Essays on cooperative banks : competition and behavior of stakeholders

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Aspects concurrentiels et comportement des parties prenantes

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Introduction

Cooperative banks have a major role in the European banking industry. In 2012 cooperative banks account for over 50 million members and 176 million consumers with banking services provided by more than 4,000 institutions in 2012 (European Association of Cooperative Banks (EACB)).

The current economic importance of cooperative banks is the result of a long process dating back to the mid-nineteenth century, which is due in part to two German politicians, Friedrich Wilhelm Raiffeisen (1818-1888) and Hermann Schulze-Delitzsch (1808-1883). They are known to have influenced the modes of organization, the establishment and development of cooperatives in Germany and Austria. Their ideas were taken later for the European development of this form of organization.

It is in the context of industrial revolution and increasing inequalities that financial systems were set up, dedicated primarily to wealthy clients consisting of wealthy industrialists living within large urban areas. The misery of the working classes made up of shopkeepers, workers and small farmers without access to credit encouraged the development of cooperative banks.

The Raiffeisen model aimed to bring together small farmers in remote areas of large cities, allowing, by pooling their savings, to promote the access to banking services and credit in order to provide funds to finance their farming activities. Moral and ethical considerations on the exclusion of these communities played an important role in the establishment of cooperative institutions.

Besides these common origins, cooperatives banks have been spread across the continent by taking different forms in their organization to adapt themselves to the increasing competition and to cultural or local specificities. Therefore, now, some countries like Germany or Italy have highly decentralized cooperative banking structures while other countries like France have more centralized cooperative banking groups.

Overall European cooperative banks have passed from autonomous local branches offering standard products to large and diversified universal banking groups (Groeneveld, 2014; Ayadi et al. 2010). Thus, very specific activities as financial market activities or financing of large firms.

However, these adaptations have not been made easily and sometimes demutualization has been done to obtain external funds in order to grow and make acquisition. For example, it was the case of British Building Societies which were demutualized in 1980-1990. In other countries (e.g. Austria, Italy, France and Germany), the structure of cooperative banks has been modified and head institutions (sometimes listed[1]) of the local network have been put in place. Head institutions allow cooperative banks growing through the acquisition of non-cooperative banks and providing new services to their customers.

Nowadays the effect of these changes on competition and on the behavior of customers remains unknown since a lack of empirical studies is observed. This dissertation aims to provide new insights of cooperative banks and their clients and stresses the future challenges of the European cooperative banking industry.

Definition of cooperative banks and governance principles

The International Cooperative Banking Association (ICBA) defines co-operative bank as a *"financial entity which belongs to its members, who are at the same time the owners and the customers of their bank. Co-operative banks are often created by persons belonging to the same local or professional community or sharing a common interest. Co-operative banks generally provide their members with a wide range of banking and financial services (loans, deposits, banking accounts...)".*

Thus, the governance of cooperative banks is based on the customer ownership and follows a logical "Bottom-up" approach. This peculiarity is currently one of the main distinguishing characteristics of cooperative banks compared to other type of banks (Ayadi et al., 2010). More specifically, members of the cooperative elect their representatives (during the yearly general assembly meeting) who will sit in representative bodies such as the board of directors or the supervisory board and the management board.

This customer based model is directly inherited from the governance principles of German cooperative banks in the 19th century. On the origins, cooperative banks aimed

[1] For instance in France Credit Agricole SA or in Austria Raiffeisen group are listed apex institutions

to support their members being managed by them. That is to say, members are responsible for financial losses and are equally treated independently of their capital holding due to the "one man/one vote" principle. Members are then clients and owners and are invested with a dual purpose: to uphold the values of mutual aid, and to ensure proper operations of the network.

In Europe, the application and respect of these principles are more or less important, depending on the country (cultural aspect), actors (historical aspect), and legislative developments. For instance, members are no longer required to cover in the entire insolvency of their cooperative as was the case originally. In France a member of the Crédit Mutuel is responsible for 20 times her investment in member shares in case of bankruptcy of the bank.

Furthermore the requirement to be a member to benefit from the services of the cooperative has been abolished in most European countries and cooperative banks provide today the same services to members and non-member customers (Groeneveld, 2014).

The capital of cooperative banks

These previous operating rules derived in part from the nature of the capital structure of cooperative banks which is composed of member shares. Each client who holds at least one member share becomes a member of the organization and participates to the decision making process.

Contrary to ordinary stocks member shares are not tradable on an exchange and do not increase in value over time. This characteristic prevents cooperative banks from hostile takeovers.

Contrasting with the original principles, member shares provide payoffs to the holders, but, they are disproportionate to the benefits and less volatile than the earnings of stocks. In addition, they are often restricted by the law. For instance, in France member shares' payoffs cannot exceed the French private corporate bond rate called TMO.

As a result benefits generated are added to reserves which have the peculiarity to be indivisible and non-distributable. In line with this characteristic, Cihak and Hesse (2007) show that the capital of cooperative banks contributes to a better intertemporal risk management. The authors show that in period of financial distress cooperative banks can

use this accumulated "consumer surplus" during more stable periods to ensure the banking activities and potential losses. Accordingly, Ferri et al. (2014) show that after the Great Crisis in 2007, cooperative banks have been downgraded to a lesser extent by ratings agencies.

Furthermore past benefits represent an intergenerational endowment that has contributed to increase the market share of cooperative banks by increasing the number of acquisitions in the early 90's.

A banking model based on relationship

As mentioned by Ayadi et al.(2010), Fonteyne, (2007) and Cuevas and Fischer (2006) cooperative banks operate more locally and closer to their customers (mainly composed by household and small and medium sized enterprises (SME)) thanks to their large networks of branches. This proximity with their customers favors banking relationship.

Basically, banking relationship can have two effects on customers: on the one hand, it permits to reduce information asymmetries between the bank and client, providing better access to financial services and reducing credit rationing (Stiglitz and Weiss, 1981). On the other hand, information collected give to the bank a monopoly power which can favor opportunistic behavior and can conduct the bank to extract rents to the detriment of clients (Sharpe, 1990).

In banking most studies have focused on the effect of banking relationship on the credit market and have found a positive effect of relationship. For instance Berger and Udell (2002) have shown that long term relationship is particular important in small business lending since SME are characterized by informational opacity and face difficulties to provide collaterals. In addition, banking relationship contributes to increase credit availability (Petersen and Rajan, 1994; Lehmann and Neuberger, 2001) and to reduce the need for collateral (Degryse and Van Cayseele, 2000).

However, results are mixed about the effect of relationship on the extraction of rents. Some findings show a negative relationship with the costs of credit and the intensity of the relationship (Uzzi, 1999; Berger et al., 2007). By contrast D'Auria et al. (1999) or Degryse and Ongena (2005) provide evidence that suggest a *hold-up* effect done by the bank.

The question whether European cooperative banks tend to extract rents and to charge higher prices to their customers remains unanswered.

Competition and efficiency of cooperative banks

In Europe cooperative and commercial banks operate in the same competitive environment facing the same regulatory framework. However, based on their governance principles, cooperative banks should have fewer incentives to maximize their profits. This peculiarity has conducted Rasmussen (1988) and Borgen (2004), to criticize the slow decision-making process of cooperatives and the possible conflicts of interest between managers and owners that may arise due to a lack of direct control of the members on the managers. These conflicts may come from the unclear definition of property rights in the cooperative and the non-transferability of member shares. From a theoretical point of view this could conduct into lower efficiency.

Empirical results are mixed depending on countries and periods. In Germany over the period 1989-1996, Altunbas et al. (2001) show that cooperative and publicly held banks have smaller costs and profits advantages to their private counterparts. The authors argue that cooperative and publicly held banks have better ability to obtain funds with lower costs. Using a sample of European banks with more than €10 billion of assets, Iannotta et al. (2007) find better cost efficiency for cooperative banks. They explain this finding by superior loan quality and less risky activities for cooperative banks.

On the competition side, a few studies have compared cooperative banks with other banks. Hempell (2002) and Guiterrez (2008) find for Germany and Italy respectively that cooperative and saving banks operate less competitively than commercial banks. Fernandez de Guevara et al. (2005) confirm this finding for the European market, but also provide evidence in favor of a negative relationship between bank size and market power.

Contents of the dissertation

Despite a significant market share in European countries like Austria, France, Germany or Italy, cooperative banks are relatively not investigated in the literature. The aim of this work is to overcome this gap.

This research is structured around four chapters. The first two chapters contribute to the literature on banking competition focusing on the governance aspects of cooperative banks (client based model and relationship banking) and their impact on banking competition. The last two chapters link behavioral finance and financial choices of cooperative banks' stakeholders (employees and members). We explore the motives of clients to purchase member shares and analyze the familiarity bias of cooperative banks' employees.

The first chapter[2] compares the market power of cooperative banks with commercial banks. Basically, market power contribute at a micro-level to the extraction of rents by the bank and then to a reduction of customers' welfare (Degryse and Ongena, 2005, Carbo-Valverde, Rodriguez-Fernandez and Udell, 2009). At a macro level lower market power and more competition can favor economic development by improving access to credit and to lower loan rates (Claessens and Laeven, 2005).

In this chapter we test whether cooperative banks have a lower market power than commercial banks according to their governance principles. In line with recent studies on banking competition (Carbo et al, 2009; Weill, 2011) we use the Lerner index to determine market power. This measure of competition is the ratio of the difference between the price charged by a firm and marginal cost out of the price. This indicator measures the ability of a bank to price above its marginal cost. A Lerner index which goes to 0 indicates a highly competitive market while greater values are associated with an uncompetitive market and a significant market power. The methodology used is similar to Fernandez de Guevara, Maudos and Perez (2005). We calculate the Lerner index using a data set from Bankscope on financial statements of cooperative, commercial and savings banks for Germany, Austria, France[3], Italy and Denmark over the period 2002-2008.

Our results indicate that cooperative banks have lower market power than their commercial counterparts. A comparative study of marginal costs and prices shows that cooperative banks do not seem less efficient than commercial banks and that observed differences could be explained by lower prices for cooperative banks.

[2] This chapter refers to the article in press in *Bankers, Markets & Investors* with Laurent Weill
[3] French savings banks became cooperative in 1999 but are considered as not cooperative in this chapter

We perform multivariate estimations to check this finding. We estimate a generalized linear model with random effects to explain market power Our results confirm that cooperative banks have a lower market power and are in line with the univariate analysis. Our findings suggest that cooperative banks have a lower market power due to lower market prices.

Interestingly, some studies put to light that property rights of cooperative banks, that are not exchangeable in a market, create a loss of control of members on managers due to lack of market discipline (Rasmusen, 1988). Managers are tempted to maximize their own utility by higher personnel expenses and salaries and bonuses (Edwards, 1977; Kontolaimou and Tsekouras, 2010) at the expense of members. Our results do not go in the direction of this type of behavior for managers.

Finally, it is also interesting to notice that savings banks have a significant lower market power than cooperative and commercial banks. This result puts to light that savings banks are different than other banks. The main reasons are that savings banks hold legal mandates to contribute to their community and their clients and are owned by municipalities or local communities which could explain why they have fewer incentives to charge high prices (Ayadi et al., 2009).

In the second chapter[4] we determine the intensity of switching costs for cooperative banks compared to non-cooperative banks.

Switching costs are financial and psychological costs incurred by customers when they decide to change of suppliers or brand (Klemperer, 1995). The presence of these costs in the market can reduce competition and increase prices (Fernandez et al., 2003). Indeed, customers with high switching costs have limited mobility and producers can take advantage of this situation to charge higher prices.

Some papers have stressed that switching costs are important on the loan market because of information asymmetries between borrower and lender (Kim et al., 2003). During the loan process the bank learns information from its customers which can have a positive effect on loan rates (Sharpe, 1990). Moreover, competitors have no incentives to charge lower loan rates in order to attract other clients (Gehrig and Stenbacka, 2007). In this case, customers who decide to switch from her banks could lose those “benefits”

[4] This chapter refers to the article co-written with Laurent Weill

from the banking relationship and face higher costs. The estimation of this risk to get a higher price is a switching cost.

In opposition to this argument, several studies have shown that old and locked-in customers faced greater costs due to informational capture. For example Ioannidou and Ongena (2010) find that firms deciding to switch obtain more favorable loan terms than those who remain. These results cast doubt on the benefits for customers of the banking relationship.

Cooperative banks are rooted locally and are able to develop long and close relationships with their customers. On the one hand the banking relationship can develop high switching costs and then opportunistic behavior for the bank. On the other hand the cooperative model based on customers/owners should reduce this behavior.

We test whether customers of cooperative banks have lower switching costs in line with the differences in corporate governance. We also investigate if switching costs influence the degree of competition.

Switching costs are estimated using the method developed by Shy (2002). In order to measure the impact of switching costs on competition we use the Lerner index as a measure of market power.

We use a data set from Bankscope on financial statements of German, French and Italian banks for the period 2006-2012.

We observe that switching costs vary in time and space and decrease with the financial crisis, suggesting that the ability of banks to practice high prices has decreased. For each country, we find that customers of cooperative banks have lower switching costs than customers of other banks (commercial and savings banks). This result is related to Stango (2002), who shows for the market of credit cards that customers of Irish Credit Unions support lower switching costs due to the objective of non-profit of these institutions.

A generalized linear model with random effects is used to estimate the link between switching costs and competition. Switching costs are positively and significantly associated with market power indicating the negative impact on bank competition and customers' welfare. Then, banks whose clients support high switching costs take advantage of this and charged higher prices.

Our findings suggest that switching costs are an obstacle to competition that cooperative banks development could reduce.

The third chapter[5] of this thesis explores the patterns of member share purchases. Member shares entitle the customer as a member of her bank and provide the opportunity to participate in the governance. Member shares represent the capital of cooperative banks, are fixed price and earn a yearly limited payoff.

Representative institutions of European cooperative banks as the European Association of Cooperative Banks (EABC) and the International Cooperative Banks Association (ICBA) indicate that the purchase of member shares is motivated by non-financial preferences and free and voluntary membership.

However, participation rates in general assembly meetings are very low suggesting that alternative motives could explain why a client decides to become a member. Indeed, McKillop et al. (2002) found a 2% participation rate in the Irish Credit Unions. In France, Caire and Nivoix (2012) show that participation rates vary from 1% to 7% with an average of 3.68%. Based on this empirical finding we try to identify alternative explanations that could explain why clients of cooperative banks decide to become member of their cooperative bank. In this chapter we test the hypothesis that clients purchase member shares like any other financial asset.

We use a unique database consisting of deposits of 246,120 customers of a French cooperative bank over a period of 13 months starting from 08/2011 to 08/2012. In this cooperative bank the unit price of member shares is €20. The interest rate paid cannot exceed the TMO and is calculated for full month of detention. In addition, a sale of member shares prior to the yearly general assembly meeting provides a null payoff.

Our analysis focuses on the 26,788 customers who conduct transactions (purchases/sales) in shares. Over the period of scrutiny these customers realize 40,000 (3,000) purchases (sales) of member shares for an average transaction in member shares of 43 (214).

Our results indicate a positive and significant correlation between the amount of member shares purchased and the portfolio value of clients. Buyers of member shares are significantly wealthier than others while sellers are on average poorer. These results shade light on financial motives in the trading of member shares. Interestingly, sales of member shares are explained by liquidity shocks. Sellers of member shares overdrawn more frequently and few reinvest their money on other financial assets in the bank.

[5] This chapter refers to the article co-written with Patrick Roger

This chapter also highlights other arguments that go against a cooperative shareholder in the sense given by the ICBA. We find that a customer becomes a member in average 20 years after she entered the bank and that only 21.74% of new customers decide to purchase member shares when they become client of the bank.

Finally, between 2007 and 2010 the number of member shares held increased by 135% and put to light that capital requirements could encourage the bank to sell member shares.

Chapter 4 explores familiarity bias of employees of cooperative banks. Familiarity bias is defined as a preference for financial assets for which the investor feels psychologically close (Heath and Tversky, 1991). This bias leads investors to overestimate the performances and to underestimate the risk of an asset. This behavioral bias has been put forward to explain why investors are not diversifying their risky asset portfolios worldwide as predicted by the standard financial portfolio theory (Markowitz, 1952, 1959 and Sharpe, 1963).

Some studies have shown that investors hold concentrated portfolios of assets in domestic assets (French and Poterba, 1991), in stocks of companies whose headquarters are close to their home (Grinblatt and Keloharju, 2001; Seacholes and Zhu, 2010), or in equity of companies where they are working (Holden and VanDerrhei, 2001; Huberman and Sengmuller, 2004).

Karlsson and Nordén (2007) and Graham et al. (2009) have shown that investors with a higher level of financial literacy and education are less subject to familiarity bias and invest more in foreign assets. Pool et al. (2012) show that fund managers invest more in their home state assets but find that it is lower for experienced managers suggesting that financial literacy reduces familiarity bias.

At the best of our knowledge no study has shown whether bank employees are more or less familiarity biased. This question may arise for two reasons. First, bank employees should be aware that hold concentrated assets of their own bank is riskier than holding diversified portfolios. Second, as employees of the bank they could be more likely to invest due to the sentiment of higher knowledge on the performances of such assets.

In this chapter we test the hypothesis that bank employees are less subject to familiarity bias than customers due to a greater degree of financial literacy. We use a unique database composed of 244,962 customers and 1,158 employees of a French

cooperative bank. For each of them we have the monthly detailed financial portfolio over the period 08/2011 to 08/2012. Stocks, bonds and member shares issued by the bank are considered as three familiar assets. We study the investment behavior of employees in these assets compared to their clients.

Our results indicate that 72% of employees hold at least one of these assets while 49% of clients are owners. We find that bank employees are 1.4 times more likely to hold familiar assets. In addition, we stress that bank employees have a preference for familiar stocks since they are 4 times more likely to hold this asset. Overall, we find that employees weight less familiar assets in their portfolio, suggesting that financial literacy reduces the familiarity bias. By contrast, we find that the preference for familiar stocks leads the employees to under-diversify their portfolio of risky assets.

This study shows that familiarity bias is a strong behavioral bias and that financial literacy is not sufficient to reduce it.

CHAPTER 1

Do cooperative banks have greater market power?

This chapters refers to the article in press in *Bankers, Markets & Investors* with Laurent Weill

Abstract

We investigate if cooperative banks have a different market power than commercial banks. We use data on a large sample of banks over the period 2002-2008 from five European countries with a large market share for the cooperative banking industry (Austria, Denmark, France, Germany, and Italy). We measure market power of banks with the Lerner index. We show that cooperative banks have a lower market power than commercial banks. We attribute this finding to the fact that, as owners of cooperative banks are also clients, managers of these banks have incentives to refrain from charging clients heavily.

JEL Codes: G21, P13.

Keywords: Lerner Index, Competition, Cooperative Banks.

1 Introduction

Cooperative banks have an average market share of 20% in Europe, with levels that can climb up to 60% in France. They are managed by 50 million members and provide services to 176 million consumers (European Association of Cooperative Banks)[6].

The key specific characteristics of cooperative banks are their ownership and governance. While commercial banks are owned by stockholders, cooperative banks are owned by their clients through claims which considerably differ from stocks. Shares of cooperative banks do not provide dividends and rather tend to provide stable earnings over time. Moreover the "one man / one vote" principle – or at least some limitations on the link between the number of shares and the number of votes - applies for decisions, and then contributes to protect cooperative banks from hostile takeovers.

We can thus wonder if these differences contribute to influence bank behaviour and notably the market power of banks. Indeed as they act in the interest of the owners who are also clients of the bank, managers of cooperative banks can have incentives to refrain from charging clients heavily (Ayadi et al., 2010). Hence cooperative banks would have a lower market power than commercial banks.

This issue is of major importance for cooperative banks, as bank competition provides economic gains. At a micro level, a higher degree of competition in the banking industry enhances the welfare of bank consumers and better access to credit (D'Auria, Foglia and Reedtz, 1999; Beck, Demirgüc-Kunt and Maksimovic, 2004; Degryse and Ongena, 2005; Carbo-Valverde, Rodriguez-Fernandez and Udell, 2009). At a macro level, bank competition contributes to influence economic development (Petersen and Rajan, 1995; Cetorelli and Gambera, 2001). Greater bank competition can favour access to credit at lower cost by reducing hold-up problems (Claessens and Laeven, 2005), which contributes to increase firm borrowing and thus growth (Maudos and Fernandez de Guevara, 2011). As a consequence, the observation of a lower market power for cooperative banks could provide support to favour the expansion or at least to preserve the market share of cooperative banks in European countries.

[6] http://www.eacb.eu/eacb.php

Surprisingly, evidence on the link between ownership type and market power in European banking is limited. In their analysis of market power of banks in the five largest EU countries in the 90s, Fernandez de Guevara, Maudos and Perez (2005) find that cooperative banks have greater market power than commercial banks. Considering only German banks, Hempell (2002) also concludes to greater market power for cooperative banks for the period 1993-1998.

In a broader perspective, it is of interest to observe that studies which examine the comparative behaviour of cooperative and commercial banks in Europe remain relatively scarce. We are aware of a handful of studies comparing efficiency (e.g. Altunbas, Evans and Molyneux, 2001; Hasan and Lozano-Vivas, 2002; Girardone, Nankervis and Velentza, 2009) or financial stability of both types of banks (Cihak and Hesse, 2007).

In this paper, we investigate if market power differs for cooperative and commercial banks in European countries by considering a large sample of banks over the last decade. We focus on the five EU countries in which the cooperative banking industry has a large market share and for which we do not suffer from data limitations: Austria, Denmark, France, Germany, and Italy. Market power is measured with the Lerner index. This measure of competition is commonly used in recent studies on bank competition (e.g. Fernandez de Guevara, Maudos and Perez, 2005; Weill, 2011).

The Lerner index presents major advantages relative to standard measures of competition like the Herfindahl index. It directly infers the conduct of a bank and then informs on the actual behaviour of the bank. Moreover the Lerner index is an individual measure of competition which is of particular interest to compare different groups of banks.

The paper is structured as follows. Section two presents the European cooperative banking system and the hypotheses. Section three presents data. Section four describes the methodology. Section five reports the empirical results. At last section six concludes.

2 Background

2.1 Cooperative banks in Europe

Germany is considered as the country where the cooperative banking model started in the 19th century, and has been widespread in European countries. Cooperative banks were established around 1850 on Friedrich Wilhelm Raiffeisen's initiative. These institutions were intended to poor populations located in marginalized rural areas largely constituted by farmers. They provided payment instruments and credit to fund activities and agricultural productions.

Currently, Germany has a wide network of cooperative banks, which includes between 1,100 and 1,200 institutions. These financial institutions are overlooked by a head funding institution created in 2001, DZ Bank. In 2012, the market share is over 19% on deposits and over 18% on private loans while the network is managed by about 17.3 million members (European Association of Cooperative Banks).

In 2012 the Austrian cooperative banking sector provides financial services to 4.5 million clients, has 2.5 million members and represents a market share of 37% of deposits and 32.5% of private loans. The cooperative bank network is divided in two banking groups operating on different markets. The Raiffeisen group has rural customers and includes 527 local banks, while the Österreichische Volksbanken-Gruppe provides services to urban populations through 64 local banks. Austrian cooperative banks network was highly inspired by the German one. However, while the German cooperative banks networks merge many rural and urban institutions together, the Austrian cooperative banking system remains today more traditional, in line with its historic origin (Ayadi et al., 2010; Bülbül, Schmidt and Schuwer, 2013).

In France, cooperative banks appeared in the end of the nineteenth century. Historically French cooperative banks, as in other countries, were established at a local level to help populations without access to credit services. Until 1980 French cooperative banks were one way or another controlled by the State, while the cooperative banking industry became independent with banking reforms in the 1980s. As a result cooperative banks were permitted to merge and to acquire other institutions. Moreover French savings banks became cooperative by the reform of 1999 and merged in 2009 with the French cooperative banking network Banque Populaire. As a result the French cooperative

banking sector is composed by three groups: Banque Populaire-Caisse d'Epargne, Crédit Mutuel and Crédit Agricole. All these three groups have market shares for credits and deposits near 50% and provide financial services to 22 million members.

The Italian cooperative banking system was primarily inspired by German urban cooperative banks model. The first cooperative was founded in the mid-1860 in the area of Milano while the first rural cooperative banks were established later in 1883 (Ayadi et al., 2010). It is however noticeable that Italian cooperative banks encountered less success than their German counterparts when they were first developed. As a consequence many cooperative banks have had efficiency and profitability issues (Bülbül, Schmidt and Schüwer, 2013). The Italian cooperative banking system is composed by two main cooperative banking networks: Banche Popolari and Banche di Credito Cooperativo. The first one is established in urban areas and holds 100 local institutions, while the second one is mainly established in small rural villages and holds about 394 local institutions. In 2012 both networks represent together about one-third of loans and deposits and provide financial services to 2.3 million members.

We can also find smaller cooperative banking industries in other European countries. The Danish cooperative banking sector is mainly represented by Nykredit which holds a market share on deposits by 4% and 31% on loans and provides financial services to about 1 million clients and has 291,000 members. Finland and the Netherlands have also cooperative networks playing a substantial role in the financial system. Each country has a cooperative banking sector which represented in 2010 about 30% and 40% of private loans and 30% and 29% of customer deposits (European Association of Cooperative Banks).

These figures show heterogeneous cooperative banking industries across European countries. Such heterogeneity is explained by history but also by recent evolution. In the last decades, cooperative banks have diversified their activities, acquired non-cooperative financial institutions, merged some institutions and implemented head institutions to fund and financially manage local entities.

For example in France Credit Mutuel acquired a major French commercial bank (Crédit Industriel et Commercial) in 1998. French savings banks and the cooperative bank Banque Populaire have merged their activities in investment banking in 2006 to create Natixis, and in 2009 they have constituted a head institution BPCE. In Germany, DZ Bank was created in 2001 by Volksbank and Raiffeisenbanks. Its aim is to manage liquidity in local networks. In Italy, following the possibilities created by the 1993

Consolidated Law on Banking, some banks belonging to the Banchi Popolari network merged to form groups while some are now listed.

A general trend in recent years has been the mergers between cooperative institutions. For example the German cooperative banking system has considerably decreased its number of entities from approximately 3,400 in the early 1990 to 1,100 in 2011. The same movement is observed for savings banks for instance in France where the number of regional institutions has fallen from 35 in 1991 to 17 in 2012. Note that the latter are quite similar than cooperative banks for historical reasons. The differences between both forms of institutions are mainly due to their legal status and their capital holding characteristics. Over all financial institutions, cooperatives banks are distinguishable by the existence of members and their local roots[7].

2.2 Hypotheses

Several arguments can be advanced to explain why cooperative banks can have a lower market power than commercial banks.

The starting point is the governance of cooperative banks. Two key characteristics of cooperative banks are the fact that owners are clients, and the principle "one man / one vote" which should apply for the management of the bank. This principle is implemented each year at the general assembly of members, which gives the main goals and delegates the day to day decisions to managers.

So governance of cooperative banks allows a high degree of subsidiarity and of power delegation. This scheme requires cooperative banks to favour close relations with clients, as clients are also owners of the banks and are hence involved in the decision-making process. These peculiarities align managers' behaviour with the bank's social mission (Kitson, 1996).

Then cooperative banks differentiate from commercial banks by their governance based on a stakeholder value maximization model more than a shareholder value maximization one. The last model is more oriented towards profit maximization than the first one (Llewellyn, 2005; Ayadi et al., 2010; Ferri, Kalmi and Kerola, 2014). To some extent cooperative banks generate profits in order to continue to provide services to their

[7] See Ayadi et al. (2009), Ayadi et al. (2010), Bülbül, Schmidt and Schüwer (2013) for more details on the European cooperative banking system.

customers, while these profits are not the main objective of the institution (Christensen, Hansen and Lando, 2004; Ayadi et al., 2009).

Another specific characteristic of cooperative banks deals with the management of these profits. They are added to bank capital and allow managing inter-temporal risk. According to Cihak and Hesse (2007), this feature contributes to make cooperative banks less risky than commercial banks. These authors compare financial stability between both categories of banks by measuring the z-score, and conclude that cooperative banks have a greater z-score associated with higher financial stability. Financial stability is the result of the ability to use consumers' surplus in weak periods. Indeed shares of cooperative banks differ from stocks of commercial banks. For example, bank earnings are not provided to shareholders in the same way. Although shares usually generate an income for the shareholders, these earnings are more stable and lower than dividends. Consequently a substantial share of profits is de facto added to reserves. As a result cooperative banks tend to be better capitalized than commercial banks (Ferri, Kalmi and Kerola, 2014).

