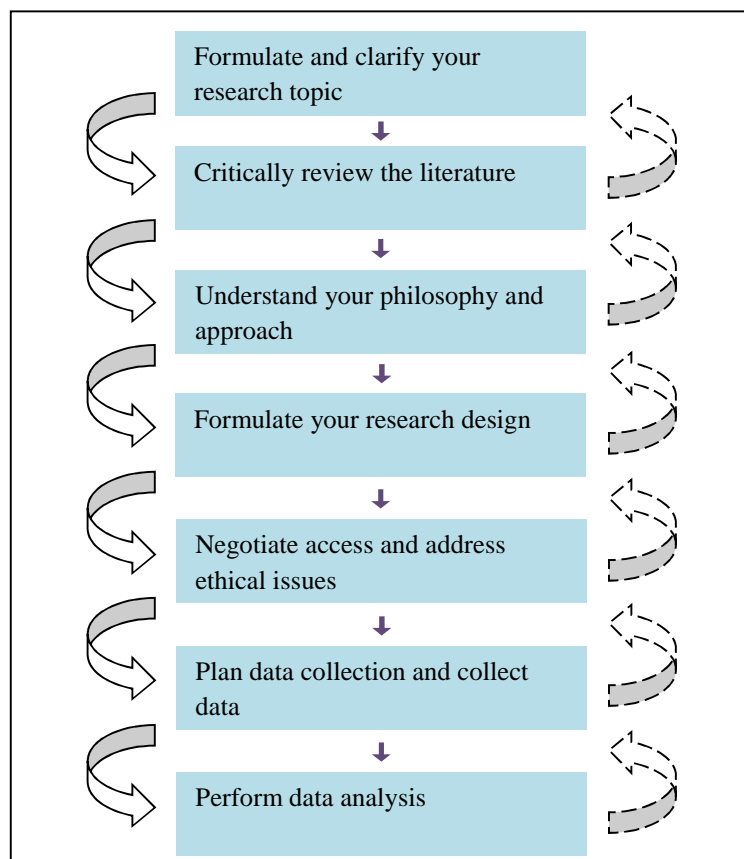
Before delving into the mechanics of the study, it is appropriate to discuss in the next section the research epistemological framework as a means of justifying our empirical strategy.

2: EPISTEMOLOGICAL PERSPECTIVES

2.1: Overview

In this section we describe the researcher's epistemological stance while reconciling epistemological assumptions with our empirical strategy. Epistemological and methodological choices fundamentally depend on the research question and the context in which the researcher performs the study. In this dissertation, our main goals are to observe and understand the factors that influence the choice of the discount rate and the expected rate of return used in the accounting for defined benefit pension plans by firms listed across Europe. In line with Koenig (2002, 2006), we will show that our research project is a coherent system that will help us go from an intention to elements of answer. As such, in our research process, we will i) clarify our research topic, ii) restate main findings derived from our literature review, iii) formulate our research philosophy and approach, and iv) establish our research design. The below diagram illustrates the subsequent steps that comprise our research process.

Exhibit XLVI: Research process



Source: Saunders, Lewis and Thornhill, 2012, p.14

Lastly, it is worthwhile to point that throughout our analysis we will rely mostly on precepts formulated by Gavard-Perret, Gotteland, Haon and Jolibert (2012) and Saunders, Lewis and Thornhill (2012).

2.2: Research topic

According to Gavard-Perret et al. (2012) the research process must be undertaken as an iterative process which allows the researcher to clearly define the research topic and research question(s). After having carefully reviewed prior pension accounting literature and taking into account recent developments in politics, demographics, regulations, and accounting rules, a study treating defined benefit pension plans came as a natural but pertinent choice. As previously explained, the accounting for defined benefit pension schemes is technical, complex, evolving, and can have repercussions on society at both the micro and macro levels. Naturally, the potential for empirical research is significant especially across Europe, a region which adopted a common set of accounting principles fairly recently. As such, our main ambition is to observe and understand the factors that influence the choice of the discount rate and the expected rate of return used in the context of the accounting for defined benefit pension plans by firms listed across Europe over the period spanning from 2005 to 2011. Our corresponding research question is formulated as follows: What are the factors impacting the choice of the discount rate and the expected rate of return?

Once research topic and question have been delineated, Saunders et al. (2012) explain that a theoretical framework is necessary in order to formulate a coherent design. Indeed, referring to Whetten (1989), Saunders et al. (2012) explain that a theory is structured around four elements relating to what, how, why and the fourth element including who, where and when. Our research topic formulated in the previous paragraph addresses the what question. The second element, how, relates to a fundamental question: “how are the [research] variables or concepts related?” As such, a theory is concerned about causality (i.e. cause and effect). The third element, why, points out another central question: “why do these relationships exist in my data?” Saunders et al. (2012) advance that a theory permits to provide “logical reasoning to explain why the relationships exist.” Lastly, the fourth element helps to contextualize the research by “indicating constraints to [...] generalisability.” Likewise, Gavard-Perret et al. (2012) emphasize on the importance of a theory which is defined as a set of formulations that are connected, non-observable and empirically testable. Furthermore, the goal of a theory is to foster knowledge through structures that are systematic and can help describe, explain and predict a phenomenon⁵⁹. As importantly, Gavard-Perret et al. (2012) describe a proposition⁶⁰ (as a logical deduction based on a particular theory about the relationships between concepts, which are seen as fundamental elements of a theory), a hypothesis⁶¹ (as a formulation in which at least two

⁵⁹ Translated from the French: “Une théorie est un ensemble de formulations connectées, non observables et testables empiriquement. Une théorie a pour but d’accroître la connaissance par des structures systématisées, capables de décrire, d’expliquer et de prédire un phénomène.” (Gavard-Perret et al., 2012, p. 74)

⁶⁰ Translated from the French: “Une proposition est une déduction logique tirée de la théorie sur des relations entre concepts, qui sont eux-mêmes des éléments de base qui permettent d’élaborer une théorie.” (Gavard-Perret et al., 2012, p. 74, 76)

⁶¹ Translated from the French: “Une hypothèse est une formulation qui spécifie qu’au moins deux variables mesurables ou potentiellement mesurables sont liées.” (Gavard-Perret et al., 2012, p. 77)

variables, measurable or potentially measurable, are linked) and variables⁶² (as empirical counterparts of a concept because they permit to observe and measure the concept). These definitions are essential and have helped us identify from the literature the elements necessary to structure our research strategy.

2.3: Main findings derived from our literature review

In preceding chapters, we have meticulously reviewed the relevant literature as a means of describing pension schemes, industry players, demographic trends, regulations and accounting treatment.

Moreover, we have examined prior accounting research literature released in the US and Europe over the past thirty years.

Such an analysis has revealed that i) pensions typically represent an important element of deferred compensation for individuals, ii) the administration and financing of pension systems represent a major challenge for governments and corporations alike, iii) rapid ageing of populations, weakening fertility rates, and rise of pensionable age are factors that further burden the task of decision-makers, iv) important forces influence the role of pension fund professionals, v) the accounting of defined benefit pension plans is extremely complex, and vi) prior scientific literature clearly epitomizes the complexity and controversy in pension accounting.

In addition, we have demonstrated that both PAT and NIT provide the theoretical material necessary to frame our understanding of the factors that influence the choice of the discount rate and the expected rate of return. Indeed, we argue that accounting choices are undertaken in light of political and contractual costs (as implied by PAT) and are impacted by isomorphic pressures exerted by the institutional environment (as suggested by NIT).

2.4: Research philosophy and approach

Now that we have delineated our research topic and formulated our research question, we need to address the notion of research philosophy, a term that “relates to the development of knowledge and the nature of that knowledge” (Saunders et al., 2012). The philosophy that the researcher adopts is influenced not only by practical considerations (such as which methods to employ to collect or analyze data) but also by the researcher’s two important perceptions. First, the researcher needs to formulate a view about the nature of reality (i.e. the notion of ontology). Second, the researcher needs to frame what “constitutes acceptable knowledge.” Other considerations (such as the role of values)

⁶² Translated from the French: “Les variables sont la contrepartie empirique du concept [...] et permettent d’observer et de mesurer le concept. Définir une variable nécessite tout d’abord la mise au point d’échelles destinées à la mesurer.” (Gavard-Perret et al., 2012, p. 78)

must be addressed by the researcher to ensure that the research project is coherent. Main epistemological paradigms and considerations are shown below.

Exhibit XLVII: Comparison of main research philosophies

	Positivism	Pragmatism	Realism	Interpretivism
<u>Ontology</u> : the researcher's view of the nature of reality or being	External, objective and independent of social actors	External, multiple, view chosen to best enable answering of research question	Is objective. Exists independently of human thoughts and beliefs or knowledge of their existence (realist), but is interpreted through social conditioning (critical realist)	Socially constructed, subjective, may change, multiple
<u>Epistemology</u> : the researcher's view of what constitutes acceptable knowledge	Only observable phenomena can provide credible data, facts. Focus on causality and law-like generalizations, reducing phenomena to simplest elements	Either or both observable phenomena and subjective meanings can provide acceptable knowledge dependent upon the research question. Focus on practical applied research, integrating different perspectives to help interpret the data	Observable phenomena provide credible data, facts. Insufficient data means inaccuracies in sensations (direct realism). Alternatively, phenomena create sensations which are open to misinterpretation (critical realism) focus on explaining within a context or contexts	Subjective meanings and social phenomena. Focus upon the details of situation, a reality behind these details, subjective meanings motivating actions
<u>Axiology</u> : the researcher's view of the role of values in research	Research is undertaken in a value-free way, the researcher is independent of the data and maintains an objective stance	Values play a large role in interpreting results, the researcher adopting both objective and subjective points of view	Research is value laden; the researcher is biased by world views, cultural experiences and upbringing. These will impact on the research	Research is value bound, the researcher is part of what is behind researched, cannot be separated and so will be subjective
<u>Data collection techniques</u> most often used	Highly structured, large samples, measurement, quantitative, but can use qualitative	Mixed or multiple method designs, quantitative and qualitative	Methods chosen must fit the subject matter, quantitative or qualitative	Small samples, in-depth investigations, qualitative

Source: Saunders, Lewis and Thornhill, 2012, p.140

From our perspective, we consider that i) the reality is external and independent of the researcher, ii) the researcher seeks to observe and understand phenomena in order to identify causality and articulate

propositions that are generalizable, iii) the researcher acts in a value-free manner, and iv) the researcher intends to measure phenomena using quantitative methods on a large sample made of historical data. In consequence, positivism appears to be the research philosophy the most adequate in our case.

However, it is worthy to note that Gavard-Perret et al. (2012) propose a classification of six research philosophies (or paradigms) that differs because the scholars recognize that differences between categories are more subtle or blurred than suggested by Saunders et al. (2012). First, Gavard-Perret et al. (2012) explain that logical positivism has lost its appeal in accounting research. Second, the scholars consider two categories of pragmatism (i.e. constructivist pragmatism and constructivist defined according to Guba and Lincoln) and one category of interpretivism. Interestingly, Gavard-Perret et al. (2012) argue for a post-positivism category made of two sub-categories: scientific realism and critical realism. Finding its roots in positivism, post-positivism addresses criticisms made by Popper (1963), who advocates for a hypothetico-deductive approach and for a theory of science (which advances the idea that progress toward a true theory can be made only by refuting old theories), and Kuhn (1972) who rejects Popper's view of falsifiability and argues that a scientific revolution takes place when researchers cannot explain anomalies using contemporary models. Additionally, post-positivism recognizes that it may not be possible to fully capture reality in its entirety. In order to reach the highest standard of objectivity, post-positivism requires controlling precisely research conditions and recommends the use of multiple methods for collecting data. To sum up, the post-positivism stance appears appropriate to our research project since we seek to examine accounting choices and understand their determinants (requiring a position which is external, objective and factual).

In addition to the research philosophy, the researcher needs to consider how he or she will use the theory(ies) identified through the literature review. The researcher can typically adopt a reasoning based on the approaches described in the next table.

Exhibit XLVIII: Comparison of research approaches

	Deduction	Induction	Abduction
<u>Logic</u>	In a deductive inference, when the premises are true, the conclusion must also be true	In an inductive inference, known premises are used to generate untested conclusions	In an abductive inference, known premises are used to generate testable conclusions
<u>Generalizability</u>	Generalizing from the general to the specific	Generalizing from the specific to the general	Generalizing from the interactions between the specific and the general
<u>Use of data</u>	Data collection is used to evaluate propositions or hypotheses related to an existing theory	Data collection is used to explore a phenomenon, identify themes and patterns and create a conceptual framework	Data collection is used to explore a phenomenon, identify themes and patterns, locate these in a conceptual framework and test this through subsequent data collection and so forth
<u>Theory</u>	Theory falsification or verification	Theory generation and building	Theory generation or modification; incorporating existing theory where appropriate, to build new theory or modify existing theory

Source: Saunders, Lewis and Thornhill, 2012, p.144

In our case, we adopt a deductive approach since the research project started with the theory(ies) that we identified through a rigorous review of the literature allowing the design of a research strategy to test the theory. As a matter of fact, in the next sub-section we discuss how we “operationalize” the project (Saunders et al., 2012). The research design will indicate the steps needed to go from the research question to answer(s).

2.5: Research design

Saunders et al. (2012) argue that “quantitative research is generally associated with positivism,” [...] “with a deductive approach,” [...] and “quantitative research examines relationships between variables, which are measured numerically and analysed using a range of statistical techniques.” Likewise, Gavard-Perret et al. (2012) explain that the classical research design enrooted in a post-positivism stance is structured around the hypothetico-deductive approach (which typically includes research topic and question, literature review, conceptual framework, hypotheses, research design, data collection, hypotheses testing, and analysis of results). Moreover, Saunders et al. (2012) recommend the researcher to specifically plan for addressing the issues of reliability, construct

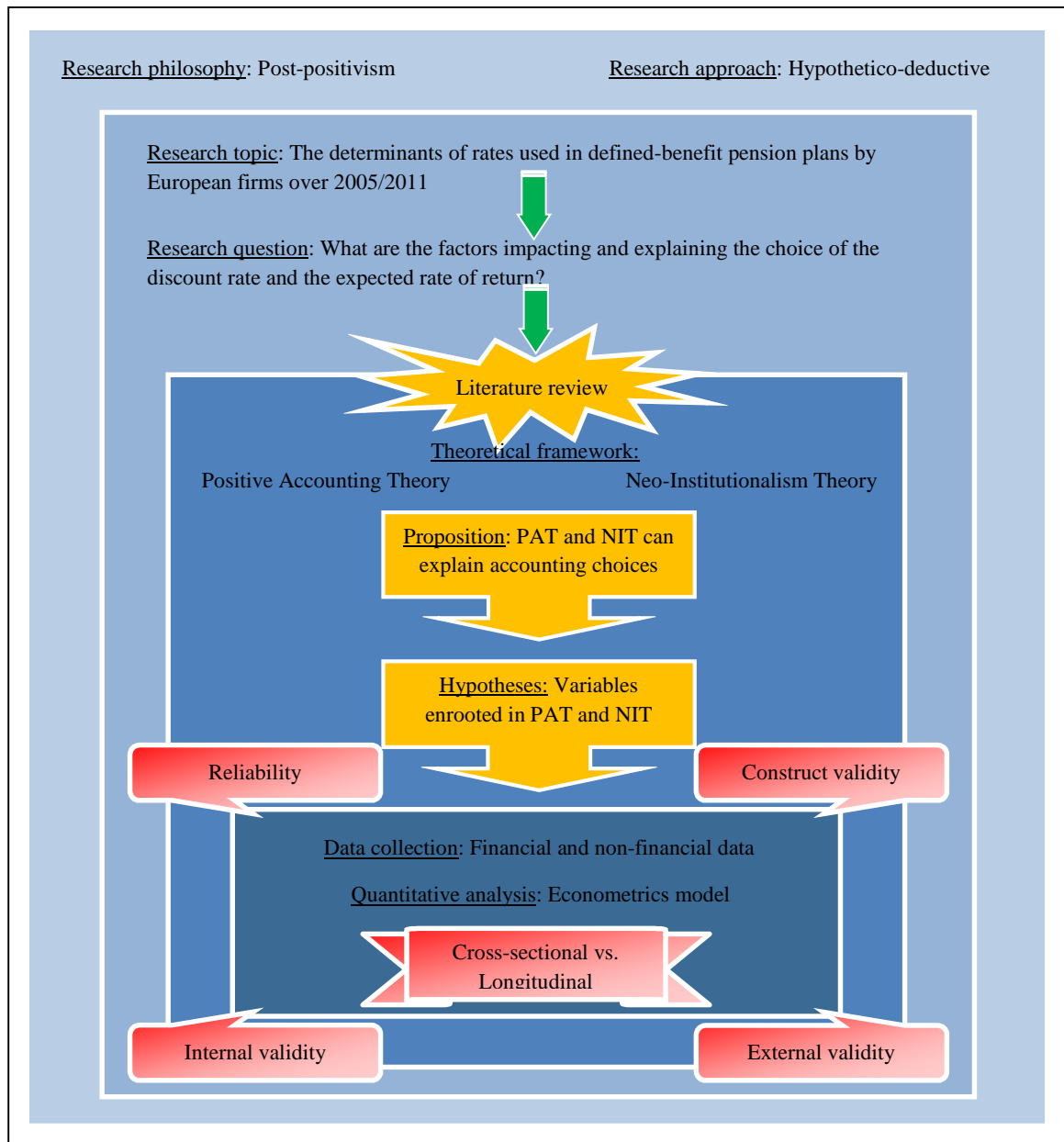
validity, internal validity, and external validity⁶³ (we discuss these issues in addition to time horizon and ethical concerns in the subsequent research methodology section).

Based on our literature review and in line with both Saunders *et al.* (2012) and Gavard-Perret *et al.* (2012), it appears appropriate to adopt the hypothetico-deductive approach based on the analysis of quantitative data (mostly historical financial data) using econometrics. In parallel with Bodie *et al.* (1987), Thomas (1988), Ghicas (1990), Gopalakrishnan and Sugrue (1995) and many others identified in chapter 2, we will retrieve financial and non-financial data from annual reports and a proprietary database (Bloomberg in our case) for the years 2005-2011 released by firms listed across Europe. Our econometrics model will include descriptive statistics, correlation analysis, non-parametric tests (if necessary), and linear regression analysis since our research variables can be numerical data (such as our dependent variables and most of our independent variables) and categorical data (e.g. industry group). In regards with statistical treatments, Saunders *et al.* (2012) notably recommend to use correlation and regression models with care and discernment. These methods in fact permit to assess the strength of relationship and are commonly used in accounting research. However, the researcher needs to consider the types of variables employed (e.g. Pearson correlation is applicable to numerical data whereas Spearman correlation is useful for ranked data) and be careful in drawing inferences from statistical outputs. Similarly, regression models are useful to assess the strength of cause-and-effect relationship between dependent and independent variables. However, the researcher needs to consider whether the relationship is linear, whether dependent and independent variables exhibit equal variance (a characteristic called homoscedasticity) or high degree of correlation (referred to as multicollinearity). In the methodology section, we detail how we implement our research protocol and discuss how we address practical issues.

To conclude this section, we present in the below diagram the key points discussed in relation to our epistemological framework.

⁶³ “Reliability refers to whether your data collection techniques and analytic procedures would produce consistent findings if they were repeated on another occasion or if they were replicated by a different researcher.” “Construct validity is concerned with the extent to which your research measures actually measure what you intend them to assess.” “Internal validity is established when your research demonstrates a causal relationship between two variables.” “External validity is concerned with the question: can a study’s research findings be generalised to other relevant settings or groups?” (Gavard-Perret *et al.*, 2012, p. 192-194)

Exhibit XLIX: Dissertation epistemological framework



Source: Moïse LOUISY-LOUIS, June 2014

In the next section we synthesize our previous discussion about the prior scientific literature, the conceptual framework enrooted in PAT and NIT and our epistemological choices and show how this analysis has led to the formulation of our research hypotheses.

3: JUSTIFYING THE DISSERTATION'S RESEARCH HYPOTHESES

In the below paragraphs we synthesize key points discussed through the review of the scientific literature and develop a set of hypotheses derived from PAT and NIT principles.

3.1: Predicting accounting choice through Positive Accounting Theory

In order to justify accounting choice, PAT sustains that the economic consequences of the accounting choice explain the motivation behind the choice (Watts and Zimmerman, 1990). Furthermore, the researchers assume that accounting is structured around a contract between a principal and an agent (thus leading to the firm being viewed as a 'nexus of contracts' when considering corporate stakeholders at large). It is worthy to note therefore that the existence of various contracts implies that PAT finds inspiration in the agency theory. Watts and Zimmerman posit in 1978 that "individuals act to maximize their own utility" and that the agent is influenced by at least three factors, namely compensation, corporate lending policy and political costs. In other words, PAT predicts that the agent (in fact managers) would favor accounting choices that i) increase remuneration (linked for instance to the achievement of certain accounting ratios), ii) increase earnings (as a means to reduce the likelihood of default), and iii) decrease earnings (to avoid attracting too much attention in response to superior or suspicious profitability).

With regard to the accounting of defined pension benefits, it can be assumed that shareholders represent the principal and corporate managers play the role of the agent. As a result, in light of the predictions made by PAT regarding managers' desire to maximize their utility, it can be argued that managers will determine DR and ERR taking into account the impact of the accounting choices on earnings, leverage and size (thus referring to Watts and Zimmerman's bonus, debt covenant and political cost hypotheses). Because DR is inversely proportional to pension obligation and ERR is positively correlated to earnings, the following hypotheses can be derived from PAT:

HYPOTHESIS 1: *Ceteris paribus*, firms with weaker profitability are likely to assume a higher discount rate and expected rate of return.

HYPOTHESIS 2: *Ceteris paribus*, firms which offer share-based bonus incentives to top management are likely to assume a higher discount rate and expected rate of return.

HYPOTHESIS 3: *Ceteris paribus*, firms with higher leverage are likely to assume a higher discount rate and expected rate of return.

HYPOTHESIS 4: *Ceteris paribus*, larger firms are likely to assume a lower discount rate and expected rate of return.

In a later section, variables that directly or indirectly influence profitability, compensation, leverage and size will be discussed (in particular profitability ratios, leverage, cash flows, funding ratio, pension asset allocation and size).

3.2: Predicting accounting choice through Neo-Institutionalism Theory

Similarly to Watts and Zimmerman, DiMaggio and Powell acknowledged the influence of the work of predecessors, in particular Hawley (1968) or Meyer and Rowan (1977) who explored the concept of “institutionalized myths.” As such, Meyer and Rowan find that “environments which have institutionalized a great number of rational myths generate more formal organization,” and that “organizations which incorporate institutionalized myths are more legitimate, successful, and likely to survive” (1977). Starting from this principle, DiMaggio and Powell noticed that organizations are homogeneous in terms of organizational structure and sought to explain such a fact. In their analysis, DiMaggio and Powell explain that organizations are structured in conformity with institutional environments and promoted the concepts of coercive, mimetic and normative isomorphism. Fundamentally, DiMaggio and Powell find that organizations use formal structures in their quest for legitimacy.

NIT research is plethoric and encompasses multiple fields (Mizruchi and Fein, 1999; Szostak Tapon and Audrey Becuwe, 2007). In the field of financial accounting, research focused on the adoption of IFRS is rich and influential. For instance, Guerreiro et al. (2008) study “the preparedness of companies to adopt IFRS” in the Portuguese context. The scholars provide an interesting table comparing samples, study periods and variables used in previous studies. The researchers test the influence of factors such as size, commercial internationalization, auditor type, rate of profitability or leverage on the propensity of companies to adopt IFRS. At a macro-level, Judge, Li and Pinsker (2010) examine “national adoption of international accounting standards.” Interestingly, the researchers associate foreign aid with coercive isomorphism, import penetration with mimetic isomorphism, and education level with normative isomorphism.

In the context of pension accounting, it can be argued that firms’ choice of DR and ERR is influenced by institutional pressures that firms are exposed to. Specifically, coercive isomorphism is evidenced when “informal pressures [are] exerted on organizations by other organizations upon which they are dependent” (DiMaggio and Powell, 1983). Touron (2005) in his study of “the adoption of US GAAP by French firms” identifies the State and Capital’s suppliers as stakeholders enjoying coercive powers. Through its agencies, the State influences nearly all aspects of social and economic lives

(Fliegstein, 1990). With regard to public firms, the country's supervisory financial authority exercises significant power over financial accounting and reporting activities with the overarching goal of protecting the interest of the general public. As a result, it can be argued that in response to the influence exerted by the supervisory authority, firms will adopt conservative rates in order to avoid political costs. We therefore formulate the below hypothesis:

HYPOTHESIS 5: *Ceteris paribus*, in the presence of State or governmental agencies, Supervisory Financial Authorities (i.e. local or international in the case of foreign listing), or international regulatory agencies, firms are likely to assume more conservative discount rate and expected rate of return.

In addition, we believe that the concept of political costs can be extended to the influence exerted by shareholders. Indeed, Demaria (2008) referring to Shleiffer and Vishny (1986) and Mtanios and Paquerot (1999) demonstrates that accounting choices undertaken by managers are influenced by large shareholders. Therefore, we posit that managers would choose conservative rates assumptions in the context of shareholding concentrated in the hands of few shareholders and formulate the below hypothesis:

HYPOTHESIS 6: *Ceteris paribus*, firms characterized by a concentrated shareholder base are likely to assume a lower discount rate and expected rate of return.