Cooperative banks have also developed networks of locally established branches (Ayadi et al., 2009; Ayadi et al., 2010) which may have several impacts. Indeed the banking sector is characterized by information asymmetries between borrowers and lenders. Cooperative banks can have better ability to collect soft information and to develop relationship with their customers with their local roots. This can contribute to reduce information asymmetries. Bank relationship has been shown to favour access to finance (Petersen and Rajan, 1994; Cole, 1998) and to reduce collateral requirements (Degryse and Van Cayseele, 2000; Chakraborty and Hu, 2006). It has nonetheless to be stressed that bank relationship might also encourage the "hold-up-problem" because customers become more informationally captured. As a result a negative effect on borrowing costs can be observed (Petersen and Rajan, 1995; Degryse and Ongena, 2005).

This characteristic can explain why some studies have found greater market power for cooperative banks in the 90s (Hempell, 2002; Fernandez de Guevara, Maudos and Perez, 2005). As bank competition has strongly evolved over time in the EU (Weill, 2013), banks have more incentives to collect soft information and to establish close relationships with borrowers. Hence cooperative banks can have benefited from their specific advantage in this field.

Thus the management of their profits, the governance of cooperative banks and their local establishment can have an impact on their pricing behaviour. Managers of cooperative banks are appointed by clients through the decision-making process and must

act in their interest. This is a key difference with commercial banks as interests of clients do not get into conflict with those of owners when it comes to pricing. Managers of cooperative banks have incentives not to fully exploit the market power they could have on their clients. Thus we assume that cooperative banks exert a lower market power than commercial banks.

3 Data

We use a large dataset of banks from European countries in which the cooperative banking industry owns a large market share and for which we can have enough observations for the different types of banks[8]. We then consider five countries: Austria, Denmark, France, Germany, and Italy. We keep commercial, cooperative, and savings banks. Focusing on these countries is in accordance with the origins and the historical development of cooperative banking system[9].

A seven-year period from 2002 to 2008 is considered as it displays a pre-crisis period. Unconsolidated accounting data from Bankscope data base are used as in other studies like Cihak and Hesse (2007) or Weill (2011)[10].

We drop outliers in the initial sample of observations by adopting a Tukey boxplot on input prices: banks with observations out of the first and third quartiles that are greater or less than twice the interquartile range are dropped. We also drop outliers in the Lerner index by proceeding to a truncation of the two extreme percentiles (1% and 99%). Finally we obtain a sample composed by 2,868 banks and 14,501 observations. The decomposition of the sample by country and by category of banks is displayed in Table 1.

Summary statistics are given in Table 2. We observe that the average commercial bank with total assets of 15.7 billion euros is larger than the average cooperative bank and

[8] For instance we exclude Finland because we have only observations of three cooperative banks of the same banking group (OP-Pohjola Group). We also exclude Spain because cooperative banks have a low market share (approximately 5% in 2009 (see Ayadi et al., 2010)).

[9] French savings banks are considered « as they are » as Cihak and Hesse (2007) do despite they became cooperative by a reform in June 1999.

[10] We use unconsolidated data in line with former works comparing cooperative banks and commercial banks, as these data notably allow differentiating bank types. The use of consolidated data would make difficult the treatment of banking groups in which commercial banks are owned by cooperative banks.

the average savings bank with total assets of 2.2 billion euros and 933 million euros respectively. It is of interest to observe that the mean prices of borrowed funds and of labor are quite similar for commercial banks and cooperative banks. Interestingly the price of physical capital is much larger for commercial banks than for cooperative banks.

4 Methodology

We use the Lerner index to measure bank competition. It refers to the new empirical Industrial Organization approach, which considers that market structure cannot be directly considered as an indicator of competition. This is at odds with the traditional Industrial Organization competition tools, which are based on the hypothesis that market structure indicators provide information on the degree of competition on a market. This latter approach thus considers for instance that the degree of concentration is an indicator of competition with greater concentration associated to lower competition. It provides structural indicators of competition like the Herfindahl index, which are based on the structure-conduct-performance (SCP) paradigm proposed by Mason (1939) and Bain (1956). New empirical Industrial Organization does not accord with this approach as it considers for instance that a market can be very competitive and concentrated. A few firms can compete fiercely leading to low prices. Thus using the tools of the traditional paradigm would be misleading. As shown by Shaffer (1983, 2004), this new approach then develops measures of competition based on the effective behavior of firms, like the Lerner index (Lerner, 1934).

The Lerner index has been applied on the banking sector in several recent studies (Maudos and Fernandez de Guevara, 2004; Carbo et al., 2009; Weill, 2011). While it allows considering the effective behavior of banks, it also presents the key advantage to provide an individual measure of competition. This latter characteristic is of particular interest for our study as we want one measure of competition for each bank instead of one aggregate measure of competition so that we can compare different groups of banks according to their type.

The Lerner index is defined as the difference between the price and the marginal cost over the price. It represents the extent to which a bank has market power to set price over marginal cost. A zero value refers to a perfectly competitive market, while higher numbers indicate greater market power and then less competition.

To estimate the parameters of the Lerner index we use the same definitions for variables than Fernandez de Guevara, Maudos and Perez (2005) and Carbo et al. (2009) or Weill (2011). The price is the average price of bank production proxied by the ratio of total revenues to total assets. The marginal cost is estimated by a translogarithmic cost function, where the total cost depends on the prices of three inputs (price of labor, price of physical capital, and price of borrowed funds) and on the bank's volume of production proxied by total assets. One intertemporal cost function is estimated including bank, year and country dummy variables. Linear homogeneity and symmetry restrictions in input prices are imposed.

$$\ln TC = \alpha_0 + \alpha_1 \ln y + \frac{1}{2}\alpha_2 (\ln y)^2 + \sum_{j=1}^{3} \beta_j ln w_j + \sum_{j=1}^{3}\sum_{k=1}^{3} \beta_{jk} \ln w_j \ln w_k + \sum_{j=1}^{3} \gamma_j ln y \ln w_j + \varepsilon \quad (1)$$

The equation (1) specifies the cost function used to estimate the marginal cost. *TC* denotes total costs (measured by the sum of personnel expenses, other non-interest expenses, and interest expenses), y represents total assets, w_1, w_2, w_3 denotes respectively the price of labor (measured by the ratio of personnel expenses to total assets), the price of physical capital (measured by the ratio of other non-interest expenses to fixed assets), and the price of borrowed funds (measured by the ratio of interest expenses to all funding). Indices for each bank and each year have been dropped for simplicity in equation (1).

The estimated coefficients of equation (1) permit to compute the following marginal cost (*MC*) such that:

$$MC = \frac{TC}{y}(\alpha_1 + \alpha_2 \ln y + \sum_{j=1}^{3} \gamma_j \ln w_j) \quad (2)$$

Once we obtain the marginal cost, we can calculate the Lerner index for each bank by the following manner:

$$Lerner\ index = \frac{Price - MC}{Price} \tag{3}$$

5 Results

We present in this section our results for the differences in market power between the categories of banks. We provide the Lerner indices for each category of banks, and we perform regressions of Lerner indices to take control variables into account.

5.1 Comparison of Lerner indices

Table 3 gives the mean values of Lerner indices for each bank type and each year. The main finding is the fact that commercial banks have on average a greater Lerner index than cooperative banks[11]. For the full period, the mean Lerner indices are respectively 17.33% and 11.60% for commercial banks and cooperative banks. The greater market power for commercial banks is observed and is significant for each year of the period.

Our results differ from those from Fernandez de Guevara, Maudos and Perez (2005) and from Hempell (2002) who both find a greater market power for cooperative banks than for commercial banks for EU banking industries. However they perform their studies for the 90s.

As shown by Weill (2013), competition in the EU banking industries has strongly evolved over time with notably the implementation of the single currency (leading to the cancellation of exchange rate risk across Eurozone countries) and the movement of mergers and acquisitions. Cooperative banks in Europe have notably proceeded to a large

[11] We find similar results when we estimate alternative cost functions (by bank category and year, by bank category including country dummies and times dummies and overall estimation without dummies).

wave of concentration in the 2000s, which makes the analysis of each decade hard to compare (see Ory, Jaeger and Gurtner, 2006 for the French case). Moreover, as cooperative banks can have greater ability to collect soft information, they can have benefited from this advantage in front of increased bank competition.

The analysis of the evolution of market power is described for all bank types in Figure 1. Overall there is an increase of market power between 2002 and 2005 followed by a reduction between 2006 and 2008. It is of interest to observe that the order of magnitude of Lerner indices we observe is rather comparable to what was found in former studies. Fernandez de Guevara, Maudos and Perez (2005) conclude to a mean Lerner index of 10% in 1999 for their sample of five EU countries (France, Germany, Italy, Spain, the UK). In their study on 11 EU countries over the period 1995-2001, Carbo et al. (2009) find a mean Lerner index of 16% with country levels ranging from 11% to 22%. When analyzing the Italian banking industry, Angelini and Cetorelli (2003) find Lerner indices ranging between 5% and 20% over the period 1983-1997.

We can then wonder if differences in Lerner indices come from differences in prices or in marginal costs. To do so, we analyze the mean values of marginal costs and prices in Table 4. We do not observe that cooperative banks and commercial banks have significantly different marginal costs over the period. While cooperative banks have significantly higher marginal costs from 2002 to 2005, the opposite finding is observed for 2007 and 2008. So we cannot conclude like Angelini and Cetorelli (2003) that cooperative banks have lower Lerner indexes because they encountered higher marginal costs.

However prices are significantly lower for cooperative banks over the period. The difference in prices is also significant for each year of the period with the exception of 2005. These results support the view that cooperative banks mainly differ from commercial banks by their lower prices. Thus they are in accordance with the hypothesis that cooperative banks charge lower prices than commercial banks. The lower Lerner index for cooperative banks is mainly not the consequence of higher marginal costs but of lower prices.

Some studies underline that non-tradable property rights of cooperative banks create a loss control of owners on managers. Indeed cooperative banks are not listed on an exchange as a consequent managers do not support any market discipline (Rasmussen, 1988) and are tempted to maximize their own utility (expense preferences behavior) to the detriment of owners 'utility (members). Accordingly, they allocate funds on bonuses

and salaries and utilize more labor inputs (Edwards, 1977; Kontolaimou and Tsekouras, 2010). This behavior expense preferences behavior can lead to higher operating costs. However our results directly contradict these findings.

The analysis of savings banks is also of interest. This type of banks has the lowest mean Lerner index with 9.46% for the full period. Savings banks have a significantly lower market power than commercial banks but also than cooperative banks. A striking finding is thus the fact that cooperative and savings banks are different financial institutions from the perspective of market power and can then not be considered as a homogenous group of banks. Saving banks resemble to cooperative banks in the extent to which they are not only profit oriented, combining social and financial objectives. They have legal mandate to contribute to their community and client welfare (Ayadi et al., 2009). However they differ from cooperative banks by their ownership: most saving banks are owned by municipalities, country or foundations. This result is further reinforced by the differences of marginal costs and prices. Savings banks have lower prices than both commercial and cooperative banks. A relevant difference on marginal costs is observed when comparing to both other categories of banks.

These results again differ from those from Fernandez de Guevara, Maudos and Perez (2005) who find a higher market power for savings banks in comparison to commercial and cooperative banks. But here again it must be stressed that the period and the sample of countries strongly differ.

5.2 Multivariate analysis

The comparison of Lerner indices has shown that cooperative banks have a lower market power than commercial banks. However we have not taken into account the potential influence of other characteristics of banks and of countries. For instance, we have seen above that size is much larger for commercial banks than for cooperative banks. Thus we can wonder if the finding of a greater market power for commercial banks is the result of the bank type or of the bank size.

To solve this problem, we perform regressions of Lerner indices. We use random effects GLS regressions (robust for autocorrelation and heteroscedasticity) to investigate

the determinants of the Lerner indices. We adopt this specification as we use panel data and as the bank type variables are constant over time[12].

We consider three dummy variables for bank type. *Cooperative* and *Savings* are dummy variables equal to one if the bank is respectively a cooperative bank or a savings bank, else equal to zero. We also create the dummy variable *Cooperative-Savings* which is equal to one if the bank is a cooperative bank or a savings bank, else equal to zero.

We consider three control variables at the bank level. Following Fernandez de Guevara and Maudos (2007) and Weill (2011), we control for size and bank activities. Bank size is measured by the logarithm of total assets (*Bank size*). The ratio of loans to investment assets is used to take the structure of assets into account (*Loans to investment assets*). The ratio of equity to assets (*Equity to assets*) controls for the capital structure and also considers risk aversion of bank managers as a greater share of equity is associated with higher risk aversion.

Following Angelini and Cetorelli (2003), we also take into account six country-level variables. We control for cyclical effects by including *Real GDP growth* and *Inflation*. We include the *Short term interest rate* (Euribor 3 month) to consider monetary policy. We also control market structure with three variables: *Herfindahl Index*, *Number of banks*, and *(Bank branches) / population*. Finally we include country dummy variables to take country-specific characteristics into account.

We run regressions in which we test alternatively the inclusion of *Cooperative* and *Savings*, or the inclusion of *Cooperative-Savings*. Table 5 displays these estimations. In all regressions we obtain negative and significant coefficients for *Cooperative*, *Savings*, and *Cooperative-Savings*. These results mean that cooperative and savings banks have a significantly lower market power than commercial banks even when we control for variables at the bank and the country level. Consequently they confirm our first conclusions based on the comparison of mean Lerner indices.

The analysis of control variables shows a positive relation with bank size, supporting the view that larger banks would benefit from higher market power. This result is in line with several studies (e.g. Bikker and Haaf, 2002; Fernandez de Guevara, Maudos and Perez, 2005). We also find a negative and significant coefficient for *Loans to investment assets*, which shows a link between the structure of assets and market power.

[12] The Hausman test supports a fixed effect estimation. However, a pooled OLS regression was run and gives the same results, than the GLS method both regression models are in line with the results obtained on the univariate analysis.

The equity to assets ratio is positive and significant, meaning that banks with higher solvency have greater market power. This could be explained by the existing confidence between the depositors and the bank. Indeed a better solvency of the bank improves depositors' confidence in the capacity of the bank to overtake and solve economic problems. Thus, knowing that depositors are confident concerning the safety of the assets, the bank could modify its price policy to tax depositors. Similar results are found in other studies as Weill (2011).

Both variables controlling for the macroeconomic situation, *Real GDP growth* and *Inflation*, are negatively and significantly related to the Lerner index, while we do not observe a significant coefficient for the *Short term interest rate*. As expected, *Herfindahl index* is positive and significant, meaning that greater concentration is associated with higher market power, and the number of bank branches per capita is significantly negative.

We also analyze if there are significant differences in marginal cost and price in multivariate estimations by performing the same regressions on these dependent variables. Indeed we have shown above that lower Lerner index for cooperative banks was mainly the result of lower price charged by these banks in comparison to commercial banks. The regressions confirm these findings. We observe that the price is significantly lower for cooperative and savings banks relative to commercial banks. We also find that marginal cost is significantly lower for cooperative and savings banks. In other words, we cannot conclude that cooperative banks have lower Lerner indices because of higher marginal cost.

Hence these results confirm that the lower Lerner index for cooperative banks is mainly due to lower prices.

6 Conclusions

In this study we have examined if cooperative banks have a different market power than commercial banks in five EU countries in the 2000s. The cooperative banking industry owns a considerable market share in these countries, questioning the impact of this specific form of bank ownership on the degree of competition.

Our hypothesis is that cooperative banks have a lower market power than commercial banks, in line with the features of the governance of the cooperative banks.

Namely, owners of cooperative banks are also clients. Hence managers of these banks have incentives not to charge excessively clients for banking products. Our findings confirm this hypothesis. We observe that cooperative banks have a lower Lerner index than commercial banks mainly due to lower prices. This conclusion stands when performing a univariate analysis and when estimating regressions of Lerner indices on a set of variables including bank type and control variables.

The normative implications of our findings are that measures preserving or even favoring the cooperative banking industry in EU countries could contribute to strengthen bank competition. Through this channel, cooperative banks generate economic gains by favoring access to credit at lower cost. In other words, cooperative banks should not be considered as old-fashioned financial institutions without economic gains for a society. So the key policy message is that the diversity of banks should be preserved in EU countries.

To prolong this work, the comparison of cost efficiency between cooperative and commercial banks should be examined to have a better understanding on the dynamics between the development of cooperative banking and access to credit. We let this issue for further research.

Table 1: The sample

This table shows the number of banks in the sample by category and country.

Country	Commercial banks	Cooperative banks	Savings banks	All banks
Austria	31	110	82	223
Denmark	42	6	47	95
Germany	73	1,174	504	1,751
France	72	84	33	189
Italy	93	468	49	610
All	311	1,842	715	2,868
Number of observations	1,270	9,050	4,181	14,501

Table 2: Summary statistics

This table shows the mean values and standard deviations (between parentheses) for bank-level variables used in estimations for each bank category. All statistics are computed for observations over the period 2002-2008.

Variables	All banks	Commercial banks	Cooperative banks	Savings banks
Total assets (Euro thousand)	2,586,908.18 (26,833,636.9)	15,649,203.2 (88,919,913.5)	933,256.43 (3,681,367.87)	2,198,588.09 (3,179,836.65)
Total costs (Euro thousand)	104,809.52 (901,079.57)	557 771.35 (2,969,414)	42,477.04 (148,443.87)	102,142.1 (145,691.66)
Total revenue (Euro thousand)	116,760.3 (934,159.97)	613 473.95 (3,068,098.14)	49,126.01 (164,735.38)	112,279.06 (160,531.17)
Price of labour (%)	1.44 (0.38)	1.47 (0.65)	1.51 (0.35)	1.29 (0.28)
Price of borrowed funds (%)	2.83 (0.77)	2.8 (1.1)	2.79 (0.78)	2.92 (0.61)
Price of physical capital (%)	78.07 (43.85)	108.42 (64.26)	75.1 (40.78)	75.27 (38.85)

Table 3: Lerner indices

This table presents Lerner indices for each bank type and year. Lerner indices are given in percentage. Means are displayed with standard deviations between parentheses. The differences between indices are displayed by bank type with the referring p-value (mean test differences).

	Categories of banks			Differences					
Date	**c**	**m**	**s**	**diff(c-m)**		**diff(c-s)**		**diff(m-s)**	
2002	14.257 (10.263)	8.330 (5.542)	7.638 (5.925)	5.927	<0.0001	6.619	<0.0001	0.692	0.021
2003	19.383 (10.996)	10.265 (5.802)	10.396 (6.218)	9.118	<0.0001	8.988	<0.0001	-0.131	0.686
2004	19.173 (10.954)	10.967 (5.863)	10.556 (6.460)	8.207	<0.0001	8.618	<0.0001	0.411	0.217
2005	19.870 (11.119)	14.163 (7.569)	11.557 (7.043)	5.708	<0.0001	8.314	<0.0001	2.606	<0.0001
2006	19.151 (11.398)	13.850 (8.128)	11.020 (7.041)	5.301	<0.0001	8.131	<0.0001	2.830	<0.0001
2007	17.490 (10.795)	12.334 (7.273)	9.241 (7.142)	5.156	<0.0001	8.249	<0.0001	3.093	<0.0001
2008	11.771 (10.719)	9.015 (6.553)	5.741 (6.100)	2.756	0.001	6.030	<0.0001	3.274	<0.0001
All	17.325 (11.261)	11.597 (7.263)	9.460 (6.849)	5.728	<0.0001	7.865	<0.0001	2.137	<0.0001

Table 4: Marginal costs and prices

This table presents marginal cost and price for each bank type and year. Marginal costs are obtained by equation (2) and the price is the average price of bank production proxied by the ratio of total revenues to total assets percentage. Mean are displayed with standard deviations between parentheses. The differences between marginal costs and prices are displayed by bank type. *, **, *** indicates a significant mean difference at 10%, 5% and 1% level.

	Marginal Costs						Prices					
Date	**c**	**m**	**s**	**diff(c-m)**	**diff(c-s)**	**diff(m-s)**	**c**	**m**	**s**	**diff(c-m)**	**diff(c-s)**	**diff(m-s)**
2002	0.053 (0.012)	0.054 (0.006)	0.051 (0.005)	-0.001	0.002***	0.002***	0.063 (0.015)	0.059 (0.006)	0.056 (0.006)	0.004***	0.007***	0.003***
2003	0.048 (0.011)	0.050 (0.006)	0.048 (0.005)	-0.002**	0.000***	0.002***	0.061 (0.016)	0.056 (0.006)	0.054 (0.006)	0.005***	0.006***	0.002***
2004	0.044 (0.011)	0.047 (0.006)	0.045 (0.005)	-0.003**	-0.001***	0.002***	0.056 (0.016)	0.053 (0.006)	0.051 (0.006)	0.003*	0.005***	0.002***
2005	0.042 (0.010)	0.045 (0.006)	0.044 (0.005)	-0.003***	-0.002***	0.001**	0.053 (0.013)	0.052 (0.008)	0.050 (0.006)	0.001	0.003***	0.002***
2006	0.045 (0.009)	0.045 (0.006)	0.044 (0.004)	0.000	0.001***	0.001***	0.056 (0.012)	0.053 (0.006)	0.050 (0.006)	0.004***	0.007***	0.003***
2007	0.050 (0.008)	0.048 (0.005)	0.047 (0.004)	0.002***	0.003***	0.000**	0.061 (0.011)	0.054 (0.006)	0.052 (0.006)	0.007***	0.009***	0.002***
2008	0.052 (0.011)	0.049 (0.005)	0.049 (0.004)	0.003***	0.003***	0.000	0.059 (0.013)	0.054 (0.006)	0.052 (0.005)	0.005***	0.007***	0.002***
All	0.048 (0.011)	0.048 (0.006)	0.047 (0.005)	0.000	0.001	0.001***	0.058 (0.014)	0.054 (0.007)	0.052 (0.006)	0.004***	0.006***	0.002***

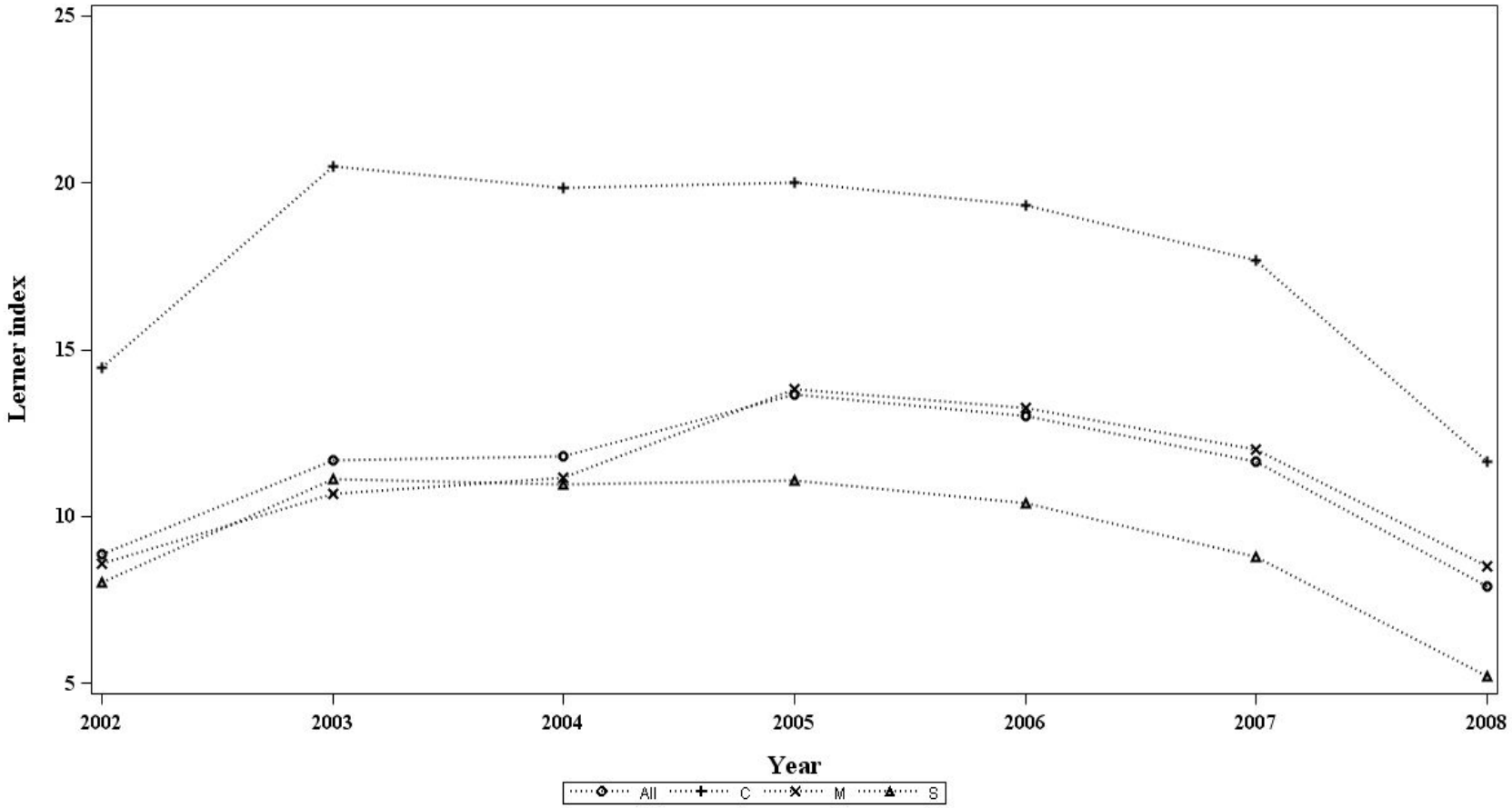
Table 5: Regression analysis

Random effects GLS regressions are presented in this table. Country dummy variables are included in all estimations. Standard errors are displayed in parenthesis.*, **, *** represents a coefficient significantly different of 0 at 10%, 5% and 1% level.

Explanatory Variables	Lerner Index		Marginal Cost		Price	
Intercept	14.096*** (5.368)	15.275*** (5.368)	4.760*** (0.369)	4.714*** (0.363)	5.822*** (0.457)	5.822*** (0.452)
Cooperative	-2.109*** (0.626)	–	-0.149** (0.064)	–	-0.367*** (0.080)	–
Savings	-2.934*** (0.599)	–	-0.115** (0.064)	–	-0.368*** (0.079)	–
Cooperative-Savings	–	-2.468*** (0.604)	–	-0.135** (0.063)	–	-0.367*** (0.078)
Bank size	0.208** (0.097)	0.102 (0.084)	-0.111*** (0.011)	-0.107*** (0.010)	-0.114*** (0.014)	-0.114*** (0.012)
Loans to investment assets	-0.006*** (0.001)	-0.006*** (0.001)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Equity to assets	76.279*** (6.777)	76.287*** (6.835)	0.577 (0.509)	0.581 (0.510)	5.781*** (0.838)	5.780*** (0.838)
Real GDP growth	-0.531** (0.234)	-0.533** (0.234)	-0.268*** (0.011)	-0.268*** (0.011)	-0.349*** (0.019)	-0.349*** (0.019)
Short term interest rate	-0.002 (0.004)	-0.002 (0.004)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Inflation	-2.219*** (0.239)	-2.226*** (0.240)	0.086*** (0.016)	0.086*** (0.016)	-0.044* (0.022)	-0.044** (0.022)
(Bank branches)/population	-4.705* (2.670)	-4.618* (2.669)	-2.053*** (0.191)	-2.056*** (0.191)	-2.808*** (0.262)	-2.807*** (0.262)
Number of banks	-0.002 (0.002)	-0.002 (0.002)	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)
Herfindahl index	0.486** (0.242)	0.482** (0.243)	-0.012 (0.016)	-0.012 (0.016)	0.022 (0.019)	0.022 (0.019)
Number of Observations	14,205	14,205	14,205	14,205	14,205	14,205
R2	0.2817	0.2815	0.4846	0.4845	0.3029	0.3027

Figure 1: Lerner indices by bank type

This graph gives the mean values by year of the Lerner index for commercial banks (c), cooperative banks (m), savings banks (s) and all bank types (All).



CHAPTER 2

Switching costs and market power in the banking industry: the case of cooperative banks

This chapter refers to the paper co-written with Laurent Weill

Abstract

In this paper, we investigate the influence of switching costs in banking for the three largest Eurozone countries (France, Germany, and Italy). We use the Shy's (2002) approach to measure switching costs on bank-level data for the period of 2006 to 2012. We examine whether cooperative banks have different switching costs than commercial banks. We find lower switching costs for cooperative banks, suggesting their client-based ownership contributes to reducing incentives to bank managers to lock in customers. We analyze whether the level of switching costs influences the market power of banks in these countries. We conclude a positive relation between switching costs and market power. Thus, our results contribute to explaining the pattern of bank competition across European countries and stress the beneficial influence of cooperative banks on consumer welfare by reducing switching costs.

JEL Codes: G21, L11 P13

Keywords: Switching Costs, Market Power, Cooperative Banks

1 Introduction

Many European banking industries are characterized by a large market share of cooperative banks. These financial institutions are distinguished from commercial banks mainly through their capital holding structures and their networks. On the one hand, cooperative banks are not listed on stock exchanges and are held directly by their clients through member shares. Members participate directly in their governance and elect their representatives through general assembly meetings. As a consequence, bank managers have special incentives to take into account the welfare of clients. On the other hand, cooperative banks have developed large and local networks from the past, providing financial services to clients and small local firms (Ayadi et al., 2010). This strong proximity favors tight bank-customer relationships (Ayadi et al., 2010; Bülbül et al., 2013). A natural question that then emerges from the observation of differences between cooperative banks and commercial banks concerns the fact that the specific characteristics of cooperative banks can influence bank behavior.

The major aim of this paper is to investigate whether switching costs differ between cooperative banks and commercial banks for the three major Eurozone countries (France, Germany, and Italy). Switching costs are present in many markets. They occur when consumers have to bear costs through time, effort, or money when switching to other suppliers. There is a consensus in the literature that switching costs are a major characteristic of the banking industry (Degryse, Kim and Ongena, 2009).

Switching costs include transactional costs related to changing a bank account from one bank to another or to taxes related when closing financial securities earlier than contractually planned. They are also associated with informational costs. Owing to the existence of information asymmetries in the bank-borrower relation, the incumbent bank has better information than any potential competitor because of the long-term relationship between the bank and the borrower. This informational advantage gives the possibility for the incumbent lender to extract profits from locked-in clients. Indeed, if a client wants to switch to another bank, the new bank does not know its quality and will then consider a low risk borrower with greater risk than what the old bank would assess, which results in unfavorable lending conditions. Hence the switching cost is the lost value of the long-

term relationship with the old bank. Informational costs can also include the better information owned by a client on its current bank in comparison to other banks, which makes the client reluctant to switch to another bank. As stressed by Klemperer (1995), for any economic activity, switching costs can also be induced by utility losses due to the consumption of another brand because of the uncertainty of the other brands' quality.

We can then wonder whether the governance and high degree of relationship banking of cooperative banks influence the magnitude of switching costs. Two opposing arguments can be suggested based on both key differences between cooperative banks and commercial banks. On the one hand, the specific governance of cooperative banks owned by their own clients suggests that these banks should have lower switching costs for two reasons. First, owners of the bank, as the clients, have lower incentives to adopt strategies that reduce the welfare of clients. Second, clients who are owners of the bank through the purchase of shares have lower incentives to switch to other banks as their ownership of shares can increase their connection to the bank. On the other hand, the higher degree of relationship banking can result in having highly "locked-in" clients.

There are few studies that measure switching costs in the banking industry. While many have been done for the US banking industry (e.g., Sharpe, 1997; Santos and Winton, 2008), a few studies have been conducted for several European banking industries. Notably, we can cite the works from Shy (2002) on the Finnish deposit market, Kim, Kliger and Vale (2003) on loan markets in Norway, and Barone et al. (2011) who consider four local loan markets in Italy. However, to the best of our knowledge no work has ever compared these costs between cooperative banks and commercial banks. We therefore fill a loophole in the literature.

The second objective of this paper is to examine whether the degree of switching costs can help in explaining bank competition. The difference in switching costs between cooperative banks and commercial banks is indeed a major question for the market structure of banking industries in Europe, as it can explain differences in market power of banks among banks and among countries. Several studies have observed cross-country differences in bank market power across Europe (Carbo et al., 2009; Weill, 2013). We can then contribute to explaining these differences by highlighting the influence of switching costs, which is conditional to the composition of the banking industry between cooperative and commercial banks. Moreover, Egarius and Weill (2014) have shown a lower market power of cooperative banks relative to commercial banks. It is of importance therefore to check whether this finding results from a difference in switching

costs between both types of banks. Nonetheless, the role of switching costs on the market structure depends on the relation between switching costs and market power of banks. In this aim, we investigate empirically this relation for European banking industries.

The influence of switching costs on firms' market power is supported by theory. For a given market switching costs exist if a buyer purchases a product repeatedly and will find that it is costly to switch from one supplier to another (Farell and Klemperer, 2007). Switching costs then are faced directly by clients when they decide to change suppliers (Kim et al., 2003). In the banking industry, the theoretical literature supports the view that switching costs enhance the market power of banks, with the work by Sharpe (1990) notably showing that a long-term relationship gives the incumbent bank market power on its clients thanks to its informational advantage.

However, the empirical literature on the influence of switching costs on market power and more generally on pricing behavior in banking is still debated today. In the US, Stango (2002) has studied the relationship between prices and consumer switching costs for the credit card market and finds that switching costs have an important influence on pricing for commercial banks, but have almost no influence on credit unions. In their analysis of local Italian loan markets, Barone et al. (2011) show that banks charge lower loan rates to new clients in line with the expected influence of switching costs on pricing. Using Bolivian credit register data, Ioannidou and Ongena (2010) determine new loan conditions for firms who switch to other banks and find that firms that decide to switch benefit from an average discount on interest rates that are 0.89% lower than loans granted to non-switching firms.

To examine these questions, we use data for banks from the three major Eurozone countries (France, Germany, and Italy) for the period 2006-2012. Cooperative banks have a large market share in these three countries, while reasonable numbers of cooperative banks and commercial banks allow a satisfactory comparison of both types of banks in terms of switching costs.

We employ the approach proposed by Shy (2002) to estimate switching costs in banking. This method assumes that firms compete according to a Bertrand competition game and follow an undercut property strategy. The undercut property implies that the firm with the lower market share wants to increase its market share by undercutting other firms offering lower prices given that "locked-in" customers in the other bank have switching costs. Several approaches have been proposed in the literature to measure switching costs in the banking industry. We choose to adopt Shy's (2002) approach as it

is a method easily applied on banking data that provides bank-level measures of switching costs. We measure banks' market power with the Lerner index, which is in line with recent studies (Carbo et al., 2009; Weill, 2013; Egarius and Weill, 2014) so that we can investigate the relation between switching costs and market power of banks to know whether switching costs matter for bank competition in European banking industries.

The remainder of this paper is structured as follows. Section 2 briefly presents the cooperative banking sector in the countries of the study. Section 3 develops the methodology and provides summary statistics. The results are outlined in section 4, and robustness checks are presented in section 5. Finally, section 6 presents the conclusions.

2 The Cooperative Banking Sectors

The cooperative banking model started in Germany in the 19th century on the initiative of Friedrich Wilhelm Raiffeisen. The initial goal of these institutions was to permit poor populations to have access to credit and banking services. To do so, the main objective was to bring together people's savings to provide credit to fund agricultural production and other activities in the local community. Cooperative banks can still be distinguished from commercial banks by the role of clients directly owning the bank through member shares.

Following figures from the European Association of Cooperative Banks, in 2012, Germany had a wide network of cooperative banks that included approximately 1,100 institutions and 13,200 branches overseen by DZ Bank, which is the head funding institution created in 2001. The market share is over 19% on deposits and over 18% on private loans while the network is managed by approximately 17.3 million members.

The French cooperative banking system appeared at the end of the nineteenth century. As in Germany, French cooperative banks were established at the local level to help populations obtain access to credit services. Until the 1980s, French cooperative banks were controlled by the state in one way or another. For instance, the head institution of Crédit Agricole, the Caisse Nationale de Crédit Agricole, was a public bank that refunded cooperative banks in the network until the banking reforms of the 1980s. These reforms gave cooperative banks the opportunity to merge and acquire other non-

cooperative institutions. For instance the cooperative bank Crédit Mutuel acquired the commercial bank Crédit Industriel et Commercial (CIC) in 1998. It is also noticeable that French savings banks became cooperative under the reform of 1999 and merged in 2009 with the cooperative banking network Banque Populaire.

In France, the cooperative banking sector includes three banking groups today: Banque Populaire-Caisse d'Epargne, Crédit Mutuel, and Crédit Agricole. Their aggregate market share for loans and deposits is approximately 50%, while they provide financial services to 22 million members with 93 banks and 25,261 branches for 2012.

In Italy, the cooperative banking model was also inspired by the German cooperative model. The first cooperative bank was launched in the mid-1860s in the area of Milan, while the first rural cooperative banks were established in 1883 (Ayadi et al., 2010). Currently, the Italian cooperative banking system is made up of two cooperative banking groups: Banche Popolari, and Banche di Credito Cooperativo. The first one is established in urban areas and holds 100 local institutions and 9,514 branches while the second one, mainly established in small rural areas, holds approximately 394 local institutions and 4,448 branches. In 2012, they had a market share of about one-third of loans and deposits and provided financial services to 2.3 million members.

3 Methodology and Data

3.1 Switching cost

We estimate switching costs with the methodology proposed by Shy (2002). Switching costs are considered a function of market share and prices, and firms are assumed to compete according to a Bertrand game. In the following section we briefly develop the theoretical model proposed by Shy (2002).

Consider a market in which two firms called A and B compete, providing brand A and brand B at price p_A and p_B, respectively. Let N_A and N_B denote clients that have already purchased brand A and brand B on the previous period. $S(>0)$ is the switching cost faced by a customer who decides to switch to one brand to another. Assume that U_α

and U_β represent the utility of a consumer, obtained, respectively, by consumption of brand A and brand B. Then, the utility from the purchase on the next period is given by:

$$U_\alpha \stackrel{\text{def}}{\equiv} \begin{cases} -p_A & if\ the\ client\ stays\ with\ brand\ A \\ -p_B - S & if\ the\ client\ switches\ to\ brand\ B \end{cases}$$

(1)

$$U_\beta \stackrel{\text{def}}{\equiv} \begin{cases} -p_B & if\ the\ client\ stays\ with\ brand\ B \\ -p_A - S & if\ the\ client\ switch\ to\ brand\ A \end{cases}$$

If n_A and n_B are, respectively, the number of buyers of brand A and brand B on next period, (1) implies:

$$n_A = \begin{cases} 0 & if\ p_A > p_B + S \\ N_A & if\ \ p_B - S \le p_A \le p_B + S \\ N_A + N_B & if\ p_A < p_B - S \end{cases}$$

$$n_B = \begin{cases} 0 & if\ p_B > p_A + S \\ N_B & if\ \ p_A - S \le p_B \le p_A + S \\ N_A + N_B & if\ p_B < p_A - S \end{cases} \qquad (2)$$

Marginal costs of both firms are assumed to be equal to zero. Hence profits for each firm are only function of prices:

$$\pi_A(p_A, p_B) = p_A n_A$$

and (3)

$$\pi_B(p_A, p_B) = p_B n_B$$

A non-negative pair of prices $\{p_A^N, p_B^N\}$ would constitute a Nash-Bertrand equilibrium. In other words, for a given price p_B firm A sets its prices at p_A to maximize π_A, and it is symmetrically true for firm B to maximize π_B. However, in pure strategy, a Nash-Bertrand equilibrium does not exist because any firm could decide to deviate from its pricing to capture all customers (see Shy, 1996).

To solve this problem, Shy (2002) assumes a new equilibrium concept, called the undercut-proof equilibrium. It implies that it is not possible for a firm to increase profits by undercutting a rival firm while it is impossible for any firm to raise its price without being profitably undercut by a rival firm.

According to the first definition given by Shy (2002), a firm i undercuts the rival firm j when its prices are set to $p_i < p_j - S$. In this case firm i is subzidising switching costs faced by rival firm j's clients.

Hence, when firm A undercuts firm B, then from Eq.(2), firm A attracts all customers, then $n_A = N_A + N_B$ and $n_B = 0$.

According to the second definition given by Shy (2002), prices $\{p_A^U, p_B^U\}$ satisfies the Undercut-Proof Property when for p_B^U and n_B^U, firm A, charges the highest prices such that, $\pi_B^U = p_B^U n_B^U \geq (p_A - S)(N_A + N_B)$ and firm B sets the highest prices for p_A^U and n_A^U, such that, $\pi_A^U = p_A^U n_A^U \geq (p_B - S)(N_A + N_B)$.

The aforementioned inequalities hold as equalities which can be solved for the unique pair of prices

$$p_A^U = \frac{(N_A + N_B)(N_A + 2N_B)S}{(N_A)^2 + N_A N_B + (N_B)^2}$$

and (4)

$$p_B^U = \frac{(N_A + N_B)(2N_A + N_B)S}{(N_A)^2 + N_A N_B + (N_B)^2}$$

To secure a positive market share, without risk of being undercut by a rival firm, both firms (A and B) set their prices such that $p_i \leq S$. Substituting Eq. (4) into Eq. (2), $n_A = N_A$ and $n_B = N_B$

For usefulness Shy (2002) extended the model considering more firms and different switching costs values for customers.

Under the undercut-proof equilibrium, the most (least) profitable firm is assumed to be the one with the largest (smallest) market share. Consequently, the firm with the smallest market share has strong incentives to undercut more profitable firms to gain market share. If there are $I \geq 2$ firms in the market indexed by i with $i = 1, \dots, I$, let denote MS_i firm i's market share such that,

$$MS_1 > MS_2 > \cdots > MS_I \tag{5}$$

Firms are assumed to behave as follows:

-Firm $i \neq I$ with the largest market share fears being undercut by the firm with the smallest market share, firm I. Hence, prices charged by I are considered as the reference point by firm i.

-Firm I fears that firm 1 targeted itself and then set its price p_I in reference to p_1

Let S_i (with $i = 1, \dots, I$)) denote the switching cost of firm i consumers. When S_i are common knowledge for firms and consumers, firm $i \neq I$ considers p_I as given and sets maximal p_i to satisfy:

$$\pi_I = p_I N_I > (p_i - S_i)(N_i + N_I) \tag{6}$$

Where π_I indicates firm I's profit.

Switching costs are directly obtained by Eq.(7):

$$S_i = p_i - \frac{N_I p_I}{N_i + N_I} \tag{7}$$

With $i \in \{1, \dots, I-1\}$

Firm 1 is considered by firm I as the "prey target", then firm I will choose price p_I to make undercutting unprofitable such that,

$$\pi_1 = p_1 N_1 \geq (P_I - S_I)(N_1 + N_I) \tag{8}$$

As p_1 is observed we can directly derive switching costs from firm I such that:

$$S_I = p_I - \frac{N_1 p_1}{N_1 + N_I} \tag{9}$$

For our study, switching costs are directly obtained from Eq. (7) for all banks in reference to bank I, that is the bank with the lowest market share. From Eq. (9) we obtain clients' switching costs for bank I in reference to bank 1, the bank with the larger market share.

To estimate switching costs we use the ratio of total revenues to total income as a proxy of the average price of the bank. Market shares are computed with total assets for each bank and for each year.

We have to stress that banks are assumed to compete on their national market in line with evidence showing that European banking markets are mainly domestic (see for instance Maudos and Fernandez de Guevara, 2004). As a consequence, the market share is computed relative to banking assets on a given market.

3.2 Lerner Indices

To measure market power we use the Lerner index, which is commonly used in the banking industry (Maudos and Fernandez de Guevara, 2004; Carbo et al., 2009, Weill, 2011, Egarius and Weill, 2014). Several measures have been proposed in the literature to assess banking competition, for example the H-statistic or the Herfindahl index. The Lerner index is adopted in our study as we want to have a bank-level measure for each year so that it can be linked to the measure of switching costs.

The Lerner index is defined as the difference between price and marginal cost divided by price. Hence it represents the extent to which a bank has market power to set price over marginal cost. A zero value refers to a perfectly competitive market, while higher numbers indicate greater market power and then less competition.

To estimate the parameters of the Lerner index we use the same definitions for variables as Fernandez de Guevara, Maudos and Perez (2005), Carbo *et* al. (2009), and Egarius and Weill (2014). The price is the average price of bank production proxied by the ratio of total revenues to total assets. The marginal cost is estimated by a translog cost function, where the total cost depends on the prices of three inputs (price of labor, price of physical capital, and price of borrowed funds) and on the bank's volume of production proxied by total assets.

To obtain an intertemporal cost function we estimate one cost function over the period of scrutiny, including time and bank fixed effects, as well as country dummy variables. Linear homogeneity and symmetry restrictions in input prices are imposed. The cost function is given by the following equation:

$$\ln TC = \alpha_0 + \alpha_1 \ln y + \frac{1}{2}\alpha_2 (\ln y)^2 + \sum_{j=1}^{3} \beta_j ln w_j + \sum_{j=1}^{3}\sum_{k=1}^{3} \beta_{jk} \ln w_j \ln w_k + \sum_{j=1}^{3} \gamma_j ln y \ln w_j + \varepsilon \quad (10)$$

Indices for each bank and for each year have been dropped for clarity. Where TC denotes total costs (the sum of personnel expenses, other non-interest expenses, and

interest expenses), y indicates the total assets and w_1, $w_{2,}w_3$ are, respectively, the price of labor (given by the ratio of personnel expenses to total assets), the price of physical capital (measured by the ratio of other non-interest expenses to fixed assets), and the price of borrowed funds (measured by the ratio of interest expenses to fixed assets).

Coefficients obtained from Eq. (10) allow marginal costs (MC) to be determined for each bank as follows:

$$MC = \frac{TC}{y}(\alpha_1 + \alpha_2 \ln y + \sum_{j=1}^{3} \gamma_j \ln w_j) \quad (11)$$

The Lerner Index is directly obtained at the bank level as follows:

$$Lerner\ index = \frac{Price - MC}{Price} \quad (12)$$

MC is the marginal cost and $Price$ is the average price of bank production.

3.3 Data

We use data from Bankscope Bureau Van Dijk containing financial balance sheets for commercial, cooperative, and savings banks over the period 2006-2012. We focus on the three major Eurozone countries (France, Germany, and Italy) as they all have a large market share owned by cooperative banks and significant numbers of cooperative banks and of commercial banks allowing for comparison of switching costs between both types of banks.

Following Cihak and Hesse (2007) and Egarius and Weill (2014), we use unconsolidated data to distinguish cooperative banks from commercial banks, as some cooperative banking groups can include commercial banks. For example, in France, the cooperative banking group Banque Populaire/Caisse d'Epargne (BPCE) holds the commercial bank Natixis, resulting in the fact that we cannot distinguish commercial and cooperative banks with consolidated data.

We apply the Tukey boxplot on input prices of the cost function. Banks with observations out of the first and third quartile, greater and lesser than twice the interquartile range are deleted. Furthermore, switching costs and Lerner indices out of 1% and 99% percentiles are excluded from the analysis. Consequently we obtain a sample composed of 1,958 banks and 11,685 observations over the period. Table 1 gives an overview of the sample by bank type and by country. Summary statistics are displayed in Table 2. We can observe that commercial banks are on average larger than cooperative banks.

4 Results

4.1 Switching costs

Our estimations on switching costs are presented in Table 3. Our main result is that overall cooperative banks have lower switching costs than commercial banks, even if we observe differences across countries and years.

In Italy, cooperative banks have significantly lower switching costs than commercial banks for all years. In France, we also note significantly lower switching costs for cooperative banks when the full period is considered. Cooperative banks have lower switching costs than commercial banks for all years, but the difference is significant for four years only. In Germany, we observe no significant difference in switching costs between cooperative banks and commercial banks, even if switching costs are significantly lower for cooperative banks for two years of the study (2007 and 2008). So the finding of lower switching costs for cooperative banks than for commercial banks is not as pronounced in every country of our analysis.

We can wonder if the financial crisis has exerted influence on the magnitude of switching costs. We observe a reduction in switching costs for all countries and all types of banks, which suggests that the ability for a bank to implement high switching costs has diminished with the financial crisis.

The analysis of savings banks is also of interest to some extent. While in France this type cannot be distinguished from cooperative banks for legal reasons, overall we observe no significant difference between this type of bank and cooperative or commercial banks in Germany. However, we find a different pattern in Italy with significantly greater switching costs for savings banks than for cooperative banks for all years of the study, while no significant difference is observed between savings banks and commercial banks.

To sum up, we find that cooperative banks have overall lower switching costs than commercial banks. We explain this finding by the difference in governance between cooperative banks and commercial banks. In particular, as cooperative banks are owned by their clients, bank managers do not have the same incentives to implement switching costs as clients are reluctant to bear such costs. The high degree of relationship banking in cooperative banks could have suggested greater switching costs in line with the informational capture of clients provided by information given by such relationship banking. Nonetheless, we do not observe this finding which may result from the fact that even if cooperative banks could have locked in their clients they do not behave this way because of governance driven incentives.

4.2 Switching costs and market power

We can now wonder if the level of switching costs exerts influence on market power. It is important to understand the determinants of market power of banks in Europe. It is also of interest for the comparative analysis of cooperative banks and commercial banks in Europe, as Egarius and Weill (2014) have shown that cooperative banks have lower market power than commercial banks in European countries. This latter result associated with our finding of lower switching costs for cooperative banks suggest that switching costs can favor market power.

To investigate this question, we perform random effects GLS regressions. This specification is motivated by the use of panel data and the fact that some explaining variables (e.g., bank type dummy variables) are constant over time.

The explained variable is the Lerner index, computed for each bank and each year. The key explaining variable is *Switching costs* as computed before. Following Fernandez de Guevara, Maudos and Perez (2007) and Weill (2011), several control variables are included in the regression model explaining the Lerner index. We use *loans to investment assets* given by the ratio of loans to investment assets to take into account the structure of activities. We control for size with the logarithm of total assets (*Size*). *Equity to assets* is calculated as the ratio of equity out of total assets and controls for risk aversion. We also take into account bank type with two dummy variables respectively equal to one if the bank is a cooperative one (*Cooperative*) or a savings one (*Savings*) and zero otherwise. We alternatively use the dummy variable *Cooperative/saving* equal to one if the bank is cooperative or savings.

The results are displayed in Table 4. To test the sensitivity of the results to the set of control variables, we use alternatively six specifications that differ with the use of dummy variables for cooperative and savings banks (no dummy variables, or *Cooperative* and *Savings*, or only *Cooperative/savings*), and with the inclusion of country dummy variables.

We find that switching costs exert a positive and significant influence on the Lerner index. This result is observed in all estimations. Hence our main conclusion is the existence of a positive and significant relation between switching costs and market power. It suggests that banks for which clients face higher switching costs on average are more likely to charge higher prices relative to their costs.

This finding is in accordance with the intuitive hypothesis that greater switching costs enhance market power and then hamper competition in the banking industry. It is in line with Barone et al. (2011) and Ioannidou and Ongena (2010) who also note the positive relationship between switching costs and prices in the banking sectors. Thus, banks with more "locked-in" clients are more likely to charge higher prices in the three European countries. Our findings can then contribute to explaining cross-country differences in competition between European countries. Differences in switching costs across countries, years, and bank types can help in understanding the patterns of bank competition in Europe.

Another interesting result is the negative and significant sign for the dummy variables *Cooperative* and *Cooperative/saving*, which indicates that cooperative banks have lower market power than commercial banks. This result is in line with Egarius and Weill (2014).

5 Robustness Checks

As a robustness check, we redo our analysis by focusing on the activity of loans. Namely, we have measured switching costs by considering all banking activities. This choice was motivated by the fact that switching costs can take place on the lending side (through information asymmetries) but also on the deposit side (with costs related to closing account for instance). Nonetheless, theoretical arguments stress the influence of switching costs in the lending activity. So we can provide robustness checks to our analysis by estimating switching costs on the loan market. To do so, we compute market shares on the loan market and we define the price as the ratio of interest income over loans.

Table 5 provides the results. We observe that switching costs on the loan market are on average higher compared to switching costs on all banking activities. Our main finding that cooperative banks have greater switching costs than commercial banks overall is still observed. The country-by-country analysis nonetheless shows interesting differences with the former results. In particular, cooperative banks have significantly lower switching costs than commercial banks in Germany for all years of the period. In Italy, they also have significantly lower switching costs when we consider the full period, but the analysis of yearly means shows that they are significantly lower only for 2006 and for 2008. Finally, in France we observe that cooperative banks have slightly lower switching costs than commercial banks but that difference is very small (0.01%) and is not significant for the period. Moreover, the difference is only significant for 2007 when considering each year. So even if the broad picture remains similar, some differences can be observed at the country level. For the rest, the same hump-shaped movement is found and suggests that the behavior of banks has been modified during and after the crisis.

We also test the robustness of our results on the relation between switching costs and market power by redoing the estimations with switching costs on the loan market. The results are presented in Table 6. We obtain the same findings with this alternative

specification for switching costs. Namely we observe a positive and significant coefficient for switching costs in all estimations, which confirms our previous results that banks with locked-in clients have a tendency to charge higher prices. All the other results for control variables are similar to what was obtained previously.

6 Conclusions

In this paper, we contribute to the literature concerning the implications of cooperative banks by measuring the switching costs for the three largest Eurozone countries in which these banks have an important market share. Switching costs are a specific characteristic of the banking industry that can influence their market structure.

We have first investigated whether switching costs differ between cooperative and commercial banks. Our findings suggest that cooperative banks have lower switching costs than commercial banks. We explain this result by the specific governance of cooperative banks. As these financial institutions are owned by their clients, their managers have lower incentives to implement switching costs so that customers are locked in.

In addition, we have analyzed whether switching costs influence market power in European banking industries. We observe a positive influence of switching costs on market power of European banks; hence, higher switching costs lead to greater market power of banks in line with intuition. It supports the view that greater switching costs faced by clients lead to higher banking prices which hamper their welfare.

All in all our results have positive and normative implications. On the positive side, they contribute to explaining the cross-country differences in bank competition across European countries. These differences are notably driven by cross-country differences in switching costs. As switching costs are influenced by the type of banks, we also suggest that the composition of the banking industry among the different types of banks contributes to explaining the degree of bank competition. On the normative side, our findings suggest that the presence of cooperative banks provide benefits for consumers by contributing to limiting switching costs. Hence, from a consumer's perspective, cooperative banks should be preserved in the European banking industry landscape.

Table 1: Composition of the sample

This table displays the number of banks used in the sample according category and country.

Country	All banks	Commercial banks	Cooperative banks	Savings banks
France	47	26	21	-
Germany	1,475	29	944	502
Italy	436	35	377	24
All	1,958	90	1,342	526
Number of observations	11,685	388	8,108	3,189

Table 2: Summary statistics

This table gives the mean values and standard deviations (between parentheses) for variables used in the estimations for each type of banks. All statistics are computed for observations over the period 2006-2012.

Variables	All banks	Commercial banks	Cooperative banks	Savings banks
Total assets (Euro thousand)	1,170,356.30 (2,317,887.89)	2,845,348.78 (3,884,567.30)	728,414.2 (2,039,988.16)	2,090,196.20 (2,364,630.66)
Total revenues (Euro thousand)	53,353.07 (102,997.12)	137,558.97 (187,478.92)	32,868.67 (86,693.09)	95,189.28 (108,718.90)
Total costs (Euro thousand)	47,545.78 (91,614.92)	115,113.48 (155,962.03)	28,990.78 (77,152.25)	86,500.82 (98,602.15)
Loans (Euro thousand)	705,008.57 (1,421,299.23)	2,035,670.80 (3,065,164.70)	419,995.12 (1,104,231.92)	1,267,753.06 (1,556,762.87)
Interest income (Euro thousand)	38,219.3 (69,757.82)	96,742.91 (134,527.20)	22,186.2 (49,794.18)	71,862.81 (84,436.04)
Price of labor (%)	1.38 (0.31)	1.38 (0.44)	1.42 (0.32)	1.26 (0.22)
Price of borrowed funds (%)	2.28 (0.77)	2.27 (1.01)	2.25 (0.78)	2.36 (0.69)
Price of physical capital (%)	77.66 (37.01)	100.52 (51.85)	75.43 (35.60)	80.55 (37.24)

Table 3: Switching costs

This table gives the average values of the estimated switching costs for each country and bank type (commercial (c), cooperative (m) and savings (s)) over the period 2006-2012. Mean differences are provided with standard deviations between parentheses. *,**,*** indicates a significant difference at 10%, 5% and 1% level.