Likewise, we believe that institutional shareholders exert pressure on managers. For instance, El-Gazzar (1998) argues that institutional investors can influence corporate choices because they require a finer level of disclosure. Similarly, Healy et al. (1999) show that institutional shareholders are a particular group of stakeholders since they rely on regular and timely available financial information. More recently, Mard (2012) examines ownership structure of French companies and evidences a link between various forms of ownership structure and earnings management. In consequence, we predict that managers would choose conservative rates assumptions in the context of shareholding concentrated in the hands of institutional shareholders and articulate the below hypothesis:

HYPOTHESIS 7: *Ceteris paribus*, firms characterized by large institutional shareholder base are likely to assume a lower discount rate and expected rate of return.

Next, DiMaggio and Powell (1983) describe normative isomorphism "as the collective struggle of members of an occupation to define the conditions and methods of their work." In other words, "practices are adopted because they are prescribed by professionals." As argued by Tournon (2005), normative isomorphism requires the transmission of norms by professionals, a process which is

greatly facilitated by auditors. Their role is to instill trust in the financial documents released by public firms. However, because auditors are appointed and remunerated by reporting entities an evident conflict of interest exists. Despite recent regulation enacted to mitigate this issue (e.g. required rotation of auditors after a certain period of time) it appears more subtle to predict the influence of auditors on the choice of DR and ERR. For the financial numbers to be faithful representation of actual accounting or business events, auditors would lead firms to adopt conservative rates. Yet, following prescriptions of their auditors acting as financial advisers, this would lead firms to adopt more aggressive assumptions. In consequence, we articulate the next hypothesis:

HYPOTHESIS 8: *Ceteris paribus*, in dealing with their Auditor, firms are likely to assume more conservative/aggressive discount rate and expected rate of return.

Additionally, we predict that when top managers have enjoyed similar training firms are likely to implement similar accounting choices. Affiliation to trade associations or lobby groups and board membership in other companies also promote the dissemination of common practices and ideas. In our context, we proxy training with the achievement of post-graduate degree(s) and industry affiliation with membership to trade association and to boards of other listed companies. We therefore formulate the below hypotheses:

HYPOTHESIS 9: *Ceteris paribus*, firms whose top management has enjoyed similar training are likely to assume more aggressive discount rate and expected rate of return.

HYPOTHESIS 10: *Ceteris paribus*, firms whose top management displays significant industry affiliation are likely to assume more aggressive discount rate and expected rate of return.

Lastly, mimetic isomorphism occurs “when goals are ambiguous, or when the environment creates symbolic uncertainty,” implying that “organizations may model themselves on other organizations” (DiMaggio and Powell, 1983). In other words, when facing uncertainty, firms “are more likely to adopt the behavior of organizations with which they would like to be assimilated” (Touren, 2005). The researcher links mimetic isomorphism with affiliation to an industry as prior literature has evidenced a significant relationship. Consequently, we develop the below hypothesis:

HYPOTHESIS 11: *Ceteris paribus*, in response to country, industry or sector’s pressures, firms are likely to assume more aggressive discount rate and expected rate of return.

In light of research treating the adoption of IFRS by nations, researchers including El-Gazzar et al. (1999) and Judge et al. (2010) demonstrate that international presence could accelerate the adoption

of IFRS (domestic economies would perceive international presence as sign of success and market penetration and would seek to emulate). Building on this rationale, we formulate the final hypothesis:

HYPOTHESIS 12: *Ceteris paribus*, firms which are deemed to be more “internationalized” or opened to international activities are likely to assume more aggressive discount rate and expected rate of return.

The below table summarizes our predictions.

Exhibit L: Research hypotheses

PAT-Concept	Prediction	NIT-Concept	Prediction
Profitability	-	Coercive pressure – Authorities, Shareholders	-
Top management bonus	+	Normative pressure – Auditor	+/-
Leverage	+	Normative pressure – Education	+
Size and cash flow	-	Normative pressure – Ind. affiliation	+
Pension items	+/-	Mimetic pressure – Country, Ind., sector	+
		Mimetic pressure – International presence	+

4: RESEARCH METHODOLOGY

4.1: Overview

In light with the research epistemological framework and the literature previously discussed, the use of econometrics appears adequate for the study of the factors influencing the choice of discount rate and expected rate of return. Specifically, we use a quantitative approach articulated around regression analyses and rely on publicly available information (collected mainly through annual reports and the Bloomberg database).

4.2: Methodology

As indicated by the methodology literature (Gavard-Perret *et al.*, 2012, Saunders *et al.*, 2012), a quantitative approach based on linear regression appears the most appropriate technique to use in order to reconcile our theoretical, epistemological and empirical frameworks.

Dependent Variables

As discussed in chapter 1, discount rate and expected rate of return play a central role in pension accounting. Directly extending from the concept of time value of money, the discount rate is used to estimate at the balance sheet date the amount of pension obligation which will be paid to beneficiaries in future periods. The expected rate of return is a metric used to estimate the return that can be anticipated on pension assets at the start of the accounting period. It is used to determine a (comprehensive) income statement item (and thus can inflate or deflate earnings) rather than for estimating the fair value of pension assets (balance sheet item). Slight changes in these rates may cause significant changes in reported pension obligation and pension income or expense and therefore may significantly affect leverage and profitability.

Information about discount rate and expected rate of return is provided in the footnotes accompanying financial statement and is usually available in the second half of annual reports. Because of inconsistencies or missing data from the Bloomberg database, we systematically checked or hand-collected data from annual reports, a procedure implemented by Amir and Benartzi (1998) or Picconi (2006). In addition, we occasionally tested the reliability of the information provided by the database by comparing the information with company's press releases, speeches and presentations available via the corporate website. The information collected was then treated with IBM's SPSS⁶⁴ analytics software, a tool which is widely used and appreciated by the research community.

⁶⁴ SPSS stands for Statistical Package for the Social Sciences

Independent Variables

Based on prior literature, we have identified the below factors as potentially influencing the choice of discount rate and expected rate of return. Because prior pension accounting literature predominantly seeks to explain accounting choices in light of financial performance or firms contractual costs, we believe it is appropriate to include this literature in our Positive Accounting Theory model. Variables frequently used in prior pension accounting research typically capture the impact of agency costs and are as follows:

- Profitability measured in terms of net profit margin, ROA, or ROE,
- Cash flows generation capability proxied with the logarithm of cash flows from operations, the logarithm of free cash flows, or the ratio of cash flows from operations to market capitalization,
- Leverage calculated as the ratio of total debt to equity, total debt to capital, total debt to asset, or pension benefit obligation to market capitalization,
- Funding status computed as the ratio of fair value of pension assets to pension benefit obligation (i.e. funding ratio),
- Allocation of pension assets determined as the percentage of assets invested in equity, in debt, and other asset classes, or
- Propensity to manage earnings proxied with a ratio that quantifies the impact of pension items on reported earnings

Moreover, according to Scott (2012), Positive Accounting Theory “is concerned with predicting such actions as the choices of accounting policies by firm managers and how managers will respond to proposed new accounting standards.” Taking into account i) the fact that the firm can be viewed as “a nexus of contracts,” ii) the firm would seek to minimize its contracting costs, and iii) the discretion given to management to choose between accounting policies give rise to opportunistic behavior (Scott, 2012), we retain metrics that can encompass management compensation (bonus), leverage (debt) and size (political costs), such as:

- Management compensation measured with a dummy variable linked to whether or not share-based incentives are available to management (we adapt in particular the methodology used by Scott (1991) who examines pension disclosures relating to SFAS n° 87. In fact, Scott (1991) retains entities that offer share-based schemes incorporating some measures based on current’s year income)
- Risk estimated with a leverage ratio such as the ratio of total debt to equity, total debt to capital, or total debt to asset, or
- Firm size proxied with the logarithm of cash flows from operations or total assets (a better measure than total assets for which data tend to be highly skewed due to the diversity of firms),

As discussed in chapter 2, prior literature has evidenced the fact that institutional pressures can potentially explain firms' accounting choices. As postulated by DiMaggio and Powell (1983), isomorphism is defined as "a constraining process that forces one unit in a population to resemble other units that face the same set of environmental conditions." Traditionally, researchers seeking to assess isomorphic pressures have relied on qualitative methods (mainly surveys and interviews). Without minimizing the robustness of qualitative approaches, we decided to employ a quantitative protocol relying on information relative to firms or managers as previously done by El-Gazzar, Finn and Jacob (1999) or Judge, Li and Pinsker (2010). Next, we identified metrics that best embody the three forms of isomorphic pressure described by DiMaggio and Powell (1983).

Coercive pressures are by and large caused by groups that are external to the firm. Coercive pressure can be proxied with:

- The effect of State regulation,
- The impact of Supervisory financial market authorities' rules,
- The adoption of foreign listing, especially the US, or
- The pressure exercised by shareholders

Based on firms' country of incorporation, supervisory financial authorities were respectively identified for each of the 17 European countries encompassing the dataset. All authorities had power to design and impose disclosure rules onto public firms. Similarly, all reporting entities incorporated in Europe must prepare financial information in accordance of rules predicted by the IASB. We anticipate, however, more variability regarding the decision to list in the US, a practice which has lost of its appeal over the past decade due to increased costs that tend to supersede potential benefits. Lastly, in light of Demaria (2008), we anticipate that accounting choices undertaken by managers are influenced by the firm's ownership structure. We use three metrics namely the percentage of equity capital controlled by institutional shareholders, by the top shareholder and the percentage of free float. According to DiMaggio and Powell (1983), mimetic behavior occurs "when the environment creates symbolic uncertainty, organizations may model themselves on other organizations." In a study of the adoption of IFRS by economies, El-Gazzar *et al.* (1999) have anticipated that international presence could accelerate the adoption of IFRS (domestic economies would perceive international presence as sign of success and market penetration and would seek to emulate). Replicating this reasoning, Judge, Li and Pinsker (2010) have tested the pertinence of possible mimetic isomorphism variables such as trade freedom, foreign direct investment and import penetration. At a firm level, these variables can be proxied with:

- The affiliation to country and industry groups
- The amount of capital expenditure allocated to foreign entities,
- The number of foreign subsidiaries,
- The percentage of sales generated outside the domestic territory, or

- The percentage of total assets located outside the domestic territory

Lastly, DiMaggio and Powell (1983) demonstrate that “formal education” and the “filtering of personnel” are important sources of [normative] isomorphism. In the context of the adoption of IFRS, Judge, Li and Pinsker (2010) have relied on the work of Carus (2002) and Wijaya (2008) to posit that “professionalism functions best in a relatively well-educated society.” Again, if we build on this reasoning, at a firm level we can use various reported data as a proxy to management education level and professionalism:

- The level of education proxied with whether top managers (i.e. CEO and/or Chairman) hold some post-graduate degree(s),
- The significance of cross membership (i.e. managers being affiliated to other firms or seating on their boards),
- The affiliation to political rights, lobby groups, industry or trade associations, or
- The reliance on auditors who help disseminate standards in financial reporting practices

Lastly, we use industry groups and size as control variables in line with the literature. Before discussing our sampling and data collection methodology in the next section, the below tables list our research variables.

Exhibit LI: Research variables

PAT-Independent Variables	Description	Literature
Profitability	<p>Net profit margin = Net income/(loss) / Sales</p> <p>ROA = Net income/(loss) / Average total assets</p> <p>ROE = Net income/(loss) / Average total common equity</p>	<p>Bodie, Light, Morck, and Taggart (1987), Ghicas (1990), Asthana (1999) uses NI/Total assets</p> <p>Gopalakrishnan and Sugrue (1995), Adams, Frank and Perry (2011)</p> <p>Guerreiro <i>et al.</i>, (2008)</p>
Cash flows	<p>Logarithm of cash flows from operations</p> <p>Logarithm of free cash flows from operations</p> <p>Cash flows from operations to market capitalization</p>	<p>Ghicas (1990)</p> <p>Based on Ghicas (1990)</p> <p>Asthana (1999) uses CFO/Total assets</p>
Leverage	<p>Total debt to equity</p> <p>Total debt to capital</p> <p>Total debt to asset</p> <p>Pension benefit obligation to market capitalization</p>	<p>Francis and Reiter (1987), Gopalakrishnan and Sugrue (1995) use (Debt+UPBO)/(Mkt Cap-UPBO)</p> <p>Amir, Guan and Oswald (2010) use LT debt / (LT debt + Mkt cap)</p> <p>Ghicas (1990), Asthana (1999)</p> <p>Gopalakrishnan and Sugrue (1995) use PBO/Total assets</p>
Funding status	<p>Fair value of pension assets to pension benefit obligation</p>	<p>Bodie, Light, Morck, and Taggart (1987), Ghicas (1990), Asthana (1999), Goodwin (1999), Franzoni and Marin (2006) define FR = (FVPA-PBO)/Mkt Cap</p>

PAT-Independent Variables (cont'd)	Description	Literature
Allocation of pension assets	Percentage of assets invested in equity Percentage of assets invested in debt Percentage of assets invested in other asset classes	Amir and Benartzi (1998), Amir, Guan and Oswald (2010) Amir, Guan and Oswald (2010) Amir, Guan and Oswald (2010)
Propensity to manage earnings	Pension items to operating profit, Pension items to operating profit before tax	Based on Scott (1991)
Size	Logarithm of total assets, cash flows from operations, pension assets and PBO	Bah and Dumontier (2001)
Management compensation	A dummy variable linked to whether or not share-based incentives are available to management and incorporate award criterion based on current year's income	Lakhal (2006), Scott (1991)

NIT-Independent Variables	Description	Literature
Coercive isomorphism	<p>Rules and regulation imposed by State, governmental, supervisory authorities (coded as dummy variables)</p> <p>Percentage of share capital controlled by institutional investors, the largest shareholder and the percentage of free float</p>	<p>Touron (2005)</p> <p>Shleiffer and Vishny (1986), El-Gazzar (1998), Healy <i>et al.</i> (1999), Mtanios and Paquerot (1999), Cormier and Martinez (2006), Demaria (2008), Mard (2012)</p>
Mimetic isomorphism	<p>Affiliation to country, industry or sector (coded as dummy variables)</p> <p>The percentage of capital expenditure allocated to foreign entities</p> <p>The percentage of sales generated and assets located outside the domestic territory</p>	<p>El-Gazzar <i>et al.</i> (1999), Touron (2005), Judge, Li and Pinsker (2010)</p> <p>El-Gazzar <i>et al.</i> (1999), Judge, Li and Pinsker (2010), Ghicas (1990)</p> <p>Based on El-Gazzar <i>et al.</i> (1999), Judge, Li and Pinsker (2010)</p>
Normative isomorphism	<p>The level of education measured with a dummy variable taking the value of 1 if CEO and/or Chairman holds post-graduate degree(s), 0 otherwise</p> <p>Industry affiliation measured with dummy variables taking the value of 1 if CEO/Chairman is affiliated to trade association/lobby group or seat on other Boards, 0 otherwise</p> <p>The auditor identified as one of the Big 4 auditor (coded as dummy variables)</p>	<p>Based on DiMaggio and Powell (1983), Judge, Li and Pinsker (2010)</p> <p>Neu (1992) uses a variable for accountant seating on the Board</p> <p>Touron (2004, 2005)</p>
Control variables	<p>Industry groups, the logarithm of the total number of employees</p>	<p>Asthana (1999), Bergstresser <i>et al.</i> (2006), Picconi (2006)</p>

In performing our analysis, we adopt an iterative process in order to refine our choice of variables and to ultimately enhance the robustness of our model.

4.3: Population and sampling / Data collection

The sample consists of European listed companies that were included in the STOXX Europe Total Market Index (or SETMI). SETMI (Bloomberg symbol and ID are respectively BKXP and BBG000RX4ZT4) encompasses the Western European region as a whole. Although the number of components vary (as firms merge or close), this index covers roughly 95% of the free float market capitalization across 18 European countries including Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, The Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and The United Kingdom. Index performance is calculated based on free float market capitalization weighting. Weights are reviewed on a quarterly basis. Lastly, the index runs as a base of 100 as of December 31, 1991.

Financial and descriptive data was extracted from the Bloomberg database for individual members of the SETMI using Bloomberg excel template files called XFA and XCSF. As of March 2013, SETMI consisted of 1,055 firms, yielding 8,454 firm-year observations for the enlarged 2004/2012 period.

- First, we excluded data points for the year 2004 since we sought to focus on the 2005/2011 period as 2005 is the first year for which public firms across Europe were required to publish financial information prepared in accordance with IAS/IFRS (following the European Commission's decree EC 1606-2002), thus $8,454 - 873 = 7,581$ firm-year data points
- Second, we excluded data for the year 2012 if available so $7,581 - 183 = 7,398$ firm-year data points
- Third, we excluded duplicates of firms having dual listing or bearer/registered shares ($1,055 - 8 = 1,047$ firms and $7,398 - 56 = 7,342$ firm-year data points)
- Fourth, we excluded firms disclosing information prepared according to standards other than IAS/IFRS ($1,047 - 42 = 1,005$ firms and $7,342 - 294 = 7,048$ firm-year data points). The reason for this is that some firms, though incorporated in Europe, have their shares primarily listed outside Europe and thus have been publishing financial information based on principles other than IAS/IFRS
- Fifth, we excluded incoherent downloaded Bloomberg data such as BB Biotech AB (data for years 2000 to 2007), Gjensidige Forsikring ASA (X, 2000, 2006 to 2011), RHJ International (2001 to 2007, 2011), thus $1,005 - 3 = 1,002$ firms and $7,048 - 19 = 7,029$ firm-year observations

- Sixth, following our ambition to study the impact(s) of accounting rules on financial institutions' investment strategy, banks and insurers were retained, bringing the sample down to 107 firms (or 749 firm-year data points)⁶⁵
- Finally, 22 firms were excluded because those firms did not sponsor defined benefit plans (or plans that correspond to IAS 19 rules). Therefore, the number of sample firms was reduced to 85 (or 595 firm-year observations).

In the end, the financial institutions sample represents roughly 9% of the total SETMI index.

However, we capture about 80% of the entire population of the financial institutions that comprise the index.

⁶⁵ In fact, the study performed here was realized in the context of a larger project aiming at examining the impact(s) of accounting and solvency rules on the investment practices of European firms. In the aftermath of the global financial crisis, financial institutions, especially banks and insurers, became subject to increasingly stringent regulation.

5: CHAPTER CONCLUSION

In chapter 4 we have discussed practical aspects relating to our study of the determinants of rates used in defined benefit pension schemes. In particular, we established a link between our theoretical, epistemological and empirical frameworks. Furthermore, we demonstrated that in light of prior literature, it appears appropriate to adopt in the context of our study a post-positivist stance and implement the hypothetico-deductive approach based on the analysis of quantitative data using econometrics. From this analysis, we derived a set of hypotheses formulated around PAT and NIT precepts and identified financial and non-financial variables. Additionally, we described our population and sampling methodology as well as the econometrics that we employ. We detail in the next chapter our findings.

CHAPTER V
ANALYSIS OF RESULTS

CHAPTER V: ANALYSIS OF RESULTS

Chapter 5 presents the results of the study. We propose to perform an-depth analysis of our findings by first presenting and synthesizing key trends and facts. Second, we relate our findings to the research question and hypotheses. Furthermore, we question the validity and reliability of our results and consider ethical issues.

Table of contents

CHAPTER V: ANALYSIS OF RESULTS.....	273
1: OVERVIEW OF RESULTS.....	274
2: DETAILED ANALYSIS.....	275
2.1: General description.....	275
2.2: Descriptive statistics.....	279
2.3: Distribution and correlation analyses.....	282
2.4: Linear regression models.....	302
2.5: GLM univariate analysis.....	311
3: DISCUSSION OF FINDINGS.....	317
3.1: Theoretical and empirical implications.....	317
3.2: Discussion about the discount rate and expected rate of return.....	327
3.3: Validity and reliability.....	328
3.4: Ethical considerations.....	329
4: CHAPTER CONCLUSION.....	330

1: OVERVIEW OF RESULTS

As indicated previously, we adopt an iterative process as a means of refining our model and selecting the most appropriate variables from the exhaustive list presented in chapter 4. For this reason, we display in the next paragraphs tables and figures showing a large variety of variables. As we make progress in our analysis and reveal the characteristics and relationships between our dependent and independent variables, we retain the most pertinent variables for our regression analyses.

Consequently, we first explore our dataset by producing cross tabular charts, frequency tables, histograms and scatterplots (though we only display the most relevant outputs in the next pages). Such an exercise is quite helpful in identifying phenomena, trends or issues. Second, we perform extensive descriptive statistics in order to gauge central tendency and dispersion in our data. Time series will also help gain a longitudinal perspective of the dataset. We next consider the distribution of our variables as normal distribution is desired when performing linear regression analysis, which represents the final stage of our study. Nonetheless, before examining potential causal relationships between our variables, we will perform correlation analyses in order to evaluate the strength of relationships.

2: DETAILED ANALYSIS

To gain an overall view of our dataset we first present statistics that compare our dependent variables to main characteristics of reporting entities, namely country, industry, and sector. We also display data relating to auditors, foreign listing, share-based compensation, and CEO/Chairman because they shed light on interesting patterns.

2.1: General description

The below tables reveal the breakdown of dependent variables by country and industry subgroup. Firms are incorporated in 17 countries and classified into 4 bank subgroups and 5 insurance subgroups.

Exhibit LII: Dependent variables per country of incorporation

Country	N	Discount Rate				Expected Rate of Return				
		% of total	Median	Average	SD	N	% of total	Median	Average	SD
Austria	19	3.4%	5.00	5.01	0.55	8	1.6%	4.25	4.31	0.31
Belgium	16	2.9%	4.20	4.42	0.56	16	3.2%	5.10	4.90	0.52
Denmark	21	3.8%	4.70	4.72	0.70	21	4.2%	5.20	5.31	0.57
Finland	13	2.3%	4.50	4.47	0.59	13	2.6%	5.26	5.34	0.94
France	54	9.6%	4.35	4.34	0.79	52	10.4%	4.78	4.86	0.93
Germany	49	8.8%	5.00	5.01	0.53	44	8.8%	5.00	5.19	1.00
Great Britain	84	15.0%	5.45	5.44	0.54	84	16.7%	6.29	6.14	0.59
Greece	28	5.0%	5.35	5.29	0.51	28	5.6%	5.25	5.20	1.12
Ireland	7	1.3%	5.30	5.46	0.55	7	1.4%	6.30	6.30	0.39
Italy	71	12.7%	4.50	4.53	0.42	31	6.2%	4.50	4.66	0.50
Jersey	7	1.3%	5.40	5.37	0.50	7	1.4%	5.80	5.53	0.88
Netherlands	21	3.8%	5.50	5.38	0.66	21	4.2%	6.20	6.27	1.35
Norway	35	6.3%	4.30	4.08	0.66	35	7.0%	5.80	5.71	0.63
Portugal	21	3.8%	5.25	5.25	0.39	21	4.2%	5.50	5.30	0.75
Spain	30	5.4%	4.25	4.67	0.97	30	6.0%	4.00	4.63	1.31
Sweden	28	5.0%	3.90	4.05	0.46	28	5.6%	5.85	5.85	1.01
Switzerland	56	10.0%	3.47	3.49	0.71	56	11.2%	4.10	4.29	0.73
Total	560	100.0%	4.70	4.68	0.86	502	100.0%	5.28	5.28	1.05

At first glance, dependent variables appear to be characterized by relatively low degree of variability since standard deviations remain small despite the 2% difference between the lowest and highest median discount rate (3.47% for Switzerland vs. 5.50% for the Netherlands). The difference is more acute for the median expected rate of return as Switzerland recorded 4.10% vs. 6.30% posted by Ireland.

Exhibit LIII: Dependent variables per industry subgroup

Industry Subgroup	Discount Rate					Expected Rate of Return				
	N	%	Median	Average	SD	N	%	Median	Average	SD
Commercial Bank	251	44.8%	4.60	4.63	0.82	214	42.6%	5.25	5.24	1.01
Div. Banking Institution	84	15.0%	4.80	4.67	0.96	84	16.7%	5.22	5.26	0.87
Mortgage Bank	21	3.8%	4.50	4.57	0.66	9	1.8%	5.50	5.29	0.81
Regional Bank	7	1.3%	5.00	5.01	0.55	7	1.4%	4.25	4.30	0.34
Insurance Broker	7	1.3%	5.45	5.47	0.62	7	1.4%	6.80	6.77	0.17
Life Insurance	42	7.5%	5.25	5.04	0.93	42	8.4%	5.94	5.63	0.95
Multiline Insurance	100	17.9%	4.50	4.53	0.77	91	18.1%	4.75	4.92	1.24
P/C Insurance	28	5.0%	5.15	5.09	0.80	28	5.6%	6.00	5.83	0.74
Reinsurance	20	3.6%	4.63	4.49	1.00	20	4.0%	5.50	5.62	1.25
Total	560	100.0%	4.70	4.68	0.86	502	100.0%	5.28	5.28	1.05

Likewise, we note that the lowest median discount rates are reported by mortgage banks and multiline insurance companies (4.50%) which contrast with the 5.45% reported by insurance brokers. The same analysis for the median expected rate of return appears somehow related since regional banks exhibit the lowest median (4.25%) vs. the highest figure again displayed by insurance brokers (6.80%). Overall, Great Britain, Italy and Switzerland represent the countries the most represented in our sample since they account respectively for 15.0%, 12.7% and 10.0% of the sample of discount rates. Similarly, Commercial Banks and Multiline Insurance represent roughly 45% and 18% (banks account for about 65% of the sample). It is worthy to note that the total count of dependent variables (560 and 502) does not match the total firm-year observations (595) because DR and ERR information is not available for each year of the study period. As a result, the data provides a nearly-complete representation of Western European countries (17 out of 19 countries represented in the SETMI).