Year	Germany			Differences			France		Differences	Italy			Differences		
	c	m	s	(c-m)	(m-s)	(c-s)	c	m	(c-m)	c	m	s	(c-m)	(m-s)	(c-s)
2006	0.0479 (0.0103)	0.0487 (0.0073)	0.0483 (0.0034)	-0.0008	0.0005	-0.0004	0.0525 (0.0099)	0.0450 (0.0108)	0.0075*	0.0563 (0.0052)	0.0459 (0.0090)	0.0573 (0.0058)	0.0104***	-0.0114***	-0.0011
2007	0.0550 (0.0063)	0.0497 (0.0059)	0.0501 (0.0034)	0.0053***	-0.0003	0.0050***	0.0563 (0.0074)	0.0476 (0.0089)	0.0087***	0.0602 (0.0059)	0.0515 (0.0084)	0.0630 (0.0052)	0.0088***	-0.0115***	-0.0028
2008	0.0554 (0.0080)	0.0483 (0.0061)	0.0503 (0.0031)	0.0071***	-0.0020***	0.0051***	0.0548 (0.0125)	0.0488 (0.0092)	0.0060	0.0619 (0.0066)	0.0537 (0.0063)	0.0637 (0.0058)	0.0082***	-0.0100***	-0.0018
2009	0.0470 (0.0100)	0.0463 (0.0052)	0.0461 (0.0039)	0.0006	0.0002	0.0008	0.0493 (0.0096)	0.0406 (0.0040)	0.0087***	0.0426 (0.0048)	0.0373 (0.0069)	0.0447 (0.0072)	0.0053***	-0.0074***	-0.0021
2010	0.0406 (0.0100)	0.0420 (0.0057)	0.0419 (0.0043)	-0.0013	0.0001	-0.0013	0.0409 (0.0091)	0.0395 (0.0047)	0.0014	0.0373 (0.0083)	0.0318 (0.0063)	0.0367 (0.0063)	0.0054***	-0.0048***	0.0006
2011	0.0397 (0.0126)	0.0405 (0.0054)	0.0402 (0.0043)	-0.0008	0.0002	-0.0005	0.0417 (0.0113)	0.0393 (0.0042)	0.0024	0.0396 (0.0081)	0.0338 (0.0060)	0.0399 (0.0039)	0.0059***	-0.0061***	-0.0003
2012	0.0395 (0.0126)	0.0392 (0.0052)	0.0389 (0.0042)	0.0002	0.0004	0.0006	0.0459 (0.0067)	0.0402 (0.0032)	0.0058***	0.0381 (0.0069)	0.0341 (0.0056)	0.0398 (0.0053)	0.0040***	-0.0056***	-0.0017
All	0.0440 (0.0120)	0.0449 (0.0071)	0.0446 (0.0058)	-0.0009	0.0003	-0.0006	0.0483 (0.0111)	0.0428 (0.0076)	0.0055***	0.0479 (0.0121)	0.0396 (0.0106)	0.0502 (0.0123)	0.0082***	-0.0106***	-0.0023

Table 4: Regression results

This table provides the results of random GLS regression model. Standard errors are given between parentheses. *,**,*** indicates a coefficient significantly different of 0 at 10%, 5% and 1% level.

Variables	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	-0.0571*** (0.0136)	-0.0578*** (0.0136)	-0.0795*** (0.0142)	-0.0831*** (0.0142)	-0.0782*** (0.0118)	-0.0815*** (0.0118)
Cooperative	-	-	-0.0111** (0.0054)	-0.0118** (0.0054)	-	-
Savings	-	-	-0.0254*** (0.0056)	-0.0281*** (0.0055)	-	-
Cooperative/savings	-0.0161*** (0.0053)	-0.0180*** (0.0053)	-	-	-	-
Switching costs	4.9370*** (0.0922)	4.8719*** (0.0910)	4.9154*** (0.0921)	4.8652*** (0.0908)	4.9459*** (0.0922)	4.8784*** (0.0911)
Loans to investment assets	-0.0002*** (0.0000)	-0.0002*** (0.0000)	-0.0002*** (0.0000)	-0.0002*** (0.0000)	-0.0002*** (0.0000)	-0.0002*** (0.0000)
Size	-0.0101*** (0.0008)	-0.0099*** (0.0008)	-0.0083*** (0.0009)	-0.0079*** (0.0009)	-0.0098*** (0.0008)	-0.0094*** (0.0008)
Equity to assets	1.0196*** (0.0321)	1.0888*** (0.0286)	1.0201*** (0.0320)	1.0709*** (0.0286)	1.0228*** (0.0321)	1.0959*** (0.0286)
Country dummies	yes	No	yes	no	yes	no
Number of observations	11,685	11,685	11,685	11,685	11,685	11,685
Number of banks	1,958	1,958	1,958	1,958	1,958	1,958

Table 5: Switching costs on loans

This table gives the average values of the estimated switching costs for each country and bank type (commercial (c), cooperative (m) and savings (s)) over the period 2006-2012. Mean differences are provided with standard deviations between parentheses. *,**,*** indicates a significant difference at 10%, 5% and 1% level.

Year	Germany			Differences			France		Differences	Italy			Differences		
	c	m	s	(c-m)	(m-s)	(c-s)	c	m	(c-m)	c	m	s	(c-m)	(m-s)	(c-s)
2006	0.0659 (0.0108)	0.0611 (0.0076)	0.0613 (0.0057)	0.0049**	-0.0002	0.0046***	0.0404 (0.0138)	0.0407 (0.0038)	-0.0003	0.0524 (0.0079)	0.0466 (0.0101)	0.0510 (0.0036)	0.0058**	-0.0045**	0.0013
2007	0.0716 (0.0106)	0.0624 (0.0082)	0.0640 (0.0066)	0.0091***	-0.0015***	0.0076***	0.0469 (0.0079)	0.0418 (0.0066)	0.0051*	0.0591 (0.0084)	0.0584 (0.0092)	0.0590 (0.0043)	0.0007	-0.0005	0.0002
2008	0.0710 (0.0115)	0.0652 (0.0090)	0.0678 (0.0084)	0.0058**	-0.0025***	0.0032	0.0442 (0.0132)	0.0448 (0.0038)	-0.0005	0.0638 (0.0153)	0.0505 (0.0159)	0.0611 (0.0052)	0.0133***	-0.0106***	0.0027
2009	0.0675 (0.0116)	0.0609 (0.0083)	0.0615 (0.0076)	0.0066***	-0.0005	0.0060***	0.0425 (0.0131)	0.0420 (0.0029)	0.0006	0.0448 (0.0075)	0.0444 (0.0096)	0.0430 (0.0058)	0.0004	0.0014	0.0018
2010	0.0591 (0.0087)	0.0550 (0.0068)	0.0553 (0.0063)	0.0041***	-0.0003	0.0038**	0.0365 (0.0101)	0.0387 (0.0036)	-0.0022	0.0351 (0.0079)	0.0376 (0.0090)	0.0342 (0.0041)	-0.0025	0.0034*	0.0009
2011	0.0553 (0.0072)	0.0526 (0.0068)	0.0526 (0.0062)	0.0027*	0.0000	0.0027**	0.0370 (0.0104)	0.0387 (0.0035)	-0.0016	0.0392 (0.0066)	0.0399 (0.0082)	0.0385 (0.0034)	-0.0007	0.0013	0.0007
2012	0.0515 (0.0074)	0.0488 (0.0057)	0.0493 (0.0060)	0.0027**	-0.0006*	0.0022*	0.0408 (0.0050)	0.0384 (0.0032)	0.0024	0.0395 (0.0069)	0.0396 (0.0085)	0.0380 (0.0045)	-0.0001	0.0016	0.0015
All	0.0614 (0.0118)	0.0580 (0.0093)	0.0584 (0.0091)	0.0034***	-0.0004*	0.0030***	0.0409 (0.0110)	0.0408 (0.0045)	0.0001	0.0470 (0.0134)	0.0441 (0.0120)	0.0456 (0.0106)	0.0029***	0.0015	0.0014

Table 6: Regression results with switching costs on loans

This table provides the results of random GLS regression model. Standard errors are given between parentheses. *,**,*** indicates a coefficient significantly different of 0 at 10%, 5% and 1% level.

Variables	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	0.0928*** (0.0133)	0.0965*** (0.0133)	0.0411*** (0.0135)	0.0434*** (0.0135)	0.0495*** (0.0116)	0.0412*** (0.0117)
Cooperative	-	-	-0.0111** (0.0053)	-0.0171*** (0.0050)	-	-
Savings	-	-	-0.0278*** (0.0056)	-0.0340*** (0.0051)	-	-
Cooperative/savings	-0.0428*** (0.0054)	-0.0512*** (0.0051)	-	-	-	-
Switching costs	0.5218*** (0.0810)	0.4488*** (0.0756)	0.5529*** (0.0803)	0.5419*** (0.0747)	0.5913*** (0.0806)	0.5021*** (0.0751)
Loans to investment assets	-0.0002*** (0.0000)	-0.0002*** (0.0000)	-0.0001*** (0.0000)	-0.0001*** (0.0000)	-0.0001** (0.0000)	-0.0001** (0.0000)
Size	-0.0042*** (0.0008)	-0.0035*** (0.0008)	-0.0024*** (0.0008)	-0.0020** (0.0008)	-0.0046*** (0.0008)	-0.0035*** (0.0008)
Equity to assets	1.1768*** (0.0322)	1.1904*** (0.0291)	1.1336*** (0.0326)	1.1093*** (0.0294)	1.1385*** (0.0329)	1.1450*** (0.0297)
Country dummies	yes	no	yes	no	yes	no
Number of observations	11,685	11,685	11,685	11,685	11,685	11,685
Number of banks	1,958	1,958	1,958	1,958	1,958	1,958

CHAPTER 3

Being a member of a cooperative bank: ethical or financial decision?

This chapter refers to the article co-written with Patrick Roger

Abstract

The definition of cooperative banks given by the International Cooperative Banking Association (ICBA) states that cooperative members, who buy and hold member shares, believe in the ethical values of honesty, openness, social responsibility and caring for others. Using a unique database of 246,120 clients/members at a cooperative bank, we show that the trading volume of member shares is far from negligible. The analysis of clients' portfolios over a 13-month period shows that clients use member shares as standard savings and investment vehicles. These results show that the reasons given by the ICBA to become a member of a cooperative bank are unimportant in the decision process.

JEL Codes: G21, G32, P13.

Keywords: Cooperative Banks, Bank Membership, Capital Requirements, Investor Behavior.

1 Introduction

An important consequence of the 2008 crisis is the strengthening of capital requirements and solvency ratios in the banking sector (Basel II and III). Understanding how cooperative banks manage these prudential requirements is of particular interest because these banks could be committed to make decisions that contradict some of the non-financial goals they aim to achieve[13].

The capital of cooperative banks is comprised of 1) member shares held by customers and 2) reserves made up of past profits. Most of these banks are not listed on an exchange, and cannot easily raise funds from the market. As a consequence, customers' money is an important source of capital. However, as clients are potential share buyers, this situation creates a strong incentive for banks to sell shares to clients. Such an incentive could contradict one of the essential principles of cooperative banks, that of "voluntary and open membership," as stated by the International Cooperative Alliance Statement. The first question addressed in this paper is to determine whether capital requirements and philosophical principles generate such a contradiction.

The second related question is to know whether the statements of the European Association of Cooperative Banks (EACB) and the ICBA are true. The ICBA emphasizes that cooperative banks pursue social and moral goals. Co-operative members, who buy and hold member shares, are supposed to believe in the ethical values of honesty, openness, social responsibility and caring for others. These cooperative banks are controlled by their members and follow the "one member-one vote" rule. The members elect representatives among themselves, and these representatives have a say in the decisions made by the bank (Fonteyne, 2007; and Cuevas and Fischer, 2006). Additionally, the European Association of Cooperative Banks (EACB) contends that clients become members for non-financial motives (EACB, 2007).

In this paper, we analyze the motivation of clients to buy (and sell) member shares. It is important to keep in mind that the price of member shares is constant over time and that these shares deliver a steady return. In other words, member shares are far less risky

[13] In Europe, the market share of cooperative banks is 20%; it reaches 60% in France.

than ordinary stocks. Equally as relevant as the low volatility of returns is the fact that the voting rights of a member do not depend on the number of shares she holds.

In this paper, we aim to answer the following question.

Are member shares of cooperative banks used in the way advocated by the ICBA?

To answer this question, our primary data source is a large sample of clients of one of the largest French cooperative banks. We had the opportunity to obtain the complete data for 640,000 clients over a 13-month period between August 2011 and August 2012. These clients held 7.8 billion euros in different types of accounts and assets (savings accounts, life insurance policies, deposit accounts, stocks, bonds, etc.). Approximately 20% of these customers are members, and during the period under consideration, 48,442 (5,065) buying (selling) trades of member shares were executed.

Our main results are as follows. Most trading activity is motivated by financial and investment reasons. If membership was explained by non-financial reasons, we shouldn't observe any relationship between the number of shares bought by a client and her wealth. In fact, we show that wealthy members are more likely to buy and sell member shares than less wealthy members. The trading volume of a given member in a given month is strongly linked to her portfolio value at the end of the previous month.

Furthermore, many customers buy an "incoherent" number of shares. For example, a significant number of clients buy five shares (20 euros each) when one share provides them with the same voting rights. Moreover, approximately 25% of the customers buy member shares at the same time as they buy other securities. Over the 13-month period we analyze, the number of member shares increased by 10.24%. When examining a longer period of time (2007-2010), we observe a 135% increase in the total number of member shares. This number jumps from four million in 2007 to 9.4 million in 2010.

Finally, the gap between the number of members in cooperative banks and the number of participants in yearly assemblies is also a signal about the lack of interest of members in the governance of the bank. The EACB estimates participation rates between 5% and 8% (EACB, 2007), while in the UK, Spear (2004) finds participation rates between 1% and 5% for cooperatives of consumers. The participation rate decreases with the size and the age of the institution. For example, McKillop et al. (2002) find a 2% participation rate in the Irish credit unions. For French cooperative banks, Caire and Nivoix (2012) obtain rates between 1% and 7%, with an average of 3.68%. These figures

seem to contradict the first principle that clients purchase member shares to participate at a democratic system. In fact, it is difficult to imagine that a client who buys five shares because she feels involved in the activities of the bank never participates in or attends general assemblies. However, as buying five shares costs only €100, such a low amount also excludes pure financial motives. It then remains the possibility that these purchases are advised by the financial advisor of the bank, according to her own incentives, linked to increased capital requirements from the regulator.

To summarize, the question we address in this paper is to determine whether the link between cooperative banks and their members is still in the spirit of F.G. Raiffeisen, who created cooperatives to favor the access to credit and payment instruments for the poor and rural populations. The alternative assumption is that cooperative banks are not different from other banks, thus they essentially develop commercial relationships with their customers.

This paper is structured as follows. Section 2 defines cooperative banks and member shares and develops our research hypotheses. Section 3 presents the database and provides some descriptive statistics, especially about trading volumes of member shares. Section 4 presents our methodology and results. A short conclusion appears in section 5.

2 Cooperative Banks and Member Shares

2.1 What is a cooperative bank?

Strictly speaking, a cooperative bank is a bank owned by its members. Members are clients who own at least one member share of the bank[14]. However, another definition is given by the ICBA: "*Cooperative banks are autonomous associations of persons united voluntarily to meet their common economic, social and cultural needs and aspirations through a jointly owned and democratically controlled enterprise. Cooperatives are*

[14] In Europe, cooperative banks hold a 20% market share, while, in France, this share is no less than 60%. European cooperative banks have 50 million members and provide financial services to 176 million customers. The main cooperative banking groups in France are Crédit Mutuel, Crédit Agricole and Banques Populaires- Caisse d'Epargne (EACB, 2010).

based on the values of self-help, self-responsibility, democracy, equality, equity and solidarity. In the tradition of their founders, cooperative members believe in the ethical values of honesty, openness, social responsibility and caring for others"[15].

This definition exhibits three main features.

1) Members are volunteers. They can buy a member share and become a member or they can choose to be only clients. No pressure should be exerted on either side.
2) Members constitute a community, and as such, they pursue common social goals.
3) A cooperative bank is democratically controlled. Members elect their representatives who are chosen among members.

These representatives have a say in decisions made by the bank (Fonteyne, 2007; Cuevas and Fischer, 2006; Caire and Nivoix, 2012). According to some authors, such as Ayadi et al. (2010), such governance is possible because of the wide networks of members that have been established for a long time (decades and sometime centuries). Therefore, cooperative banks are well established in local areas[16].

2.2 What are member shares?

In France, member shares of cooperative banks are defined by a law voted after World War II (1947). Member shares exhibit strong peculiarities, compared to ordinary stocks.

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[15] http://ica.coop/

[16] The pros and cons of such governance are emphasized in a number of studies. Cooperative institutions may be better prepared than commercial banks for estimating the solvency risk of their customers due to their proximity with their clients (Groeneveld, 2011). The cooperative model also mitigates conflicts of interest between owners and customers and is considered an efficient, low-cost banking model (Hansman, 1996; Birchall, 2013).
The governance model of cooperative banks also has some drawbacks, however. For example, it is considered an old-fashioned institution with an inefficient decision-making process, and it is characterized by the members' lack of control over the representatives (Rasmussen, 1988; Iliopoulos and Cook, 1999; Borgen, 2004).

First, member shares are not anonymous. The bank knows any holder of member shares at any point in time. A client who wants to buy shares contacts her financial advisor who transmits the order to the board of representatives. The board then decides to accept or reject the request. The same procedure applies to sales. When a sale order is approved, it is executed after the yearly general assembly[17] in a completely formalized process.

The second important feature that distinguishes stocks from member shares is the price that remains constant for a member share. Thus, trading member shares cannot be motivated by the hope of capital gains. Moreover, a member share does not give a direct right to the profits of the bank. In fact, member shares of French cooperative banks earn a yearly interest rate that must be lower than the French corporate bond rate (called the TMO). The payoff generated by a member share is then "half-dividend, half-coupon".

Finally, member shares are also different from stocks in case of bankruptcy of the cooperative bank. Member shares do not give rights to the residual assets of the bank. Moreover, members are committed to pay the debts of the bank (according to the importance of their membership), and they remain liable for these amounts for a number of years[18].

2.3 Hypotheses development

The EACB proposes five reasons (listed in decreasing order of importance) as to why people choose to become members: 1) participate in a democratic system, 2) contribute to the development of a local community, 3) benefit from loyalty programs (access to fair priced services), 4) opportunity to buy an attractive asset (member shares are presented as low-risk assets) and 5) other reasons, such as financial securities purchases bounded to member shares (EACB, 2007).

The EACB further emphasizes that non-consumerist motives dominate when clients buy member shares. However, Caire and Nivoix (2010) argue that the lack of individual data prevents drawing such conclusions and answering questions related to the motivations behind the purchasing of member shares. Our paper is an attempt to fill this

[17] Note that some special situations allow to sell at other points in time (if members die, have financial difficulties or move to another location).
[18] The detailed rule may vary from one cooperative bank to another.

gap. We then test the hypothesis that customers of cooperative banks trade member shares as they trade other financial securities.

Not rejecting this hypothesis would be an indicator that customers become members essentially for financial motives. This would show that the reasons put forward by the ICBA are not the relevant ones to explain membership in cooperative banks

3 Data and Descriptive Statistics

3.1 Data sources

Our primary data source is a large database of 640,000 accounts of all clients from a cooperative bank in a given French region (Alsace). Our data are probably not representative of clients of all cooperative banks over the country but, in our case, this is an advantage.

In fact, the first French cooperative bank was launched in Alsace, a region that has still today strong relationships with Germany where there are more than 1,100 cooperative banks[19]. Therefore, the "cooperative spirit" is more pronounced in Alsace, compared to other French regions. Not being able to reject our hypothesis would be a strong indicator that clients (and members) of cooperative banks are similar to clients of commercial banks. Moreover, our database is quite complete because we have access to all accounts (of course in an anonymous way) of all clients over a 13-month period, beginning in August 2011 and ending in August 2012.

In this paper, *client's portfolio* means the complete set of financial products possessed by a given household or individual. A portfolio may contain savings accounts, bonds, stocks, mutual funds, life insurance contract, etc. Thus, the *portfolio value* of a given household is the aggregate value of all the products in its portfolio.

The average portfolio value is €12,086 over the complete sample, with a standard deviation of €41,218. As usual for wealth distributions, the median is considerably lower than the mean. Here, the median is only €370. There are also a few wealthy clients that move the average upward, thus resulting in a 99th percentile equal to €170,000.

[19] http://www.bundesbank.de

Our sample also contains a large number of "sleeping accounts" that are endowed with only a few euros. Many clients also hold nothing else than a saving plan within the bank[20]. This situation generally means that the main banking activity of the client is located in another bank. We then decided to delete these clients from the sample not to underestimate the portfolio value.

In addition the accounts of customers who are less than 18 years old[21] are deleted because we do not know who decides for them. Finally, we exclude clients for which exact home addresses are unknown to the bank, indicating that the client has moved without informing the bank[22]. We obtain a complete sample composed by 246,120 clients with 6.9 billion deposits[23].

Table 1 provides descriptive statistics about monthly portfolio values. Panel A is related to the complete sample, and Panel B is restricted to members (clients holding at least one member share). The first column indicates the month at the end of which calculations are performed, N is the number of clients (members) entering the statistics provided in columns 3 to 6. Column 3 gives the average portfolio value and the three other columns give the quartiles for the cross-sectional distribution of portfolio values.

In the complete sample, the average portfolio value is €28,126, with a standard deviation of €63,020 and a median of €8,262. Panel B shows that members account for approximately 40% of the complete sample, but these clients hold 57% of the cumulated portfolio value. Members hold portfolios that are worth €37,168 on average.

Therefore, the average value of members' portfolios is significantly higher than the value of non-members' portfolios. Moreover, the number of members increases by 9% during the 13-month period under study. This increase partly explains the structure of purchases during the period.

Table 2 provides information on the demographics of members. 52.50% of members are female and 47% are either single, divorced or widowed. Half of the

[20] It is common for cooperative banks to open a saving account to newborn children when parents have an account with the bank. A lot of these accounts are neither active nor closed.
[21] In France, the age of majority is 18.
[22] The database provides a dummy variable equal to one if the client lives in the mentioned location and zero if the client does not live at the mentioned address.
[23] Even if the number of customers dramatically falls by 61.5%, the total of deposits only decreases by 12.7%.

members own their houses. Finally, it is interesting to note that approximately 50% of members are 50 years old and more[24].

We are aware that households in our sample may hold other accounts in other banks[25]. Nevertheless, we think that the sample is sufficiently large and the data sufficiently detailed to perform a careful analysis of the reasons why clients trade member shares.

3.2 Categories of trades

We start by recalling a few important features of member shares. First, the unit price of member shares is €20; remains constant over time. Consequently, in our analysis we refer to numbers of shares traded.

Second, membership is not necessary to benefit from all of the services provided by the bank.

Third, a single share gives the same rights as one million shares when it comes to vote at the general assembly.

Fourth, the interest rate paid by member shares is decided every year in May; it applies immediately for one year, and is paid in July of each year[26]. When a customer buys shares on a given date, the amount of interest he will eventually receive depends on the number of complete holding months until the following May. Concerning taxation, payoffs of member shares are considered as dividends on stocks. But contrary to stocks, trading member shares do not generate transaction costs.

There are 110,082 members in our sample at the end of August 2012. If membership is not related to financial reasons, members should only hold 110,082 shares, that is one share per member. The reason is that one share gives the same rights as one million shares.

[24] It should also be recalled that in the initial database, 7,443 clients are less than 18 years old.
[25] As mentioned in Campbell (2006), this is a common difficulty encountered in such studies.
[26] For 2007 to 2011, member shares paid between 3% and 3.75%

However, Table 3 reveals that members hold approximately 10.98 million shares, an average of 100 shares per member. It is also worth noting that the median holding is five shares and the third quartile is about 50 shares.

Figure 1 shows the time-series of the aggregate number of shares held by members. Apart from the strong growth rate already mentioned, the curve is almost flat between April and May. The reason is simple: trades are frozen just prior to the yearly general assembly. The decrease observed in July could be justified by a fear, on the part of members, of not obtaining the payoffs on shares if they sell at that time. For a more precise understanding of the long-term evolution of membership, we obtained figures of membership for the preceding years. The results show that there were four million outstanding shares in 2007, 4.6 million in 2008, and 9.4 million in 2010. These numbers demonstrate that the main part of the increase occurred after the 2008 financial crisis, a strong argument in favor of the use of member shares by the bank to respond to increasing capital requirements.

To understand more deeply member share trades, Figure 2 depicts the different types of trades. Purchases may be realized by clients or non-clients. Among clients, some are already members while others become members by buying member shares. On the selling side, only members can sell shares, but they either sell a part of their shares, or they sell all their shares and surrender their membership. For the latter, we distinguish those who stay clients of the bank from those who leave the bank.

The above categories of share trades may have diverse motivations. For this reason, they will be distinguished in the econometric analysis of the next section.

3.3 The dynamics of trades

In this section, we partition trades according to the category of clients making the trades (new members/existing members, new clients/existing clients). Our reference point in time is August 2011 because we do not know the subscription date of member shares for the clients that are already members at the beginning of our period.

Let us denote S_t as the number of member shares at the end of month t. S_t varies as follows:

$$\Delta S_t = S_t - S_{t-1} = BEM_t + NM_t - LM_t - SEM_t \quad (1)$$

where BEM_t (SEM_t) denotes the purchases (sales) of existing members within month t and NM_t (LM_t) denotes trades (purchases or sales) realized by new members (leaving members) within month t. All the numbers on the right hand side are positive.

Table 4 summarizes the monthly trades. Panel A gives the monthly values of NM_t and LM_t, and Panel B provides the values for BEM_t and SEM_t. Panel A shows that while the number of members increases over time, the median value of sales is greater than the median value of purchases. Overall, over the 12-month period the trades realized by these two categories are almost equal; the number of shares sold exceeds the number of shares purchased by a few hundred. This finding means that the evolution of the aggregate number of shares is explained by the trades of existing members (see Panel B).

According to the features defining member shares, Panel B exhibits surprising figures. For example, consider the sale of 3,900 shares in a single trade in October 2011 (column Max, Panel B of Table 4). Such a trade means that the client sells a part of her shares, giving up the interest accumulated since the end of May, that is, four months of interest. More generally, selling shares months before the general assembly is costly in terms of interest lost (recall the unit price is always €20). Such a trade is then irrational except for sales due to liquidity shocks. However, it could be rational to sell shares during the year if another, more profitable, investment is proposed by the bank.

4 Methodology and Results

4.1 Classification of members

Table 4 shows that 23,774 (3,516) members buy (sell) shares[27]. Together, buyers and sellers realize 44,301 trades, that is, 40,724 purchases and 3,577 sales.

Table 5 provides a synthetic distribution of the number of trades. More than 80% of the members realize only one trade, but almost 8% of the members realize more than three trades and more than 4% of members trade more than 10 times during the year of our study. For these lasts, the trading activity is due to "member share saving plans" subscription. The bank proposes to clients to purchase automatically (without meeting with her financial advisor after subscription) member shares on a monthly basis.

Another interesting and perhaps surprising figure in Table 5 is the 502 members buying and selling during this period, some exhibiting intense trading activity. According to the features of these member shares, it is difficult to determine the rationale for this significant trading activity.

In the following analyses, we divide the members of our sample into different categories using standard dummy variables. First, we distinguish between men and women; second, we define an investor dummy. A client is called an investor (in member shares) if she buys either more than the third quartile of the distribution of member shares (50 shares), or if she is already a member. Remember that purchasing one more share does not increase voting rights and the power within the bank.

4.2 Empirical study

The first intuitive idea to explain purchases and sales is purely financial. People buy shares because their wealth increases and sell shares because of consumption needs or other liquidity shocks. If trades are motivated by such reasons, the evolution of wealth of buyers and sellers should be different. We expect that buyers exhibit an increase of

[27] Within the period 21.74% of new clients decide to become member as the same time they entered the bank.

their portfolio value and sellers exhibit a decline of their portfolio value during the period under scrutiny.

Figure 3 illustrates this premise, giving the time series of the average portfolio values (in euro) for buyers and sellers. We construct these curves by computing, for each of the 23,774 buyers and each of the 3,516 sellers[28], their monthly portfolio values from August 2011 to August 2012, regardless of the date the trades were realized. We calculate the following:

$$P_{it} = \sum_{j} x_{ijt} \tag{2}$$

with x_{ijt} the amount held in asset j by member i at date t. Each point on the curve is obtained by aggregating clients' portfolios on date t and dividing by the portfolio value at month 08/2011 as follows:

$$C_t = \frac{\frac{1}{N}\sum_i P_{it}}{\frac{1}{N}\sum_i P_{it_{08/2011}}} \tag{3}$$

The average portfolio value of buyers appears on the increasing curve, and the corresponding curve for sellers is the decreasing one. The portfolio value of buyers increases by 9.31% while it decreases by 12.52% for sellers. For other clients a slight increase of 3.63% of their portfolio value is observed.

The result is consistent with the idea that members purchase member shares for investment motives. The natural interpretation of the decreasing curve for sellers is that customers decide to sell shares because they need money for economic reasons (liquidity shocks, buy customer goods etc.).

[28] We keep the 502 clients who buy and sell during the period; they are treated as buyers and sellers.

To explain the evolution of portfolio values we determine the growth of individual portfolios after one purchase or sale of a member shares. The growth rate of a portfolio value is evaluated by:

$$PV_{it} = \frac{P_{it}}{P_{i\,t-1}} \tag{4}$$

where P_{it} denotes customer i's portfolio value at the end of month t . The trade is assumed to be realized during month t. The results are reported in Table 6. After a purchase, the portfolio value increases by 1% on average, but after a sale, the portfolio value decreases by a striking 10%.

The monthly distribution of the growth index shows that customers take the proceeds of sales away from the bank (to reimburse debts in the case of liquidity shocks, to buy consumer goods or invest in real estate). Conversely, when clients buy member shares, their portfolio values increase significantly, indicating that financial motives are far from negligible.

To analyze more deeply the evolution of portfolio values displayed by Figure 3, we check whether this evolution may be due to trades of other financial securities. Table 7 identifies the number of customers who simultaneously trade member shares and financial securities. To better differentiate between investment motives and other motives we classify customers into categories as defined in Section 4.1.

First, within our time frame, transactions are mainly initiated by investor members. Approximately 51% of clients purchase member shares for investment motives. More surprisingly, within the category of other members, 25% of them invest in at least one other financial product when they purchase member shares.

On the sell side, the decrease in portfolio values is mainly due to the sales of member shares. Approximately 9.39% of the sellers simultaneously sell member shares and other securities[29]. Finally, the reinvestment in another product following a sale is almost nonexistent, involving less than 2.87% of the sellers.

[29] This feature especially concerns sellers of small quantities (less than 50 member shares), 12.80% of clients who sell small quantities of member shares sell also other securities.

4.3 The influence of portfolio value on trading activity

To explore the impact of portfolio value on members' share trades, we implement a two-step analysis. First, we capture the heterogeneity between groups of clients by tests of differences in means over a set of variables. In a second step, we perform a multivariate analysis to test whether some variables influence the number of shares traded by clients.

4.3.1 Sellers and buyers peculiarities

Table 8 provides the means of several variables in the different subgroups. $Number\ of\ securities$ denotes the average number of financial securities held by clients the month before a transaction occurs (date $t-1$). To avoid overestimations of the number of financial securities held by some categories of customers, member shares do not count in this variable. $Portfolio\ value$ gives the total portfolio value (in euros) of client i in month $t-1$. $Transaction$ is the number of shares purchased or sold by customer i in month t and Age is the client's age at the time of the trade.

Panel A confirms that the average sale exceeds the average purchase by 130 member shares and that the portfolio value of buyers greatly exceeds the portfolio value of sellers (the difference between the two is €15,003). Sellers are also younger than buyers and hold fewer financial products.

Panel B shows no significant differences in member shares traded between men and women. Male sellers appear to be wealthier than female sellers, while the reverse is true for buyers (though the difference is not significant). Finally, males, on average, are younger. This is not surprising given that the expected lifetime of women is longer and our population includes a large number of elderly clients.

Panel C shows that investor members are prominent (14,181 investor members) and are also wealthier than other members with a difference between investor members and non-investor members of approximately €42,000. This difference is an indication of the key role financial motives play in the purchase of member shares. Investor members

also hold more financial products and are older than other members. Again, this result is not surprising as we expect new members to be younger than investor members.

Finally, Table 8 shows that financial motives are at the heart of membership in cooperative banks. To examine more closely the relationship between these variables and the propensity to purchase or sell, we turn to a multivariate regression analysis.

4.3.2 Regression analysis on trades

To study whether portfolio value is an important variable to explain members' share trades, we run the following regression where the dependent variable may be the amount of sales or purchases by categories:

$$T_{it} = \alpha_0 + \alpha_1 Port\_value_{it-1} + \alpha_2 Number\ of\ securities_{\ it-1} + \alpha_3 Overdraft_{it-1} + \alpha_4 Age_i + \alpha_5 Partner_i + \alpha_6 Female_i + \varepsilon_{it} \quad (5)$$

The dependent variable is the logarithm of the total amount of member shares (in euros) bought or sold by the client i in month t. $Port\_value_{it-1}$ is the logarithm of the portfolio value of client i at the end of the month before the transaction occurs. $Number\ of\ securities_{\ it-1}$ is the number of financial securities (different from member shares) held by the client i at the end of the month before the transaction occurs. $Overdraft_{it-1}$ is a dummy variable equal to one if the client i is overdrawn on his deposit account at the end of month *t*-1, and zero otherwise. Age_i is the age of client i. $Partner_i$ is a dummy variable equal to one if the client lives with a partner (married, civil union or cohabitation), and zero otherwise. This variable takes into account the fact that married people are less risk averse (Love, 2010). As a consequence, we expect they invest less in member shares. $Female_i$ is a dummy variable equal to one if the client is a female, and 0 otherwise. We introduce this variable because a number of studies suggest that men trade more aggressively than women because men are more overconfident than women (Barber and Odean, 2001). Men seem also to be less risk averse than women (Jianakoplos

and Bernasek, 1998; Sundén and Surette, 1998). Finally, α_j and ε_{it} denote, respectively, the regression coefficients and the error term.

We estimate these regressions for all subcategories defined in Section 4.1 using a pooled OLS regression method with client-level clusters because some clients purchase and sell more than once in a given month.

Table 9 displays the results of three regressions - sales, purchases and all transactions. Whatever the dependent variable, a strong and positive relation appears between the portfolio value and the amount of member shares traded. This result confirms that clients decide to invest a part of their savings in member shares and increase this amount when the value of their portfolio increases over time. Moreover, elderly people have a tendency to purchase more member shares than other customers. However, age is less significant when sales are considered.

The holding of financial securities (*Number of securities*) is positively and significantly linked to the amount of shares purchased. This relationship confirms that a diversification purpose can be a partial explanation for purchases. Indeed, as customers already hold several products, financial advisors could propose they invest in member shares by arguing for the diversification and the quasi-absence of a risk-free asset in the economy. Such advice may increase the capital of the bank.

We also find a negative and highly significant relation between the financial difficulties of clients (*Overdraft*) and the amount of member shares purchased. This result is quite intuitive and indicates that clients with cash problems do not buy, in general, member shares. A positive and significant relation is found when considering sales and indicates that an overdrawn client the month before the sale occurs trades an amount higher than other clients. This result is not surprising and confirms sales in the case of liquidity shocks.

Finally, we found that *Partner* is negatively related to the number of member shares purchased or sold. However, *Partner* is less significant on the selling side. Controlling for gender, we find a negative relation between the purchases and *Female* and a positive relation between sales and *Female*. However, this result is not statistically significant.

Regression results on subcategories of clients are presented in Table 10. First, there are no significant differences in transaction size on the buy side across genders. Males

and females have the same motives that drive the number of member shares purchased. Furthermore, portfolio value is positively and significantly linked to the number of member shares purchased and sold, and the number of securities in portfolios is positively (negatively) linked to the number of member shares purchased (sold). Finally, there is a gender effect concerning banking overdraft, especially for sales, and the variable *Age* is significant for purchases and in a lesser extent for female sales.

Comparing investor members versus other members, we find that for both portfolio value is significant for explaining the number of shares purchased. Coefficient is particularly high when we consider investor members. Thus, economic motives probably dominate when considering share purchases. *Age* is positively linked with investor members and indicates that elderly members purchase more than younger members. *Partner* is positively and significantly related with the amount purchased for other members. These results suggest that *Partner* could impact members' share trades.

4.3.3 What impacts the propensity to buy and sell?

We now use logistic regressions to understand the determinants of the probability to buy and sell. Most clients trade once. Only 502 members buy and sell over the period. Therefore, we consider net positions in the regressions, and we estimate the following cross-sectional logit regression:

$$B_i = \alpha_0 + \alpha_1 Port\_value_i + \alpha_2 Age_i + \alpha_3 SILFA_i + \alpha_4 MFM_i + \alpha_5 Partner_i + \alpha_6 Female_i \quad (6)$$

B_i is a dummy variable equal to one if client i is a net buyer (seller) of shares, and 0 otherwise. $Port\_value_i$ is the logarithm of the monthly portfolio value held by client i. We introduce this variable to determine whether wealthier people are more likely to purchase member shares. $SILFA_i$ is the proportion of direct holding of listed financial products (bonds, stocks and mutual funds shares) to total wealth held by client i. We use this variable to determine whether people who are more inclined to buy these categories

of products might also purchase member shares. MFM_i is a dummy variable equal to one if one or more members of the family of client i (parents, children, wife or husband) also holds shares, and zero otherwise. $Partner_i$ is a dummy equal to one if client i is *Partner*, and zero otherwise. Age_i and $Female_i$are defined as in Eq.(5) .

The results of the estimations appear in Table 11. Purchases are explained by the portfolio value of customers and confirm that clients of cooperative banks buy member shares for investment purposes. This relationship between portfolio value and the probability of buying is also a sign of the willingness of cooperative banks to increase their capital and to sell shares to wealthy people who have the capacity to invest a part of their savings in shares.

The variable *Age* does not significantly impacts the probability of buying shares.

Clients with large portfolios of stocks and bonds also hold more member shares compared to clients not invested in stocks and bonds. This finding could be justified either by diversification motives and/or attitude toward risk or simply because these clients are wealthy and hold large and diversified portfolios. Clients with a member of their family (wife, husband or child) who is also a member of the cooperative bank have a higher probability of becoming a member. Thus, the intergenerational relationship could be an explanation of such results. As people have a tendency to stay in the same banks as their parents, the financial advisor can then easily sell member shares to the children. This is consistent with the relationship dilemma previously referenced and can explain why 7% of the members are less than 18 years of age.

The variable *Partner* reduces the purchasing probability and is consistent with the results obtained in studies focused on household finance, especially the results on risk-taking behavior. For instance, Love (2010) finds that married investors are less risk averse than single investors, a result that stands for both men and women. Other studies emphasize that living with a partner increases stock market participation (Bertaut 1998, Agnew et al. 2003, and Christiansen et al. 2010). Because shares of cooperative banks are less risky than ordinary stocks, married investors may be less prone to buy member shares and may prefer assets with higher risk/return tradeoff, such as life insurance contracts, stocks and bonds.

Last, gender has few impacts on the purchase probability, though some studies, such as Sundén and Surette (1998), Jianakoplos and Bernasek (1998) Barber and Odean

(2001), and Agnew et al. (2003), find evidence that gender has important implications in risk preferences and impacts portfolio choices.

On the sell side, regression (2) suggests that there is a negative relation between the portfolio value and the propensity to sell. This result highlights that members decide to sell shares as doing so provides a source of wealth, and in this way, it confirms the notion that sales are motivated by liquidity shocks.

Client's age is negatively related to the propensity to sell. This result is not surprising because middle-aged people (28 to 40 years of age) in our database are, in some cases, poorer than elderly customers. Indeed, middle-aged customers hold fewer securities, are less wealthy and have more overdrafts on their deposit accounts, which may explain why these members decide to sell shares. Sales of shares provide them with enough wealth to face liquidity needs. However, sales can also occur when the relationship between a client and her financial advisor is broken.

Holding listed financial assets increases the propensity to sell, but the coefficient is not statistically significant. However, having a family member who is also a member of the bank strongly reduces the propensity to sell. This suggests a long relationship with the bank, in general, over several generations, reduces the propensity to sell or to surrender membership.

In contrast to purchases, we find that living with a partner increases the probability of selling shares. We explain this result by the high proportion of members who live with a partner and sell shares. Moreover, being female decreases the propensity to sell because, in general, males are poorer than females and more frequently overdraft their accounts; thus, they can be more prone to sell shares.

5 Conclusions

Our study confirms that customers use member shares as an investment and/or saving vehicle. More than 40,000 (3,000) purchases (sales) are observed over our one-year period of observation. Purchases are highly driven by investment motives; a strong positive link exists between the portfolio value before the purchase and the number of shares purchased. This link is confirmed when examining the level of wealth and the propensity to purchase. Accordingly, as wealth is a determining factor of purchases, member shares can be considered similar to any other securities.

We also find that most clients hold an irrational number of member shares (the median value of member shares held is five). Of non-investor members, 25% simultaneously purchase member shares and other financial securities. A few new clients purchase shares in subsequent months after entering the bank compared to existing clients.

Our main results are difficult to reconcile with non-financial motives. Such evidence could be due to financial advisors' incentives to sell member shares. Indeed, capital constraints (Basel II and III) have been reinforced after the crisis of 2008. To satisfy these commitments, cooperative banks have need to propose member shares to their customers. Thus, cooperative banks have a tendency to behave as other banks in terms of financial assets, and member shares are more and more viewed as standard financial assets.

This raises the question whether a real (non-financial) membership exists in cooperative banks. Several studies highlight a low participation rate in the general assembly, which is the most democratic moment of the year for cooperative banks (Caire and Nivoix, 2012). This fact suggests that the sense of belonging to a community is weak and that clients are ambivalent about the way they consider the specificities of cooperative banks.

Cooperative banks need to clarify their "cultural" identity by highlighting the differences between themselves and commercial banks. They need to provide customers with incentives to participate in the democratic governance of the bank. Up to now, our results show that the principles stated by the ICBA and EACB are mainly theoretical. The reasons for becoming a member are essentially the following: 1) buying member shares as usual investment products 2) Being convinced by a financial advisor to purchase member shares, and 3) buying member shares together with other financial securities in a standard process of portfolio diversification.

Table 1: Portfolio values

Panel A: Total deposits

This table gives monthly total deposits (in euros) per client. Date indicates the month and the year of observation, N represents the number of clients observed at a given month. Mean is the average portfolio value per client at a given month. Q1, Me, Q3 are respectively the first quartile, the median, the third quartile of the monthly distribution of deposits per client.

Date	N	Mean	Q1	Me	Q3
08/11	246,120	27,601.39	1,222.64	8,135.06	28,729.83
09/11	246,120	27,599.67	1,206.54	8,105.48	28,756.59
10/11	246,120	27,626.53	1,186.58	8,085.76	28,843.41
11/11	246,120	27,588.80	1,190.86	8,090.73	28,714.05
12/11	246,120	27,574.59	1,147.83	8,107.80	28,664.92
01/12	246,120	28,256.47	1,207.13	8,367.11	29,521.85
02/12	246,120	28,367.57	1,198.00	8,346.12	29,605.41
03/12	246,120	28,267.16	1,085.55	8,224.42	29,438.90
04/12	246,120	28,532.54	1,195.22	8,451.62	29,815.88
05/12	246,120	28,379.80	1,157.18	8,341.56	29,643.31
06/12	246,120	28,348.68	1,078.79	8,270.18	29,586.96
07/12	246,120	28,710.68	1,212.62	8,468.19	30,021.19
08/12	246,120	28,790.95	1,208.72	8,416.18	30,008.10

Panel B: Members' deposits

This table gives monthly total deposits (in euros) per member. Date indicates the month and the year of observation, N represents the number of clients observed at a given month. Mean is the average portfolio value per clients at a given month. Q1, Me, Q3 are respectively the first quartile, the median, the third quartile of the monthly distribution of deposits per member.

Date	N	Mean	Q1	Me	Q3
08/11	101,073	37,525.38	2,061.12	12,123.33	41,743.34
09/11	101,777	37,258.85	2,016.69	11,972.84	41,378.79
10/11	102,665	37,101.99	1,958.10	11,830.66	41,155.44
11/11	103,042	36,798.71	1,955.62	11,681.89	40,734.02
12/11	103,724	36,661.15	1,923.80	11,605.15	40,398.01
01/12	105,133	37,369.41	1,952.94	11,833.75	41,278.26
02/12	106,411	37,321.78	1,903.01	11,735.93	41,043.20
03/12	107,733	37,025.61	1,752.95	11,451.58	40,620.46
04/12	108,797	37,251.81	1,906.08	11,673.43	40,850.21
05/12	108,797	37,029.74	1,856.85	11,537.09	40,578.14
06/12	110,465	36,904.44	1,759.81	11,447.05	40,383.02
07/12	109,700	37,428.10	1,939.98	11,717.52	40,901.26
08/12	110,082	37,513.74	1,918.53	11,574.62	40,888.52

Table 2: Demographics

This table gives demographics for the 110,082 members at the end of the period. N indicates the frequency of members for each modality and Percent is the frequency expressed as a percentage of all members.

Variable	N	Percent (%)
GENDER		
Male	52,294	47.50
Female	57,788	52.50
MARITAL STATUS		
Single	33,942	30.83
Divorced	8,651	7.86
Widowed	9,091	8.26
Partner	58,398	53.05
PRIMARY RESIDENCE		
Non Owner	54,472	49.48
Owner	55,610	50.52
AGE		
]17, 30]	17,768	16.14
]30, 40]	17,364	15.77
]40, 50]	19,994	18.16
]50, 60]	18,381	16.70
]60, 70]	15,823	14.37
$\geq$ 70	20,752	18.85

Table 3: Evolution of shares

This table gives times series of the number of member shares held per member. Date indicates the month and the year of observation, N represents the number of members present on a given month. Sum and Mean give respectively, the sum and the average number of shares held by members. St-D, Q1, Me, Q3 and P99 gives the standard deviation, the first quartile, the median, the third quartile and the 99th percentile of the monthly distribution of total amount of shares held per member.

Date	N	Sum	Mean	St-D	Q1	Me	Q3	P99
08/11	101,073	9,965,187	98.59	269.53	1	5	60	1,232
09/11	101,777	9,989,110	98.15	268.72	1	5	57	1,231
10/11	102,665	10,025,502	97.65	267.51	1	5	55	1,226
11/11	103,042	10,037,162	97.41	268.35	1	5	52	1,227
12/11	103,724	10,131,617	97.68	270.38	1	5	52	1,239
01/12	105,133	10,267,977	97.67	273.42	1	5	51	1,250
02/12	106,411	10,380,703	97.55	274.60	1	5	51	1,250
03/12	107,733	10,487,978	97.35	274.70	1	5	51	1,250
04/12	108,797	10,842,627	99.66	282.73	1	5	51	1,260
05/12	108,797	10,844,669	99.68	282.76	1	5	51	1,260
06/12	110,465	11,136,144	100.81	285.93	1	5	52	1,274
07/12	109,700	10,892,439	99.29	283.17	1	5	50	1,267
08/12	110,082	10,985,618	99.79	284.69	1	5	51	1,278

Table 4: Evolution of the set of Members

Panel A: Leaving Members and New Members' trades

This table gives the number of member shares bought and sold by Leaving Members and New Members in the bank. Date indicates the month and the year of observation, N represents the number of New Members or Leaving Members observed at a given month. Sum, Mean and Me denote the sum, the mean and the median of member shares bought or sold by New Members and Leaving Members at a given month. St-D and Max are respectively the standard deviation and the maximum of the monthly distribution of member shares bought or sold per member. Not that in May there are very few transactions because it is not possible to buy member shares if you are not already a member.

Date	Leaving Members						New Members					
	N	Sum	Mean	Me	St-D	Max	N	Sum	Mean	Me	St-D	Max
09/11	73	9,984	136.77	5	389.37	3,000	777	12,125	15.6	1	81.9	1,500
10/11	82	9,803	119.55	6	223.56	1,000	970	19,652	20.26	1	96.86	1,150
11/11	358	32,951	92.04	100	107.71	1,580	735	12,772	17.38	1	71.19	1,000
12/11	56	2,873	51.3	2	137.78	755	738	32,538	44.09	1	200.82	3,000
01/12	67	3,131	46.73	1	122.93	650	1,476	55,035	37.29	1	189.89	5,000
02/12	43	1,994	46.37	2	154.07	887	1,321	36,736	27.81	1	121.94	1,500
03/12	35	3,275	93.57	5	282.64	1,376	1,357	39,338	28.99	1	120.48	2,000
04/12	42	1,025	24.4	1	75.42	421	1,106	102,307	92.5	5	313.83	5,000
05/12	-	-	-	-	-	-	-	-	-	-	-	-
06/12	70	4,985	71.21	1	165.34	1,001	1,738	118,004	67.9	2	277.55	4,250
07/12	1,451	223,873	154.29	11	324.07	3,747	686	44,687	65.14	2	253.38	3,500
08/12	117	19,676	168.17	5	481.84	2,500	499	34,005	68.15	2	260.96	2,725

Table 4 (cont'd)

Panel B: Existing Members' trades

This table gives the number of member shares bought and sold by Existing Members. Date indicates the month and the year of observation, N represents the number of Existing Members who buy and sell at a given month. Sum, Mean and Me denote the sum, the mean and the median of member shares bought or sold by New Members and Leaving Members at a given month. St-D and Max are respectively the standard deviation and the maximum of the monthly distribution of member shares bought or sold per member.

Date	Existing Members											
	SELL						BUY					
	N	Sum	Mean	Me	St-D	Max	N	Sum	Mean	Me	St-D	Max
09/11	54	17,603	325.98	67.5	707.75	4,250	2,328	39,385	16.92	3	118.45	5,000
10/11	39	14,945	383.21	170	675.54	3,900	1,745	41,488	23.78	2	107.24	1,950
11/11	123	16,882	137.25	100	260.34	1,995	1,666	48,721	29.24	2	151.41	3,003
12/11	42	6,738	160.43	47	257.82	1,150	1,899	71,528	37.67	2	172.57	5,000
01/12	26	3,083	118.58	34.5	217.28	999	1,886	87,539	46.42	3	272.05	10,000
02/12	26	3,736	143.69	23.5	317.16	1,376	2,019	81,720	40.48	3	179.63	4,000
03/12	24	1,750	72.92	31	86.56	304	1,991	72,962	36.65	3	133.12	2,650
04/12	14	2,154	153.86	87	188.17	635	2,396	255,521	106.64	4	296.41	5,000
05/12	-	-	-	-	-	-	17	2042	120.12	3	257.77	850
06/12	36	15,687	435.75	172.5	635.53	2,500	2,811	194,143	69.07	6	177.3	3,000
07/12	762	208,090	273.08	133.5	592.85	11,500	7,614	143,571	18.86	5	96.83	3,747
08/12	37	6,427	173.70	37	434.81	2,512	2,949	85,277	28.92	3	137.6	4,350

Table 5: Number of trades over the period

This table gives the number of members (26,788) classified according to the number of trades within the period (08/2011-08/2012) and the nature of the position (Buy, Sell or Buy and Sell).N is the number of members in a given category of trades.

Number of Trades	Buy	Sell	Buy and Sell	N
1	19,564	2,977	-	22,541
2	1,930	36	262	2,228
Between 3 and 10	791	1	147	939
11	987	0	93	1,080
Total	23,272	3,014	502	26,788

Table 6: Portfolio variation after purchases and sales

This table shows monthly portfolio variation after member shares 'purchases and sales. For client i the variation is given by the following ratio: $PV_i = \frac{P_{it}}{P_{it-1}}$ where P_{it} is customer i's portfolio value (in euros) at the end of the month of transaction t and $P_{i\,t-1}$ customer i's portfolio value (in euros) at the end of the month before the transaction occurs. N is the number of clients who purchase or sale member shares at date t. P10, Me, P90 denote respectively the first decile, the median and the last decile of the monthly distribution of individual portfolio variations.

	Purchases				Sales			
Date	**N**	**P10**	**ME**	**P90**	**N**	**P10**	**ME**	**P90**
09/11	3,105	0.84	1.00	1.46	127	0.10	0.90	1.04
10/11	2,715	0.80	1.01	2.01	121	0.11	0.89	1.08
11/11	2,401	0.83	1.01	1.65	481	0.69	0.95	1.03
12/11	2,637	0.77	1.00	1.52	98	0.07	0.88	1.11
01/12	3,362	0.81	1.03	2.02	93	0.06	0.92	1.07
02/12	3,340	0.81	1.01	1.87	69	0.12	0.96	1.43
03/12	3,348	0.78	1.00	1.60	59	0.11	0.83	1.03
04/12	3,502	0.90	1.01	1.64	56	0.03	0.88	1.11
05/12	17	0.95	1.01	1.37				
06/12	4,549	0.82	1.00	1.51	106	0.07	0.87	1.06
07/12	8,300	0.97	1.00	1.12	2,213	0.60	1.00	1.22
08/12	3,448	0.89	1.00	1.22	154	0.01	0.92	1.02

Table 7: Member shares transactions bounded to other securities

This table shows the proportion of clients who purchase or sale member shares (defined by category) at the same time of other securities. N gives the number of customers within each of the four categories (Other members, Investor members, Low sellers, high sellers). n indicates the number of customers who purchase or sell at least one security when they buy or sell at least one member share within the period. Freq. denotes the percentage of customers who purchase or sale securities in a given category and is computed as follows $Freq. = \frac{n}{N}$. Number gives the total number of securities purchased or sold by customers at the same time than member shares.

	Purchases					
	Other Members (N: 9,593)			**Investor Members (N: 14,181)**		
	n	**Freq.**	**Number**	**n**	**Freq.**	**Number**
Purchase securities	2,432	25.35%	3,176	1,825	12.87%	2,585
Sale securities	324	3.38%	375	1,450	10.22%	1,973
	Sales					
	Sellers (N: 3,516)					
	n		**Freq.**		**Number**	
Purchase securities	101		2.87%		113	
Sale securities	330		9.39%		571	

Table 8: Sellers and Buyers: mean comparisons

This table gives mean comparisons between subcategories of buyers and sellers (Male vs. Female, Investor Members vs. other Members, and Low sellers vs. Large sellers). In each table, *Number*, *Portfolio value*, *Transaction* and *Age* is respectively the average number of financial securities (different from member shares) held at date $t-1$, the average portfolio value at date $t-1$, the average number of shares purchased or sold at date t and the average age of buyers or sellers. N is the number of clients. Diff. gives the mean difference. Standard errors are displayed between parentheses. ***, **, * indicates a significant difference at 1%, 5% and 10%.

Panel A: Purchases vs. Sales

	Purchases (1) (N: 23,774)	**Sales (2) (N: 3,516)**	**Diff. (1)-(2)**
Number	5.80 (5.21)	5.02 (5.11)	0.78***
Portfolio value	48,254.20 (92,750.50)	33,251.10 (74,845.60)	15,003.10***
Transaction	40.05 (178.70)	170.70 (401.00)	-130.65***
Age	51.48 (18.37)	48.03 (17.14)	3.45***

Panel B: Gender

	PURCHASES			**SALES**		
	Male (1) (N:11,291)	**Female (2) (N:12,483)**	**Diff. (1)-(2)**	**Male (1) (N: 1,801)**	**Female (2) (N: 1,715)**	**Diff. (1)-(2)**
Number	5.94 (5.56)	5.67 (4.87)	0.27***	5.42 (5.86)	4.60 (4.14)	0.82***
Portfolio value	47,484.30 (99,846.20)	48,960.10 (85,725.80)	-1,475.80	35,844.70 (82,243.20)	30,515.90 (66,067.90)	5,328.80**
Transaction	38.79 (185.50)	41.21 (172.30)	-2.43	178.00 (426.40)	163.00 (372.30)	15.00
Age	49.18 (17.95)	53.58 (18.50)	-4.40***	47.43 (16.58)	48.65 (17.70)	-1.22**

Panel C: Category of Members

	PURCHASES		
	Investor Members (1) (N : 14,181)	**Other Members (2) (N : 9,593)**	**Diff. (1)-(2)**
Number	6.52 (5.67)	3.46 (2.01)	3.06***
Portfolio value	58,362.90 (101,595.00)	15,454.00 (40,228.80)	42,908.90***
Transaction	51.23 (202.90)	3.52 (5.66)	47.71***
Age	53.57 (18.01)	44.68 (17.88)	8.89***

Table 9: Estimation results of the regression analysis.

This table gives the estimation results (pooled OLS with client-level clusters) of the following regression: $T_{it} = \alpha_0 + \alpha_1 Port\_value_{it-1} + \alpha_2 Number\ of\ securities_{it-1} + \alpha_3 Overdraft_{it-1} + \alpha_4 Age_i + \alpha_5 Partner_i + \alpha_6 Female_i + \varepsilon_{it}$. The dependent variable is the logarithm of the total amount of shares bought or sold by the client i at month t. Intercept, $Port\_value$, *Number of securities*, *Overdraft* , *Age*, *Partner*, *Female* are respectively the intercept of the regression, the logarithm of portfolio value for client i the end of the month before the transaction occurs, the number of financial securities (different from member shares) held by the client i the month before the transaction occurs, a dummy variable equal to 1 if the client i is overdrawn on his deposit account at the end of the month before the transaction occurs and 0 otherwise, client's i age, a dummy variable equal to 1 if the client lives with a partner (married, civil union and cohabitation) and 0 otherwise, a dummy variable equal to 1 if the client is a female and 0 otherwise. ***,**,* indicates a significant coefficient at 1%, 5% and 10% level. Standard errors are displayed between parentheses. N, Obs., R^2 gives the number of customers, the number of transactions and the coefficient of determination.