Exhibit LIV: Dependent variables vs. auditor

Auditor	Discount Rate					Expected Rate of Return				
	N	%	Median	Average	SD	N	%	Median	Average	SD
Deloitte	107	19.1%	4.50	4.55	0.93	100	19.9%	5.50	5.39	1.01
Ernst & Young	108	19.3%	4.50	4.44	0.87	86	17.1%	5.00	5.10	1.14
KPMG	172	30.7%	4.80	4.82	0.80	164	32.7%	5.30	5.32	0.92
PWC	172	30.7%	4.80	4.77	0.81	151	30.1%	5.40	5.25	1.16
N/A	1	0.2%	n/m	n/m	n/m	1	0.2%	n/m	n/m	n/m
Total	560	100.0%	4.70	4.68	0.86	502	100.0%	5.28	5.28	1.05

Based on the above table there seems to be no relationship between discount rate and auditor since there is almost no variability in the median discount rate disclosed by financial institutions over the study period. In contrast, the median expected rate of return exhibit higher volatility but there is no sufficient evidence at this stage to make any particular statement. We however note that market is fairly split between auditing firms since each KPMG and PWC provide services to roughly 30% of

companies in our sample, while each Deloitte and Ernst & Young attract about 20% of reporting entities.

Exhibit LV: Dependent variables vs. foreign listing

US listing	Discount Rate					Expected Rate of Return				
	N	%	Median	Average	SD	N	%	Median	Average	SD
Yes	440	78.6%	4.80	4.75	0.86	411	81.9%	5.40	5.37	1.07
No	119	21.3%	4.50	4.43	0.78	90	17.9%	4.85	4.86	0.86
N/A	1	0.2%	n/m	n/m	n/m	1	0.2%	n/m	n/m	n/m
Total	560	100.0%	4.70	4.68	0.86	502	100.0%	5.28	5.28	1.05

From the above table we can highlight two interesting facts. First, it appears that a large portion of the firms comprising our sample have their equity security(ies) listed in the US. Second, a comparison based on median discount rate and expected rate of return seem to indicate that firms exposed to US financial markets report higher rates than those which are not exposed to US markets.

Exhibit LVI: Dependent variables vs. top management share-based compensation

Bonus	Discount Rate					Expected Rate of Return				
	N	%	Median	Average	SD	N	%	Median	Average	SD
Yes	464	82.9%	4.70	4.67	0.89	425	84.7%	5.30	5.27	1.07
No	77	13.8%	4.50	4.66	0.72	65	12.9%	5.00	5.39	1.03
N/A	19	3.4%	n/m	n/m	n/m	12	2.4%	n/m	n/m	n/m
Total	560	100.0%	4.70	4.68	0.86	502	100.0%	5.28	5.28	1.05

Similarly to patterns observed in relation to foreign listing, in the case of share-based incentives, it seems that firms offering bonus schemes report higher median discount rate and expected rate of return than those which do not offer share-based schemes or schemes that do not match our study criteria. Additionally, more than 80% of the financial institutions surveyed offer share-based compensation schemes to top management (again, the award criteria take into account some forms of current year's income).

Exhibit LVII: Dependent variables vs. top management affiliation to trade association/lobby group

CEO Trade	Discount Rate					Expected Rate of Return				
	N	%	Median	Average	SD	N	%	Median	Average	SD
Yes	373	66.6%	4.80	4.69	0.88	367	73.1%	5.30	5.23	1.01
No	29	5.2%	5.10	4.78	1.27	29	5.8%	4.80	5.47	1.56
N/A	158	28.2%	n/m	n/m	n/m	106	21.1%	n/m	n/m	n/m
Total	560	100.0%	4.70	4.68	0.86	502	100.0%	5.28	5.28	1.05

Exhibit LVIII: Dependent variables vs. top management board membership

Chairman Other	Discount Rate					Expected Rate of Return				
	N	%	Median	Average	SD	N	%	Median	Average	SD
Yes	533	95.2%	4.70	4.70	0.86	479	95.4%	5.30	5.31	1.03
No	13	2.3%	3.80	3.81	0.44	13	2.6%	3.50	3.59	0.38
N/A	14	2.5%	n/m	n/m	n/m	10	2.0%	n/m	n/m	n/m
Total	560	100.0%	4.70	4.68	0.86	502	100.0%	5.28	5.28	1.05

We have shown in the above two tables the most interesting patterns relating to the independent variables that capture normative isomorphic pressures. First, there seems to exist a notable difference in the median discount rate reported by firms whose CEO is affiliated to some trade association, lobby group or NGO. The phenomenon is also true for median expected rate of return, however, the relationship is inverse since median discount rate disclosed by firms whose CEO is active outside the firm is lower than firms whose CEO is less active or inactive outside the firm (which is the opposite for the median expected rate of return).

The next table compares dependent variable and whether Chairman seats on other boards. Median discount and expected rates of return differ notably from whether or not the Chairman seats on other boards. Nonetheless, in contrast to the CEO Trade variable, discount and expected rates of return for the Chairman Board membership vary in the same direction.

Overall, when taking into account all variables relating to normative isomorphic pressures, it appears that at least of two thirds of top personnel (i.e. CEO or Chairman) managing our sample firms are affiliated to some forms of industry groups. In addition, the Chairman appears to be a more prominent industry activist than the CEO (most likely because CEOs are responsible for managing day-to-day business while Chairmen are not). Furthermore, we noticed in rare instances that some firms had both CEO and Chairman who did not hold a post-graduate degree. A large proportion of firms located in Southern Europe are managed by CEOs who do not hold post-graduate degree and enjoys low-level of industry activism while Chairmen hold some law degrees and appear as visible industry activists. In contrast, firms located in Northern Europe (especially Anglo-Saxon firms) tend to have high educated top personnel (at times both CEO and Chairman hold ph. d) whose expertise relate essentially with business administration, finance or economics (in contrast to law).

So far we have focused on discussing interesting facts in relation to independent variables that are represented by categorical data. In the next paragraphs we concentrate on variables that are quantified with continuous data.

2.2: Descriptive statistics

The below table indicates summary descriptive statistics relating to our main variables. The next table illustrates time series of averages over the study period.

Exhibit LIX: Descriptive statistics

Variable	N	Minimum	Average	Maximum	SD
DR (%)	560	2.25	4.68	6.89	0.85
ERR (%)	502	2.25	5.28	8.25	1.05
ROE (5-yr avg.) (%)	539	(17.02)	12.32	53.35	7.25
Operating margin (%)	575	n/m	15.98	56.93	25.86
Profit margin (%)	575	n/m	9.34	68.69	41.60
ROE (%)	570	n/m	10.22	55.39	13.23
ROA (%)	572	(12.37)	0.84	10.04	1.66
Return on total capital (%)	535	(29.85)	4.20	45.28	6.42
Funding ratio (%) ¹	578	0.00	66.24	166.23	0.36
% of pension assets in debt	432	4.97	51.64	100.00	0.21
% of pension assets in equity	425	0.10	32.53	87.60	0.21
% of pension assets in real estate	298	0.00	8.83	55.52	0.07
% of pension assets in cash	155	0.38	9.51	85.67	0.14
Debt-to-Market Cap. (%)	565	0.02	8.47	158.41	14.85
Debt-to-Assets (%) ²	578	0.00	27.64	75.76	20.40
Debt-to-Equity (%) ²	574	4.75	67.44	107.63	28.31
Debt-to-Capital (%) ²	572	4.99	568.20	2,757.10	548.17
PBO-to-Market Cap. (%) ³	565	0.03	134.59	40,295.08	17.31
Log. of total assets ⁴	578	2.87	5.15	6.55	0.77
Log. of number of employees ⁵	568	2.45	4.18	5.52	0.67
Log. of CFO ⁶	394	(0.98)	3.45	5.34	0.82
Log. of FCF ⁶	355	(1.07)	3.40	5.23	0.86
Log. of PA ⁶	531	0.15	3.11	7.29	1.04
Log. of PBO ⁶	578	0.48	3.23	7.22	0.93
% Institutional shareholding	193	11.30	80.84	97.90	15.81
% Top shareholder	483	1.00	26.44	99.70	23.60
% Free float	454	8.52	79.74	100.00	0.24
% Foreign sales	504	n/m	36.74	100.00	0.29
% Foreign assets	382	0.00	28.75	100.00	0.26
Pension Item/PBT ⁷ (%)	443	n/m	3.91	1,573.44	1.47
Pension Item/OP ⁷ (%)	444	n/m	0.07	1,573.44	2.34
Valid N (listwise)	16				

Notes: ¹Fair value of pension assets / Pension benefit obligation (at balance sheet date); ²Total debt / Total assets, equity, or total capital; ³Pension benefit obligation (at balance sheet date) / Market capitalization; ⁴Logarithm of total assets;

⁵Logarithm of number of employees at year-end; ⁶Logarithm of cash flow from operations, free cash flow, pension assets, or pension benefit obligation; ⁷Pension income(loss) / Profit before tax or operating income

The above table lists all of the main variables identified in previous literature and/or that best match our empirical strategy. Interestingly, between 2005 and 2011, there has been very low variation in dependent and independent variables as illustrated by low standard deviations. This is true for all variables at the exception of operating margin, PBO-to-Market Cap., and debt ratios whose volatility is certainly due to the business model of these financial institutions (characterized by high leverage and cyclical exposure to loan losses as well as to financial markets). It is also worthy to note that

pension asset allocation has remained very stable over time, with firms predominantly investing in fixed income securities (roughly 50% on average) and in equity securities (for about a third of pension assets).

In line with the literature, averages for DR and ERR are relatively close since DR should be determined in reference to yields observed on investment grade corporate bonds and that ERR should be based on the historical performance of financial markets. Given that a basket containing fixed income instruments and equity securities would be riskier than a basket comprised only of fixed income instruments, it is not surprising that on average ERR is greater than DR.

Furthermore, the above table suggests that on average institutional shareholders and the largest shareholder control respectively roughly 80% and 26% of the equity capital of sample firms. Both the percentage of sales generated outside the domestic market and assets located in foreign territories corroborate the intuition that sample firms manage approximately a third of their business activities outside their home region.

Exhibit LX: Time series of averages

Variables	2005	2006	2007	2008	2009	2010	2011	2005/2011		
								Min.	Average	Max.
DR (%)	4.68	4.68	4.68	4.68	4.68	4.68	4.68	2.25	4.68	6.89
ERR (%)	5.28	5.28	5.28	5.28	5.28	5.28	5.28	2.25 (17.02)	5.28	8.25
ROE (5-yr avg.) (%)	12.29	12.28	12.31	12.33	12.36	12.38	12.39)	12.33	53.35
Operating margin (%)	16.03	16.06	16.05	16.01	16.00	15.99	15.98	n/m	16.02	56.93
Profit margin (%)	9.36	9.37	9.38	9.38	9.38	9.39	9.39	n/m	9.38	68.69
ROE (%)	10.16	10.21	10.23	10.21	10.23	10.24	10.25	n/m (12.37)	10.22	55.39
ROA (%)	0.84	0.84	0.84	0.85	0.85	0.85	0.85) (29.85)	0.85	10.04
ROCap. (%)	4.13	4.15	4.18	4.19	4.21	4.23	4.25)	4.19	45.28
Funding ratio (%)	65.99	66.15	66.32	66.47	66.63	66.77	66.88	0.00	66.46	166.23
% Debt	51.56	51.52	51.53	51.55	51.58	51.60	51.63	4.97	51.57	100.00
% Equity	32.54	32.59	32.59	32.58	32.57	32.56	32.53	0.10	32.57	87.60
% Real estate	8.88	8.88	8.87	8.86	8.85	8.84	8.83	0.00	8.86	55.52
% Cash	9.84	9.78	9.72	9.67	9.61	9.56	9.51	0.38	9.67	85.67
Debt-to-Mkt Cap. (%)	8.55	8.52	8.49	8.45	8.24	8.15	8.10	0.02	8.36	158.41
Debt-to-Assets (%)	27.90	27.78	27.67	27.56	27.44	27.32	27.21	0.00	27.56	75.76
Debt-to-Equity (%)	67.84	67.73	67.61	67.51	67.39	67.27	67.16	4.75	67.50	107.63
	573.7	570.0	566.8	564.0	560.4	558.1	555.7			2,757.1
Debt-to-Capital (%)	7	1	2	0	2	4	1	4.99	564.12	0
PBO-to-Mkt Cap. (%)	135.6	133.8	133.9	133.9	133.9	134.0	134.0			
	0	8	2	9	8	1	8	0.00	134.21	n/m
Log. of total assets	5.14	5.14	5.15	5.15	5.15	5.15	5.15	2.87	5.15	6.55
Log. of # of employees	4.17	4.17	4.18	4.18	4.18	4.18	4.19	2.45	4.18	5.52
Log. of CFO	3.45	3.45	3.45	3.45	3.45	3.45	3.45	(0.98)	3.45	5.34
Log. of PA	3.10	3.10	3.10	3.10	3.11	3.11	3.12	0.15	3.11	7.29
Log. of PBO	3.22	3.23	3.23	3.23	3.24	3.24	3.25	0.48	3.23	7.22
% Ins. shareholding	80.89	80.89	80.89	80.88	80.87	80.86	80.84	11.30	80.88	97.90
% Top shareholder	26.63	26.63	26.56	26.49	26.42	26.35	26.32	1.00	26.49	99.70
% Free float	79.48	79.59	79.67	79.74	79.83	79.90	80.07	8.52	79.75	100.00
% Foreign sales	36.08	36.16	36.23	36.28	36.34	36.37	36.41	0.00	36.27	100.00
% Foreign assets	28.75	28.75	28.75	28.75	28.75	28.75	28.75	0.00	28.75	100.00
Pension Item/PBT (%)										1,573.4
	3.89	3.89	3.89	3.90	3.91	3.91	3.90	n/m	3.90	4
										1,573.4
Pension Item/OP (%)	(0.00)	0.01	0.01	0.03	0.04	0.05	0.04	n/m	0.03	4

The previous table shows trends in averages over time. First, all variables indicate strikingly low level of volatility, which confirms the impression left by the descriptive statistics table. Despite interquartile ranges of respectively 4.70% and 4.00%, DR and ERR have continuously averaged 4.68% and 5.28% over the study period. This is in line with prior literature (Blankey and Swanson, 1995; Amir and Benartzi, 1998) and demonstrates that firms do not significantly alter their pension strategy over time. It is worthy to point that trends are occasionally impacted by outliers. For example, the average of PBO-to-Market-capitalization drops from 134.21% to 32.11% when we exclude Alpha Bank AE, a Greek bank, whose market capitalization massively shrunk during the Greek debt crisis (during which the bank was in fact bailed out). Second, such low variability in variables may weaken

our model since it may become challenging to explain changes that appear modest. Yet, the below charts support the belief that DR and ERR do vary.

2.3: Distribution and correlation analyses

The subsequent charts and tables describe distribution and correlation patterns between dependent vs. independent variables.

Exhibit LXI: Distribution of discount rates

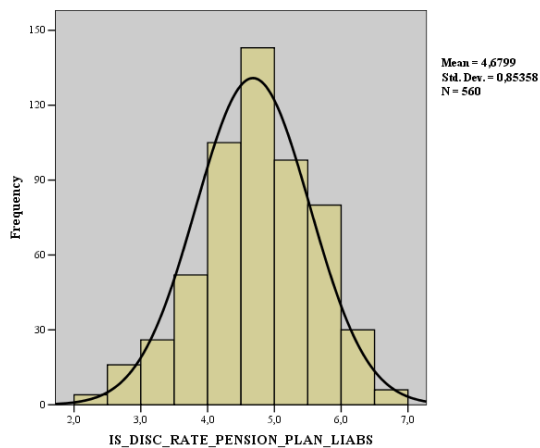
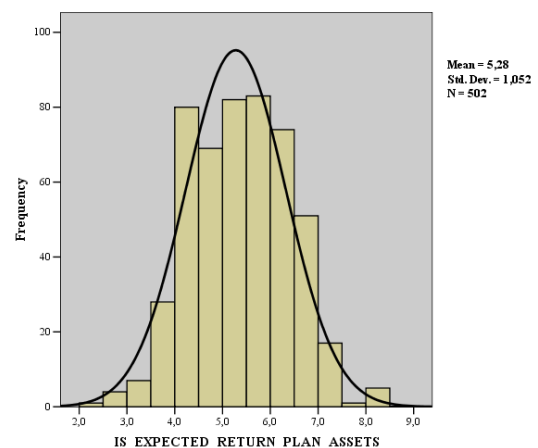


Exhibit LXII: Distribution of expected rates of return



Between 2005 and 2011, DR and ERR are roughly normally distributed. Despite being slightly right-skewed, the distribution of discount rates appears visually more symmetrical than the one of expected rates of return, for which several high values are centered around the mean. The right tail of the distribution of ERR shows outliers that corresponds to rates of approximately 8.25% used by the insurer Aegon NV in 2005 and 2006. In any case, from the table showing the breakdown of dependent variables per country of incorporation, we learn that the median and the mean for ERR are identical, implying that the distribution of ERR is predominantly symmetrical. Next, we examine correlation patterns between sets of dependent and independent variables.

Exhibit LXIII: Pearson correlations – Dependent variables vs. Profitability ratios

		DR	ERR	ROE¹	OM²	PM³	ROE	ROA	ROCap⁴
DR	Pearson	1							
	Sig.								
	N	560							
ERR	Pearson	0.540**	1						
	Sig.	0.000							
	N	502	502						
ROE ¹	Pearson	0.196**	0.272**	1					
	Sig.	0.000	0.000						
	N	520	468	539					
OM ²	Pearson	-0.090*	0.121**	0.299**	1				
	Sig.	0.035	0.007	0.000					
	N	550	493	537	575				
PM ³	Pearson	-0.091*	0.102*	0.413**	0.664**	1			
	Sig.	0.032	0.024	0.000	0.000				
	N	550	493	537	575	575			
ROE	Pearson	-0.045	0.182**	0.559**	0.618**	0.700**	1		
	Sig.	0.298	0.000	0.000	0.000	0.000			
	N	548	491	539	567	567	570		
ROA	Pearson	-0.004	0.124**	0.549**	0.404**	0.495**	0.637**	1	
	Sig.	0.926	0.006	0.000	0.000	0.000	0.000		
	N	550	493	539	569	569	570	572	
ROCap ⁴	Pearson	0.034	0.168**	0.418**	0.182**	0.300**	0.569**	0.833**	1
	Sig.	0.438	0.000	0.000	0.000	0.000	0.000	0.000	
	N	519	463	509	535	535	533	535	535

Notes: ** p < 0.01 and * p < 0.05 (2-tailed); ¹5-year average ROE; ²Operating margin; ³Profit margin; ⁴Return on capital

At the exception of the strong correlations between DR and ERR (because employers' goal is to book obligations that can be realistically met, thus obligations should be in line with the historical performance of pension assets, as discussed by Glaum, 2009) and between profitability ratios (which share common accounting metrics), we notice a weak but significant relationship i) between DR and 5-year average ROE and ii) between ERR and all of the profitability ratios shown here.

Exhibit LXIV: Pearson correlations – Dependent variables vs. Bonus

		DR	ERR	Bonus
DR	Pearson	1		
	Sig.			
	N	560		
ERR	Pearson	0.540**	1	
	Sig.	0.000		
	N	502	502	
Bonus	Pearson	0.005	-0.038	1
	Sig.	0.914	0.399	
	N	541	490	565

From the above table, there seems to exist no relationship between our dependent variables and variations in share-based compensation awarded to top management (curiously, the Pearson coefficients carry opposite signs for DR and ERR). Nonetheless, because the Bonus variable is a

dummy variable taking the value of 1 when top personnel earns i) share-based compensation ii) whose award mechanism requires the achievement of some profitability target measured through current year's income and 0 otherwise, the above statistics does not necessarily mean that there is no relation at all between pension accounting choices and compensation. In practice, it appears difficult to gauge such a relation because firms in trying to retain key personnel and align management and shareholders' interests increasingly defer compensation over time through gradual payments, often using a combination of cash and paper. Similarly, the effects of pension accounting choices would arguably be realized over significant periods of time. Here, we have sought to circumvent the impact of time by focusing on compensation schemes that take into account some forms of current year's income. This reasoning also explains why we have also included in our model a metric called Pension income(loss)/PBT (or Pension income(loss)/OP) aimed at quantifying the likelihood that management would manipulate earnings to boost reported figures and possibly their own compensation. In consequence, we do not ditch the bonus argument but further examine the potential relationship between pension accounting choices and management compensation later in this analysis.

Exhibit LXV: Pearson correlations – Dependent variables vs. Leverage

		DR	ERR	Debt/MK ¹	DTA ²	DTC ³	DTE ⁴	PBO/MK ⁵
DR	Pearson	1						
	Sig.							
	N	560						
ERR	Pearson	0.540**	1					
	Sig.	0.000						
	N	502	502					
Debt/MK ¹	Pearson	0.081	-0.063	1				
	Sig.	0.060	0.164					
	N	545	488	565				
DTA ²	Pearson	-0.071	-0.050	0.514**	1			
	Sig.	0.094	0.271	0.000				
	N	553	496	565	578			
DTC ³	Pearson	0.051	0.019	0.442**	0.857**	1		
	Sig.	0.230	0.680	0.000	0.000			
	N	553	496	565	574	574		
DTE ⁴	Pearson	-0.005	-0.008	0.593**	0.857**	0.765**	1	
	Sig.	0.902	0.855	0.000	0.000	0.000		
	N	551	494	563	572	572	572	
PBO/MK ⁵	Pearson	0.039	-0.128**	0.237**	0.039	0.049	0.056	1
	Sig.	0.358	0.005	0.000	0.359	0.251	0.188	
	N	548	490	559	563	560	558	565

Notes: ** p < 0.01 and * p < 0.05 (2-tailed); ¹Debt / Market capitalization; ²Debt / Assets; ³Debt / Capital; ⁴Debt / Equity; ⁵Pension benefit obligation / Market capitalization

At the exception of the strong and significant correlations that exist between the various debt ratios (as they share common accounting metrics), the above table suggests that there is an absence of relationship between discount and expected rates of return and financial leverage measured in terms of widely used ratios (e.g. debt ratio and similar). This is in itself a very interesting issue. Indeed, the most important contribution of the above table is compelling because it implies that there is no relationship between DR and corporate financial leverage. Perhaps, the rationale behind this observation is that pension accounting represents a very specific aspect of firms' activities (in fact, pension matters are often outsourced by reporting entities). The interesting point here is that pension leverage and financial leverage appear separate and thus there should not be any attempt to determine the discount rate based on corporate credit worthiness as it has been suggested by prior literature (Glaum, 2009). This analysis would be, however, in line with Napier (2009).

Exhibit LXVI: Pearson correlations – Dependent variables vs. Size and Cash flow

		DR	ERR	LogAss¹	LogEmp²	LogCFO³	LogFCF⁴
DR	Pearson	1					
	Sig.						
ERR	N	560					
	Pearson	0.540**	1				
LogAss ¹	Sig.	0.000					
	N	502	502				
LogEmp ²	Pearson	0.037	0.115*	1			
	Sig.	0.385	0.010				
LogCFO ³	N	553	496	578			
	Pearson	0.265**	0.053	0.732**	1		
LogFCF ⁴	Sig.	0.000	0.241	0.000			
	N	544	487	566	568		
LogCFO ³	Pearson	0.017	0.095	0.801**	0.539**	1	
	Sig.	0.743	0.083	0.000	0.000		
LogFCF ⁴	N	378	335	394	388	394	
	Pearson	0.012	0.083	0.781**	0.525**	0.988**	1
LogFCF ⁴	Sig.	0.826	0.149	0.000	0.000	0.000	
	N	340	302	355	349	355	355

Notes: ** p < 0.01 and * p < 0.05 (2-tailed); ¹Logarithm of total assets; ²Logarithm of number of employees; ³Logarithm of Cash Flow from Operations; ⁴Logarithm of Free Cash Flow

The above table implies that there is a weak, positive but significant relationship i) between DR and the logarithm of the number of employees and ii) between ERR and the logarithm of total assets, which makes sense. The size of the workforce is certainly an important factor influencing the pension accounting policy. Nonetheless, there is no obvious rationale to explain the positive relationship between ERR and the size of the balance sheet. Lastly, though not displayed here, we have examined the correlation between dependent variables and logarithm of pension assets and logarithm of PBO. In both instances, we find a weak, positive and significant relationship between DR/ERR and these two metrics. Nonetheless, we remain cautious about these results because DR and ERR are obviously linked to the computation or valuation of PBO and pension assets.

Besides, the previous table suggests that there is essentially no relationship between DR/ERR and cash flows, which would contradict our intuition (since the payment of pension to beneficiaries and contributions to pension funds impact cash flows) and prior literature (Asthana, 1999). At last, though pension matters affect corporate cash flows, the choice of discount and expected rates of return do seem to relate with corporate cash flows.

Exhibit LXVII: Pearson correlations – Dependent variables vs. Pension items

		DR	ERR	FR¹	Pens./PBT²	Pens./OP³
DR	Pearson	1				
	Sig.					
	N	560				
ERR	Pearson	0.540**	1			
	Sig.	0.000				
	N	502	502			
FR ¹	Pearson	0.097*	0.264**	1		
	Sig.	0.021	0.000			
	N	560	502	578		
Pens./PBT ²	Pearson	-0.097*	-0.058	-0.043	1	
	Sig.	0.044	0.244	0.369		
	N	434	407	442	443	
Pens./OP ³	Pearson	-0.082	-0.052	-0.083	0.139**	1
	Sig.	0.087	0.295	0.080	0.003	
	N	435	408	443	443	444

Notes: ** p < 0.01 and * p < 0.05 (2-tailed); ¹Funding ratio; ²Pension income(loss) / Profit before tax; ³Pension income(loss) / Operating profit

The above table suggests that there is a weak but significant relationship between DR and Funding ratio and a stronger and significant relationship between ERR and Funding ratio. This is not really surprising since DR is inversely proportional to PBO (which is used in the calculation of the Funding ratio). Similarly, ERR appears correlated to PBO (because ERR is strongly correlated to DR) and to Funding ratio for the same reason. In addition, a positive relationship between DR and Funding ratio parallels an analysis made by Gopalakrishnan and Sugrue (1995) in their study of 150 US firms for the years 1986 and 1987.

We also learn from this output that DR is marginally negatively correlated to management's propensity to manipulate earnings, a practice which is proxied here with Pension income(loss) / Profit before tax.

Exhibit LXVIII: Pearson correlations – Dependent variables vs. Pension assets allocation

		DR	ERR	% Debt	% Equity	% RE ¹	% Cash
DR	Pearson	1					
	Sig.						
	N	560					
ERR	Pearson	0.540**	1				
	Sig.	0.000					
	N	502	502				
% Debt	Pearson	-0.054	-0.291**	1			
	Sig.	0.265	0.000				
	N	431	417	432			
% Equity	Pearson	0.117*	0.467**	-0.728**	1		
	Sig.	0.016	0.000	0.000			
	N	424	420	405	425		
% RE ¹	Pearson	-0.114*	-0.143*	-0.228**	-0.100	1	
	Sig.	0.050	0.014	0.000	0.087		
	N	297	290	290	295	298	
% Cash	Pearson	0.023	-0.129	-0.207*	-0.241**	0.236*	1
	Sig.	0.779	0.125	0.011	0.004	0.011	
	N	154	142	150	144	114	155

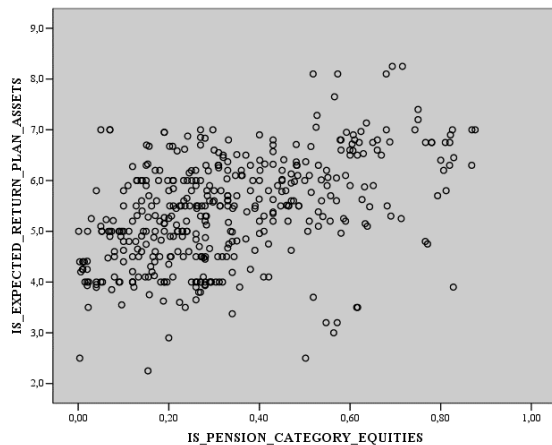
Notes: ** p < 0.01 and * p < 0.05 (2-tailed); ¹Percentage of pension assets invested in Real Estate

Once we disregard the correlations between the percentage of plan assets invested in the various asset classes (since the number of main asset classes is limited, investing in one particular asset class means not investing in the other ones, and vice-versa), we notice i) a strong, positive and significant relationship between ERR and %Equity and ii) a weaker, negative but significant relationship between ERR and %Debt. Again, this is not surprising because ERR is in theory determined in reference to historical performance of financial markets and that riskier equity securities on average generate higher return. The negative relation with debt instruments parallels the inverse relationship between yield and value.

Insights from the above table partly parallels results of Bodie, Light, Morck and Taggart (1987) who use figures from 1980 SEC filings for 939 firms in order to assess the strength of relationships between the discount rate, inflation-adjusted ROA, profitability and risk. The researchers find that the percentage of plan assets invested in bonds is negatively related to both total size of plan and the proportion of unfunded liabilities (which we do not consider here).

In contrast, our results confirm and strengthen the conclusion of Amir and Benartzi (1998). In their study of Compustat data for 300 firms for the 1991-1994 period, the authors find that ERR and %Equity are related, but the relationship is rather weak. Specifically, Amir and Benartzi (1998) believe that “there should be a positive correlation between the percentage of equity in the fund and the disclosed ERR.” This reflects the risk-return trade-off, which is a cornerstone in finance theories: “firms with high equity exposure take relatively more risk and are expected to earn higher returns” (Amir and Benartzi, 1998).

Exhibit LXIX: Scatterplot of ERR vs. %Equity



The graph on the left illustrates the strength and direction of the relationship between ERR and %Equity. This finding is not per se groundbreaking because equity securities have historically earned on average higher return than fixed income instruments.

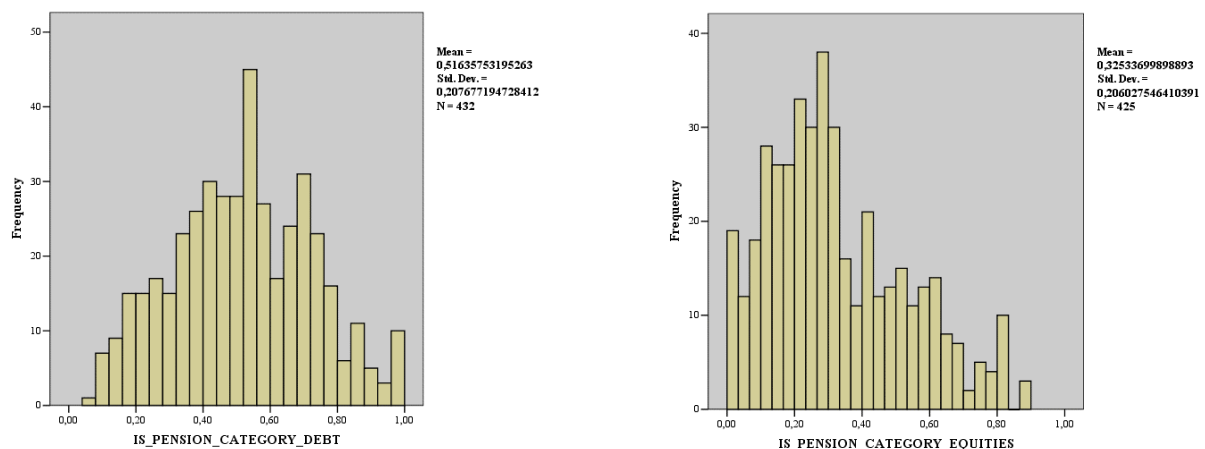
However, in the context the 2011 revised IAS 19 (which enacts the net interest approach and promotes the use of a single rate, in fact ERR needs to equal DR), our result shows that pension assets allocation is a crucial element of the sponsoring firm's strategy. As a matter of fact, in a separate working paper relating to a study of the 227 comment letters sent by interest parties to the IASB amidst the IAS 19 due process (which occurred between 2006 and 2011), Demaria, Dufour, Louisy-Louis and Luu (2012) reveal respondents' concerns about the single rate approach. The researchers point out that by applying a single rate to both the defined benefit obligation and plan assets the standard would in substance take away entities' ability to design a competitive and effective investment strategy. This view is echoed in the following citation extracted from CL26: *“even if the assets and obligations are presented on a net basis in the statement of financial position, they not do share the same characteristics nor are they measured on the same basis; entities do not invest in assets only to be rewarded by the time value of money.”*

In addition, Demaria et al. (2012) advance that by applying a discount rate based on market yields of high quality corporate bond rates, the standard eliminates the superior return expected from mixed investment portfolios that contain assets riskier than debt securities and thus ignores the fact that defined benefit obligations and plan assets are inherently different and therefore managed accordingly. Moreover, respondents have on several instances indicated that such a discount rate would likely force asset managers to shift their investment strategy and favor lower-return assets (such as government bonds). Ultimately, it appears that the main beneficiaries of pension plan, employees, are the ones who will be worst off. For example, this view is shared by the Vice President in Finance of a large US mobile phone company: *“requiring the use of a discount rate that is based on the current yield for high quality corporate bonds seems inconsistent with nature of the investment portfolios that we see in current benefit plan disclosures.”* (CL188)

Similarly, in a recent study about the “economic consequences of pension accounting,” Sandu (2012) provides a compelling description of the two main weaknesses in the “unique interest rate” approach: *So although not intended, the revised version of IAS 19 creates a difference in treatment between assets and liabilities: the liabilities are allowed to include expectations (through the actuarial assumptions made in determining the value of the projected liabilities) while the assets are assumed to grow in a deterministic manner (expected rates of return for assets are replaced by currently known interest rates). This makes assets and liabilities incomparable and a net interest income (interest cost minus asset growth) calculation unreliable. Furthermore, if accounting standards impose the use of the same interest rate for assets and liabilities, then it should not matter anymore if the investments are shared between stocks and fixed instruments as both will grow with the same rate in the profit and loss account of the company sponsoring DBs (although any extra return can be recognized in the other comprehensive income).* Sandu (2012)

The next graphs corroborate the idea that i) the pension asset allocation strategy is fundamental to sponsors and that ii) %Equity is a central element of this strategy.

Exhibits LXX and LXXI: Distribution of the percentage of pension assets invested in debt and equity

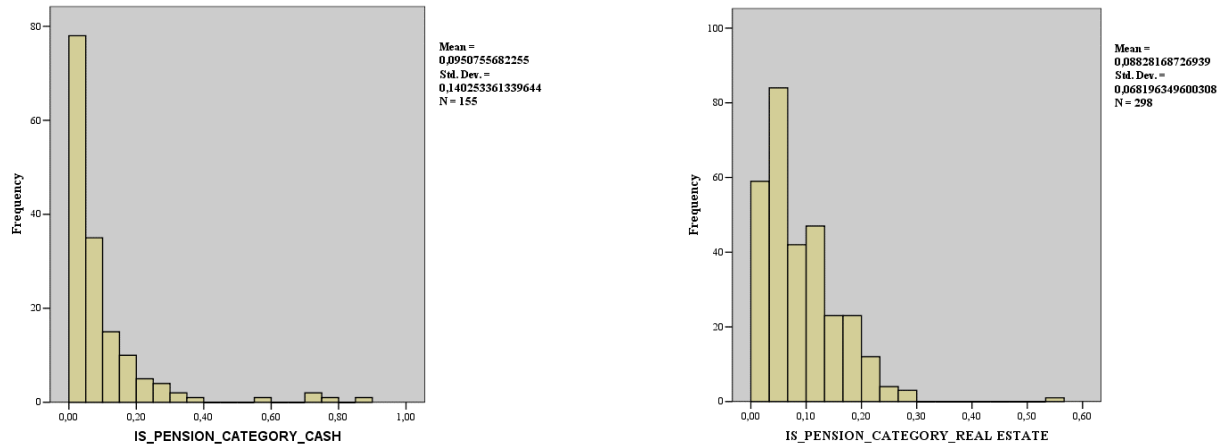


For instance, the above left graph shows that the distribution of %Debt is mostly symmetrical. Our previous time series analysis supports the fact that the weights assigned to the main asset classes are altered only slightly over the study period with debt and equity securities remaining pivotal to the asset allocation strategy (averaging respectively 51.6% and 32.5% between 2005 and 2011).

As a result, it appears that the decision to allocate pension assets to Real Estate and Cash (graphs shown below) is i) constrained by %Equity and %Debt and ii) appears opportunistic in some sense because a large portion of our sample firms invest in their own equity instruments and real estate investment portfolio. The below histograms indicate that allocations to Real Estate and Cash remain

small and at times marginal (distribution is highly left-skewed and averages for %RE and %Cash are respectively 8.8% and 9.5% over the study period).

Exhibits LXXII and LXXIII: Distribution of the percentage of pension assets invested in cash and real estate



To sum up this analysis of pension assets allocation, it appears that debt and equity instruments are central in the investment strategy, real estate and cash play a complementary role, and the allocation to various classes is adjusted by increments over time rather than drastically changed overnight (in line with Blankey and Swanson, 1995). However, based on the findings of Demaria *et al.* (2012), it seems difficult to predict how interest parties will react to the 2011 revised IAS 19.

Next we consider correlation patterns between our dependent variables and independent variables enrooted in NIT.

Exhibit LXXIV: Pearson correlations – Dependent variables vs. Coercive isomorphic pressures

		DR	ERR	Disc. ¹	Acct. ²	US Listing
DR	Pearson	1				
	Sig.					
	N	560				
ERR	Pearson	0.540**	1			
	Sig.	0.000				
	N	502	502			
Disc. ¹	Pearson	n/m	n/m	n/m		
	Sig.					
	N	559	501	589		
Acct. ²	Pearson	0.024	0.020	n/m	1	
	Sig.	0.569	0.647			
	N	559	501	589	589	
US Listing	Pearson	0.155**	0.184**	n/m	0.147	1
	Sig.	0.000	0.000		0.000	
	N	559	501	589	589	589

Notes: ** p < 0.01 and * p < 0.05 (2-tailed); ¹Disclosure rules are promulgated by the Supervisory Market Authority; ²Financial accounting rules are designed by an international standard-setter (IASB) and enforced by the European Commission

The above table in essence reveals that there is a weak, positive but significant relationship between DR/ERR and the fact that reporting entities have (or not) listed equity security(ies) on US financial markets. This supports an intuition previously developed when we discussed descriptive statistics. We disregard results relating to the Disclosure and Accounting variables because these remain nearly constant: there is no variation since all sample firms are subject to rules promulgated by supervisory market authorities and the IASB. The subtle change indicated above for the Accounting variable has to do with the fact that some companies have abandoned some local or international standards and started producing financial information prepared in accordance with IFRS during the study period (e.g. Deutsche Bank).

Exhibit LXXV: Pearson correlations – Dependent variables vs. Ownership structure

		DR	ERR	% Ins. Share.¹	% Top Share.²	% Float
DR	Pearson	1				
	Sig.					
	N	560				
ERR	Pearson	0.540**	1			
	Sig.	0.000				
	N	502	502			
% Ins. Share. ¹	Pearson	0.354**	0.183*	1		
	Sig.	0.000	0.013			
	N	190	182	193		
% Top Share. ²	Pearson	-0.065	-0.218**	-0.002	1	
	Sig.	0.162	0.000	0.983		
	N	466	428	178	483	
% Float	Pearson	0.125**	0.218**	-0.007	-0.649**	1
	Sig.	0.009	0.000	0.934	0.000	
	N	431	385	151	372	454

Notes: ** p < 0.01 and * p < 0.05 (2-tailed); ¹Percentage of equity capital controlled by institutional shareholders; ²Percentage of equity capital controlled by the largest shareholder

The above table implies that there is a small, positive and significant relationship between DR and the percentage of equity capital held by institutional shareholders and somehow a milder relationship between ERR and the same variable. Likewise, there seems to exist a similar relationship between DR/ERR and the percentage of free float but such a relationship appears weaker in magnitude. Interestingly, the table also suggests that there is a negative relationship between DR/ERR and the percentage of equity capital controlled by the largest shareholder. The relationship seems firmer and significant for the ERR variable. Our best intuition to explain such a discrepancy between % Ins. Share. and % Top Share. is that management would choose aggressive DR and ERR when pressure from institutional shareholders is significant and would in contrast opt for conservative rates when facing a single but powerful shareholder. In essence, the rationale for this behavior would be that accountability to a single and presumably vigilant shareholder is more coercive than a group of institutional shareholders most likely driven by the maximization of shareholder wealth.

Exhibit LXXVI: Pearson correlations – Dependent variables vs. Normative isomorphic pressures

		DR	ERR	CEO Post.¹	Chair. Post.²	CEO Other³	Chair. Other⁴
DR	Pearson	1					
	Sig.						
	N	560					
ERR	Pearson	0.540**	1				
	Sig.	0.000					
	N	502	502				
CEO Post. ¹	Pearson	-0.181**	-0.202**	1			
	Sig.	0.000	0.000				
	N	467	449	486			
Chair. Post. ²	Pearson	0.026	0.044	0.304**	1		
	Sig.	0.550	0.345	0.000			
	N	511	472	477	536		
CEO Other ³	Pearson	0.019	0.015	0.162**	0.050	1	
	Sig.	0.660	0.751	0.000	0.262		
	N	529	483	472	512	554	
Chair. Other ⁴	Pearson	0.158**	0.261**	0.046	0.059	0.261**	1
	Sig.	0.000	0.000	0.313	0.178	0.000	
	N	546	492	479	529	547	571

Notes: ** p < 0.01 and * p < 0.05 (2-tailed); ¹CEO holds post-graduate degree(s); ²Chairman holds post-graduate degree(s); ³CEO seats on other Board(s); ⁴Chairman seats on other Board(s);

From the above, we notice two interesting facts. First, it appears that both DR and ERR share a weak, negative but significant relationship with the education level of the firm CEO. We could cautiously interpret this inverse relationship by advancing that the top executive would adopt conservative rates assumption the more trained (and supposedly qualified) he or she is. In contrast, this rationale would imply that lower level of training would parallel the formulation of more aggressive pension accounting choices. Second, both DR and ERR appear correlated with the Chairman's propensity to seat and participate in the board activities of other firms. Curiously, compared to CEO's education level, both DR and ERR share a relationship with the independent variable which is similar in terms of magnitude and significance but in the opposite direction. As such, the above statistics suggests that firms would opt for higher discount rate and expected rate of return which would parallel the Chairman's participation in boards' activities. If these phenomena were further supported by our linear regression models this would substantiate NIT principles previously discussed.

Exhibit LXXVII: Pearson correlations – Dependent variables vs. Auditor

		DR	ERR	Aud1 ¹	Aud2 ²	Aud3 ³
DR	Pearson	1				
	Sig.					
	N	560				
ERR	Pearson	0.540**	1			
	Sig.	0.000				
	N	502	502			
Aud1 ¹	Pearson	-0.136**	-0.075	1		
	Sig.	0.001	0.094			
	N	559	501	589		
Aud2 ²	Pearson	0.108*	0.031	-0.316**	1	
	Sig.	0.011	0.486	0.000		
	N	559	501	589	589	
Aud3 ³	Pearson	0.071	-0.016	-0.313**	-0.426**	1
	Sig.	0.094	0.719	0.000	0.000	
	N	559	501	589	589	589

Notes: ** p < 0.01 and * p < 0.05 (2-tailed); ¹Ernst & Young; ²KPMG; ³PWC

When considering the changes in the dummy variables representing the *Big 4* auditing firms, it transpires that there is rather weak but relatively significant relationship between discount rate and the choice of the company's auditor. Again, we want to be cautious in analyzing this information. From the general description statistics provided at the beginning of this section, we learned that the four auditing groups provide services to European financial institutions almost in equal proportion (i.e. roughly 30% for KPMG and PWC while Deloitte and Ernst & Young manage each about 20%). As a result, it would not be judicious to state that the appointment of a given auditor would be associated with the formulation of conservative or aggressive rates assumptions. However, the above statistics suggests that the choice of the auditor would influence the pension accounting practices, especially given that Aud1 and Aud2 score Pearson correlation coefficients that are similar in magnitude but with opposite signs. Such an intuition would support presumptions formulated by Touron (2004, 2005) who highlights the potential conflict of interest inherent with the role of auditor (arguably there is a trade-off between complying with regulations and optimizing the impact of regulations on corporate activities and performance).

Exhibit LXXVIII: Pearson correlations – Dependent variables vs. Mimetic isomorphic pressures (Industry)

		DR	ERR	Industry¹
DR	Pearson	1		
	Sig.			
	N	560		
ERR	Pearson	0.540**	1	
	Sig.	0.000		
	N	502	502	
Industry ¹	Pearson	0.061	0.060	1
	Sig.	0.146	0.179	
	N	560	502	595

Notes: ** p < 0.01 and * p < 0.05 (2-tailed); ¹Industry groups are Banks and Insurance companies

The above table reports the Pearson correlation statistics between our dependent variables and the dummy variable Industry which takes value of 1 and 0 respectively for insurance companies and banks. It appears here that industry affiliation does not relate to or influence the choice of rates assumptions, which is a finding that corroborates an intuition we formulated earlier when examining statistics in the general description paragraphs at the beginning of this section.

Exhibit LXXIX: Pearson correlations – Dependent variables vs. Mimetic isomorphic pressures (Industry subgroup)

		DR	ERR	IS1 ¹	IS2	IS3	IS4	IS5	IS6	IS7	IS8
DR	Pearson	1									
	Sig.										
	N	560									
ERR	Pearson	0.540**	1								
	Sig.	0.000									
	N	502	502								
IS1 ¹	Pearson	-0.005	-0.008	1							
	Sig.	0.905	0.859								
	N	560	502	595							
IS2	Pearson	0.106*	0.169**	-0.044	1						
	Sig.	0.012	0.000	0.281							
	N	560	502	595	595						
IS3	Pearson	0.121**	0.102*	-0.112**	-0.030	1					
	Sig.	0.004	0.023	0.006	0.464						
	N	560	502	595	595	595					
IS4	Pearson	-0.025	0.003	-0.078	-0.021	-0.053	1				
	Sig.	0.553	0.947	0.059	0.611	0.199					
	N	560	502	595	595	595	595				
IS5	Pearson	-0.080	-0.159**	-0.195**	-0.053	-0.133**	-0.092*	1			
	Sig.	0.059	0.000	0.000	0.201	0.001	0.025				
	N	560	502	595	595	595	595	595			
IS6	Pearson	0.111**	0.128**	-0.090*	-0.024	-0.061	-0.043	-0.107**	1		
	Sig.	0.008	0.004	0.028	0.555	0.136	0.301	0.009			
	N	560	502	595	595	595	595	595	595		
IS7	Pearson	0.045	-0.107*	-0.044	-0.012	-0.030	-0.021	-0.053	-0.024	1	
	Sig.	0.287	0.017	0.281	0.772	0.464	0.611	0.201	0.555		
	N	560	502	595	595	595	595	595	595	595	
IS8	Pearson	-0.042	0.066	-0.078	-0.021	-0.053	-0.037	-0.092*	-0.043	-0.021	1
	Sig.	0.317	0.143	0.059	0.611	0.199	0.373	0.025	0.301	0.611	
	N	560	502	595	595	595	595	595	595	595	595

Notes: ** p < 0.01 and * p < 0.05 (2-tailed); ¹Industry subgroups are respectively Diversified Banking Institution, Insurance Brokers, Life/Health Insurance, Mortgage Banks, Multi-line Insurance, Property/Casualty Insurance, Regional Banks-Non US, Reinsurance

The above table displays Pearson correlation coefficients between DR/ERR and dummy variables taking values of 0 and 1 and capturing the variations between 4 bank subgroups and 5 insurance subgroups in which our sample financial institutions are classified (the reference variable missing above is Commercial Bank Non-US since coding dummy variables requires n-1 measurements). Obviously, the above statistics reveal weak but significant relationships between DR/ERR and IS2, IS3, IS5 and IS6. However, as previously explained, it would be incorrect to presume or link particular pension accounting practice with affiliation to a given sector. Nonetheless, we notice few curiosities. First, most of the significant coefficients are associated with insurance industry subgroups. Second, though coefficients across the line have the same absolute magnitude (i.e. roughly 0.100), they carry opposite signs between industry subgroups. Although we cannot at this stage interpret these observations, we can cautiously advance that affiliation to industry subgroup does relate to the choice of rates assumptions (though at a weak degree).