	Purchases	**Sales**	**All**
Intercept	1.5945*** (0.0506)	0.7695*** (0.0889)	1.7538*** (0.0485)
Portfolio Value	0.2548*** (0.0058)	0.6795*** (0.0123)	0.2675*** (0.0055)
Number of securities	0.0343*** (0.0027)	-0.0574*** (0.0096)	0.0279*** (0.0026)
Overdraft	-0.3294*** (0.0304)	0.1861*** (0.0600)	-0.3503*** (0.0316)
Age	0.0091*** (0.0007)	0.0033** (0.0016)	0.0079*** (0.0007)
Partner	-0.0960*** (0.0250)	-0.1110** (0.0545)	-0.0829*** (0.0256)
Female	-0.0178 (0.0234)	0.0418 (0.0513)	-0.0371 (0.0242)
N	23,774	3,516	26,788
Obs.	40,724	3,577	44,301
R^2	0.2320	0.5461	0.2067

Table 10: Estimation results of the regression analysis: by subcategories

This table gives the estimation results (pooled OLS with client-level clusters) of the following regression

$$T_{it} = \alpha_0 + \alpha_1 Port\_value_{it-1} + \alpha_2 Number\ of\ securities_{it-1} + \alpha_3 Overdraft_{it-1} + \alpha_4 Age_i + \alpha_5 Partner_i + \alpha_6 Female_i + \varepsilon_{it}.$$

The dependent variable is the logarithm of the total amount of shares bought or sold by the client i at month t. Intercept, $Port\_value$, *Number of securities*, *Overdraft*, *Age*, *Partner*, *Female*, *Married* are respectively the intercept of the regression, the logarithm of portfolio value for client i the end of the month before the transaction occurs, the number of financial securities (different from member shares) held by the client i the month before the transaction occurs, a dummy variable equal to 1 if the client i is overdrawn on his deposit account at the end of the month before the transaction occurs and 0 otherwise, client's i age, a dummy variable equal to 1 if the client lives with a partner (married, civil union and cohabitation) and 0 otherwise, a dummy variable equal to 1 if the client is a female and 0 otherwise. ***, **,* indicates a significant coefficient at 1%, 5% and 10% level. Standard errors are displayed between parentheses. N, Obs., R^2 gives the number of customers, the number of transactions and the coefficient of determination.

	Gender				**Purchases**	
	Female purchases	**Male purchases**	**Female sales**	**Male sales**	**Other Members**	**Investors Members**
Intercept	1.4710***	1.6995***	0.6843***	0.8937***	2.8547***	0.3627***
	(0.0703)	(0.0706)	(0.1158)	(0.1293)	(0.0361)	(0.1164)
Portfolio Value	0.2577***	0.2507***	0.6841***	0.6771***	0.0785***	0.4181***
	(0.0085)	(0.0080)	(0.0152)	(0.0178)	(0.0041)	(0.0130)
Number of Securities	0.0377***	0.0317***	-0.0673***	-0.0529***	0.0465***	0.0019
	(0.0038)	(0.0036)	(0.0119)	(0.0120)	(0.0063)	(0.0031)
Overdraft	-0.2677***	-0.3918***	0.2746 ***	0.1059	-0.0261	-0.3780***
	(0.0431)	(0.0429)	(0.0788)	(0.0908)	(0.0240)	(0.0423)
Age	0.0096***	0.0086***	0.0054**	0.0011	0.0002	0.0077***
	(0.0010)	(0.0012)	(0.0022)	(0.0025)	(0.0006)	(0.0010)
Partner	-0.0647*	-0.1233***	-0.0776	-0.1287	0.0923***	-0.1099***
	(0.0343)	(0.0367)	(0.0731)	(0.0841)	(0.0200)	(0.0326)
Female	-	-	-	-	-0.0518***	-0.0145
					(0.0187)	(0.0309)
N	12,483	11,291	1,715	1,801	9,593	14,181
Obs.	21,244	19,480	1,741	1,836	9,594	31,130
R-Square	0.2278	0.2371	0.5632	0.5309	0.0888	0.2311

Table 11: Estimation results of the logistic regression

This table gives the results of the following logistic regression: $B_i = \alpha_0 + \alpha_1 Port\_value_i + \alpha_2 Age_i + \alpha_3 SILFA_i + \alpha_4 MFM_i + \alpha_5 Partner_i + \alpha_6 Female_i$. The dependent variable is a binary variable equal to 1 if the client i is a net buyer (net seller) of shares, 0 otherwise. $Port\_value$, Age, $SILFA$, MFM, Partner, Female are respectively the logarithm of client i's average portfolio value, client i's age, the proportion of listed financial products (stocks and bonds) held by client i on the total portfolio value, a dummy variable equal to 1 if the client i has a member of his family who is also member, , a dummy variable equal to 1 if the client is Partner and 0 otherwise, a dummy variable equal to 1 if the client is a female and 0 otherwise. ***, **,* indicates a significant coefficient at 1%, 5% and 10% level. Standard errors are displayed between parentheses. Obs., N, Intercept, Likelihood ratio denotes the number of observations, the number of buyers or sellers, the intercept and the likelihood ratio of the regression.

	Purchases	**Sales**
	(1)	**(2)**
Portfolio Value	0.2052***	-0.0380***
	(0.0039)	(0.0084)
Age	0.0001	-0.0089***
	(0.0004)	(0.0011)
SILFA	0.6558***	0.2035*
	(0.0434)	(0.1225)
MFM	1.2938***	-0.2351***
	(0.0176)	(0.0439)
Partner	-0.4422***	0.1961***
	(0.0166)	(0.0415)
Female	-0.0317**	-0.1103***
	(0.0141)	(0.0345)
Intercept	-4.1633***	-2.6425***
	(0.0360)	(0.0739)
Obs.	246,120	112,440
N	23,774	3,516
Likelihood ratio	10,396.7349	180.7461

Figure 1: Total number of shares over the period

This graph gives the monthly time series of the aggregate number of member shares held by members over the period 08/2011-08/2012. Number of Shares (in millions) indicates the number of member shares held by members.

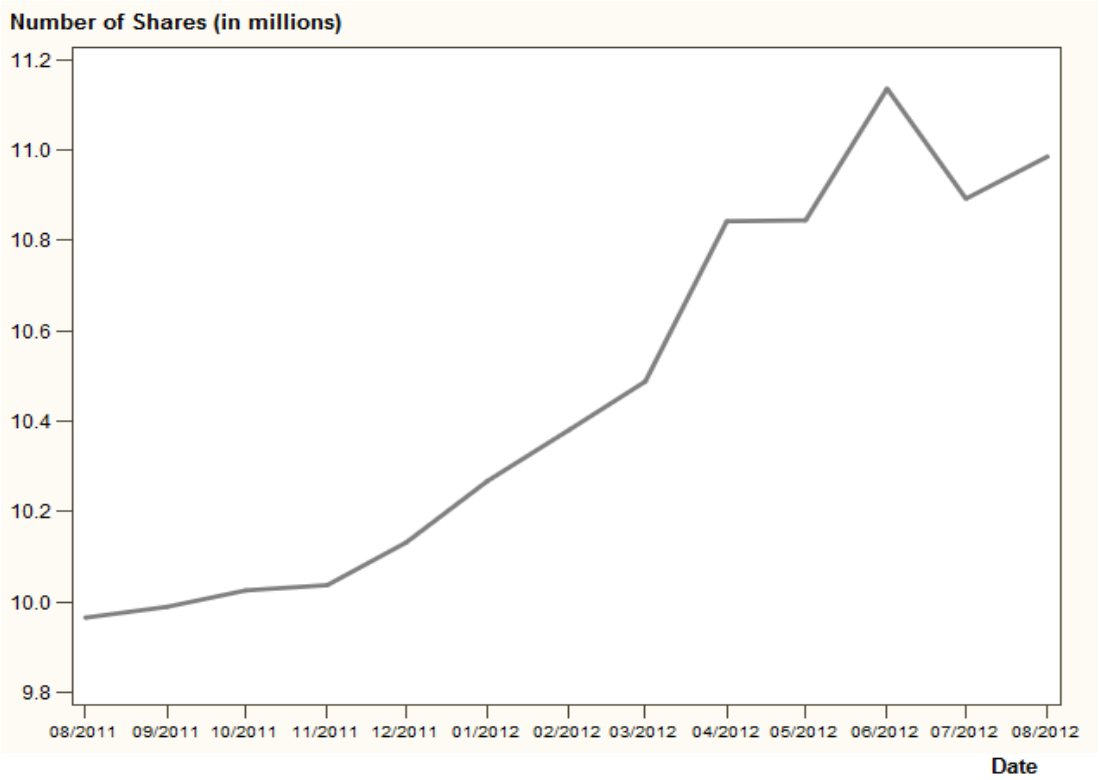


Figure 2: Categories of clients

This graph gives information about members' origin and destination from date t to date $t+1$. Clients on the left of the table are bank customers who can be members or non-members. Not Clients, on the right of the table are people outside the bank's network, but they can become clients and/or members. The set of members contains three subcategories: Existing Members, Leaving Members and New Members. The first subcategory is the subset of clients who are already members when they buy or stay members when they sell a part of their shares. The second subcategory is composed by members selling their entire portfolio of member shares. These people can stay as clients of the bank or can leave the bank (they become Not Clients).The third subcategory is composed by New Members who purchase member shares while they are non-members before.

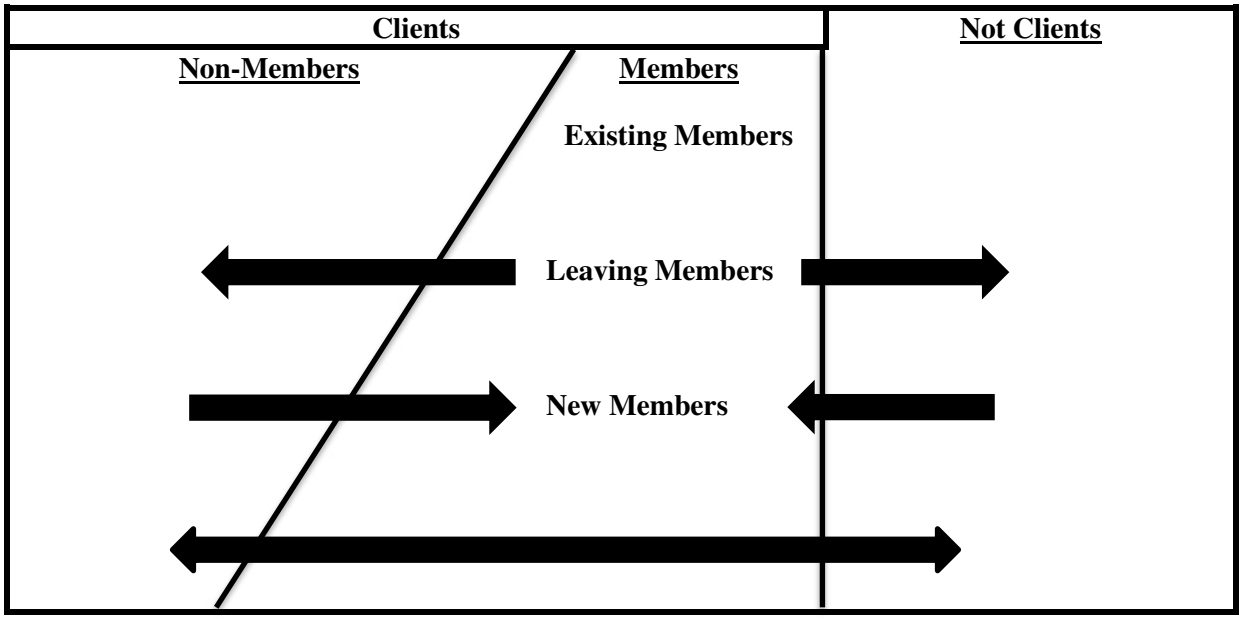
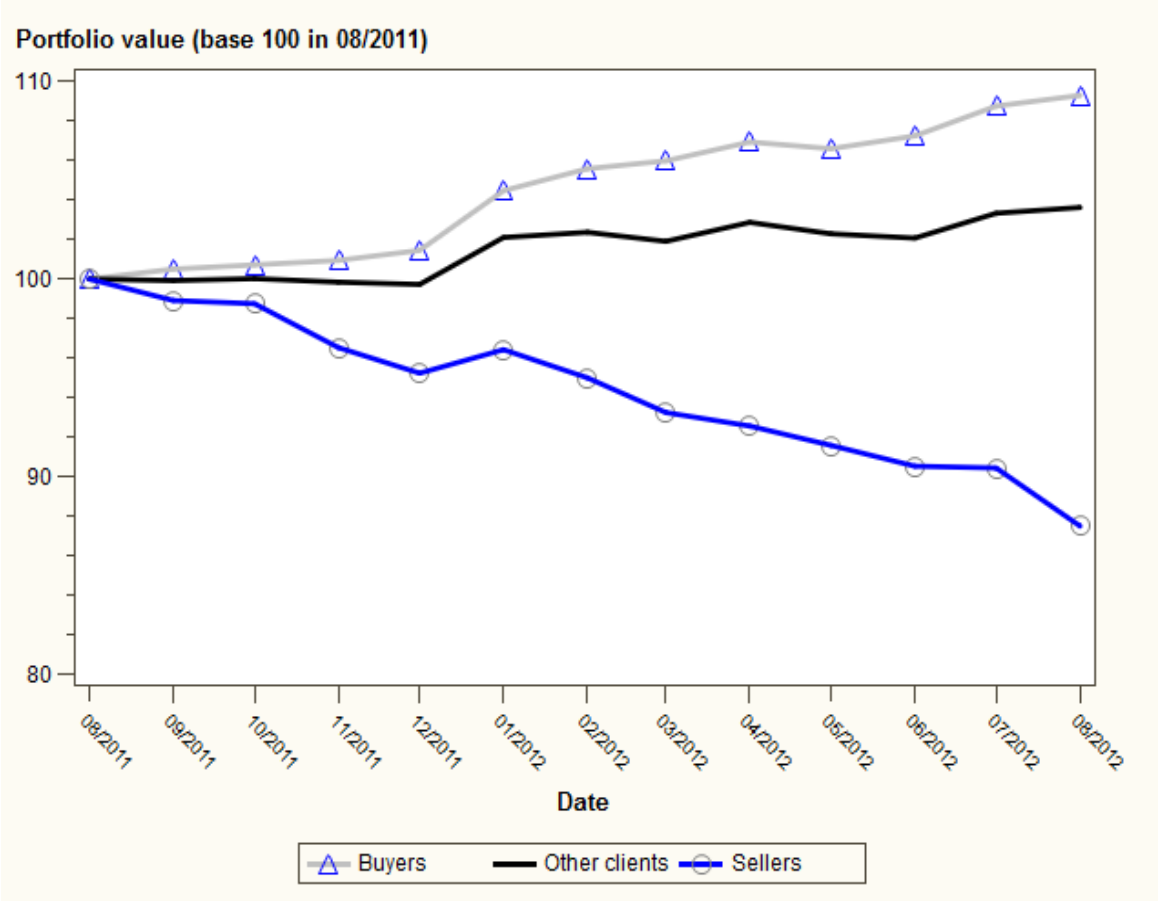


Figure 3: Evolution of total deposits: Sellers vs. Buyers

This graph gives time series (08/2011 to 08/2012) of the values of portfolios held by Sellers, Buyers and other clients. All clients who trade member shares over the period are classified according to their choices (purchase or sale) within the category of Buyers or Sellers. For each month t and each client i, the portfolio value (in euros) by aggregating the amount invested in each financial security j. We use the following equation: $P_{it} = \sum_j x_{ijt}$ where x_{ijt} is the amount invested on asset j by client i at date t. Each point of the curves is obtained by aggregating clients' portfolios at date t and dividing by the portfolio value the beginning of the period (08/2011) as follows: $C_t = \frac{\frac{1}{N}\sum_i P_{it}}{\frac{1}{N}\sum_i P_{it_{08/2011}}}$.



CHAPTER 4

Does financial literacy reduce familiarity bias? Evidence from bank employees

Abstract

Previous research indicates that more educated and financially literate individuals are less prone to familiarity bias. In line with this literature, this paper investigates whether bank employees are prone to familiarity bias. Comparing individual portfolios of 1,158 bank employees to 244,962 clients of the same French cooperative bank, we find that 72% of the employees hold familiar assets of their own-bank (bonds, member shares and stocks), while only 49% of clients hold these assets. Our results show that on average, bank employees invest a lower stake of their portfolio in familiar assets but are more likely to hold such assets due to familiarity bias. Interestingly, an employee is four times more likely than an ordinary client to hold familiar stocks, leading bank employees to hold highly under-diversified portfolios of risky assets. This study provides evidence that familiarity bias is a strong behavioral bias and that financial literacy is not sufficient to reduce it.

JEL Codes: G11, G02

Keywords: Bank employees, familiarity bias, behavioral finance, cooperative bank

1 Introduction

The preference of investors for familiar assets has been largely documented (French and Poterba, 1991; Tesar and Werner, 1995; Coval and Moskowitz, 1999, Keloharju et al., 2012). Two explanations are currently being debated. The first one states that investors hold better information on familiar assets and therefore are more prone to invest in them. However, empirical results are mixed. For instance, Seasholes and Zhu (2010), analyzing a large sample of 40,000 US investors, show that the returns of familiar stocks do not significantly beat the market. By contrast, Coval and Moskowitz (1999, 2001) find support for informed investing in familiar assets by mutual funds.

An alternative explanation is that individuals' choices are driven by ambiguity aversion that leads to prefer familiar assets (Heath and Tversky, 1991). Thus, in the context of uncertainty (without information on expected payoffs), investors who face two financial assets prefer the more familiar one compared to the non-familiar. Said differently, individual investors fear the unknown and prefer familiar assets.

This bias has direct consequences for investors. More familiarity-biased investors hold under-diversified portfolios of assets (Heath and Tversky, 1991; Cao et al., 2011) and neglect more profitable alternative choices (Meulbroek, 2005). Importantly, when familiarity-biased employees invest in the stock of the firms they work for, they take the risk of losing their money and their jobs if the firms fail. As mentioned by Benartzi et al. (2007), it is worth recalling that 62% of Enron's 401(k) plan were invested in Enron stocks.

Consequently, familiarity bias strongly contradicts standard financial theory (Markowitz, 1952, 1959; Sharpe, 1963) stating that rational investors should diversify their portfolio of financial assets worldwide according to their risk/return preferences.

The recent literature shows that investors' financial literacy, education, gender and wealth are strong determinants of familiarity bias. For instance, Karlsson and Nordén, (2007) define the representative familiarity-biased investor as an old overconfident man with low income and a low level of education. Grinblatt and Keloharju (2001) show that less sophisticated investors invest more in familiar assets compared to other investors. In the same way, Pool et al. (2012) find that mutual fund managers are also subject to familiarity bias; bias is stronger for inexperienced managers. Finally, Graham et al.

(2009) find that investors who view themselves as more knowledgeable than average are less prone to invest in familiar assets. They show that male, higher income and more educated investors have a lower familiarity bias.

This paper contributes to this debate by testing whether highly financially literate investors as bank employees are less prone to familiarity bias than regular clients.

We use a unique dataset of 246,120 individual accounts of clients and employees of one of France's larger cooperative banks. For each employee/client we know his or her portfolio over a 13-month period (08/2011-08/2012) on a monthly basis. To the best of our knowledge no study has already tested this hypothesis. In addition, we provide a unique study of the impact of familiarity bias when the complete financial portfolio of investors is considered.

Our analysis contains two steps. We start by estimating the propensity for a given employee to hold familiar assets that we divided into three categories: bonds, stocks and member shares issued by the bank. We compare the result to the holdings of regular clients. Next, in the spirit of Karlsson and Nordén (2007) and Pool et al. (2012) we measure familiarity bias as the weight of familiar assets in portfolios. A familiarity-biased investor puts more weight on familiar assets than a rational investor.

Our results come as follows: we find that 72% of employees and 49% of clients hold familiar assets and that bank employees are 1.4 times more likely to hold familiar assets compared to ordinary clients. When the propensity to hold familiar assets is restricted to stocks, we find that employees are four times more likely to hold familiar stocks. Interestingly, we find that employees allocate a non-negligible amount of familiar assets of 59.05% of their portfolios of stock in familiar stocks (for clients it is 57.60%), which suggests a strong familiarity bias among employees.

Conversely, the weight invested in familiar assets represents on average 5% of the portfolio of employees and 7% of the portfolio of clients. This finding suggests that being an employee is negatively linked to the weight of familiar assets in the portfolio. This result remains when we use a regression model including several controls such as age, gender, portfolio value, number of securities and preference for risk.

Our study produced the following results. Financial literacy does not significantly reduce familiarity bias. The preference of employees for the stocks of the bank they work

for suggests that bank employees prefer to gamble on the market with assets they feel they know. In line with Huberman (2001), these findings can be interpreted as a misperception of the risk of familiar assets and an overestimation of their future performance.

The remainder of the paper is structured as follows: Motivating evidence and hypothesis development are outlined in section 2. Section 3 provides a description of the sample and methodology. The results are in section 4, and robustness checks in section 5. Finally, section 6 presents the conclusions.

2 Motivating Evidence and Hypothesis Development

Standard financial theory (Markowitz, 1952, 1959; Sharpe, 1963) predicts that investors should hold diversified portfolios of assets and make their investment decisions according to future expected returns and asset co-movements. However, empirical findings show that investors hold under-diversified portfolios of financial assets, sometimes highly concentrated on familiar assets. This behavior has been observed worldwide for stock market investors and mutual fund managers.

French and Poterba (1991) were among the first to highlight this empirical fact. They found that 94% of equity portfolios of US investors were held domestically in 1989. More recently, Seasholes and Zhu (2010) have studied investment choices of US households and show that households invest on average 30% of their equity portfolio in stocks of firms located less than 250 miles from their homes. Grinblatt et Keloharju (2001) find that Finnish households are 81% more likely to hold stocks of firms located close to their homes than stocks from elsewhere (see also Hong et al., 2008).

In a study of 11 million pension plan participants, Mitchell and Utkus (2004) show that 20% of assets held are invested in stocks of the firms where participants work. Accordingly, Huberman and Sengmueller (2004) find that stocks of firms sponsoring 401(k) plans are the second preferred investment among participants. Holden and VanDerhei (2001) show that for 401(k) plans with more than 5,000 participants, 25.4% of invested funds are stocks of the firms sponsoring the plan.

For a given employee, it is suboptimal to invest in his or her own company stock because in addition to financial risk, employees can lose their job and income. As such,

Benartzi et al. (2007) mentioned that 62% of stocks in Enron's 401(k) plan were Enron stocks. Following Enron's failure employees lost their jobs and their savings. In addition, Meulbroek (2005) empirically shows that familiar investments are worse when compared to a market portfolio. Over a 10-year period, employees who allocated their portfolio to own-company stocks saw their portfolios grow by 25% compared to 42% growth for employees who had a diversified portfolio of stocks.

Therefore, why do investors invest heavily in familiar assets? Two main explanations have been given: 1) Investors have an informational advantage about future returns 2) Investors are familiarity biased and underestimate the risk of investing in familiar assets.

No clear-cut answer has been found about whether an information advantage drives investors' choices. For instance, Coval and Moskowitz (2001), using domestic investments as a proxy for familiar investments, find that fund managers earn a 2.70% yearly extra return from their familiar investments compared to non-familiar investments, which suggests that investment decisions are driven by an informational advantage. By contrast, Seasholes and Zhu (2010) do not find that local stock holdings significantly beat the market (no positive and significant Jensen Alpha is found) even when controlling for the local market portfolio. They attribute these results to investors' familiarity bias.

Experimental research in psychology and behavioral finance has shown that individuals are prone to ambiguity aversion. Ambiguity aversion can be viewed as a preference for the familiar compared to the unfamiliar. Thus, when investors face two lotteries with the same expected payoffs they prefer the one that seems more "familiar" (see Heath and Tversky (1991), Ackert et al. (2005) and Dlugosch et al. (2014) for experimental evidence).

A rapidly growing body of literature shows that familiarity bias depends on financial literacy, education, demographics and wealth. For instance, Goetzman and Kumar (2008) find that familiarity bias is stronger for young investors with low incomes and who are less sophisticated and less educated. Karlsson and Nordén (2007) use a large sample of 13,749 Swedish pension plan participants to determine the likelihood for a Swedish citizen to be familiarity biased. They characterize the typical familiarity-biased investor as an old, overconfident man with a high level of job security (public workers), a low level of sophistication (measured by the educational level, unfamiliar risky assets owned, and level of wealth), and who invests a low amount of money.

Vissing-Jorgensen (2003) shows that wealthier households are more likely to invest in unfamiliar assets (defined as foreign assets) because they can afford the information costs associated with such investments. In the same way, Graham et al. (2009) found that investors with a yearly income higher than $100,000 are more likely to hold not familiar assets. They find that 44.60% of high income investors hold unfamiliar assets when only 24.80% of investors with an annual income lower than $50,000 hold unfamiliar assets.

In addition, Graham et al. (2009) found that investors who are more educated are less prone to familiarity bias. Indeed, they show that 27.40% of investors with a level of education lower than a college degree invest in unfamiliar assets while 48.10% of post-graduate investors invest in these assets. Hau and Rey (2008) compared US mutual funds and individual investors; they found that individual investors invest on average 87% of their portfolio in familiar assets (domestic assets) while institutional investors invest on average 68%. The authors conclude that familiarity bias decreases in intensity with financial literacy. Recently, Pool et al. (2012) show that US mutual fund managers overweigh stocks of their home states in their portfolios compared to the average mutual fund of a given state. They find that this overweighting does not leads to higher performance of the fund. They attribute this result to familiarity bias. In addition, they find that inexperienced managers are more likely to overweigh home assets within their portfolio than experienced managers are.

At the firm level, Benartzi (2001) shows that only 16% of employees understand that investing in an employer's stock is riskier than investing in the overall stock market. In addition, only 6% of those with a high school education or less recognize the risk of holding stocks in their firms. This finding is also confirmed by Benartzi et al. (2007), who, using a survey of 500 participants in pension 401(k) plan programs, show that 25% of the respondents believe that their company stock is safer than a diversified stock fund, 39% believe that it has the same risk as a stock fund and only 10% of respondents realize that their own company stock is riskier.

Overall these findings suggest that wealth, education and financial literacy could strongly affect the preferences for familiar assets.

This paper contributes directly to the aforementioned literature and investigates whether financial literacy affects familiarity bias. We proxy financial literacy by status as a bank employee. Bank employees can be considered more financially educated

compared to the general population[30]. They should be aware that investing in familiar assets of their own company and holding an under-diversified portfolio is risky. Furthermore, it is an interesting population to study because some employees, such as financial advisors, provide financial advice to bank clients and are supposed to encourage diversification.

On the one hand, according to Bernatzi et al. (2007), few employees of firms believe that it is more risky to invest in familiar assets than in the whole equity market; on the other hand, bank employees should be more aware of this basic financial knowledge. According Graham et al. (2009), and Karlsson and Nordén (2007), they should know that investing heavily in familiar assets is more risky than in a broad market index.

3 Data and Methodology

3.1 Data and descriptive statistics

Our primary data source is a large database of 640,000 accounts of all clients and employees from a cooperative bank in a given French region (Alsace). Our database is complete because we have access to all accounts of all clients over a 13-month period, beginning in August 2011 and ending in August 2012.

In the following section, we use "client's portfolio" to identify the set of products owned by a given individual. A portfolio may contain savings accounts, a portfolio of stocks, funds, life insurance policies, etc. We call "portfolio value" the aggregate value of all these products as it is registered by the bank.

On the full sample, the average portfolio value is €12,086, with a standard deviation of €41,218. As often observed in wealth distributions, the median is considerably lower than the mean. Here, the median is only €370. This asymmetry is due to a number of "sleeping accounts" that have not been closed but are endowed with only a few euros. These sleeping accounts are mainly located in the lower quartile of the portfolio values.

[30] Empirical papers have shown that households' financial literacy is low, and most of them cannot answer basic questions on finance. See Lusardi and Mitchell, 2007; Christelis et al., 2010; Remund, 2010; Alessie et al., 2011; Yoong, 2011 see also Arrondel et al., 2012 for evidence on the French market

As usual, there are also a few wealthy clients who move the average portfolio value upward, thus resulting in a 99th percentile equal to €170,000.

The "sleeping accounts" essentially contain residual saving plans within the bank, which indicates that a client has left the bank. We decided to delete these accounts to avoid introducing strong bias in the results.

We select customers with complete records over the period with at least two products in their portfolio. Customers who are less than 18 years of age[31] are excluded because we do not know who makes decisions for them. We exclude clients for which exact home addresses are unknown by the bank, indicating that the client has moved without informing the bank[32]. Finally, we obtain a complete sample composed of 246,120 clients with 6.9 billion deposits[33].

To study familiarity bias of bank employees we focus on portfolios of the 1,158 employees in the sample and compare their accounts to those of the 244,962 other clients. Contrary to ordinary clients, employees have to hold at least one deposit account within the bank because their salary is paid into it. As a consequence, they may be less confronted by the problem of multiple banks and have less incentive to switch to another bank, consider their own bank as their principal bank.

Table 1 provides descriptive statistics about monthly portfolios for employees and clients. Portfolios are evaluated at the end of the month. The first column indicates the month at the end of which calculations are performed, N is the number of employees (clients) entering the calculation of the figures provided in columns 2 to 6. Column 2 contains the average portfolio value and the four other columns giving the standard deviation, first decile, median and last decile for the cross-sectional distribution of portfolio values. In the complete sample, the average portfolio value for employees (clients) is €39,741.25 (€28,146.45), with a standard deviation of €66,433.75 (€63,030.06) and a median of €16,432.24 (€8,268.83). Therefore, the average value of employees' portfolios is significantly higher than the average value of clients' portfolios.