Exhibit LXXX: Pearson correlations – Dependent variables vs. Mimetic isomorphic pressures (Country)

		DR	ERR	C1 ¹	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
DR	Pearson	1																	
	Sig.																		
	N	560																	
ERR	Pearson	0.540**	1																
	Sig.	0.000																	
	N	502	502																
C1 ¹	Pearson	-0.053	-0.065	1															
	Sig.	0.215	0.145																
	N	560	502	595															
C2	Pearson	-0.463**	-0.331**	-0.062	1														
	Sig.	0.000	0.000	0.133															
	N	560	502	595	595														
C3	Pearson	0.121**	-0.025	-0.057	-0.097*	1													
	Sig.	0.004	0.582	0.163	0.018														
	N	560	502	595	595	595													
C4	Pearson	0.011	0.007	-0.037	-0.062	-0.057	1												
	Sig.	0.800	0.869	0.373	0.133	0.163													
	N	560	502	595	595	595	595												
C5	Pearson	-0.004	-0.157**	-0.057	-0.097*	-0.090*	-0.057	1											
	Sig.	0.928	0.000	0.163	0.018	0.029	0.163												
	N	560	502	595	595	595	595	595											
C6	Pearson	-0.035	0.009	-0.030	-0.050	-0.047	-0.030	-0.047	1										
	Sig.	0.409	0.845	0.470	0.223	0.257	0.470	0.257											
	N	560	502	595	595	595	595	595	595										
C7	Pearson	-0.133**	-0.137**	-0.062	-0.104*	-0.097*	-0.062	-0.097*	-0.050	1									
	Sig.	0.002	0.002	0.133	0.011	0.018	0.133	0.018	0.223										
	N	560	502	595	595	595	595	595	595	595									
C8	Pearson	0.374**	0.366**	-0.078	-0.131**	-0.121**	-0.078	-0.121**	-0.063	-0.131**	1								
	Sig.	0.000	0.000	0.059	0.001	0.003	0.059	0.003	0.125	0.001									
	N	560	502	595	595	595	595	595	595	595	595								
C9	Pearson	0.165**	-0.018	-0.043	-0.072	-0.067	-0.043	-0.067	-0.034	-0.072	-0.090*	1							
	Sig.	0.000	0.683	0.301	0.081	0.105	0.301	0.105	0.401	0.081	0.028								

	N	560	502	595	595	595	595	595	595	595	595	595							
C10	Pearson	0.103*	0.115**	-0.021	-0.035	-0.033	-0.021	-0.033	-0.017	-0.035	-0.044	-0.024	1						
	Sig.	0.015	0.010	0.611	0.392	0.426	0.611	0.426	0.680	0.392	0.281	0.555							
	N	560	502	595	595	595	595	595	595	595	595	595	595						
C11	Pearson	-0.066	-0.151**	-0.074	-0.124**	-0.116**	-0.074	-0.116**	-0.060	-0.124**	-0.156**	-0.086*	-0.042	1					
	Sig.	0.119	0.001	0.072	0.002	0.005	0.072	0.005	0.145	0.002	0.000	0.037	0.306						
	N	560	502	595	595	595	595	595	595	595	595	595	595	595					
C12	Pearson	0.091*	0.028	-0.021	-0.035	-0.033	-0.021	-0.033	-0.017	-0.035	-0.044	-0.024	-0.012	-0.042	1				
	Sig.	0.031	0.525	0.611	0.392	0.426	0.611	0.426	0.680	0.392	0.281	0.555	0.772	0.306					
	N	560	502	595	595	595	595	595	595	595	595	595	595	595	595				
C13	Pearson	0.162**	0.199**	-0.037	-0.062	-0.057	-0.037	-0.057	-0.030	-0.062	-0.078	-0.043	-0.021	-0.074	-0.021	1			
	Sig.	0.000	0.000	0.373	0.133	0.163	0.373	0.163	0.470	0.133	0.059	0.301	0.611	0.072	0.611				
	N	560	502	595	595	595	595	595	595	595	595	595	595	595	595	595			
C14	Pearson	-0.181**	0.112*	-0.048	-0.081*	-0.075	-0.048	-0.075	-0.039	-0.081*	-0.101*	-0.056	-0.027	-0.096*	-0.027	-0.048	1		
	Sig.	0.000	0.012	0.244	0.049	0.068	0.244	0.068	0.345	0.049	0.013	0.176	0.507	0.019	0.507	0.244			
	N	560	502	595	595	595	595	595	595	595	595	595	595	595	595	595	595		
C15	Pearson	0.130**	0.007	-0.037	-0.062	-0.057	-0.037	-0.057	-0.030	-0.062	-0.078	-0.043	-0.021	-0.074	-0.021	-0.037	-0.048	1	
	Sig.	0.002	0.877	0.373	0.133	0.163	0.373	0.163	0.470	0.133	0.059	0.301	0.611	0.072	0.611	0.373	0.244		
	N	560	502	595	595	595	595	595	595	595	595	595	595	595	595	595	595	595	
C16	Pearson	-0.171**	0.130**	-0.043	-0.072	-0.067	-0.043	-0.067	-0.034	-0.072	-0.090*	-0.049	-0.024	-0.086	-0.024	-0.043	-0.056	-0.043	1
	Sig.	0.000	0.003	0.301	0.081	0.105	0.301	0.105	0.401	0.081	0.028	0.229	0.555	0.037	0.555	0.301	0.176	0.301	
	N	560	502	595	595	595	595	595	595	595	595	595	595	595	595	595	595	595	

Notes: ** p < 0.01 and * p < 0.05 (2-tailed); ¹Countries are respectively Belgium, Switzerland, Germany, Denmark, Spain, Finland, France, Great Britain, Greece, Ireland, Italy, Jersey, Netherlands (The), Norway, Portugal, and Sweden

Similarly to the investigation relating to industry subgroups, the above table establishes stronger and significant relationships between DR/ERR and variations in country of incorporation where highest Pearson coefficients are associated with C2, C7, C8, C13, C14 and C16. Again we notice alternatively positive and negative relationships between dependent and independent variables. For the same reason explained previously, at this stage we conceive that the country of incorporation may relate to or influence the choice of rates assumptions. Further examination of appropriate statistics should help us explicate the nature of such a relationship.

Exhibit LXXXI: Pearson correlations – Dependent variables vs. Internationalization

		DR	ERR	% Forg. Sales¹	% Forg. Assets²
DR	Pearson	1			
	Sig.				
	N	560			
ERR	Pearson	0.540**	1		
	Sig.	0.000			
	N	502	502		
% Forg. Sales ¹	Pearson	0.151**	0.161**	1	
	Sig.	0.001	0.001		
	N	482	432	504	
% Forg. Assets ²	Pearson	0.104*	0.083	0.850**	1
	Sig.	0.049	0.126	0.000	
	N	362	338	364	382

Notes: ** p < 0.01 and * p < 0.05 (2-tailed); ¹Percentage of foreign sales; ²Percentage of foreign assets

The final table devoted to the analysis of correlation patterns reveals a positive, weak but significant relationship between DR/ERR and the notion of internationalization as defined by El-Gazzar et al. (1999), Judge et al. (2010) and many others. Such a positive relationship between DR/ERR and the percentage of sales generated outside the domestic territory suggests that as firms gain exposure to international markets they tend to adopt more aggressive pension accounting assumptions. In light of prior literature (especially Touron, 2004, 2005), this could mean that firms attempt to emulate global and successful peers, seek to respond to competitive pressures by raising their financial profile (in the eyes of international stakeholders, notably clients), or enhance their financial profile as a means of attracting capital.

2.4: Linear regression models

In this section, we run linear regression analyses to determine whether the variables identified through the literature review influence the choice of the discount rate and the expected rate of return used in the accounting of defined benefit pension plans. Put in simple words, a multiple regression protocol will help us model the influence and causal relationship (a step further than the previous correlation analyses) that identified independent variables (also called predictors) exert on our dependent (or response) variables. The model would take the form of the below general equations:

$$DR = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \dots + \varepsilon$$

$$ERR = \alpha' + \beta'_1 X'_1 + \beta'_2 X'_2 + \beta'_3 X'_3 + \beta'_4 X'_4 + \dots + \varepsilon$$

where:

- DR and ERR are the dependent variables of interest,
- $X_1, X_2 \dots$ etc. represent the set of independent variables
- α and α' are the intercepts or the theoretical values that the response variable takes when all independent variables exert no influence on it
- $\beta_1, \beta_2 \dots$ etc. represent the coefficients or slopes that permit to quantify the strength and direction that a one-unit change in the corresponding independent variable would cause on the dependent variable
- ε represents the error term (or noise) which captures the average distance between values predicted by the model (and graphically represented by the best-fit line) and observed

The use of linear regression methods requires that i) “the relationship between dependent and independent variables is linear,” ii) there is a reasonable degree of homoscedasticity (i.e. dependent and independent variables display equal variances), iii) there is no significant level of multicollinearity (i.e. high collinearity between two or more independent variables), and iv) dependent and independent variables are normally distributed (Saunders *et al.*, 2012). As discussed at the beginning of this chapter, we have generated scatterplots and histograms to appreciate distribution, performed correlation analyses, displayed the distribution of residuals, and checked for multicollinearity (as recommended by Saunders *et al.* (2012), the variance inflation factor (or VIF) for our variables are kept at satisfactory low levels, when a score of 10 indicates significant level of multicollinearity). Having satisfied these conditions, we present and discuss our results below. It is worthy to point, however, that the findings discussed below are the result of a systematic iterative process in which we have sought to optimize the explanatory power and statistical significance of the model while mitigating the effects of multicollinearity. As such, we have tested various combinations between dependent and independent variables while controlling for size and/or industry as recommended by prior literature (Picconi, 2006). Lastly, such a protocol has also contributed in improving the robustness of our findings. We present here for both DR and ERR two models: a base

model and a parsimonious model (in which multicollinearity is the most constraining criteria in the analysis).

Exhibit LXXXII: Base linear regression model – Discount rate

	DR	β	SE	Stand. Beta	t	Sig.	VIF
PAT	Intercept	1.308	1.306		1.001	0.321	
	ROE (5-yr avg.)	0.045	0.014	0.369	3.167	0.003**	1.960
	Bonus	1.052	0.397	0.327	2.649	0.011*	2.194
	LogCFO	0.161	0.139	0.153	1.157	0.253	2.512
	FR	1.362	0.541	0.360	2.519	0.015*	2.949
	% Debt	-0.519	0.592	-0.105	-0.877	0.385	2.055
	Pension Item(s)/PBT	-0.065	0.031	-0.222	-2.117	0.039*	1.584
NIT	US Listing	0.847	0.290	0.314	2.917	0.005**	1.674
	% Ins. Share.	0.002	0.009	0.028	0.249	0.804	1.761
	% Top Share.	0.002	0.006	0.044	0.335	0.739	2.429
	CEO Post.	-0.330	0.258	-0.178	-1.278	0.207	2.791
	Aud1	-1.339	0.266	-0.540	-5.038	0.000***	1.656
	Aud2	-0.148	0.271	-0.070	-0.546	0.588	2.367
	IS3	0.375	0.396	0.097	0.947	0.348	1.504
	IS6	0.952	0.393	0.296	2.422	0.019*	2.151
	IS7	0.478	0.528	0.137	0.905	0.370	3.291
	% Forg. Sales	-0.038	0.481	-0.009	-0.078	0.938	2.101
R	0.808		F	5.891			
R ²	0.653		Sig.	0.000			
Adjusted R ²	0.542						

Notes: *** p < 0.001, ** p < 0.01, and * p < 0.05

A systematic analysis of the above output from left to right reveals interesting facts. First, if we disregard the intercept at this stage (as it often reveals to be not a meaningful metric in practice), β coefficients (or slopes) are small in absolute value (0 to roughly 1.4), which does not necessarily mean that independent variables do not significantly influence the choice of the discount rate. For example, recall that Bonus is a dummy variable taking the value of 1 when the firm sponsors share-based schemes that match our research criteria. Here a positive coefficient of 1.052 suggests that when a firm offers the required type of compensation to top management, the discount rate used in pension accounting tends to rise by 1.05%. Recall that in pension accounting, a slight change in rates assumptions can have significant repercussions on the balance sheet since DR and the present value of defined pension obligation are inversely proportional. Following this rationale, all positive coefficient shown above would mean that management adopt higher discount rates and would mechanically cause reported pension obligation to fall. This is the case for the funding ratio and marginally for whether a firm is listed in the US: a one percent increase in FR causes DR to rise by nearly 1.4% while US listing causes an increase of roughly 85 bps.

Obviously, independent variables that carry negative signs have the reverse impact on DR. For instance, a β coefficient of -0.519 for % Debt suggests that when the percentage of pension assets

allocated to debt instruments increase by 1% DR drops by nearly 52 bps. This implies reported pension obligation would rise. The analysis is similar for the variables accounting for CEO's level of education and the choice of auditor. When a firm CEO holds a post-graduate degree the entity tends to choose DR lower on average by 33 bps compared to when CEO does not hold the same type of degree. The rationale here would be to minimize reported DR which mechanically causes pension obligation to rise. The analysis is even more subtle when considering the auditor variables. Recall Aud1, Aud2 and Aud3 are dummy variables representing respectively Ernst & Young, KPMG, and PWC while the reference variable (coded 0) is Deloitte. As such, from the above table we learn that when a firm appoints Ernst & Young (Aud1), the firm tends to choose DR which is lower on average by 1.3% than if the firm had appointed Deloitte. Likewise, if the auditor is KPMG (Aud2) DR would be lower by about 15 bps compared to Deloitte. This analysis supports our earlier intuition that the choice of auditor does matter.

In the next column, the standard error term (or SE) represents the standard deviation in each β coefficient. As such, SE quantifies the variability in the predicted coefficient across cases. The column displays relatively small values in absolute terms but again we examine here influences that independent variables may have on DR which is measured in percentage points. We will better appreciate the impact of the standard error when we consider the column showing t-statistic (which equals to the β coefficient divided by the standard error).

Next, the values shown in the standardized coefficients (beta) column helps quantify the overall impact of each predictor on the discount rate. In terms of decreasing order the variables Aud1, 5-year average ROE, FR, Bonus and US listing are the ones that are the most influential on DR.

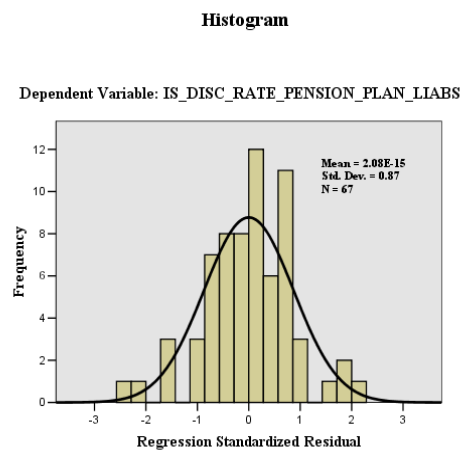
Now that we have somehow quantified the strength of the relationships between independent and dependent variables, it is necessary to question the validity of this relationship. The information contained in the t-statistic and p-value columns helps ascertain whether the anticipated relationship is statistically significant. The underlying principle behind the t-statistic is to measure if we can comfortably reject the null hypothesis which states that the β coefficient is equal to zero. The lower the p-value, the less likely that results are the outcome of pure chance, the higher the likelihood that we can safely reject the null hypothesis and affirm that a true relationship exists between our study variables. Having said this, we find a relationship between DR and predictors that is statistically:

- significant with Bonus, Funding ratio, Pension item(s)/PBT and IS6 (i.e. Property/Casualty Insurance),
- very significant with 5-year average ROE and US listing, and
- highly significant with Aud1 (i.e. Ernst & Young)

Consequently, these statistics are compelling and strong enough to help confirm or reject some or all of the research hypotheses we derived from the literature (we perform a detailed review of our findings and practical implications in the next section). Additionally, the "goodness of fit" statistics

including R^2 and adjusted R^2 are also helpful. Notably, the R^2 score implies that in our model roughly 65.3% of the variations in the discount rate are explained by variations in the independent variables. Lastly, the F statistic and sig. score enhance the statistical significance of our model (as we can reject the null hypothesis that predicts that all β coefficients are null). The residual plot shown below, which helps ascertain the assumption of equal variance for a linear regression to hold (in other words homoscedasticity), further evidences the coherence of our model. In this case, standardized residuals (i.e. residual divided by an estimate of its standard deviation) are fairly normally distributed.

Exhibit LXXXIII: Base linear regression model – Discount rate (homoscedasticity test)



Lastly, the far-right column in our linear regression statistical output displays VIF statistics which help gauge the level of multicollinearity in the model. In our case, scores range from 1.5 to 3.2 which meets the recommendations of Saunders *et al.* (2012). Nonetheless, we sought to further minimize multicollinearity and did run a parsimonious model whose statistics are shown next.

Exhibit LXXXIV: Parsimonious linear regression model – Discount rate

	DR	β	SE	Stand. Beta	t	Sig.	VIF
PAT	Intercept	2.363	0.477		4.955	0.000	
	ROE (5-yr avg.)	0.028	0.009	0.198	3.006	0.003**	1.144
	Bonus	0.903	0.212	0.316	4.258	0.000***	1.446
	LogCFO	0.220	0.083	0.205	2.635	0.009**	1.587
	FR	0.611	0.243	0.172	2.513	0.013*	1.236
	% Debt	-0.326	0.336	-0.069	-0.970	0.334	1.316
	Pension Item(s)/PBT	-0.075	0.031	-0.157	-2.462	0.015*	1.064
NIT	US Listing	0.372	0.216	0.116	1.720	0.087	1.199
	CEO Post.	-0.438	0.128	-0.235	-3.424	0.001**	1.241
	Aud1	-0.580	0.166	-0.249	-3.497	0.001**	1.327
	Aud2	-0.022	0.145	-0.011	-0.151	0.880	1.452
	IS3	0.454	0.206	0.142	2.199	0.029*	1.090
	IS6	0.734	0.252	0.229	2.915	0.004**	1.621
	% Forg. Sales	-0.079	0.234	-0.023	-0.337	0.736	1.224
R	0.571		F	6.587			
R ²	0.326		Sig.	0.000			
Adjusted R ²	0.277						

Notes: *** p < 0.001, ** p < 0.01, and * p < 0.05

In this so-called parsimonious model we have identified an optimal combination of independent variables that preserve the statistical significance of the model (with satisfactory F statistic and sig. score) and VIF scores kept below 1.6. Yet, this result came at the expense of the explanatory power of the model since R² is nearly halved from 65.3% to 32.6%. Essentially, we have removed from the base model variables that poorly contributed to model in terms of strength but scored high on the VIF scale: % Ins. Share., % Top Share. and IS7. Overall, β coefficients have weakened and maintained their sign at the exception of CEO Post. and IS3 whose β coefficient have increased in magnitude. For example, when a firm CEO holds a post-graduate degree the entity now tends to choose DR lower on average by nearly 44 bps. Besides, the statistical significance of the overall model improves since we find a relationship between DR and predictors that is statistically:

- significant with Funding ratio, Pension item(s)/PBT and IS3 (i.e. Life/Health Insurance),
- very significant with 5-year average ROE, LogCFO, CEO Post., Aud1 and IS6 (i.e. Property/Casualty Insurance), and
- highly significant with Bonus

Finally, in line with the base case, the parsimonious model meets the homoscedasticity requirement since standardized residuals appear slightly better normally distributed as shown below:

Exhibit LXXXV: Parsimonious linear regression model – Discount rate (homoscedasticity test)

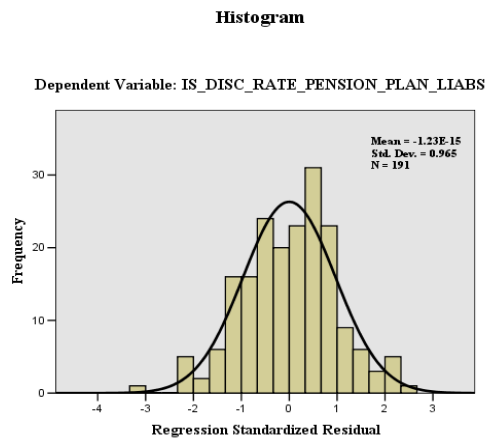


Exhibit LXXXVI: Base linear regression model – Expected rate of return

	ERR	β	SE	Stand. Beta	t	Sig.	VIF
PAT	Intercept	2.347	1.360		1.726	0.090	
	ROE (5-yr avg.)	0.030	0.015	0.222	2.014	0.049*	1.960
	Bonus	-0.138	0.413	-0.039	-0.334	0.740	2.194
	LogCFO	0.202	0.144	0.175	1.398	0.168	2.512
	FR	2.259	0.563	0.544	4.014	0.000***	2.949
	% Debt	-1.428	0.616	-0.262	-2.317	0.025*	2.055
	Pension Item(s)/PBT	-0.022	0.032	-0.067	-0.677	0.501	1.584
NIT	US Listing	0.720	0.302	0.243	2.383	0.021*	1.674
	% Ins. Share.	0.008	0.010	0.086	0.818	0.417	1.761
	% Top Share.	-0.002	0.007	-0.042	-0.343	0.733	2.429
	CEO Post.	-0.210	0.269	-0.103	-0.783	0.437	2.791
	Aud1	-0.718	0.277	-0.263	-2.596	0.012*	1.656
	Aud2	-0.720	0.282	-0.310	-2.555	0.014*	2.367
	IS3	0.065	0.412	0.015	0.157	0.876	1.504
	IS6	0.449	0.409	0.127	1.098	0.277	2.151
	IS7	-0.045	0.550	-0.012	-0.081	0.936	3.291
	% Forg. Sales	-0.165	0.501	-0.038	-0.330	0.743	2.101
	R	0.830		F	6.927		
	R ²	0.689		Sig.	0.000		
	Adjusted R ²	0.590					

Notes: *** p < 0.001, ** p < 0.01, and * p < 0.05

Similarly to the analysis performed for DR, we examined the linear regression statistic output produced for ERR from left to right. In this model we use the same variables that comprise the DR models. Overall, β coefficients range from -0.720 to 2.259. At the lowest range, a β coefficient of -0.720 indicates that when a firm chooses to work with KPMG, ERR tends to be on average 72 bps lower than if the firm had appointed Deloitte. At the other extreme, a β coefficient of 2.259 reveals that a one percent increase in the funding ratio leads to a nearly 2.26% jump in the ERR disclosed by the financial institution. Likewise the DR base model, all variables carry the same sign at the

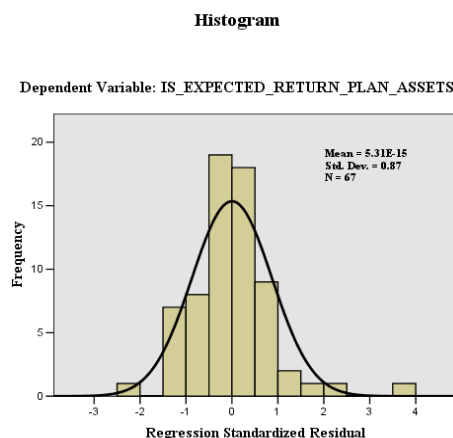
exception of Bonus which is weaker in terms of magnitude. Here, a β coefficient of -0.138 implies that when a firm offers the required type of compensation to top management, the expected rate of return used in pension accounting tends to fall by almost 14 bps. If confirmed, such a phenomenon would contradict the assumption that managers are driven by their own utility because an increase in ERR leads mechanically to higher reported pension income and thus higher earnings *ceteris paribus*. Next, we skip the SE column since it does not bring much to the analysis and consider the standardized coefficients (beta). We notice that the most influential variables (in regards with ERR) are in decreasing order Funding ratio, Aud2, Aud1, % Debt, US listing and 5-year average ROE (in terms of absolute value). In addition to Aud2 and % Debt, we find the same variables identified for DR.

In terms of statistical significance, we remark a relationship between ERR and independent variables that is statistically:

- significant with 5-year average ROE, % Debt, US listing, Aud1 and Aud2, and
- highly significant with Funding ratio

This supports the findings from the β coefficients and standardized coefficients columns since Funding ratio appears as the most influential predictor in the ERR base model. Again, we review in details these results and their practical implications in the next section. In terms of explanatory power, the model yields a satisfactory level since R^2 and adjusted R^2 values are respectively 68.9% and 69.0% which is slightly better than the DR base model. F statistic and sig. score have also confirmatory value about the significance of the model. Lastly, the residual plot shown below also confirms that the model meets the homoscedasticity requirement.

Exhibit LXXXVII: Base linear regression model – Expected rate of return (homoscedasticity test)



The far-right column in the linear regression statistical output displays VIF scores ranging from 1.5 to 3.3. Although we find these values acceptable across the line, we ran a parsimonious model in order to further reduce the impact of multicollinearity.

Exhibit LXXXVIII: Parsimonious linear regression model – Expected rate of return

	ERR	β	SE	Stand. Beta	t	Sig.	VIF
PAT	Intercept	2.546	0.515		4.946	0.000	
	ROE (5-yr avg.)	0.032	0.010	0.193	3.242	0.001**	1.145
	Bonus	0.177	0.232	0.051	0.764	0.446	1.447
	LogCFO	0.360	0.090	0.283	4.015	0.000***	1.602
	FR	1.192	0.260	0.283	4.584	0.000***	1.234
	% Debt	-1.290	0.364	-0.228	-3.543	0.001**	1.334
	Pension Item(s)/PBT	-0.025	0.033	-0.044	-0.771	0.442	1.066
NIT	US Listing	0.745	0.232	0.196	3.218	0.002**	1.200
	CEO Post.	-0.533	0.137	-0.240	-3.886	0.000***	1.238
	Aud1	0.018	0.178	0.006	0.101	0.920	1.329
	Aud2	-0.042	0.156	-0.018	-0.268	0.789	1.448
	IS3	0.539	0.221	0.142	2.443	0.016*	1.090
	IS6	1.016	0.270	0.267	3.764	0.000***	1.628
	% Forg. Sales	0.306	0.252	0.075	1.216	0.226	1.217
R	0.675		F	11.317			
R ²	0.455		Sig.	0.000			
Adjusted R ²	0.415						

Notes: *** p < 0.001, ** p < 0.01, and * p < 0.05

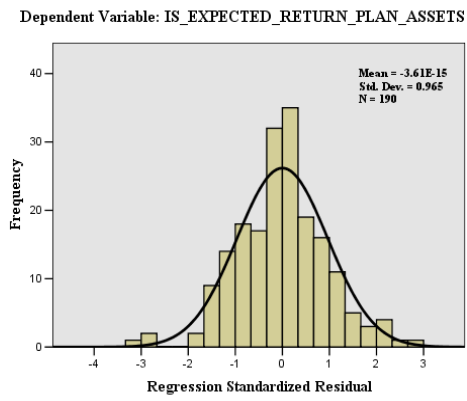
In line with the protocol used in the analysis of DR, we removed the same variables that brought little contribution to the model in terms of strength or significance. In terms of magnitude, Funding ratio remains is the most impactful variable, followed by IS6 and % Debt. Standardized coefficients indicate, however, that LogCFO and FR are equally important as well as % Debt and CEO Post. Additionally, significance levels have increased since we find a relationship between ERR and predictors that is statistically:

- significant with IS3,
- very significant with 5-year average ROE, % Debt, and US listing, and
- highly significant with LogCFO, Funding ratio, CEO Post., and IS6

Finally, in line with the base case, the parsimonious model meets the homoscedasticity requirement since standardized residuals appear almost perfectly normally distributed as shown below:

Exhibit LXXXIX: Parsimonious linear regression model – Expected rate of return (homoscedasticity test)

Histogram



2.5: GLM univariate analysis

Arguably, through the preceding linear regression models, we have analyzed data pertaining to reporting companies from a cross sectional perspective, which is in line with numerous studies of the determinants of pension accounting choices. However, if we observe data relating to reporting entities over time we can appreciate the dynamic aspect of pension accounting choices. In other words, adopting a longitudinal approach (i.e. a panel data analysis methodology) would allow us to observe reporting entities over time and thus help gauge both the longitudinal and cross-sectional aspects of pension accounting practices. Although a widely appreciated methodology, panel data analysis carries some limitations that we acknowledge (in particular endogeneity, heterogeneity and the omitted variable bias)⁶⁶. We account in particular for heterogeneity by using entity fixed effects and time fixed effects to control respectively for unobserved variables that differ from one entity to the next but are constant over time and that are the same across entities but differ over time (Stock and Watson, 2003, p. 290). In other words, when using company fixed effects, we posit that some characteristics inherent to companies may affect or bias the relationship between dependent and independent variables. Company fixed effects allow to control for these undesired phenomena. Under such a rationale, the general regression equation is altered to incorporate a constant (in fact one intercept for each entity) because the unobserved characteristic that varies from one entity to the next remains constant over time. The general regression equation becomes:

$$DR_{it} = \alpha_i + \beta_1 X_{it} + \varepsilon$$

where:

- DR_{it} represents the dependent variable of interest,
- X_{it} represents a particular independent variable,
- α_i represents an intercept for each entity that comprises the model,
- β_1 represents the coefficient that permits to quantify the strength and direction that a one-unit change in the corresponding independent variable would cause on the dependent variable
- ε represents the error term
- $i = 1, \dots, N$ and $t = 1, \dots, T$ represent each entity observed at a given point in time

In practice, company fixed effects can be accounted for in a model by including dummy variables for $n-1$ companies. A similar rationale is adopted when one seeks to control for unobserved variables that are identical across companies but vary over time (leading to the use of time fixed effects).

⁶⁶ Endogeneity occurs when variables are correlated with the error term and the omitted variables bias occurs when meaningful variables are left out of a model leading to over or under-compensate for these missing variables. Ultimately, the risk is to create a loop of causality in the model.

In contrast to fixed effects, the concept of random effects implies that the unobserved phenomena described above are random and uncorrelated with the model's independent variables. The main difficulty with random effects is the requirement to indicate in the model the individual characteristics that possibly affect the relationship between dependent and independent variables. The dilemma is that certain variables may not be readily available thus introducing the so-called omitted variable bias in the model.

In the context of our study we make the assumption that unobserved characteristics are inherent to individual reporting entities on the ground that entities are fundamentally different and pursue activities to achieve their own set of strategic goals. Such goals may appear similar across companies, sectors, industries or countries (e.g. capture market share or raise dividend payment over time) but companies fundamentally use different means to reach their goals by taking into accounts their strengths and weaknesses, know-how, human capital, and so on. Likewise, we argue that unobserved characteristics that are the same across firms may vary over time when for example common accounting or solvency rules change over time and affect corporate activities. In consequence, we believe that it is appropriate to perform a set of panel data analyses by taking into account company and time fixed effects while discarding random effects since they are not justified at this stage.

In the SPSS package, the General Linear Model (or GLM) function is the simplest tool designed for panel data analysis. In fact, the GLM univariate protocol permits to perform regression analysis and analysis of variance for one dependent variable in function of one or more factors and/or variables. We discuss our main results in the next paragraphs.

Exhibit XC: Panel data analysis – Discount rate (company fixed effects)

	Source	Type III Sum of Squares	df	Mean Square	F	Sig.
PAT	Corrected Model	52.333	34	1.539	9.369	0.000
	Intercept	1.573	1	1.573	9.573	0.003
	ROE (5-yr avg.)	0.751	1	0.751	4.569	0.038*
	Bonus	0.519	1	0.519	3.161	0.083
	LogCFO	0.111	1	0.111	0.673	0.416
	FR	0.654	1	0.654	3.984	0.052
	% Debt	0.270	1	0.270	1.642	0.207
NIT	US Listing	0.313	1	0.313	1.905	0.175
	% Ins. Share.	0.330	1	0.330	2.010	0.163
	%Top Share.	0.064	1	0.064	0.391	0.535
	CEO Post.	0	0	.	.	.
	Aud1	0	0	.	.	.
	Aud2	0	0	.	.	.
	Forg. Sales	0.004	1	0.004	0.022	0.882
	Company	21.887	22	0.995	6.056	0.000
	Error	7.064	43	0.164		
	Total	1,930.230	78			
	Corrected Total	59.398	77			
	R ²	0.881				
	Adjusted R ²	0.787				

Notes: *** p < 0.001, ** p < 0.01, and * p < 0.05

The statistical output generated by SPSS in relation to panel data analysis presents similarities with the linear regression statistical output. Above, the source column identifies the independent variables previously used and that are considered as sources of variation for the dependent variable. The variation in the dependent variable referred to as corrected total further breaks into corrected model and error. The type III method (which contrasts with methods named I through IV in SPSS) helps compute the sums of squares of an effect in the design as the sums of squares, adjusted for any other effects that do not contain the effect (*Source: ibm.com, 2014*). The choice between methods is mainly relevant depending on whether the panel is balanced or unbalanced. Here, we use the default type III method. Furthermore, we remark that 5-year average ROE, Funding ratio, and Bonus are the predictors that account for the largest portion of variation in DR.

Next, df (degrees of freedom relating to corresponding sources of variance) and Mean Square provide information about the characteristics of our study sample. Lastly, F value and p-value indicate the statistical significance of the relationship between DR and independent variables. The F-value tests the null hypothesis that states that the model does not explain the variance observed in the independent variable. The lower the p-value, the more safely we can reject the null hypothesis. In the context of our study, only the variance explained by the 5-year average ROE is statistically significant. Funding ratio is not quite significant though close to the 0.05 threshold.

Lastly, R² indicates the overall quality of the model as it shows the proportion of the total variance explained in the model. Here, R² equals to 0.881 meaning that the model explains 88.1% of the

variance observed in DR. This finding is compelling as it further confirms the coherence of the model following results of the linear regression models.

Exhibit XCI: Panel data analysis – Expected rate of return (company fixed effects)

	Source	Type III Sum of Squares	df	Mean Square	F	Sig.
PAT	Corrected Model	64.832	34	1.907	10.089	0.000
	Intercept	0.134	1	0.134	0.707	0.405
	ROE (5-yr avg.)	0.342	1	0.342	1.810	0.186
	Bonus	0.121	1	0.121	0.642	0.428
	LogCFO	0.446	1	0.446	2.361	0.132
	FR	0.003	1	0.003	0.014	0.906
	% Debt	0.135	1	0.135	0.716	0.402
NIT	US Listing	0.070	1	0.070	0.372	0.545
	% Ins. Share	0.065	1	0.065	0.343	0.561
	%Top Share.	0.117	1	0.117	0.619	0.436
	CEO Post.	0	0	.	.	.
	Aud1	0	0	.	.	.
	Aud2	0	0	.	.	.
	Forg. Sales	0.000	1	0.000	0.002	0.969
	Company	19.877	22	0.903	4.780	0.000
	Error	8.127	43	0.189		
	Total	2,182.365	78			
	Corrected Total	72.959	77			
	R ²	0.889				
	Adjusted R ²	0.801				

Notes: *** p < 0.001, ** p < 0.01, and * p < 0.05

Similarly to DR, we run the same GLM protocol for ERR. LogCFO and 5-year average ROE are the predictors that account for the largest share of the variance observed in ERR but these values are lower than for DR. In addition, none of the predictors appear to exert an impact on ERR that is statistically significant. However, the overall model seems solid since R² reaches nearly 90.0%. In both cases, company fixed effects have led to the improvement of the goodness of the model since R² significantly increased compared to results obtained from the linear regression analyses. As suggested earlier, a set of unobserved characteristics that change over time but not across companies may influence the choice of DR and ERR. The literature often attributes these characteristics that cannot be captured in annual reports nor in databases to factors such as corporate culture, human behavior, practices, unwritten rules, norms, agreements, regulations, and so on. Next, we consider time fixed effects.

Exhibit XCII: Panel data analysis – Discount rate (time fixed effects)

	Source	Type III Sum of Squares	df	Mean Square	F	Sig.
PAT	Corrected Model	40.050	18	2.225	6.785	0.000
	Intercept	4.959	1	4.959	15.123	0.000
	ROE (5-yr avg.)	0.617	1	0.617	1.881	0.175
	Bonus	0.742	1	0.742	2.262	0.138
	LogCFO	1.090	1	1.090	3.325	0.073
	FR	3.050	1	3.050	9.302	0.003**
	% Debt	0.214	1	0.214	0.654	0.422
NIT	US Listing	4.225	1	4.225	12.885	0.001**
	% Ins. Share	0.001	1	0.001	0.002	0.961
	%Top Share.	0.115	1	0.115	0.350	0.556
	CEO Post	0.884	1	0.884	2.695	0.106
	Aud1	15.259	1	15.259	46.531	0.000***
	Aud2	1.387	1	1.387	4.230	0.044*
	Forg. Sales	0.334	1	0.334	1.018	0.317
	year	9.604	6	1.601	4.881	0.000
	Error	19.347	59	0.328		
	Total	1,930.230	78			
	Corrected Total	59.398	77			
	R ²	0.674				
	Adjusted R ²	0.575				

Notes: *** p < 0.001, ** p < 0.01, and * p < 0.05

The above table indicates Aud1 (by far), US listing, Funding ratio, Aud2 and LogCFO are the most important sources of variation in DR when using time fixed effects. The p-values show that the variance explained by Forg. Sales, Funding ratio and US listing and lastly Aud1 are respectively statistically significant, very and highly significant. Nonetheless, the overall model yields a lower R² of 67.4% compared with 88.1% recorded in the company fixed effects model.

Exhibit XCIII: Panel data analysis – Expected rate of return (time fixed effects)

	Source	Type III Sum of Squares	df	Mean Square	F	Sig.
PAT	Corrected Model	51.344	18	2.852	7.786	0.000
	Intercept	1.649	1	1.649	4.500	0.038
	ROE (5-yr avg.)	1.283	1	1.283	3.501	0.066
	Bonus	0.583	1	0.583	1.592	0.212
	LogCFO	2.106	1	2.106	5.748	0.020*
	FR	15.271	1	15.271	41.683	0.000***
	% Debt	2.868	1	2.868	7.829	0.007**
NIT	US Listing	1.318	1	1.318	3.598	0.063
	% Ins. Share	0.768	1	0.768	2.098	0.153
	%Top Share.	0.242	1	0.242	0.662	0.419
	CEO Post	0.001	1	0.001	0.002	0.966
	Aud1	2.912	1	2.912	7.949	0.007**
	Aud2	5.054	1	5.054	13.794	0.000***
	Forg. Sales	0.008	1	0.008	0.021	0.886
	year	6.389	6	1.065	2.907	0.015
	Error	21.614	59	0.366		
	Total	2,182.365	78			
	Corrected Total	72.959	77			
	R ²	0.704				
	Adjusted R ²	0.613				

Notes: *** p < 0.001, ** p < 0.01, and * p < 0.05

The final statistical output denotes that Funding ratio (by far), Aud2, Aud1, % Debt, LogCFO and US listing are the main sources of variation in ERR. P-values corroborate these observations since the variance explained by Funding ratio and Aud2 are statistically highly significant, % Debt and Aud1 are statistically very significant and LogCFO is statistically significant. The R² score is smaller than for the company fixed effects model but reaches a satisfactory 70.4%.

Although not yielding R² as large as those produced by the company fixed effects models, time fixed models for both DR and ERR support our earlier intuition. Indeed, the choice of rates assumptions appear influenced by unobserved factors that are the same across entities but vary over time. In practice, these factors could embody unexpected changes in corporate life or special events that affect the pension accounting policy such as a radical shift in regulation, beneficiaries' aspirations, pension instruments, and so forth.

Overall, the results of the panel data analysis confirm earlier results derived from the linear regression models since the “goodness of fit” statistics show satisfactory R². In addition, when we control for company and year fixed effects are results and intuitions are comforted in terms of the direction of the relationships though statistical significance varies (this certainly relates to the unobserved characteristics that we argue about, both in relation to company specific characteristics and special events).

3: DISCUSSION OF FINDINGS

As demonstrated in the preceding pages, the statistical treatment of various sets of characteristics relating to our sample of European financial institutions has allowed us to unearth interesting facts, phenomena and relationships among dependent and independent variables. The analysis structured successively around descriptive statistics, correlation patterns and regression models helped us develop intuitions about the practical meaning of this statistical information. Over the next paragraphs, we propose to systematically review this information by comparing it to the research hypotheses and establishing meaningful links between theoretical and empirical concepts.

3.1: Theoretical and empirical implications

Overall, results support the belief that the choice of discount rate and expected rate of return is influenced by financial-related factors (as envisioned by PAT) and institutional pressures (as predicted by NIT). In particular, our econometrics model provides confirmatory value to most of our research hypotheses. In some instances, findings confirmed our intuitions but under certain circumstances. In addition, some of our predictions were contradicted because the expected relationship between dependent and independent variables is statically significant but occurs in the opposite direction. Lastly, we could not confirmed three research hypotheses due to the lack of statistical significance. The below tables summarize our results and suggest that both PAT and NIT are appropriate theoretical framework in helping conceptualize and predict the choice of discount rate and expected rate of return.

Exhibit XCIV: Empirical results – PAT framework

Variable	Concept	Prediction confirmed	Significance level
ROE (5-yr avg.)	Profitability	Contradicted	**
Bonus	Top management bonus	Yes	***
DTA, DTC, DTE	Leverage	No	-
LogCFO	Size and cash flow	Contradicted	***
Funding ratio	Leverage	Yes	***
Pension item(s)/PBT	Profitability	Yes	*
%Debt	Profitability	Yes	**

Hypothesis 1 (profitability): contradicted

More specifically, we first were interested in the influence of profitability over DR and ERR. In light of prior literature, we identified several metrics commonly used in pension accounting research. We refined our model and finally retained the 5-year average ROE due to its statistically significant Pearson correlation scores with both DR and ERR. Other metrics including operating margin, profit margin, ROA, ROE, and ROCap. exhibited little explanatory power but contributed significantly in terms of multicollinearity.

According to the literature, in particular the agency precepts (that characterize PAT and posit that managers seek to maximize their own utility), we anticipated that firms exhibiting weak profitability would choose aggressive (i.e. higher) rates assumptions in order to boost earnings. In effect, a higher DR translates in lower present value of pension obligation, which causes pension expense to drop. Likewise, a higher ERR helps generate higher pension income. As result, lower pension expense combined to higher pension income leads to higher earnings. In fact, our regression models did establish a relationship between both DR/ERR and 5-year average ROE that is statistically very significant. However, in most instances our findings accounted for a relationship that is trivial in terms of magnitude. The most interesting fact has do with the sign of the relationship: while we expected an inverse relationship, regression models revealed a positive relationship. In other words, we could interpret this by saying that the more profitable firms are the more likely management would choose aggressive accounting methods or assumptions that would further strengthen profitability (and creating a causality loop). For instance, it is a well-established fact that bottom performance influences EPS, P/E and obviously share price performance. However, we do not believe this statement to be credible as we have shown in our descriptive statistics section that the impact of pension items (i.e. pension income/expense) remains marginal relatively to other items disclosed on the income statement of financial institutions.

Interestingly enough, Bodie *et al.* (1987) also expected an inverse relationship between DR and profitability (which they measure with an inflation-adjusted ROA figure). The researchers ultimately find a positive relationship.

Hypothesis 2 (bonus): confirmed

Second, we formulated Hypothesis 2 to test the idea that top management incentivization is influential to the choice of rates assumptions. Again, in line with agency principles, we presumed a positive relationship between DR/ERR and Bonus. As explained previously, we needed to set Bonus as a dichotomous variable relating to share-based compensation whose award mechanism incorporate some form of current year's income (following Scott, 1991). This is an artificial way to try reduce the distance between corporate and pension accounting policy. Otherwise, it is arguably very difficult to appreciate links since pension accounting policy is essentially structured to achieve long-term goals. In any case, our regression models established a statistically highly significant relationship between

DR/ERR and Bonus. Notably, the relationship between DR and Bonus appears stronger than for ERR since the linear regression statistics indicate that firms that offer bonus schemes (as required in our research protocol) to top management choose DR that are on average higher by about 1% than firms that do not offer such bonus schemes. Nonetheless, we want to remain cautious about this relationship because of the distance that exists between managing pension accounting policy and corporate earnings. Comparatively, Bergstresser *et al.* (2006) find a relationship between ERR and share-based compensation in the context of a study seeking to unearth earnings management practices based on ERR.

Hypothesis 3 (leverage): not confirmed

Leverage was the next concept that we sought to relate to the choice of discount rate and expected rate of return. In light of the debt covenant hypothesis we formulated hypothesis 3 by positing that firms reporting higher leverage would assume higher DR and ERR. Thus, we anticipated a positive relationship in this case. We identified several ratios that measure leverage namely DTA, DTC, DTE and PBO/Market Cap. However, neither Pearson correlation and regression analyses established a meaningful and significant relationship between leverage and DR/ERR. As previously presumed, this absence of relationship between pension rates assumptions and corporate financial leverage supports the belief that there is a divide between pension accounting policy and the management of corporate financial leverage. Again, the rationale behind this fact is that pension accounting represents a very specific aspect of firms' activities (in fact, pension matters are often outsourced by reporting entities). This also weakens methods used by researchers who attempt to determine the discount rate based on corporate credit worthiness as it has been suggested by prior literature (Glaum, 2009). Lastly, our analysis clearly supports prior findings by Napier (2009). Furthermore, this reasoning finds support in the work of Bodie *et al.* (1987) who differentiate the "traditional perspective" (in which defined benefit pension plans are managed independently from the corporation and its shareholders) and the "corporate financial perspective" (which is an integrated approach to manage pension and corporate liabilities).

Hypothesis 4 (size): contradicted

Next, we attempted to gauge the relationship between size and the choice of rates assumptions. We formulated hypothesis 4 by taking into account the fact that in light of political costs larger firms would implement accounting assumptions or methods that mitigate reprisals (such as tougher regulation). As such, we expected an inverse relationship between size and rates assumptions by advancing that larger firms would assume lower DR and ERR. In light of prior literature, we identified the logarithm of total assets, number of employees, cash flows from operations and free cash flows as relevant size measures. From the examination of Pearson correlation scores, we remarked that there is a weak, positive but significant relationship between DR and the logarithm of

the number of employees. The size of the workforce is certainly an important factor influencing the pension accounting policy. Later, we discarded from our regression models both LogEmp. and LogAss. since they contributed in higher multicollinearity. We can further justify this choice based on the fact that in the context of pension accounting the number of employees is probably more relevant for firms that rely on a large workforce to conduct their business activities (e.g. oil companies). Unlike capital intensive firms, financial institutions carry disproportionate balance sheets that account for sizeable financial assets and liabilities. Again, even the use of the logarithm does not quite reduce the gap between pension accounting matters and corporate activities.

In contrast to Legmen. and LogAss., the logarithm of cash flows revealed to be a more pertinent element to include in our model. Indeed, we established that there is a positive relationship between LogCFO and DR that is statistically significant and with ERR that is statistically highly significant. Yet, our findings suggest that such a relationship is weak in terms of magnitude. For example, based on our parsimonious linear regression models, a one increment increase in LogCFO parallels on average a 22 bps increase in DR (36 bps increase in ERR). We admit again that in practice management probably does not manage corporate cash flows while being obsessed with the choice of DR and ERR (though pension policy affects cash flows since sponsors must pay contributions to the pension fund or entity that ensures payment of pensions to beneficiaries).

The surprise, however, came from the sign of the relationship between DR/ERR and LogCFO. In contrast to the prediction based on political costs, we found that size and rates assumptions evolve in the same direction. Similarly to the reasoning discussed above for hypothesis 1 (profitability), we reject the temptation of interpreting this result by saying that the larger the firm the more likely management would choose aggressive accounting methods or assumptions. Managers typically share the belief that “cash is blood,” as their prime focus is to generate cash regardless of the political costs it may cause. In consequence, though statistically significant we consider this result to have limited practical implications.

Lastly, before addressing the outcomes relating to NIT-variables, we examine findings in relation to pension accounting variables namely Funding ratio, Pension item(s)/PBT and % Debt. At the exception of Pension item(s)/PBT that we created based on the work of Scott (1991), Funding ratio and % Debt are independent variables widely used in studies of pension accounting determinants. Funding ratio which represents of the ratio of the fair value of pension assets to pension benefit obligation is a metric that somehow captures pension leverage (in contrast to corporate financial leverage) and provides a measure of riskiness for the sponsors. For example, from the descriptive statistics, we noticed that the 2005/2011 FR average was 66.5% which means that over the study period financial institutions could settle roughly two thirds of their pension. In other words, these institutions mostly run unfunded pension plans which is not a sign of financial sustainability (we have discussed in chapter 2 the risks inherent with PAYG schemes). Similarly, % Debt is commonly used

to assess the link between rates assumptions and the pension asset allocation strategy (Amir and Benartzi, 1998 or Amir, Guan and Oswald, 2010). The composition of the pension asset portfolio essentially influences the pension income generated and thus % Debt indirectly impacts corporate earnings. Finally, the Pension item(s)/PBT is an innovation that we conceptualized in order to quantify the relative impact of pension income or expense on the income statement. Following the reasoning of Scott (1991), we consider that the variable Pension item(s)/PBT is a good proxy for the management's propensity to manipulate earnings (i.e. the larger the impact of pension items on earnings, the more likely managers would want to optimize pension accounting choices). As a result, statistics derived from these three variables provided further support to our model as evidenced below.

Hypothesis 3 (leverage): confirmed

Considering that Funding ratio can be viewed as a measure of pension leverage, in line with hypothesis 3, we anticipated a positive relationship between DR/ERR and FR. Indeed, statistics from our regression models highlighted significant to highly significant statistical relationships between the study variables. In addition, the magnitude of the relationship appears strong since findings show that a one percent increase in FR leads on average DR to be higher by 0.6% to 1.4% (while ERR increases by 1.2% to 2.3%). Prudence is again necessary before stating any conclusion. As explained earlier, $FR = \text{Pension assets} / \text{Pension obligation}$ where Pension obligation is the present value of pension liabilities that will (hopefully) be paid in future periods to beneficiaries. Evidently, the calculation of present value requires an essential element: DR. Likewise, ERR is based on the historical performance of pension assets (i.e. equity and debt instruments, and at some extent real estate and cash) and therefore is obviously linked to pension assets. It appears as a result that there is risk of creating a causality loop in this analysis: is it management's concern for pension leverage that influences the choice of rates assumptions or is it the reverse? In fact, in light of the overall findings of this study, we believe that managers attempt to reconcile various (even contradictory) demands from stakeholders when managing corporate activities. In the end, we believe that in this case the choice of rates assumptions is made taking into considerations regulatory and financial constraints. This rationale goes in line with Gopalakrishnan and Sugrue (1995) who find a positive relationship between DR and funding ratio. Because the researchers tested in addition to DR other actuarial variables they find evidence that in fact "firms choose a 'package' of actuarial assumptions that are 'favorable' to them."

Hypothesis 1 (profitability): confirmed

As explained in the preceding paragraphs, % Debt and Pension item(s)/PBT affect corporate earnings at some degree. Our findings suggest that there is a negative relationship between % Debt and Pension item(s)/PBT and DR/ERR. Although statistically significant the relationship is firmer with % Debt since a one percent increase parallels a drop of 33bps to 52 bps in DR compared to a drop of 1.3% to 1.4% in ERR. The impact of Pension item(s)/PBT is trivial (less than 10 bps in DR/ERR). In terms of practical implications, we believe that for reasons previously discussed pension accounting matters remain separate from corporate financial matters (i.e. relating to for-profit business activities). It appears that Pension item(s)/PBT (which averaged 3.9% for our sample firms over the study period) is not realistically a tool that managers use or worry about. However, there is sufficient evidence here to advance that % Debt (and more broadly the pension asset allocation strategy) is a relevant management tool. Managers may not in practice seek to manipulate % Debt hoping to better personal financial outcomes (such as bonus) but certainly account for it in the pension accounting policy. Next, we discuss implications derived from the analysis based on NIT-independent variables.

Exhibit XCV: Empirical results – NIT framework

Variable	Concept	Prediction confirmed	Significance level
US listing	Coercive pressure	Contradicted	**
%Ins. Share, % Top Share.	Coercive pressure	No	-
Auditor	Normative pressure	Yes	***
CEO Post.	Normative pressure	Contradicted	***
Chair. Other	Normative pressure	No	-
Industry subgroup	Mimetic pressure	Yes	***
%Forg. sales	Mimetic pressure	No	-

Hypothesis 5 (coercive pressure from authorities): contradicted

In light of NIT principles, we expected that coercive isomorphic pressures exerted by governmental bodies would be influential on the choice of rates assumptions. Following Touron (2004, 2005), we attempted to incorporate in our model the role played by supervisory market authorities (Disclosure variable) and the international standard-setter, the IASB (Accounting). Due to the absence or limited variability shown by these dichotomous variables, we relied on US listing for which statistics were much meaningful. We thus evidenced that there is a statistically very significant relationship between DR/ERR and the fact that firms have equity security(ies) listed on US financial markets and therefore are exposed to US market authorities. However, our statistics contradict our presumption since we found a positive relationship in all regression models. In fact, when firms have securities listed on US

financial markets, DR is on average higher by 37 bps to 85 bps than firms that are not exposed to US financial markets (between 72 and 75 bps for ERR). In contrast to NIT principles, which posit that firms would adopt conservative practices in presence of authorities in fear of retaliation (especially in the US where authorities have enacted increasingly tougher regulation since the collapses of Enron, WorldCom or Lehman Brothers), we find that firms tend to adopt higher DR and ERR. In light of Touron (2005), Irvine (2008) or Judge *et al.* (2010), we postulate that the desire to compete on international markets to gain visibility, recognition, or market share would lead firms to compete in terms of financial performance. When entering or being exposed to international markets, Irvine (2008) explains that UAE firms sought to conform to practices in order to raise their credibility. However, in the case of the choice of rates assumptions the practice may well reflect not the fear of reprisal from authorities but simply mimetism with other firms.