[31] In France, the age of majority is 18.
[32] The database provides a dummy variable equal to one if the client lives at the mentioned location and zero if the client does not live at the mentioned address.
[33] Even if the number of customers dramatically falls by 61.5%, total deposits decrease by only 12.7%.

Table 2 provides the demographics for the subsets of clients and employees. The employees (clients) are on average 41 (50) years old and 49% (47%) are men. Over the sample, 24% (4%) of the employees (clients) hold unfamiliar stocks. Finally, over the period employees hold on average eight financial products (different from familiars) while only four financial products are held by clients.

3.2 Methodology

3.2.1 A short definition of familiar assets

The cooperative bank (customer owned) is structured as shown on Figure 1: local branches are at the bottom, regional institutions in the middle and a head institution at the top. The head institution holds a listed investment bank. Through its local branches the banking group supplies customers financial securities, such as life insurance policies, saving plans, housing plans, and mutual funds. However, it also provides three bank-specific assets that we call "familiar assets": bonds issued by the head institution, stocks issued by the listed bank and member shares of the cooperative bank.

The bank in this study is a cooperative bank owned by its members who are ordinary clients holding member shares[34]. Since 2002, the head institution issues bonds. Each bond has a nominal value of €1 refunded at maturity.
Finally, the cooperative bank holds one listed investment bank, which issues stocks on the market (see Appendix A for details on stock performance).

[34] Member shares are unlisted and fixed price (€20) stake of equity. They provide a yearly payoff framed by the law (must be lower than the French private bond rate (TMO)) and taxed as dividends of ordinary stocks.

3.2.2 Job position of bank employees

In this study, the bank employees are divided into three categories:

1) *Financial advisors* provide advice and sell financial products to investors/clients. They are supposed to have a high level of financial literacy. In France, since 2008, financial advisors have had to pass a specific certification on behalf of the French Market Authority (AMF) to insure they have sufficient knowledge on financial matters. Accordingly, we consider that financial advisors are financially literate employees due to their job position and the knowledge required.

2) *White collars* hold highly qualified positions that require high knowledge and high competences. We find managers and chief executives in this category.

3) *Other employees* who work in the back office and for which the position requires technical and specific competences.

Overall we have 1,158 employees for the study. In the full sample employees are identified by a dummy.

3.2.3 Measures of familiarity bias

We are aware that our definition of familiar assets is more appropriate for measuring familiarity bias of employees than that of ordinary clients. However, for convenience we will use the same definition for both employees and clients in the following section. In fact, employees have incentives to sell "familiar assets" to clients, even if these incentives are informal and not monetary[35].

[35] A number of studies show that many factors increase the incentives for financial advisors to sell products that are not optimal for their clients (Inderst and Ottaviani, 2009; Hackethal et al., 2012)

Our analysis of familiarity bias includes two steps. To estimate the likelihood of holding familiar assets for a given client we consider familiarity bias as a choice between the decision to hold or not hold familiar assets. More familiar biased investors are more likely to purchase familiar assets. This measure is close to the definition given by Heath and Tversky, (1991). We determine the likelihood for a given client to hold any familiar asset and test whether financial literacy, identified by the dummy variable *bank employee*, affects the propensity to hold familiar assets. We estimate logistic regressions to identify whether employees are less prone to hold familiar assets (e.g., stocks, bonds and member shares).

Next, we calculate the intensity of familiarity bias using the monthly weight of familiar assets for each client/employee[36]. For a given month familiarity bias intensity is calculated as follows:

$$Familiarity_i = \frac{\sum_F A_{if}}{\sum_J A_{ij}} \quad (1)$$

Where F gives the set of familiar assets f (bonds, member shares and stocks), and J the set of assets j (familiar + not-familiar) and $F \subset J$.

With $\sum_F A_{if}$ the aggregate amount invested by employee i in familiar asset f for a given month, $\sum_J A_{ij}$ gives employee i's portfolio value on month t. We assume that the higher the weight invested in familiar assets, the higher the familiarity bias intensity and the possible impact on the portfolio of any holder.

It is noticeable that our measure of familiarity bias considers the whole portfolio value of investors and is not restricted to the equity portfolio as in other studies.

[36] The weight of familiar assets in the portfolio is usually used as a proxy of familiarity bias.

4 Preference for Familiar Assets

4.1 Investment in familiar assets

A first way of estimating how financial literacy impacts familiarity bias consisted in comparing the portfolios of bank employees with those of clients. Table 3 provides employee and client holdings of familiar assets. Over the period 72% (49%) of the employees (clients) hold familiar assets (stocks, bonds and member shares), investing on average €2,921.75 (€4,659.37), which represents 4.77% (7.28%) of their portfolio value. The median values for the amount invested and the weight in the portfolio value are €461.54 (€503.53) and 0.9% (1%), respectively. Differences between employees and clients are statistically significant and indicate that employees invest less than clients in familiar assets.

As seen from Appendix B (Panel A) 8% (7%) of the employees (clients) hold bonds, 34% (6%) hold stocks and 62% (46%) hold member shares. Interestingly, 83% (75%) of employees (clients) who hold stocks hold familiar stocks and 90% (95%) of employees (clients) who hold bonds hold familiar bonds. These results suggest a strong preference for familiar assets for both employees and clients.

For stocks, we find that employees invest on average €238.90 more than clients and the weight in their portfolio is 0.8% higher than the weight in ordinary clients' portfolios. If we limit the sample to portfolios of stocks, employees hold a significantly more concentrated portfolio of stocks (1.45% higher) compared to clients.

For bonds and member shares, employees invest less for both, absolutely and relative to portfolio values. In addition when we consider only portfolios of bonds, employees hold a portfolio that is 5% more concentrated on average than clients, but the difference is not statistically significant.

These preliminary results show that employees prefer familiar assets but that familiar assets have a lower weight in their portfolio than clients. By contrast, when the equity portfolio is considered we find that employees are more likely to hold familiar stocks and hold more concentrated portfolios of stocks than clients.

4.2 Determinants and familiarity bias intensity

To explore the effect of financial literacy on familiarity bias we implement a two-step analysis: We determine the likelihood that an individual will hold familiar assets. Next, we perform a multivariate analysis to test whether employees weigh familiar assets less than clients when we control for a number of variables.

4.2.1 Familiar asset choices

We estimate the likelihood for a given individual to hold familiar assets. We first estimate a set of logistic regression models with a binary dependent variable. The model can be written as follows (see Appendix C for details):

$$Familiar\ asset_i = \beta_0 + \beta_1 Bank\ employee_i + \beta_2 Portfolio\ value_i + \beta_3 Male_i + \beta_4 Age_i + \beta_5 Number\ of\ securities_i + \beta_6 Risky\ assets_i \quad (2)$$

$Familiar\ asset_i$ is equal to one if individual i holds any familiar asset (bonds, stocks or member shares) at the end of the period and zero otherwise. $Bank\ employee_i$ is a dummy variable equal one if the individual is employed by the bank and zero otherwise. We include several control variables. $Portfolio\ value_i$ gives the logarithm of the average deposits over the period per client and controls for wealth. $Male_i$ is a dummy variable equal to one if the client is a male zero otherwise and controls for gender in line with Barber and Odean (2001), Karlsson and Nordén (2007) and Graham et al. (2009). Age_i gives a client's age. $Number\ of\ securities_i$ gives the average number of securities held by client i (different from familiar assets) and controls for sophistication in line with Grinblatt and Keloharju (2001) and Karlson and Nordén (2007). Finally, the variable $Risky\ assets_i$ controls for risk aversion and is a dummy variable equal to one if client i holds stocks (different from familiar stocks) and zero otherwise. The results are displayed in Table 4.

Overall (regression (1)) bank employees are 1.4 times ($e^{0.3663}$) more likely to hold familiar assets than ordinary clients, suggesting that employees are more subject to familiarity bias. Regression (2) shows that bank employees exhibit a strong preference for familiar stocks and are 4.2 times ($e^{1.4446}$) more likely to hold familiar stocks compared to ordinary clients.

The negative coefficient of regression (3) indicates that employees are less prone to buy familiar bonds than clients. Employees are also more likely to invest in member shares compared to other clients.

For control variables we find that the logarithm of the *portfolio value* is positively and significantly related to the propensity to hold familiar assets and the coefficient is particularly high for bondholders. This result suggests that on average wealthier individuals are more likely to hold familiar assets.

The positive and significant coefficient for gender in regression (1) and (2) indicates that men are more likely than women to hold familiar assets and familiar stocks. Client age is also positively related to the propensity to hold familiar assets. These results are in line with Karlsson and Nordén (2007) who show that males and old individuals are more prone to familiarity bias.

We find that the number of securities held (different than familiar) is positively related to the holding of familiar assets. Finally, we find a positive and significant relationship with the preference for stocks (different from familiar stocks) and the propensity to purchase familiar assets. An individual who holds stocks (different from familiar stocks) is 5.5 times ($e^{1.7117}$) more likely to hold familiar stocks. By contrast, the negative and significant coefficient found for the propensity to hold bonds and member shares suggests that bondholders and member shareholders are in general more risk averse than stockholders, a result that is in line with intuition.

Clients can hold several categories of familiar assets simultaneously. To control for this cross holding we estimate a multinomial logistic regression model (see Appendix D) using the portfolio of familiar assets as the dependent variable. Because we have three familiar assets, seven types of portfolios can be built. The dependent variable then has eight outcomes including the portfolio composed of zero familiar assets. Intuitively a multinomial logistic regression model can be understood as a set of several logistic regressions with each regression linked to one outcome relative to the pivot outcome (or reference outcome). In this study, we consider the portfolio without familiar assets as the

pivot outcome, which is compared to the seven different outcomes of familiar assets. Thus, the regression model compares familiar asset holders to clients holding no familiar assets.

Over the period under scrutiny some clients purchase familiar assets and then switch from one category to another. As a consequence we decided to estimate a pooled multinomial logistic regression model using clustered robust standard errors to address autocorrelation and heteroscedasticity.

The results are reported in Table 5. On average, 78% of familiar assets holders hold a portfolio of member shares only, which contrasts with 0.61% invest simultaneously in familiar bonds and stocks.

Bank employees are more likely to be familiarity biased, as shown by the regression model. Interestingly, the preference of bank employees for stocks is confirmed by outcomes 3, 5 and 6. Each of these portfolios includes stocks. We find that being an employee positively and significantly affects the propensity to hold familiar stocks. By contrast, bank employees are less prone to invest in portfolios that include member shares only and portfolios of "member shares and bonds" only.

For all outcomes, wealth positively affects the propensity to hold familiar assets. The positive coefficient of the variable age indicates that elderly clients are more likely to invest in familiar assets.

We find that males are significantly more likely than females to hold outcomes 2, 3, 6 and 7. The number of securities is positively related to the propensity to hold familiar assets. Clients who hold stocks (different from familiar stocks) are more likely to hold portfolios of familiar stocks and less prone to hold portfolios of member shares and bonds, which suggests a higher risk preference for such clients.

4.2.2 The intensity of familiarity bias

To explore the intensity of familiarity bias between employees and clients we estimate the following regression model using a pooled OLS technique and clustered robust standard errors to address autocorrelation and heteroscedasticity:

$$Familiarity_{it} = \beta_0 + \beta_1 Bank\ employee_i + \beta_2 Portfolio\ value_{it} + \beta_3 Male_i + \beta_4 Age_i + \beta_5 Number\ of\ securities_{it} + \beta_6 Risky\ assets_{it} + \varepsilon_{it} \quad (3)$$

$Familiarity_{it}$ gives the individual monthly weight of familiar assets in the portfolio. $Bank\ employee_i$ is a dummy variable equal to one if the individual is employed by the bank and zero otherwise.

$Portfolio\ value_{it}$ gives the logarithm of the monthly individual total deposits. $Male_i$ is a dummy variable equal to one if the client is a man and zero otherwise and control for gender. Age_i gives individual i's age. $Number\ of\ securities_{it}$ gives the monthly number of securities held by individual i (different from familiar assets) and control for sophistication. Finally, $Risky\ assets_{it}$ is a dummy variable equal to one if the individual hold stocks (different from familiar stocks) and zero otherwise. The results are displayed in Table 6.

Regression (1) shows that being a bank employee reduces the weight of familiar assets (Bonds + Stocks + Member shares) in the portfolio. By contrast, the results of regression (2) show that employees weigh more familiar stocks in their portfolios.

According to Grinblatt and Keloharju (2001), Graham et al. (2009) and Vissing-Jorgensen (2003) we find that individuals with higher portfolio values allocate a lower weight of their portfolio to familiar assets. Furthermore, men and older investors are more prone to invest a wider weight of their portfolio in familiar assets, confirming the findings of Karlson and Nordén (2007) that older and male investors are more prone to familiarity. As seen from regression (1), sophistication does not significantly affect the weight invested in familiar assets. By contrast when the sample is restricted to familiar asset holders we find that more sophisticated clients also hold more concentrated portfolios of familiar assets.

Finally, the positive and significant coefficient for the preference for risky assets indicates that stock market investors have a tendency to invest more in familiar assets and are on average more likely to be subject to familiarity bias.

According to Cao et al. (2011) and Grinblatt and Keloharju (2012), more familiarity biased investors should hold less diversified equity portfolios that are more concentrated in familiar assets. To test this hypothesis we restrict the sample to bond and

stock portfolios. The weight of familiar bonds (stocks) in individual portfolio values is used as a measure of familiarity bias. The results are displayed in Table 7.

For bonds portfolios regression (1) indicates that bank employees do not weigh more familiar bonds in their portfolios compared to clients. By contrast, regression (2) shows that bank employees on average hold more concentrated portfolios of risky assets and give weight to more familiarity bias. These results put to light that the strong preference of employees for familiar stocks induces more concentrated portfolios of risky assets.

Interestingly wealthier investors hold more concentrated portfolios of bonds and stocks. Males hold a lower weight of familiar bonds (stocks) in their portfolio, while older investors weighted more familiar bonds in their portfolio, but the results are not statistically significant for portfolios of stocks.

The negative relationship with the number of securities held and the dependent variables suggests that more sophisticated investors diversify their equity portfolios more, as mentioned by Karlsson and Nordén (2007). Finally, risky asset holders have a less concentrated portfolio of bonds.

5 Robustness Checks

We decided to use financial advisors as a new proxy for financial literacy. While we cannot control the degree of financial literacy for white collars and back office employees, financial advisors hold a certification confirming they have basic knowledge on financial assets and financial laws. In the sample, 379 of the employees are financial advisors.

As seen in Appendix B, (Panel B), 76.25% (48.78%) of financial advisors (clients) hold familiar assets. Interestingly, when we go to stockholdings, we find that 40.11% of financial advisors hold familiar stocks while 5.65% of clients hold familiar stocks. Furthermore, Panel C shows that when we restrict the sample to bank employees, financial advisors are more likely to hold familiar assets compared to employees who are not financial advisors. These results suggest that familiarity bias is stronger for employees with a high degree of financial literacy.

To test the robustness of these results we decided to estimate a multinomial regression model (see Appendix D), including the variable *financial advisor* equal to one if the client is a financial advisor of the bank and zero otherwise.

The results are given in Table 8 and confirm that financial advisors have a strong preference for portfolios composed of familiar stocks. The higher values of the coefficients confirm that familiarity bias is higher for financial advisors than for other employees.

6 Conclusions

The main goal of this paper was to determine whether financial literacy reduces familiarity bias. We use bank employees as a proxy for financial literacy. We found that approximately 72% of bank employees invest in familiar assets (bonds, stocks and member shares). The average weight of familiar assets is approximately 5% of their portfolios.

Bank employees are more likely compared to clients to hold familiar assets but on average allocate a lower stake of their portfolios to such assets. However, we show that employees are four times more likely than regular clients to hold familiar stocks and hold also more concentrated portfolios of stocks. Finally, when we restrict the sample of employees to financial advisors we find that the propensity to invest in familiar assets is stronger, suggesting a higher familiarity bias.

Therefore, one of the more significant findings emerging from this study is that familiarity bias is a strong behavioral bias and that financial literacy is not sufficient to reduce it.

This work contributes to the existing knowledge on familiarity bias of individual investors by considering bank employees. We plan to conduct further studies to establish whether the familiarity bias of employees revealed in this study could interact with clients' holdings. Future trials should also assess the impact of social interactions for familiar asset holdings at the household level.

Table 1: Portfolio values

This table gives monthly deposits (in euros) per employees and clients. Date indicates the month and the year of observation, N represents the number of bank employees and clients observed over the period. Mean is the average deposits per client at a given month. D1, Me, D9 give respectively the first decile, the median, the last decile of the monthly distribution of deposits.

	Bank employees (N:1,158)					Clients (N:244,962)				
Date	**Mean**	**St-D**	**D1**	**Median**	**D9**	**Mean**	**St-D**	**D1**	**Median**	**D9**
08/2011	38,496.68	67,371.21	1,346.27	15,763.61	95,832.96	27,622.73	62,039.23	85.08	8,148.32	72,211.25
09/2011	38,458.51	67,113.66	1,504.48	15,564.80	97,459.62	27,622.68	62,073.97	84.42	8,118.31	72,299.43
10/2011	38,512.04	66,234.97	1,466.46	15,434.74	99,531.52	27,656.79	62,190.11	81.21	8,104.52	72,444.28
11/2011	38,061.54	65,619.65	1,276.18	14,956.71	97,413.25	27,615.67	62,003.64	79.52	8,107.99	72,311.59
12/2011	39,355.59	65,271.93	2,172.08	16,476.45	102,302.36	27,600.54	62,153.67	75.34	8,117.93	72,157.07
01/2012	39,424.25	65,555.81	1,729.76	16,526.55	102,740.97	28,274.44	63,205.86	80.27	8,370.10	74,067.96
02/2012	39,872.64	66,063.26	1,802.39	16,423.80	106,473.53	28,377.29	63,609.58	80.96	8,350.42	74,200.98
03/2012	40,362.35	66,076.73	2,151.96	17,051.56	106,269.03	28,283.55	63,644.04	68.14	8,227.25	73,997.24
04/2012	39,821.91	65,468.60	1,912.82	16,438.71	107,026.70	28,546.04	63,711.33	76.40	8,455.75	74,649.77
05/2012	41,408.55	66,216.05	3,268.74	17,503.74	110,651.69	28,390.01	63,315.27	73.78	8,340.57	74,315.65
06/2012	40,723.18	65,777.32	2,425.66	17,028.71	109,529.96	28,372.91	63,334.65	66.18	8,276.33	74,258.24
07/2012	40,880.06	68,349.77	1,938.66	16,837.79	109,798.90	28,730.87	63,864.74	77.46	8,477.74	75,093.21
08/2012	41,251.16	68,636.35	1,898.97	17,085.47	111,689.54	28,810.09	64,163.90	79.97	8,430.14	75,372.78
All	39,741.25	66,433.75	1,864.65	16,432.24	103,767.43	28,146.45	63,030.06	77.13	8,268.83	73,603.26

Table 2: Variables

This table shows descriptive statistics of the explanatory variables according bank employees and clients. *Male* is a dummy variable equal one if the employee (client) is a man and zero otherwise. *Number of securities* gives the number of securities (corrected for familiar assets), held by employees (clients). *Risky assets* is a dummy variable which indicates if the employee (client) holds stocks (different from familiar assets). N, gives the number of employees (clients) over the period. Mean and St-D gives the mean and the standard deviation. Min and Max report the minimum and the maximum value. D1, Median and D9, are respectively the first decile, the median and the last decile.

	Bank employees (N : 1,158)							**Clients (N: 244,962)**						
Variable	**Mean**	**St-D**	**Min**	**Max**	**D1**	**Median**	**D9**	**Mean**	**St-D**	**Min**	**Max**	**D1**	**Median**	**D9**
Age	40.69	10.37	20	66	26	41	55	50.06	19.09	18	99	24	49	77
Male	0.49	0.50	0	1	0	1	1	0.47	0.50	0	1	0	1	1
Number of securities	8.03	5.94	1	66	3	7	15	4.26	3.20	1	122	2	3	7
Risky assets	0.24	0.43	0	1	0	0	1	0.04	0.19	0	1	0	0	0

Table 3: Investment on familiar assets

This table gives the weight of familiar assets (stocks, bonds and member shares) in individual portfolios for clients and bank employees. *Weight in the portfolio* gives the average amount invested on familiar assets out of the portfolio value over the period and is calculated each month as follows: $Weight\ in\ the\ portfolio_i = \frac{A_{ik}}{\sum_z A_{iz}}$ with A_{ik} the amount invested by employee i on familiar asset k, and $\sum_z A_{iz}$ is the amount invested by client i on security z. *Weight in the net worth* gives the average amount invested on familiar asset out of net worth (amount invested on all securities within the bank) and is calculated as follows for each month: $Weight\ in\ the\ net\ worth_i = \frac{A_{ik}}{\sum_J A_{ij}}$ with A_{ik} the amount invested by employee i on familiar asset k, and $\sum_J A_{ij}$ the portfolio value. *Amount invested* gives the average amount invested in familiar assets over the period. N, Mean, St-D, Min and Max indicate respectively the number of bank employees and clients, the mean, the standard deviation, the minimum and the maximum. Diff. gives the difference of mean between bank employees and clients. ***, **, * indicates a significant difference of mean at 1%, 5% and 10% level respectively.

	Bank employees (1)						Clients (2)						Diff. (1)-(2)
Bond holdings	**N**	**Mean**	**St-d**	**Median**	**Min**	**Max**	**N**	**Mean**	**St-d**	**Median**	**Min**	**Max**	
Weight in the portfolio (%)	106	86.80	31.59	100	0	100	18,104	91.75	24.34	100	0	100	- 4.95*
Weight in the net worth (%)	1,158	1.29	6.12	0	0	94.08	244,962	1.89	9.12	0	0	99.99	- 0.60**
Amount invested (in euros)	95	13,865.75	18,293.28	8,825.59	190.40	142,255.52	17,203	20,897.55	27,986.06	11,812.63	2.85	429,664.70	- 7,031.80***
Stock holdings													
Weight in the portfolio (%)	469	59.05	42.60	100	0	100	18,541	57.60	46.10	100	0	100	1.45***
Weight in the net worth (%)	1,158	1.01	3.83	0	0	72.02	244,962	0.18	2.64	0	0	99.38	0.83***
Amount invested (in euros)	388	763.1	2062.1	331.66	2.31	28,980.2	13,843	524.2	1 807.4	235.74	2.31	90,454.9	238.9**
Member shares holdings													
Weight in the net worth (%)	1,158	2.65	7.56	0.23	0	77.55	244,962	5.95	16.02	0	0	100	- 3.30***
Amount invested (in euros)	718	1,628.60	3,590.36	315.38	20	43,353.8	111,722	1,931.5	5,417.4	100	20	214,000	- 302.9**
All familiar assets													
Weight in the net worth (%)	1,158	4.77	10.60	0.93	0	96.37	244,962	7.28	17.65	0	0	100	- 2.51***
Amount invested (in euros)	829	2,921.75	8,441.99	461.54	2.31	142,255.52	119,488	4,659.37	14,526.49	503.53	2.31	508,708.78	- 1,737.62***

Table 4: Likelihood to hold familiar assets

This table gives the results of logistic regressions. Dependent variables are equal one if the client holds familiar assets such that bonds, stocks, member shares or one of these assets and zero otherwise. *Bank employee* is a dummy variable equal one if the customer is employed by the bank and zero otherwise. *Portfolio value* is the average portfolio value held over the period. *Male* is a dummy variable equal one if the customer is a man and zero otherwise. *Age* indicates customer's age. *Number of securities* is the average number of securities corrected by familiar assets held by customers. *Risky assets* is a dummy variable equal one if the customer hold stocks (different than familiar stocks) within her portfolio. *Intercept, Obs*., give the intercept and the number of observations of the regressions. R^2, *c and Likelihood ratio* give respectively the r-square, the area under the Receiver Operating Characteristic (ROC) curve of the logistic regression and the likelihood ratio. Coefficients of the regressions are displayed with standard errors between parentheses. ***, **, * indicate a significant coefficient at 1%, 5% and 10% level.

Variable	All (1)	Stocks (2)	Bonds (3)	Member shares (4)
Bank employee	0.3663***	1.4446***	-0.6462***	0.1438**
	(0.0703)	(0.0806)	(0.1291)	(0.0646)
Portfolio value	0.0365***	0.3279***	0.7260***	0.0153***
	(0.0021)	(0.0077)	(0.0094)	(0.0021)
Male	0.0945***	0.3258***	-0.0640***	0.0774***
	(0.0085)	(0.0201)	(0.0186)	(0.0084)
Age	0.0050***	0.0028***	0.0185***	0.0034***
	(0.0002)	(0.0006)	(0.0005)	(0.0002)
Number of securities	0.2276***	0.1503***	0.1443***	0.1976***
	(0.0025)	(0.0031)	(0.0030)	(0.0023)
Risky assets	0.2998***	1.7117***	-0.1722***	-0.3055***
	(0.0306)	(0.0292)	(0.0354)	(0.0267)
Intercept	-1.5840***	-7.3059***	-11.6512***	-1.3189***
	(0.0173)	(0.0677)	(0.0897)	(0.0170)
Obs.	246,120	246,120	246,120	246,120
R^2	0.0912	0.1115	0.1442	0.0640
c	0.6600	0.8610	0.8900	0.6390
Likelihood ratio	23,526.7323	29,084.0225	38,331.5812	16,278.6001

Table 5: Likelihood to hold a portfolio of familiar assets

This table gives the results of a multinomial logistic regression. The dependent variable has eight outcomes ($y_i = 0 - 7$) and corresponds to the different portfolios of familiar assets. The portfolio without familiar assets ($y_i = 0$) is considered as the outcome of reference (see Appendix C). *Bank employee* is a dummy variable equal to one if the customer is employed by the bank and zero otherwise. *Portfolio value* is the logarithm of the portfolio value. *Male* is a dummy variable equal to one if the customer is a man and zero otherwise. *Age* indicates customer's age. *Number of securities* is the number of securities held (different from familiar assets). *Risky assets* is a dummy variable equal to one if the customer hold stocks (different from familiar stocks). *Intercept*, *Familiar asset holders* and *Reference group* give the intercept, the number of customers for a given outcomes, the number of customers without familiar assets. *Likelihood ratio* and R^2 give respectively the likelihood ratio and the r-square of the regression. Each *Chi-2 Statistic* results from a Wald test for the hypothesis that each explanatory variable does not affect the likelihoods of outcomes $y_i = 1-7$, relative the first outcome $y_i = 0$. P-values are given between parentheses. The estimated coefficients are displayed, and clustered robust standard errors for autocorrelation and heteroscedasticity are given between parentheses. ***, **, * indicate a significant coefficient at 1%, 5% and 10% level.

Variables	Bonds $Pr(y_i = 1)$	Member shares $Pr(y_i = 2)$	Stocks $Pr(y_i = 3)$	Bonds*Member shares $Pr(y_i = 4)$	Bonds*Stocks $Pr(y_i = 5)$	Member Shares*Stocks $Pr(y_i = 6)$	Bonds*Member shares*Stocks $Pr(y_i = 7)$	Chi-2 Statistic
Bank employee	0.3595 (0.2344)	-0.1632** (0.0704)	1.8996*** (0.1100)	-0.4997** (0.2137)	1.1347*** (0.2215)	0.9963*** (0.1164)	-0.1819 (0.2315)	410.3575 <.0001
Portfolio value	0.8746*** (0.0155)	0.0232*** (0.0019)	0.1845*** (0.0114)	0.6956*** (0.0119)	0.6726*** (0.0341)	0.3121*** (0.0096)	0.8352*** (0.0204)	7,288.8667 <.0001
Male	0.0328 (0.0332)	0.0787*** (0.0087)	0.4058*** (0.0372)	-0.0136 (0.0263)	0.0994 (0.0760)	0.4482*** (0.0279)	0.1512*** (0.0390)	398.7652 <.0001
Age	0.0139*** (0.0009)	0.0026*** (0.0002)	0.0017* (0.0009)	0.0233*** (0.0007)	0.0118*** (0.0018)	0.0044*** (0.0007)	0.0222*** (0.0011)	1,376.3965 <.0001
Number of securities	0.0405*** (0.0096)	0.1626*** (0.0028)	0.2218*** (0.0089)	0.3479*** (0.0054)	0.3064*** (0.0106)	0.3196*** (0.0058)	0.3970*** (0.0072)	5,442.0499 <.0001
Risky assets	0.6780*** (0.0756)	-0.1671*** (0.0330)	2.0561*** (0.0591)	-0.2802*** (0.0594)	1.5088*** (0.1048)	1.5689*** (0.0468)	0.8253*** (0.0649)	3,045.3815 <.0001
Intercept	-13.0017*** (0.1404)	-1.3732*** (0.0170)	-6.8645*** (0.0884)	-12.8893*** (0.1109)	-14.3262*** (0.3246)	-8.1688*** (0.0792)	-15.9876*** (0.1954)	
Familiar asset holders (average)	4,136	93,455	3,011	8,495	730	6,553	3,937	
Reference group ($y_i = 0$)								125,803
Likelihood ratio								88,1401,759
R^2								0.2500

Table 6: Weight of familiar assets in the portfolio

This table gives the results of pooled OLS regressions with clustered robust standard errors for autocorrelation and heteroscedasticity. The dependent variable is the weight of familiar assets in the portfolio value. *Bank employee* is a dummy variable equal to one if the customer is employed by the bank and zero otherwise. *Portfolio value* is the logarithm of the portfolio value held. *Male* is a dummy variable equal to one if the customer is a man and zero otherwise. *Age* indicates customer's age. *Number of securities* is the number of securities held (different from familiar assets). *Risky assets* is a dummy variable equal to one if the customer hold stocks (different from familiar stocks). Intercept, R^2, Obs., give the intercept, the r-square and the number of observations. Number of clients indicates the total number of clients used. Coefficients of the regressions are displayed with standard errors between parentheses. ***, **, * indicate a significant coefficient at 1%, 5% and 10% level.