Hypotheses 6 and 7 (coercive pressure from shareholders): not confirmed

Although we discarded from our model the variables relating to ownership structure (due to limited significance), we would like to recall our findings from the analysis of Pearson correlation scores. In fact, we noticed a small, positive and significant relationship between DR and the percentage of equity capital held by institutional shareholders and somehow a milder relationship between ERR and the same variable. Interestingly, the correlation statistics also suggested that there is a negative relationship between DR/ERR and the percentage of equity capital controlled by the largest shareholder. The relationship seems firmer and significant for the ERR variable. To explain such an incongruity between % Ins. Share. and % Top Share. we advanced that management would choose aggressive DR and ERR when pressure from institutional shareholders is significant and would in contrast opt for conservative rates when facing a single but powerful shareholder. In essence, the rationale for this behavior would be that accountability to a single and presumably vigilant shareholder is more coercive than a group of institutional shareholders most likely driven by the maximization of shareholder wealth. Our findings both contrast and align with prior studies. However, as indicated by Mard (2012) prior research has not evidenced any consensus regarding the relationship between ownership structure and earnings management. We therefore believe that such a relationship offers potential for further research.

Hypothesis 8 (normative pressure from auditor): confirmed

Following Touron (2004, 2005), we anticipated that the relationship between the choice of rates assumptions and the auditor would be unclear due the potential conflict of interest that characterizes the role of the auditing firm. As such, we had formulated hypothesis 8 by expecting the choice of auditor to lead firms to choose either higher or lower DR and ERR. Indeed, our findings did not help answer this question which in itself is not important (firms would not want to be associated with an auditor which is renowned for advising strictly aggressive or conservative accounting practices).

Because we used dichotomous variables to account for the *Big 4* auditors, our analysis then focused on the impact of the variation between the choice of alternatives. Regression statistics indicated that there is a statistically highly significant relationship between DR/ERR and the choice of the auditor. The relationship is stronger for DR. For example, we found that the appointment of Ernst & Young would lead firms to choose DR that is as much as 1.3% lower than the number recommended by Deloitte if it had been the audit advisor. We obtained similar but weaker results with Aud2. We find these results extremely important because they imply two fundamental facts. First, the auditor does influence the choice of rates assumptions, in particular the discount rate. Second, the choice of the auditor leads to diverging pension accounting policy. This is an important element that we would be tempted to consider as an unwritten industry rule. What could explain otherwise why advisory provided to the same reporting entity would be so different? As a final remark, we build on the work of Collin *et al.* (2009) who argue that the influence of the Auditor opens up a broader and more ambitious question about causality: “is the auditing firm that influence the corporation, or is it the corporation that chooses an auditing firm that tends to choose the accounting standard that the corporation wants to select?”

Hypothesis 9 (normative pressure relating to education): contradicted

As postulated by DiMaggio and Powell (1983), we anticipated that “formal education” is an important source of [normative] isomorphism and considered that firms whose CEO had earned post-graduate degrees would opt for higher rates assumptions than firms whose CEO had not. In contrast to our predictions, Pearson correlation numbers revealed that DR and ERR share a weak, negative but significant relationship with the education level of the firm CEO. This finding was further substantiated through our parsimonious regression models which shed light on a statistically highly significant relationship between DR/ERR and CEO Post. We noticed in fact that when a firm CEO holds a post-graduate degree the entity tends to choose DR(ERR) lower on average by 44 bps (53 bps) compared to when CEO does not hold the same type of degree.

In this case, it is frankly difficult to find a satisfactory rationale for this phenomenon. On the one hand, we could argue that when the top executive has pursued higher education, he or she is better prepared for the top job and is likely to choose lower DR/ERR which mechanically leads to lower profitability (though again the impact of pension income or expense is rather weak on the income statement). On the other hand, we could argue that the CEO is wiser and seeks to minimize political costs. None of these statements appear realistic, though.

Lastly, though we may not at this stage explain this phenomenon regarding the level of education of the CEO, we would like to draw a parallel here with Selznick’s (1948) ideas about “non-rational dimensions.”

Hypothesis 10 (normative pressure relating to industry activism): not confirmed

Building once more on the work of DiMaggio and Powell (1983), we expected that professionalization in the form of membership to trade associations, lobby groups or other boards would cause firms to implement higher rates assumptions. We conceptualized two pairs of dichotomous variables, Trade (relating to membership to trade associations, lobby groups, public functions, or NGOs) and Other (accounting for membership to other listed companies), for both CEO and Chairman. Although both Trade and Other variables poorly contributed to the model (and thus were discarded), we noticed a weak but significant correlation between DR/ERR and Chairman Other. Once more, Selznick's (1948) ideas, notably his concept of "cooptation" (i.e. "the process of absorbing new leadership or policy-determining structure of an organization as a means of averting threats to its stability or existence") could provide some rationale here to explicate board membership.

Hypothesis 11 (mimetic pressure from industry subgroup): confirmed

In order to capture the influence of mimetic pressures exerted by industries, industry subgroups, and countries of incorporation, we used dummy variables. Following DiMaggio and Powell (1983), Irvine (2008) or Touron (2005), we anticipated that in response to country, industry or sector's pressures, firms would adopt higher discount rate and expected rate of return. The rationale for this behavior is to mimic entities that are perceived as successful or industry leaders. Once again, we were not so much interested in identifying which country, industry or sector would exhibit particular trends (though we noticed in the general description section that median DR differed sharply between some insurance and bank groups). Rather, we examined the impact of the variation in country, industry or sector could have on DR and ERR. Statistics from our regression models revealed that the relationship between DR/ERR and IS3 or IS6 is statistically significant or highly significant. Similarly to findings relating to the choice of auditor, we learn that sector affiliation does matter. For example, we remarked that firms belonging to the Property/Casualty Insurance sector tend to adopt ERR that is higher on average 1.0% compared to the reference sector, Commercial Banks. As we also noticed discrepancies between insurance companies within the insurance industry, we attribute these findings to regulation and the business model pursued by these entities. It is worthy to point out that, in contrast to banks, insurance companies do play an active role in the pension world since they often manage pension matters on behalf of sponsors.

Hypothesis 12 (mimetic pressure relating to international activities): not confirmed

Based on Guerreiro et al. (2008), we posited that the more a firm enjoys an international profile measured in terms of the share of sales generated or assets located outside the domestic territory, the more likely such a firm would assume higher rates assumptions. Surprisingly, the % Forg. sales and % Forg. assets poorly contributed in our regression models. Nonetheless, the Pearson correlation statistics revealed a positive, weak but significant relationship between DR/ERR and % Forg. sales.

We find this result somehow disappointing as it fails short of the reasoning provided by Touron (2004, 2005). We could formulate the following conjecture: except for a small proportion of sample firms which do not generate sales outside the home market, most global firms manage their pension policy on a regional basis since they need to comply with local jurisdictions, rules, or norms corresponding to where employees are located. As such, DR and ERR disclosed in the footnotes of annual reports may differ significantly from local realities. Consequently, in some sense, attempting to link “internationalization” with locally defined-but-globally reported DR/ERR appears daunting. It is worthy to make a final remark: some firms do provide in their annual reports a breakdown of DR/ERR per region. However, the information is not sufficient in order to reconcile regional and global rates.

Now that we have reviewed in details our results and assessed theoretical, empirical, as well as practical implications, we can finally summarize our findings through the below general regression equations (based on our base linear regression models):

$$\begin{aligned}
 \text{DR} = & \alpha + \beta_1 \text{ROE (5-yr avg.)} + \beta_2 \text{Bonus} + \beta_3 \text{LogCFO} + \beta_4 \text{Funding ratio} + \beta_5 \text{Pension} \\
 & \text{item(s)/PBT} + \beta_6 \% \text{Debt} + \beta_7 \text{US listing} + \beta_8 \text{Auditor} + \beta_9 \text{CEO Post.} + \\
 & \beta_{10} \text{Industry subgroup} + \varepsilon \\
 \text{ERR} = & \alpha' + \beta'_1 \text{ROE (5-yr avg.)} + \beta'_2 \text{Bonus} + \beta'_3 \text{LogCFO} + \beta'_4 \text{Funding ratio} + \\
 & \beta'_5 \text{Pension item(s)/PBT} + \beta'_6 \% \text{Debt} + \beta'_7 \text{US listing} + \beta'_8 \text{Auditor} + \beta'_9 \text{CEO} \\
 & \text{Post.} + \beta'_{10} \text{Industry subgroup} + \varepsilon'
 \end{aligned}$$

3.2: Discussion about the discount rate and expected rate of return

Now that we have completed our study, we would like to relate conceptual and empirical findings as a means of debating about what the discount rate should be. As a starting point, we recognize that Beechy (2009) and Napier (2009) provide interesting elements to think about. Following their rationale, we believe that the main weakness in the rules prescribed by IAS 19 (which stipulates that the discount rate should be based on yields observed on AA-rated corporate or government bonds) is that such a practice considers that the risks inherent in administering pension plans are identical to those linked to corporate financial debt. If we further stretch this reasoning, it would also mean that investment risk and actuarial risk (that the sponsor normally retains when providing defined benefit pension schemes to employees) are comparable to the default risk attached to corporate financial debt. This is evidently conceptually flawed but somehow represents “an expedient” that helps foster transparency (though in practice reporting entities do have discretion in choosing the actual AA-rated corporate or government bonds). Worst, we believe that such a flawed rationale is further prolonged when the net interest approach requires to set the expected rate of return in function of the discount rate. So, what should be the appropriate discount rate?

We argue that Beechy (2009), Brown and Wilcox (2009), Napier (2009), Novy-Marx and Rauh (2011), and Novy-Marx (2013) provide the seeds for the right product to aim at. Notably, the debate should be focused on what the discount rate conceptually means rather than elaborating a mechanical tool aimed at fostering uniformed practices. Of course we know the danger of not having transparent and comparable practices. We would therefore favor a mechanism that permits to add a pension risk premium to a market benchmark possibly comparable to what the Libor is. Obviously, the determination of such a benchmark could be a daunting task because it raises a flurry of difficult questions: should such a benchmark be determined by market forces (knowing that the world is still traumatized by the libor scandal in which large banks have manipulated the index for so many years without being caught)? Would such a benchmark pour unnecessary volatility in financial statements (again there is a trade-off between short-term (focus on fair value and transparency) and long-term management of pension schemes)? Would a price mechanism based on quarterly or semiannually moving average be a good compromise between short-term and long-term? This analysis fuels more and more questions which evidences that our reasoning is still at an infancy stage and probably needs further research to grow and strengthen.

3.3: Validity and reliability

As discussed previously we have followed a systematic protocol to establish our theoretical, epistemological, and empirical frameworks. Notably, our research design for which the quantitative study is central allows us to preserve the external validity of our model (and ability to generalize findings). In addition, our rigorous econometrics model has evidenced through several statistical methods the internal validity of our results (and the fact that the choice of rates assumptions is influenced by a set of factors). Lastly, the reliability of our findings and derived conclusion is constrained by the quality of i) reported data (whether or not the data faithfully represent historical financial performance), ii) Bloomberg database (which we know contains errors since the transcription of annual report information into spreadsheet requires the intermediation of analysts), and iii) researcher's analysis which is subject to bias or error(s) in hand-collecting and interpreting publicly available information, performing the various statistical treatments and interpreting results. We, however, believe that our empirical protocol is fairly replicable since we relied on publicly available information and employed widely used statistical tools. As a result, taking into account all of these facts we can cautiously highlight the following key points:

- Our sample is comprised of 85 European financial institutions that belong to the SETMI index which represents roughly 9% of the constituents of the total SETMI index (which covers about 95% of the free float market capitalization across Europe). Nonetheless, in our sample we capture 80% of the entire population of the financial institutions that comprise the index. These firms are incorporated in nearly all (17 out of 18) countries that comprise the index and are distributed across all industry subgroups. For these reasons, we believe that the sample is fairly representative of the population of European financial institutions
- Despite a rigorous protocol we would refrain from the temptation to broaden our findings to i) other European firms that constitute that the SETMI index or ii) financial institutions located outside Europe, for example North America or Asia. The main reason for this has to do with regulation, unwritten rules, norms, corporate culture, and so on. As a matter of fact Casta (2009) explains that PAT appears more suitable for the North American context which renders generalization elsewhere difficult. Likewise, Morais (2008) or Ding *et al.* (2007) show that country or industry specific factors influence accounting practices
- In line with recognized research literature (discussed previously), we have employed linear regression models. However, we do acknowledge the potential of a non-linear approach. For instance, Martinez (2004), in her study of the informational value of accounting metrics released by a sample of French entities, uncovers two interesting findings. First, the author demonstrates that a quadratic variant of the relationship between accounting metrics and share price returns can be more relevant than the traditional linear approach when measuring the informational value of financial accounting data. We therefore believe that a non-linear

approach would hold potential for further research. Second, Martinez (2004) highlights the fact the informational value of accounting data should be considered in function of firms' characteristics and the economic context. This is a statement that goes in line with our own findings

- Lastly, we would argue, however, that certain factors would certainly affect (at probably differing degree) the choice of rates assumptions regardless of location or industry affiliation. In fact, we believe that funding ratio, pension assets allocation, auditor and at some degree the level of education (or training or expertise) of senior management affect the choice of pension accounting assumptions

3.4: Ethical considerations

Given that this study is entirely based on publicly available information and conclusion(s) reached by the researcher about corporate practices remain general, we believe that our findings do not breach any rules nor cause any ethical dilemmas.

4: CHAPTER CONCLUSION

Chapter 5 was exclusively devoted to the analysis of the results generated through our econometrics model. Following a systematic procedure, we have first explored our dataset by producing cross tabular charts, frequency tables, histograms and scatterplots. Such an exercise was quite helpful since it helped identify phenomena, trends or issues. Second, we performed extensive descriptive statistics in order to gauge central tendency and dispersion in our data. Time series also helped gain a longitudinal understanding of the dataset. We next considered the distribution of our variables, performed correlation analyses in order to evaluate the strength of relationships between dependent and independent variables and ultimately ran several linear regression models.

From the detailed analysis of our results, we were able to confirm nearly all predictions derived from PAT and NIT principles. We then discussed theoretical, empirical and practical implications of these findings. Lastly, we assessed the internal and external validity and reliability of our results and conclusions.

In the next and final chapter, we consider practical usefulness of our study, examine limitations, discuss elements for further research and provide concluding remarks.

CHAPTER VI
CONCLUSION AND ELEMENTS FOR FURTHER
RESEARCH

CHAPTER VI: CONCLUSION AND ELEMENTS FOR FURTHER RESEARCH

Chapter 6 rephrases main findings and essentially draws concluding remarks. In addition, we assess the dissertation's practical usefulness and applicability. After having acknowledged certain limitations, we can finally provide direction and elements for further research.

Table of contents

CHAPTER VI: CONCLUSION AND ELEMENTS FOR FURTHER RESEARCH	332
1: OVERALL CONCLUSION	333
1.1: Research question	333
1.2: Theoretical framework.....	334
1.3: Epistemological and empirical frameworks.....	335
2: PRACTICAL USEFULNESS AND APPLICABILITY	337
2.1: Theoretical contributions	337
2.2: Conceptual contributions	338
2.3: Empirical contributions.....	338
2.4: Management contributions.....	339
2.5: Right balance between relevance and reliability and between practices and rules	339
3: RESEARCH LIMITATIONS.....	341
4: ELEMENTS FOR FURTHER RESEARCH.....	342
REFERENCES.....	343
INDEX OF SCHEDULES	362
DEFINITIONS AND NOTES	369

1: OVERALL CONCLUSION

Our main motivations in conducting this research endeavor were to observe and understand the factors that influence the choice of the discount rate and the expected rate of return in the context of the accounting of defined benefit pension plans. To do so, we established a research strategy structured around three pillars:

- A theoretical framework solidly enrooted in both Positive Accounting Theory and Neo-Institutionalism Theory
- An epistemological framework that effectively bridges theoretical concerns and empirical goals, and
- An empirical framework built on a rigorous quantitative study of publicly available financial information

To finalize this dissertation and provide concluding remarks, we first recall the research question, summarize key findings, highlight main contributions, indicate limitations and propose elements for further research.

1.1: Research question

The research question discussed in the introductory chapter was formulated as follows:

What are the factors impacting and explaining the choice of the discount rate and the expected rate of return?

To address this question, we first sought to understand the context that surrounds the pension industry, the stakeholders, the geopolitical and demographic environment, the regulation and regulatory authorities. We then performed a careful review of the scientific literature in order to precisely identify gaps and potential contributions. More specifically, we explained that pensions represent an important element of deferred compensation for individuals and are classified according to the Pillar system. Pillar I is commonly referred to as “social security” (i.e. public pension), whereas Pillars II and III respectively represent employment-related and voluntary pension systems. The administration and financing of pension systems represent a major challenge for governments and corporations alike. Rapid ageing of populations, weakening fertility rates, and rise of pensionable age are factors that further burden the task of decision-makers. Furthermore, pension fund administrators must act in the best interest of pension beneficiaries. The investment strategy is often seen as the apex of fund managers’ responsibilities. We highlighted that important factors influence the role of pension fund professionals: the rapid evolution of management techniques (such as ALM or LDI), the growth of

investment portfolios as illustrated by the Towers Watson survey and the effects of regulatory changes (enacted by the European Commission or EIOPA for instance) and affecting both public and private pension schemes. Next, we demonstrated that the accounting of defined benefit pension plans is extremely complex as it requires the formulation of sophisticated assumptions over future periods. International standard-setters, IASB and FASB, have combined their efforts in order to address issues raised by various interest parties. Lastly, the review of the academic literature released over the past thirty years allowed us to appreciate the complexity and controversy of pension accounting practices and above all helped us identify important empirical parameters (benefits and limitations of methods typically used, variables, sources of information, and potential contributions).

Once we identified the elements that characterized the pension accounting landscape, we needed to understand how we could explain why certain factors influence the choice of rates assumptions. We then established a theoretical framework to provide explanatory substance to the relations between factors and rates assumptions.

1.2: Theoretical framework

We relied on two theories to structure our understanding of the mechanisms that influence the choice of rates assumptions. First, we have considered Positive Accounting Theory as a pertinent explanatory model for several reasons. Precursors including Watts and Zimmerman (1978, 1979, 1986, 1990), Ball and Brown (1968), Beaver (1968), and others have introduced influential empirical finance methods to financial accounting. Driven by the desire to move away from an era dominated by normative currents, proponents of PAT have sought to provide scientific roots to accounting research, paving the way for rigorous empirical research. Indeed, PAT has introduced an empirical protocol structured around the observation of practices, followed by the formulation of a model, hypotheses, experiment(s) to test those hypotheses and lastly the validation (or not) of the researcher's predictions. In order to explain and predict behaviors, Watts and Zimmerman establish the theoretical foundations of PAT on both the Agency Theory (or AT) and the Economic Theory of Regulation (or ETR). AT envisions the firm as a nexus of contracts linking various interest parties or stakeholders who act to maximize their own interest (Jensen and Meckling, 1976) whereas ETR originates from the public choice field of economics and portrays the political process as a competition between individuals seeking to maximize their own interests. Consequently, PAT has over time proved to be highly influential since used in numerous empirical studies to explain various (organizational and) accounting decisions (Dumontier and Raffournier, 1999). Despite numerous criticisms from scholars who have predominantly argued against epistemological, theoretical, and methodological limitations, we believe PAT precepts are appropriate to explain pension accounting choices.

Second, similarly to PAT, we have examined in details the principles that characterize Neo-Institutionalism Theory. In our analysis, we have adopted a concentric approach in which the work of DiMaggio and Powell (1983) lays at the center since their isomorphic model of the institutional environment has profoundly influenced the institutional literature. Next, we considered ideologies that have explicitly influenced DiMaggio and Powell (such as Hawley and Meyer & Rowan), then scholars who have implicitly influenced DiMaggio and Powell (especially Selznick), and the scholars who played a central role in disseminating neo-institutional ideas since the 1880s. We noticed that several currents have been influential, especially the new institutional economics (with Coase, Williamson or North) and the sociologic perspective (with Meyer and Rowan, Scott, or Zucker). In particular, we did not attempt to favor a specific current because we believe that both economic and sociologic perspectives share common features and we believe that the study of rates assumptions in the context of defined benefit pension plans overlaps several fields and has repercussions in politics, economics and social matters.

In light of DiMaggio and Powell (1983) three forms of isomorphic pressure are identified to explain the homogeneity in organizational forms. Coercive institutional pressures embody rules promulgated in regulatory systems to encourage a certain desired set of behaviors. Professionalization, affiliation to professional or trade association and training represent forms of normative pressure. Lastly, in situations of uncertainty, mimetic isomorphism occurs when firms model themselves on entities sharing similar activity and/or entities considered as the most successful. Although these three forms of isomorphism tend to weave into a complex social fabric which renders the task of the researcher more challenging (as noticed by Mizruchi and Fein, 1999), we believe that NIT remains a pertinent framework to use in our study.

Third, we extended the findings of our analysis by arguing that, together, PAT and NIT form a relevant framework to explain accounting choices. We reviewed the rare studies in which such a combination has been attempted. Indeed, in all instances, the researchers have demonstrated the pertinence and efficacy of such an approach. This is true for Mezas (1990), Neu (1992), Neu and Simmons (1996), Touron (2004) and Collin, et al. (2009).

1.3: Epistemological and empirical frameworks

Once we understood the pension accounting context and conceptualized an explanatory framework to justify relationships between factors and rates, we needed to address questions such as how we would carry the study. Indeed, based on our literature review and in line with both Saunders et al. (2012) and Gavard-Perret et al. (2012), we found that is appropriate to adopt the hypothetico-deductive approach

based on the analysis of quantitative data using econometrics. In parallel with Bodie et al. (1987), Thomas (1988), Ghicas (1990), Gopalakrishnan and Sugrue (1995) and many others identified in chapter 2, we decided to retrieve financial and non-financial data from annual reports and the Bloomberg database (to which we have a professional access) for the years 2005-2011 released by firms listed across Europe. Our econometrics model included descriptive statistics, correlation analysis and linear regression analyses since our research variables are numerical data and categorical data.

As result, we performed a rigorous analysis of statistics generated from our econometrics model and were able to precisely i) identify the factors impacting rates assumptions, ii) quantify the magnitude of such an impact, and iii) explain in light of both PAT and NIT the reason(s) why such relationships exist between factors and rates. In consequence, we both thoroughly addressed the research question and demonstrated the adequacy of PAT and NIT to explain complex phenomena. Now that we have summarized the dissertation's aim and outcomes, we next discuss the dissertation's main contributions.

2: PRACTICAL USEFULNESS AND APPLICABILITY

As previously mentioned, we have sought and successfully observed the factors that influence the choice of rates assumptions implemented by European financial institutions over the 2005/2011 period. As such, we have earned a solid understanding of these pension accounting practices and would like to highlight below the dissertation's main contributions.

2.1: Theoretical contributions

The analysis of pension accounting practices through the lenses of both PAT and NIT represents an innovative approach. In addition, an analysis framed around both PAT and NIT has been previously performed only in rare instances (as discussed in chapter 3). Furthermore, this dual theoretical approach compares with prior pension accounting literature which has predominantly investigated determinants of actuarial choices, earnings management and value-relevance through the lenses of Agency or Signaling theories. As a result, we demonstrate that PAT and NIT, not only individually but also in combination, can explain the mechanisms that characterize complex management behaviors. Our findings therefore support a similar conclusion reached by Collin *et al.* (2009). Furthermore, in line with Neu and Simmons (1996), we advocate that PAT and NIT are not necessarily standing at the opposite side of a profound divide. Indeed, Neu and Simmons (1996) argue that “managers function in a complex web of social relations that influence, constrain, and define appropriate behaviour and appropriate accounting methods. Internal, institutional, state and quasi-state relations frame a manager’s choices. As a consequence, managers do not necessarily act as rational expected utility maximizers.” We have indeed shown in our analysis that management may not always seek to boost earnings and/or personal compensation. We rather believe that management being exposed to pressing (even contradictory) demands from a wide range of stakeholders (e.g. regulators, shareholders, creditors, employees, clients, etc.) would seek to optimize outcomes while mitigating reputational and litigation risks. We believe that such a behavior translates in what we call a “check-off the box mentality” which basically means that management acts in compliance with the flurry of prescriptive rules, norms, and laws without necessarily addressing qualitative issues. For example, the thickness of an annual report reflects compliance but does not necessarily address a fundamental question: is the reporting entity’s share a viable investment?

2.2: Conceptual contributions

We made three notable conceptual contributions in relation to the actual mechanical accounting of defined benefit pension plans. In our analysis of IAS 19, we first performed a detailed description of how the standard has evolved conceptually since the 1980s. For instance, we highlighted the fact that the rules had moved from an income statement to a balance sheet approach in the late 1990s and that more recently (and going into the future) the concern of standard-setters is with fair value. Second, we produced a thorough analysis of IAS 19 before and after the 2011 amendment that introduced the so-called net interest approach. Third, in light of our present study we sought to reconcile our statistical findings and predictions about the repercussions of the net interest approach (in particular we contrasted statistics relating to ERR, % Debt and % Equity and the work of Demaria *et al.* (2008), Brown and Wilcox (2009), Amir *et al.* (2010), Novy-Marx and Rauh (2011), Easterday and Eaton (2012), Sandu (2012), and Novy-Marx (2013) who offer worrying perspectives about the impact of the net interest approach on reporting entities).

2.3: Empirical contributions

Our main empirical contribution has to do with our concern for a pan-European sample of banks and insurers. Indeed, our approach contrasts with prior pension accounting research which has historically focused on US and UK markets. Additionally, we focus on the 2005/2011 period which contrasts with most similar pension accounting studies whose authors have been mostly concerned about the period preceding the adoption of IFRS across Europe. As such, the dissertation fills an important gap in the literature and sheds light over corporate practices across Europe.

In addition, we differentiate ourselves from prior research because we effectively produce a quantitative study that incorporates variables bred into NIT, a framework traditionally used in qualitative studies. This was made possible through the process of coding categorical data into dummy variables (which in itself is not a novel approach). Yet, we made some practical contributions since we adapted findings from prior literature to conceptualize a set of new variables.

In terms of data collection, we relied on the interactive capabilities that offer the Bloomberg database which allowed us to retrieve the necessary historical data from pre-built excel template files and various screens within the online platform. The major weaknesses in this approach, however, are the lack of integration between the excel template files (rendering the information retrieval a lengthy and tedious process) and the lack of reliability of certain categories of information (while market data is reliable, the quality of the information extracted from footnotes accompanying annual reports remain questionable).

2.4: Management contributions

Our findings can have implications for various stakeholders especially standard-setters and users of financial information. First, recall that our study reveals that, in light of PAT and NIT, the choice of the discount rate and the expected rate of return, in the context of the accounting of defined benefit pension plans, is influenced by financial/contractual factors and institutional pressures. Our regression models evidence the relative strength and significance of several explanatory variables (namely profitability, top management compensation, cash flows, funding status, pension assets allocation, foreign listing, the choice of auditor and the education or training of top personnel). In addition, the dissertation examines the 2011 revised IAS 19, provides further substance to the current debate about the net interest approach, and suggests perspectives about future developments.

It is also anticipated that the study will provide users of financial statements with the means to better understand the potential financial impact of pension accounting strategies on companies' financial performance and position, and therefore help them to effectively allocate their economic resources. On a larger scale, it is believed that the dissertation will help enhance financial literacy in the domain of pension accounting.

2.5: Right balance between relevance and reliability and between practices and rules

Our review of pension accounting rules and our study of pension accounting practices across Europe have also allowed us to examine a recurring theme in financial accounting research: the trade-off between relevance and reliability. We have indeed shown that because the accounting of defined benefit pension schemes remains a complex field (within the already-sophisticated accounting realm), the task of standard-setters in reforming or improving rules is sensibly difficult. We have in particular highlighted that pension accounting steps across various domains including corporate finance and requires the formulation of sophisticated assumptions over long periods of uncertainty. In addition, we understand that, when it launched the due process in 2006, the IASB needed to swiftly address criticisms, especially those regarding the ERR.

However, now that the due process has ended, we believe that the final product is unsatisfactory. As indicated by several parties who participated in the due process, the Board appears to have chosen an expedient while ignoring valid calls for a fundamental review. It appears therefore that the Board has found a compromise between relevant and reliable pension accounting information being prepared under the so-called net interest approach. We regret this decision for two main reasons. First, the research community has produced numerous studies examining the impacts of the net interest approach (e.g. Brown and Wilcox, 2009; Amir *et al.*, 2010; Novy-Marx and Rauh, 2011; amongst others) while the professional community (including both preparers and users) have raised concerns

and proposed alternatives (e.g. before, during and after the due process). Second, our experience of financial markets has taught us that at the end of the day market participants need information that is timely, complete and unbiased in order to best allocate their resources. In other words, decision-makers value substantially information that is relevant (i.e. that makes a difference in the decision-making process) and typically acknowledge that such information may not be accurate or may be the result of various assumptions (i.e. the information may not be free of error or fully reliable). In other words, decision-makers price in the fact that information may not be reliable provided that it is relevant. Furthermore, we find the direction chosen by the Board worrisome because our analysis has evidenced a clear divide between practices and rules. We have shown that practices are influenced by various parameters including corporate governance and culture, management compensation, choice of auditor, education of senior management and so on. Obviously rules are necessary in order to safeguard the system, instill transparency, and foster comparability. But are these objectives not reconcilable with the overarching goal of financial accounting which is to allow users (i.e. investors and creditors) to best allocate their financial resources? To conclude, we recognize that there is no one-size-fits-all solution to the Board's dilemma. Nevertheless, we find opting for a compromise between relevance and reliability is unsatisfactory and we would favor alternatives that foster relevance and allow decision-makers to consider the incremental impact of various accounting methods, options and assumptions.

3: RESEARCH LIMITATIONS

Despite a rigorous empirical protocol, the present study has limitations that should be acknowledged. First, only PAT and NIT-enrooted factors have been considered here. However, it appears that reporting entities' strategic choices (and thus accounting choices) are potentially influenced by various other factors such as regulatory powers, competitive pressure, changes in financial markets, or global geopolitical events. Impacts of these factors can be highly intertwined, reinforce each other or counterbalance each other. In line with this view, in their study of the determinants of discount rates, Gopalakrishnan and Sugrue (1995) find that firms choose a "package" of actuarial assumptions that are "favorable" to them.

Second, this analysis relies mostly on historical data. Although this approach is traditionally used in the field of financial accounting, research focused on the actual process or decision-making behind the choice of accounting assumptions made by preparers is evidently needed.

Third, financial reporting rules continuously change (as evidenced by the numerous revisions that have impacted IAS 19). Preparers may or may not account for this fact in their choice of accounting assumptions (for example, since it is costly for preparers to implement new rules, preparers may simply adopt a check-off mentality and opt for the least costly alternative). More than three decades ago, Watts and Zimmerman had recognized that "changes in accounting procedures are not costless to firms" (1978).

Finally, the study is based mostly on the Bloomberg database. When checking downloaded data versus annual report data, discrepancies or errors have been discovered. These errors are likely the result of human errors as data is hand-collected (especially the information contained in the footnotes) and integrated into commercial databases. As such, the validity and reliability of the outcome of this study are constrained by the quality of the input.

4: ELEMENTS FOR FURTHER RESEARCH

Having acknowledged the study's limitations, the present analysis provides a comprehensive view of corporate practices implemented by European banks and insurers. Whilst most previous research has focused on US markets or some European countries, this study examines defined benefit pension accounting on a pan-European basis. Of course, financial institutions are very atypical entities; however, results of this analysis help better understand corporate behavior at a time when accounting standards are fast evolving. This brings opportunities for further studies which could help better understand accounting choices across industries or quantitative research coupled with a qualitative approach that would help better appreciate the actual decision-making process employed by preparers. The research also offers interesting perspectives in regards with future developments in IAS 19. Indeed, further research seeking to better identify and quantify the impact(s) of the 2011 revised IAS 19 would find practical meaning and guidance to reporting entities.

Another area of interest that we unearthed in chapter 5 relates to corporate relations with shareholders. In the context of our examination of the factors impacting the choice of rates assumptions, we noticed that management does not appear to respond the same way to shareholder pressure when it faces a single and large shareholder vs. a group of large institutional shareholders. This topic probably offers perspectives not only in the domain of pension accounting but also in various management domains. Similarly to this shareholder enigma, we discovered several questions that could be researched. We noticed that the level of CEO education does affect the choice of rates assumptions. However, statistics generated from our regression models contradicted our prediction and we could not satisfactorily explain such a phenomenon. Additionally, during the collection of historical data, we noticed trends in the formal education and training pursued by CEOs and Chairmen across Europe. Studies seeking to relate top personnel's characteristics and corporate life and performance could yield useful information for investors, creditors or regulators.

Likewise, we were surprised by the results relating to the US listing variable. Statistics in fact contracted our presumption that firms that decide to list equity security(ies) on US financial markets would opt for conservative accounting assumptions and methods in the fear of retaliation. This is another peculiarity that certainly offers good research potential...

... So many perspectives... which probably means that the quest for knowledge is a never ending story.

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INDEX OF SCHEDULES

Exhibit I: IASB's IAS 19 due process	13
Exhibit II: Size of public pension expenditure for OECD countries.....	26
Exhibit III: Chart showing dissertation theoretical, epistemological and empirical frameworks	35
Exhibit IV: Scope of research	36
Exhibit V: Contributions.....	36
Exhibit VI: Dissertation structure	39
Exhibit VII: Classification of pension schemes	46
Exhibit VIII: Pension regimes across OECD countries	47
Exhibit IX: Key parameters of pension systems used across Europe	48
Exhibit X: Historical and expected pensionable age in OECD countries	49
Exhibit XI: Historical and expected life expectancy at pensionable age in OECD countries.....	50
Exhibit XII: Pension incentives to retire across OECD countries	52
Exhibit XIII: Historical public pension contribution rates and revenues across OECD countries	54
Exhibit XIV: Size of public pension expenditure for OECD countries	56
Exhibit XV: Pension benefit expenditures for public and private schemes across OECD countries ...	59
Exhibit XVI: Overview of ALM and corresponding asset management techniques	69
Exhibit XVII: Overview of ALM techniques used across Europe.....	70
Exhibit XVIII: Evolution of the size of pension funds between 2007 and 2012	72
Exhibit XIX: Evolution of the size of the top 20 pension funds between 2007 and 2012.....	73
Exhibit XX: Geographical distribution of pension fund assets.....	74
Exhibit XXI: Breakdown of pension fund assets in terms of types of pension liabilities.....	75
Exhibit XXII: Breakdown of pension fund assets by asset classes.....	76
Exhibit XXIII: Pillars under Solvency II	86
Exhibit XXIV: SWOT Analysis of the European pension system	91
Exhibit XXV: IFRS Foundation's organizational structure.....	96
Exhibit XXVI: IFRS' accounting standards-setting (due) process	97
Exhibit XXVII: IASB's conceptual framework.....	100
Exhibit XXVIII: United States' accounting landscape	104
Exhibit XXIX: FASB's accounting standards-setting process	105
Exhibit XXX: Evolution of the accounting for retirement arrangements	109
Exhibit XXXI: User groups that influence the IASB.....	110
Exhibit XXXII: Key events and pronouncements in history of IAS 19.....	118
Exhibit XXXIII: Comparison of defined contribution and defined benefit plans.....	126
Exhibit XXXIV: Three methods to account for actuarial gains and losses	130
Exhibit XXXV: Description of the corridor method.....	132
Exhibit XXXVI: A single method to account for defined benefit costs	134
Exhibit XXXVII: Studies of the determinants of rates used in defined benefit pension plans.....	150
Exhibit XXXVIII: Prior literature treating pension and financial reporting in the US and pan-European contexts.....	165
Exhibit XXXIX: Gaps in prior literature and research opportunity.....	175
Exhibit XL: Prior literature treating Positive Accounting Theory	194
Exhibit XLI: Analysis of the most influential literature treating the neo-institutional current.....	204

Exhibit XLII: Analysis of the most influential ideas that have shaped the neo-institutional current .	211
Exhibit XLIII: Prior literature treating Neo Institutionalism Theory.....	226
Exhibit XLIV: Comparison of Agency Theory assumptions and organizational perspectives	233
Exhibit XLV: Dissertation theoretical framework.....	243
Exhibit XLVI: Research process.....	248
Exhibit XLVII: Comparison of main research philosophies.....	252
Exhibit XLVIII: Comparison of research approaches	254
Exhibit XLIX: Dissertation epistemological framework	256
Exhibit L: Research hypotheses.....	261
Exhibit LI: Research variables.....	266
Exhibit LII: Dependent variables per country of incorporation.....	275
Exhibit LIII: Dependent variables per industry subgroup.....	276
Exhibit LIV: Dependent variables vs. auditor.....	276
Exhibit LV: Dependent variables vs. foreign listing.....	277
Exhibit LVI: Dependent variables vs. top management share-based compensation	277
Exhibit LVII: Dependent variables vs. top management affiliation to trade association/lobby group	277
Exhibit LVIII: Dependent variables vs. top management board membership	278
Exhibit LIX: Descriptive statistics.....	279
Exhibit LX: Time series of averages.....	281
Exhibit LXI: Distribution of discount rates Exhibit LXII: Distribution of expected rates of return	282
Exhibit LXIII: Pearson correlations – Dependent variables vs. Profitability ratios.....	283
Exhibit LXIV: Pearson correlations – Dependent variables vs. Bonus	283
Exhibit LXV: Pearson correlations – Dependent variables vs. Leverage	285
Exhibit LXVI: Pearson correlations – Dependent variables vs. Size and Cash flow.....	286
Exhibit LXVII: Pearson correlations – Dependent variables vs. Pension items.....	287
Exhibit LXVIII: Pearson correlations – Dependent variables vs. Pension assets allocation	288
Exhibit LXIX: Scatterplot of ERR vs. %Equity	289
Exhibits LXX and LXXI: Distribution of the percentage of pension assets invested in debt and equity	290
Exhibits LXXII and LXXIII: Distribution of the percentage of pension assets invested in cash and real estate	291
Exhibit LXXIV: Pearson correlations – Dependent variables vs. Coercive isomorphic pressures	292
Exhibit LXXV: Pearson correlations – Dependent variables vs. Ownership structure.....	293
Exhibit LXXVI: Pearson correlations – Dependent variables vs. Normative isomorphic pressures..	294
Exhibit LXXVII: Pearson correlations – Dependent variables vs. Auditor.....	295
Exhibit LXXVIII: Pearson correlations – Dependent variables vs. Mimetic isomorphic pressures (Industry)	296
Exhibit LXXIX: Pearson correlations – Dependent variables vs. Mimetic isomorphic pressures (Industry subgroup).....	297
Exhibit LXXX: Pearson correlations – Dependent variables vs. Mimetic isomorphic pressures (Country).....	299
Exhibit LXXXI: Pearson correlations – Dependent variables vs. Internationalization	301
Exhibit LXXXII: Base linear regression model – Discount rate	303
Exhibit LXXXIII: Base linear regression model – Discount rate (homoscedasticity test)	305
Exhibit LXXXIV: Parsimonious linear regression model – Discount rate	306

Exhibit LXXXV: Parsimonious linear regression model – Discount rate (homoscedasticity test)	307
Exhibit LXXXVI: Base linear regression model – Expected rate of return.....	307
Exhibit LXXXVII: Base linear regression model – Expected rate of return (homoscedasticity test)	308
Exhibit LXXXVIII: Parsimonious linear regression model – Expected rate of return.....	309
Exhibit LXXXIX: Parsimonious linear regression model – Expected rate of return (homoscedasticity test).....	310
Exhibit XC: Panel data analysis – Discount rate (company fixed effects)	313
Exhibit XCI: Panel data analysis – Expected rate of return (company fixed effects).....	314
Exhibit XCII: Panel data analysis – Discount rate (time fixed effects)	315
Exhibit XCIII: Panel data analysis – Expected rate of return (time fixed effects).....	316
Exhibit XCIV: Empirical results – PAT framework.....	317
Exhibit XCV: Empirical results – NIT framework.....	322

TABLE OF CONTENTS

ABSTRACT	2
ACKNOWLEDGEMENTS	4
LIST OF ABBREVIATIONS	8
PART I - THEORETICAL FRAMEWORK: PENSION ACCOUNTING CONCEPTS, RULES AND PRACTICES	10
CHAPTER I: SCOPE AND RESEARCH QUESTION	12
1: SCOPE OF THESIS	13
2: RESEARCH QUESTION.....	16
3: THEORETICAL FRAMEWORK.....	19
3.1: Positive Accounting Theory	19
3.2: Neo-Institutionalism Theory.....	20
4: HYPOTHESES DEVELOPMENT	22
5: CONCEPTS AND DEFINITIONS.....	25
5.1: Pensions	25
5.2: Pension accounting	28
5.3: Discount rate	29
5.4: Expected rate of return.....	30
6: EPISTEMOLOGICAL AND EMPIRICAL FRAMEWORKS	31
6.1: Epistemic assumptions.....	31
6.2: Empirical assumptions	33
7: DISSERTATION STRUCTURE.....	37
CHAPTER II: A REVIEW OF PENSION ACCOUNTING RULES	41
1: OVERVIEW OF THE EUROPEAN PENSION FUND INDUSTRY	43
1.1: Overview of pension schemes and products	43
1.2: Overview of pension funds	62
1.3: Public vs. private pension funds	72
1.4: Pan-European regulatory pressures and prospects for the pension fund industry.....	82
1.5: Current state of the European pension system	90
2: PENSION ACCOUNTING: REGULATORY ENVIRONMENT.....	92
2.1: IFRS: Authoritative bodies and key principles	93

2.2: US GAAP: Authoritative bodies and key principles	103
2.3: Issues and challenges with financial reporting	110
2.4: Global convergence towards IFRS	115
3: PENSION ACCOUNTING: RULES AND PRACTICES	117
3.1: Historical perspective.....	117
3.2: Introduction to IAS 19	122
3.3: Conceptual and technical issues (IAS 19 including amendments up to December 31 2010)	125
3.4: Conceptual and technical issues (IAS 19 revised as of June 2011)	133
4: REVIEW OF ACADEMIC LITERATURE	138
4.1: Overview.....	138
4.2: Research treating the determinants of pension accounting choices	139
4.3: Other research treating pension accounting	157
4.4: Limitations of prior research and research opportunities.....	173
5: CHAPTER CONCLUSION.....	176
CHAPTER III: THEORETICAL FRAMEWORK.....	178
1: POSITIVE ACCOUNTING THEORY	179
1.1: Historical perspective and founding principles.....	179
1.2: Criticisms of PAT	187
1.3: Research opportunity(ies)	192
2: NEO-INSTITUTIONALISM THEORY	203
2.1: Historical perspective and founding principles.....	203
2.2: Criticisms of NIT	217
2.3: Research opportunity(ies)	221
3: OTHER THEORETICAL CONSIDERATIONS	231
3.1: Agency Theory	231
3.2: Conventions Theory.....	236
4: CHAPTER CONCLUSION.....	241
PART II – EPISTEMOLOGICAL AND EMPIRICAL FRAMEWORKS: STUDY OF THE DETERMINANTS OF THE RATES ASSUMPTIONS.....	244
CHAPTER IV: STUDY OF THE DETERMINANTS OF THE RATES ASSUMPTIONS	246
1: RESEARCH DESIGN	247
2: EPISTEMOLOGICAL PERSPECTIVES	248

2.1: Overview.....	248
2.2: Research topic.....	249
2.3: Main findings derived from our literature review.....	250
2.4: Research philosophy and approach.....	250
2.5: Research design	254
3: JUSTIFYING THE DISSERTATION’S RESEARCH HYPOTHESES.....	257
3.1: Predicting accounting choice through Positive Accounting Theory.....	257
3.2: Predicting accounting choice through Neo-Institutionalism Theory	258
4: RESEARCH METHODOLOGY.....	262
4.1: Overview.....	262
4.2: Methodology	262
4.3: Population and sampling / Data collection	269
5: CHAPTER CONCLUSION.....	271
CHAPTER V: ANALYSIS OF RESULTS.....	273
1: OVERVIEW OF RESULTS.....	274
2: DETAILED ANALYSIS	275
2.1: General description	275
2.2: Descriptive statistics	279
2.3: Distribution and correlation analyses.....	282
2.4: Linear regression models	302
2.5: GLM univariate analysis.....	311
3: DISCUSSION OF FINDINGS	317
3.1: Theoretical and empirical implications.....	317
3.2: Discussion about the discount rate and expected rate of return	327
3.3: Validity and reliability	328
3.4: Ethical considerations	329
4: CHAPTER CONCLUSION.....	330
CHAPTER VI: CONCLUSION AND ELEMENTS FOR FURTHER RESEARCH	332
1: OVERALL CONCLUSION.....	333
1.1: Research question	333
1.2: Theoretical framework.....	334
1.3: Epistemological and empirical frameworks.....	335

2: PRACTICAL USEFULNESS AND APPLICABILITY	337
2.1: Theoretical contributions	337
2.2: Conceptual contributions	338
2.3: Empirical contributions.....	338
2.4: Management contributions.....	339
2.5: Right balance between relevance and reliability and between practices and rules	339
3: RESEARCH LIMITATIONS.....	341
4: ELEMENTS FOR FURTHER RESEARCH.....	342
REFERENCES.....	343
INDEX OF SCHEDULES	362
DEFINITIONS AND NOTES.....	369

DEFINITIONS AND NOTES

^A Actuarial valuation method and related disclosure

Defined benefit obligation

For each beneficiary of a defined benefit plan, an entity must determine the value of its obligation referred to as Defined Benefit Obligation (or DBO). IAS 19's paragraph 64 requires reporting entities to use the Projected Unit Credit (or PUC) method to determine the present value of DBO. Also known as the "accrued benefit method," the PUC is a capitalization approach in which each period of service gives rise to an additional unit of benefit and evaluates each unit separately to build up the final obligation (IFRS Foundation, IAS 19, p. A606).

To illustrate this methodology, the below example is formulated based on simplified assumptions. The terms of a defined benefit plan that provides a lump-sum benefit on retirement could be as follows:

Projected Unit Credit Method	
<u>Post-employment benefits</u>	
Lump sum benefit ratio (calculated on the final salary for each year of service)	10.0%
<u>Beneficiary</u>	
Retirement age (years)	65
Age as at 31/12/2006 (years)	45
Number of years of service as at 31/12/2006 (years)	20
Salary as at 31/12/2006 (euros)	75,000
Actual salary as at 31/12/2007 (euros)	78,750
<u>Assumptions</u>	
Discount rate (per year)	5.5%
Compensation growth rate (per year)	4.0%
Actual compensation growth rate in 2007 (per year)	5.0%
Expected rate of return on plan assets (per year)	6.0%
Actual rate of return on plan assets in 2007	7.0%
Probability of survival at the age of 65	90.0%
Plan assets as at 31/12/2006 (euros)	95,000
Insurance premiums and contributions paid to pension fund in 2007	2,000

Calculations				
Projected Benefit (PB) = Lump sum benefit ratio x Years of service x Projected salary				
PB			328,668	
DBO as at 31/12/2006 = Probability of survival at the age of 65 x Discount rate x PB				
DBO			101,380	
Actual DBO as at 31/12/2007			113,383	
Interest cost = DBO at beginning of the period x Discount rate				
Interest cost			5,576	
Current service cost = increase in the pension obligation resulting from employee service in the current period				
Current service cost = DBO as at 31/12/2006 / Years of service			5,069	
Basic cost = Current service cost + Interest cost = DBO expected at end of the period - DBO at beginning of the period				
Basic cost			10,645	
Expected return on plan assets = Expected rate of return x Plan assets				
Expected return on plan assets			5,700	
Cost for benefits or Pension expense = Basic cost - Expected return on plan assets				
Cost for benefits or Pension expense			4,945	
DBO at beginning of the period = DBO at end of previous period (i.e. as at 31/12/2006) + Basic cost				
DBO at beginning of the period			112,025	
Expected plan assets at end of the period = Plan assets at end of previous period + expected return + contributions paid				
Expected plan assets at end of the period			102,700	
Actual plan assets as at 31/12/2007			103,650	
Actuarial losses/(gains) in 2007 = (Actual DBO - Expected DBO) + (Expected plan assets - Actual plan assets)				
Actuarial losses/(gains) in 2007			409	C
Corridor = 10% max (DBO, Plan assets) at B/S date				
Corridor DBO			11,338	A
Corridor Plan assets			10,365	B
Amount to amortize = Max (Gains/losses - Corridor, 0)				
There is nothing to amortize here since C < A ou B				

FINANCIAL DATA						
(As at 1 January, euros)						
				2006	2007	2008
Current service cost				5,069		
Interest cost				5,576		
Expected return on plan assets				5,700		
Pension expense				4,945		
DBO at beginning of the period				112,025		
Expected plan assets at end of the period				-		
BALANCE SHEET						
(As at 31 December, euros)						
				2006	2007	2008
Defined benefit obligation				101,380	113,383	
Less: Plan assets				(95,000)	(103,650)	
Unfunded obligation				6,380	9,733	
Less: Unrecognized actuarial losses/(gains)*				-	(409)	
Less: Unrecognized past service cost*				-	-	
Defined benefit liability/(asset)				6,380	9,325	
<i>*Simplified assumption for 2006: computations were made for the first time thus no opening balance</i>						
Pension expense					4,945	
Less: Employer contributions					(2,000)	
Increase in defined benefit liability					2,945	
Defined benefit liability/(asset) (as at 1 January)					6,380	
Add: Defined benefit liability/(asset)					2,945	
Defined benefit liability/(asset)					9,325	
<i>Source: Sougne, D. (2009) L'évaluation actuarielle des engagements de pension selon l'IAS 19 et ses perspectives d'évolution</i>						