	Whole sample				Restricted to familial asset holders			
Variables	**All (1)**	**Stocks (2)**	**Member Shares (3)**	**Bonds (4)**	**All (5)**	**Stocks (6)**	**Member shares (7)**	**Bonds (8)**
Bank employee	-0.0164***	0.0070***	-0.0133***	-0.0181***	-0.0349***	0.0106***	-0.0314***	-0.0264***
	(0.0028)	(0.0011)	(0.0023)	(0.0018)	(0.0043)	(0.0016)	(0.0038)	(0.0027)
Portfolio value	-0.0133***	-0.0003***	-0.0151***	0.0029***	-0.0551***	-0.0012***	-0.0599***	0.0088***
	(0.0002)	(0.0000)	(0.0002)	(0.0001)	(0.0004)	(0.0001)	(0.0004)	(0.0002)
Male	0.0043***	0.0012***	0.0036***	-0.0004	0.0031**	0.0024***	0.0020*	-0.0016**
	(0.0007)	(0.0001)	(0.0006)	(0.0003)	(0.0012)	(0.0002)	(0.0011)	(0.0007)
Age	0.0006***	0.0001***	0.0003***	0.0004***	0.0016***	0.0001***	0.0012***	0.0006***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Number of securities	-0.0001	-0.0002***	-0.0010***	0.0033***	0.0012***	-0.0003***	0.0018***	0.0012***
	(0.0001)	(0.0000)	(0.0001)	(0.0001)	(0.0002)	(0.0000)	(0.0001)	(0.0001)
Risky assets	0.0360***	0.0103***	0.0216***	0.0047***	0.0360***	0.0129***	0.0185***	0.0038**
	(0.0017)	(0.0005)	(0.0012)	(0.0015)	(0.0022)	(0.0006)	(0.0017)	(0.0019)
Intercept	0.1551***	0.0041***	0.1749***	-0.0401***	0.5596***	0.0136***	0.5978***	-0.0820***
	(0.0017)	(0.0002)	(0.0016)	0.0005	(0.0030)	(0.0006)	(0.0028)	(0.0011)
R-square	0.0312	0.0057	0.0510	0.0474	0.2201	0.0103	0.2943	0.0575
Number of observation	3,195,855	3,195,855	3,195,855	3,195,855	1,471,866	1,471,866	1,471,866	1,471,866
Number of clients	246,120	246,120	246,120	246,120	120,317	120,317	120,317	120,317

Table 7: Weight of familiar assets in bond and stock portfolios

This table gives the results of pooled OLS regressions with clustered robust standard errors. The dependent variable gives the weight of familiar bonds (stocks) in the bonds (stocks) portfolio. *Bank employee* is a dummy variable equal to one if the customer is employed by the bank and zero otherwise. *Portfolio value* is the logarithm of the portfolio value held. *Male* is a dummy variable equal to one if the customer is a man and zero otherwise. *Age* indicates customer's age. *Number of securities* is the number of securities held (different from familiar assets). *Risky assets* is a dummy variable equal to one if the customer hold stocks (different from familiar stocks). Intercept, R^2, Obs., give the intercept, the r-square and the number of observations. Number of clients indicates the total number of clients used. Coefficients of the regressions are displayed with standard errors between parentheses. ***, **, * indicate a significant coefficient at 1%, 5% and 10% level.

Variables	Bonds and Stocks portfolios	
	Bonds portfolios	**Stocks portfolios**
	(1)	**(2)**
Bank employee	-0.0207	0.0830***
	(0.0313)	(0.0185)
Portfolio value	0.0061***	0.0393***
	(0.0022)	(0.0029)
Male	- 0.0140***	- 0.0407***
	(0.0036)	(0.0064)
Age	0.0011***	0.0004*
	(0.0001)	(0.0002)
Number of securities	- 0.0019***	- 0.0265***
	(0.0004)	(0.0008)
Risky assets	- 0.0342***	-
	(0.0060)	
Intercept	0.8012***	0.3768***
	(0.0215)	(0.0260)
R-square	0.0150	0.1247
Obs.	216,633	241,493
Number of clients	18,210	19,010

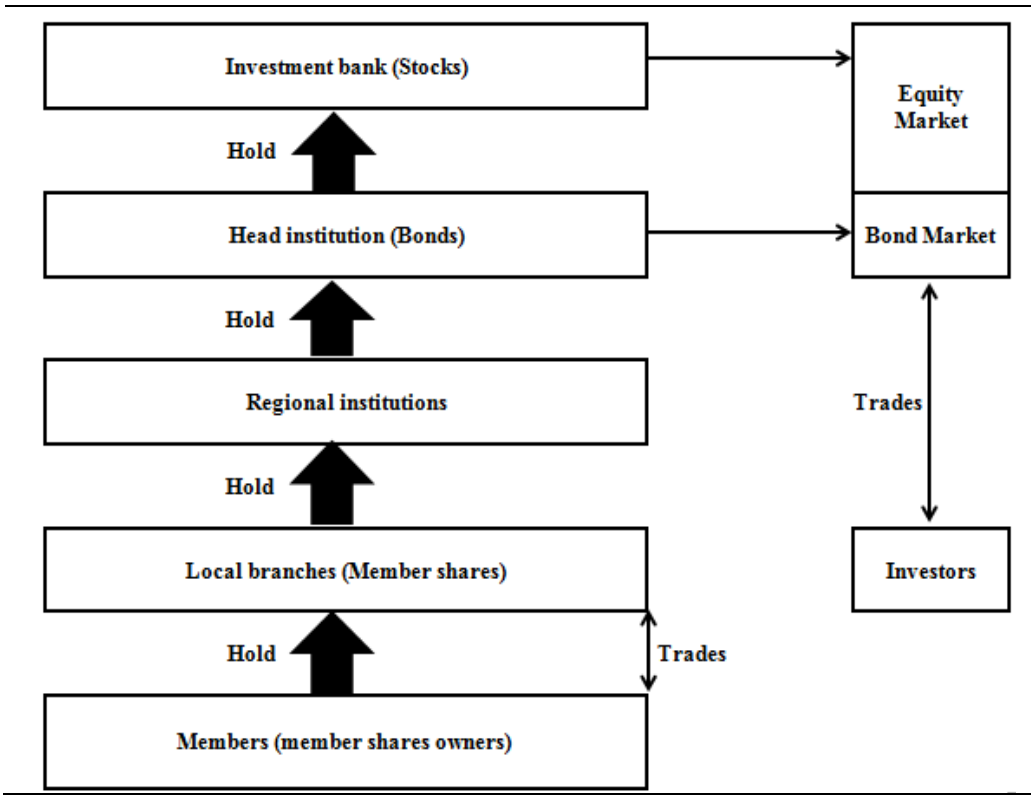
Table 8: Likelihood to hold a portfolio of familiar assets

This table gives the results of a multinomial logistic regression. The dependent variable has eight outcomes ($y_i = 0 - 7$) and corresponds to the different portfolios of familiar assets. The portfolio without familiar assets ($y_i = 0$) is considered as the outcome of reference (see Appendix C). *Financial advisor* is a dummy variable equal to one if the customer is employed by the bank and zero otherwise. *Portfolio value* is the logarithm of the portfolio value. *Male* is a dummy variable equal to one if the customer is a man and zero otherwise. *Age* indicates customer's age. *Number of securities* is the number of securities held (different from familiar assets). *Risky assets* is a dummy variable equal to one if the customer hold stocks (different from familiar stocks). *Intercept*, *Familiar asset holders* and *Reference group* give the intercept, the number of customers for a given outcomes, the number of customers without familiar assets. *Likelihood ratio* and R^2 give respectively the likelihood ratio and the r-square of the regression. Each *Chi-2 Statistic* results from a Wald test for the hypothesis that each explanatory variable does not affect the likelihoods of outcomes $y_i = 1-7$, relative the first outcome $y_i = 0$. P-values are given between parentheses. The estimated coefficients are displayed, and clustered robust standard errors for autocorrelation and heteroscedasticity are given between parentheses. ***, **, * indicate a significant coefficient at 1%, 5% and 10% level.

Variables	Bonds $Pr(y_i = 1)$	Member shares $Pr(y_i = 2)$	Stocks $Pr(y_i = 3)$	Bonds*Member shares $Pr(y_i = 4)$	Bonds*Stocks $Pr(y_i = 5)$	Member Shares*Stocks $Pr(y_i = 6)$	Bonds*Member shares*Stocks $Pr(y_i = 7)$	Chi-2 Statistic
Financial advisor	0.5028	-0.0443	2.0656***	-0.4267	1.4921***	1.2057***	-0.7430	184.3042
	(0.4153)	(0.1245)	(0.1781)	(0.3816)	(0.3303)	(0.1890)	(0.4820)	<.0001
Portfolio value	0.8745***	0.0232***	0.1847***	0.6957***	0.6726***	0.3121***	0.8351***	7,298.0869
	(0.0155)	(0.0019)	(0.0114)	(0.0119)	(0.0340)	(0.0096)	(0.0203)	<.0001
Male	0.0327	0.0789***	0.3969***	-0.0132	0.0979	0.4465***	0.1516***	393.5612
	(0.0332)	(0.0087)	(0.0371)	(0.0263)	(0.0760)	(0.0279)	(0.0390)	<.0001
Age	0.0139***	0.0027***	0.0009	0.0234***	0.0115***	0.0042***	0.0223***	1,391.613
	(0.0009)	(0.0002)	(0.0009)	(0.0007)	(0.0018)	(0.0007)	(0.0011)	<.0001
Number of securities	0.0409***	0.1624***	0.2260***	0.3481***	0.3071***	0.3207***	0.3975***	5,461.4792
	(0.0096)	(0.0028)	(0.0088)	(0.0054)	(0.0105)	(0.0058)	(0.0072)	<.0001
Risky assets	0.6793***	-0.1676***	2.0639***	-0.2789***	1.5127***	1.5718***	0.8271***	3,089.6432
	(0.0756)	(0.0330)	(0.0588)	(0.0593)	(0.1046)	(0.0468)	(0.0648)	<.0001
Intercept	-12.9991***	-1.3739***	-6.8239***	-12.9016***	-14.3068***	-8.1539***	-15.9973***	
	(0.1404)	(0.0170)	(0.0876)	(0.1109)	(0.3236)	(0.0791)	(0.1950)	
Familiar asset holders (average)	4,136	93,455	3,011	8,495	730	6,553	3,937	
Reference group ($y_i = 0$)								125,803
Observation								3,199,560
Likelihood ratio								878,902.842
R^2								0.2402

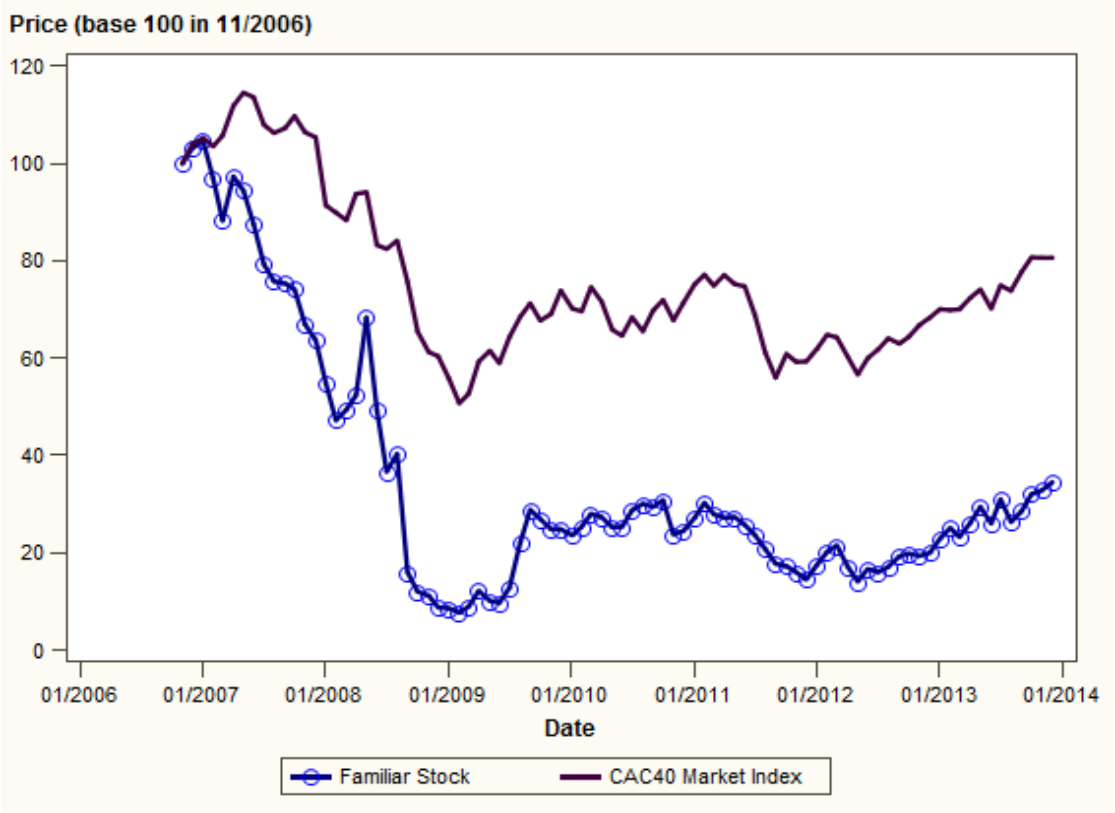
Figure 1: The banking group: member shares, equity shares and bonds issuers

This figure shows the banking group structure and the equity and debt shares issuers. Members are the owners of the bank. They hold member shares, which are capital stakes of local branches. Member shares can only be traded inside the bank. Local branches own the regional institutions which own the head institution which in turn owns a listed investment bank. The head institution issues bonds on the bond market and the investment bank issues stocks on the equity market. Bonds and stocks can directly be traded by investors on the market.



Appendix

Appendix A: Familiar stock performances



This graph provides the time series for familiar stock prices compared to the market index (CAC40) from November 2006 as reference date (creation of the listed company) to December 2013. An investor who invested 1 euro on the familiar stock (market index) in 2006 would have 0.35€ (0.81€) at the end of 2013.

To determine if on a monthly basis familiar stocks significantly beat the market we determine the one factor Jensen Alpha using the Capital Asset Pricing Model (CAPM) framework. We regress familiar stock monthly excess returns on market monthly excess returns as follows:

$$r_k - r_f = \alpha_k + \beta_k(r_M - r_f) + \varepsilon_k$$

Where r_k indicates monthly returns of the familiar, r_f is the risk free rate (Euribor 1 month) and r_M is the market portfolio return (CAC40). β_k is the beta coefficient and is a measure of sensitivity of the familiar stock excess returns related to the market excess returns. The one factor Jensen Alpha is

given by the constant of the regression and indicates the abnormal returns compare to the market of the familiar asset. A positive and significant sign of α_k will signal that investing on familiar stocks could be motivated by information advantages.

On the long run (11/2006-12/2013) familiar stocks do not significantly beat the market, and we find a 0.07% insignificant Jensen Alpha, it is noticeable that the familiar stock overreact the market with a beta value of 2.1. Over the period of scrutiny (08/2011-08/2012) we find a beta value of 1.7 and an insignificant negative Jensen Alpha of -1.4%.

Appendix B: Familiar asset holdings

Panel A, B and C provides Chi-Square test according the categories of individuals (employees or clients) and familiar assets (bonds, member shares and stocks). The percentage of holders of one category of familiar assets is given between parentheses. N gives the amount of employees or clients. Chi-Square gives the Chi-2 statistic values. ***, **,* indicate that the null hypothesis of dependence can be rejected at 1%, 5% and 10% level.

Panel A: Employees vs Clients

	Bonds	Member Shares	Stocks	All	N
Employees	95 (8.2%)	718 (62%)	388 (33.51%)	829 (71.59%)	1,158
Clients	17,203 (7.02%)	111,722 (45.61%)	13,843 (5.65%)	119,488 (48.78%)	244,962
Chi-Square	2.46	124.86***	1,641.51***	240.00***	

Panel B: Financial advisors vs Clients

	Bonds	Member Shares	Stocks	All	N
Financial advisors	32 (8.44%)	246 (64.91%)	152 (40.11%)	289 (76.25%)	379
Clients	17,203 (7.02%)	111,722 (45.61%)	13,843 (5.65%)	119,488 (48.78%)	244,962
Chi-Square	1.17	56.81***	835.15***	114.33***	

Panel C: Financial advisors vs Not financial advisors

	Bonds	Member Shares	Stocks	All	N
Financial advisors	32 (8.44%)	246 (64.91%)	152 (40.11%)	289 (76.25%)	379
Not financial advisors	63 (8.09%)	472 (60.59%)	236 (30.30%)	540 (69.32%)	779
Chi-Square	0.04	2.02	11.01***	6.03**	

Appendix C: The logistic regression model

The logistic regression model can be written as:

$$ln\left(\frac{P(y=1/x_j)}{1-P(y=1/x_j)}\right) = \beta_0 + \beta_j x_j \quad \text{(C.1)}$$

$P(y=1/x_j)$ is the probability to choose the outcome $y=1$ given a set of explanatory variables x_j. β_0 and β_j give respectively the intercept and the coefficients associated to the explanatory variables x_j. Rearranging Eq.(C.1) we find

$$P(y=1/x_j) = \frac{e^{\beta_0+\beta_j x_j}}{1+e^{\beta_0+\beta_j x_j}} \quad \text{(C.2)}$$

The odds of outcome $y=1$ relatively to outcome $y=0$ given the variable x_j are:

$$\theta_{y=1/y=0} = \frac{\Pr(y=1/x_j)}{\Pr(y=0/x_j)} = e^{\beta_0+\beta_j x_j} \quad \text{(C.3)}$$

Taking the natural log we find

$$\ln(\theta_{y=1/y=0}) = \beta_0 + \beta_j x_j \quad \text{(C.4)}$$

The partial derivatives of Eq.(C.4) relatively to x_j gives:

$$\frac{\delta \ln(\theta_{y=1/y=0})}{\delta X_j} = \beta_j \quad \text{(C.5)}$$

We can then interpret β_j as the expectation of the change of the logit of outcome $y=1$ relatively to the outcome $y=0$ for a change of one unit of the variable x_j. Thus, coefficients of the logit regression can be interpreted as the effect of variable x_j on the log odd of outcome $y=1$ relatively to outcome $y=0$.

Appendix D: Multinomial Logistic regression model

Since three familiar assets are considered (bonds, stocks and member shares) eight different portfolio compositions exist. Let y be a nominal variable with $J = 8$ outcomes (different portfolios) where $y = 0$ gives the "pivot" outcome corresponding to clients without familiar assets. Let $\Pr(y = j/X_k)$ with $j = 0, \dots, 7$ represent the conditional probability to observe outcome j given k explanatory variables X_k .

In addition, assume that $\Pr(y = j/X_k)$ is a function of $X_k\beta_{k,j}$ with $\beta_{k,j} = (\beta_{0,j} \dots \beta_{K,j})$ where $\beta_{0,j}$ gives the intercept term and $\beta_{K,j}$ is the coefficient of the variable X_K on outcome j.

The probabilities for the ith individual are given by:

$$\Pr(y_i = 0/X_{i,k}) = \frac{1}{1 + \sum_{J=1}^{J} e^{X_{i,k}\beta_{k,j}}} \quad \text{for} \quad j = 0$$

and (D.1)

$$\Pr(y_i = j/X_{i,k}) = \frac{e^{X_k\beta_{k,j}}}{1 + \sum_{J=1}^{J} e^{X_{i,k}\beta_{k,j}}} \quad \text{for} \quad j > 0$$

The odds of outcome $j > 0$ relatively to outcome $j = 0$ given the variable X_k are:

$$\theta_{j>0/j=0} = \frac{\Pr(y = j/X_k)}{\Pr(y = 0/X_k)} = \frac{e^{X_k\beta_{k,j}}}{e^{X_k\beta_{k,0}}} = e^{X_k(\beta_{k,j} - \beta_{k,0})} \quad \text{(D.2)}$$

Taking the natural log we find

$$\ln(\theta_{j>0/j=0}) = X_k(\beta_{k,j} - \beta_{k,0}) \quad \text{(D.3)}$$

The partial derivatives of Eq.(D.3) relatively to X_k gives:

$$\frac{\delta \ln(\theta_{j>0/j=0})}{\delta X_k} = \beta_{k,j} - \beta_{k,0} \quad \text{(D.4)}$$

We can interpret the difference $\beta_{k,j} - \beta_{k,0}$ as the expectation of the change of the logit of outcome $j > 0$ relatively to the pivot outcome $j = 0$ for a change of one unit of the variable X_k. Thus, coefficients of the multinomial logit regression can be interpreted as the effect of variable X_k on the log odd of outcome $j > 0$ relatively to outcome $j = 0$.

Concluding remarks

This dissertation has analyzed the characteristics of cooperative banks. In a first section it has shed light on how cooperative banks contribute to increase competition and customers' welfare. The second section has studied the motives of clients to purchase member shares and has studied the link between financial literacy and familiarity bias.

The first chapter has shown that cooperative banks have a lower market power compared to commercial banks. The findings are in line with the governance and ownership of cooperative banks.

Chapter 2 put to light that clients of cooperative banks face lower switching costs compared to clients of commercial banks. It confirms that the customer based business model of cooperative banks is beneficial to customers. In addition we show that switching costs have a negative impact on competition. Therefore, preserve and develop cooperative banks can contribute to increase competition and clients' welfare.

Chapter 3 stressed that financial motives explain why clients of cooperative banks decide to purchase member shares and to become members of their cooperative banks. Results strongly contradict the official reasons to become a member as mentioned by the International Cooperative Bank Association (ICBA).

Chapter 4 revealed that employees of cooperative banks are more likely than other clients to hold assets of their own bank suggesting familiarity bias. By contrast we find that employees weight less familiar assets in their portfolio, but hold more concentrated portfolios of risky assets. These contrasting results suggest that financial literacy does not reduce familiarity bias.

Following this dissertation, substantial research questions remain. On the competition side a more detailed data set on extended loans could provide interesting insight on the importance of switching costs in the loan market.

Future trials should also assess the correlation of financial motives and participation rates in general assembly meetings and should also try to determine the importance of "free and voluntary membership" within cooperative banks.

Finally, we can wonder whether clients of cooperative banks benefit from financial advice. In particular, the question whether behavioral biases and asset preferences of employees interact with clients' asset choices is of particular interest.

References

Ackert, L. F, Church, B. K, Tompkins, J and Zhang, P. 2005: What's in a name? An experimental examination of investment behavior. *Review of Finance* 9(2):281–304.

Agnew, J, Balduzzi, P, Sundén A. 2003: Portfolio choice and trading in a large 401(k) plan. *American Economic Review* 93:193–215.

Alessie, R.J.M, Lusardi, A, Van Rooij, M.C.J. 2011: Financial literacy and stock market participation. *Journal of Financial Economics* 101:449–472.

Altunbas, Y, Evans, L and Molyneux, P. 2001: Bank ownership and efficiency. *Journal of Money, Credit and Banking* 33(4):926–954.

Angelini, P, Cetorelli, N. 2003: The effects of regulatory reform on competition in the banking industry. *Journal of Money, Credit and Banking* 35(5):663–684.

Arrondel, L, Debbich, M, Savignac, F. 2012: Stockholding and financial literacy in the French population. *International Journal of Social Sciences and Humanity Studies* 4(2):285–294.

Ayadi, R, Arbak, E, Carbo Valverde, S, Rodriguez Fernandez, F, Schmidt, R.H. 2009: Investigating diversity in the banking sector in Europe: the performance and role of savings banks. Brussels: Centre for European Policy Studies.

Ayadi, R, Llewellyn, D, Schmidt, R.H, Arbak, E, de Groen W.P. 2010: Investigating diversity in the banking sector in Europe: key developments, performance and role of cooperative banks. Centre for European Policy Studies, Brussels.

Bain, J.S. 1956: Barriers to new competition. Harvard Press, Cambridge.

Barber, B and Odean, T. 2001: Boys will be boys: gender, overconfidence, and common stock investment. *Quarterly Journal of Economics* 141:261–292.

Barone, G, Felici, R and Pagnini, M. 2011: Switching costs in local credit markets. *International Journal of Industrial Organization* 29(6):694–704.

Beck, T, Demirguc-Kunt, A, and Maksimovic, V. 2004: Bank competition, and access to finance: international evidence . *Journal of Money, Credit and Banking* 36(3):627–654.

Benartzi, S, Thaler, R.H, Utkus, S.P, Sunstein, C. R. 2007: The law and economics of company stock in 401(k) plans. *Journal of Law and Economics* 50(1):45–79.

Benartzi, S. 2001: Excessive extrapolation and the allocation of 401(k) accounts to company stock. *Journal of Finance* 56(5):1747–1764.

Berger, A.N and Udell, G.F. 2002: Small business credit availability and relationship lending: the importance of bank organizational structure. *Economic Journal* 112(477):32–53.

Berger, A.N, Rosen, R.J and Udell, G.F. 2007: Does market size structure affect competition: the case of small business lending. *Journal of Banking and Finance* 31(1):11–33.

Bertaut, C.C. 1998: Stockholding behavior of U.S. households: evidence from the 1983-1989 survey of consumer finances. *Review of Economics and Statistics* 80(2):263–75.

Bikker, J and Haaf, K. 2002: Competition, concentration and their relationship: an empirical analysis of the banking industry. *Journal of Banking and Finance* 26:2191–2214.

Birchall, J. 2013: Resilience in a downturn: the power of financial cooperatives. International Labour Organisation. http://www.ilo.org/empent/Publications/WCMS_207768/lang--en/index.htm.

Borgen, SO. 2004: Rethinking incentive problems in cooperative organizations. *The Journal of Socio-Economics* 33:383–393.

Bülbül, D, Schmidt, R., Schüwer, U. 2013: Caisses d'épargne et banques coopératives en Europe. *Revue d'Economie Financière* 111:159–187.

Caire, G and Nivoix, S. 2010. Evidence of democracy among associates: the case of local general assemblies of French cooperative banks. World Congress IFSAM 2010. *http://gilles.bruno.caire.free.fr/index.php?option=com_docman&task=doc_download&gid=22&Itemid=*.

Caire, G and Nivoix, S. 2012: La démocratie sociétariale « vue d'en bas » observations sur des assemblées générales locales de banques coopératives. *Revue française de gestion* 220(1):17–30.

Campbell, J.Y. 2006: Household finance. *Journal of Finance* 61:1553–1604.

Cao, H.H, Han, B, Hirshleifer, B and Zhang, H.H. 2011: Fear of the unknown: familiarity and economic decisions. *Review of Finance* 15:173–206.

Carbo, S, Humphrey, D, Maudos, J and Molyneux, P. 2009: Cross-country comparisons of competition and pricing power in European banking. *Journal of International Money and Finance* 28(1):115–134.

Carbo-Valverde, S, Rodriguez-Fernandez F. and G. Udell 2009: Bank market power and SME financing constraints. *Review of Finance* 13:309–340.

Cetorelli, N, and Gambera, M. 2001: Banking market structure, financial dependence, and growth: international evidence from industry data. *Journal of Finance* 56(2):617–648.

Chakraborty, A, Hu, C. X. 2006: Lending relationships in line-of-credit and nonline-of-credit loans: evidence from collateral use in small business. *Journal of Financial Intermediation*. 15:86–107.

Christellis, D, Jappelli, T, Padula, M. 2010: Cognitive abilities and portfolio choice. *European Economic Review* 54:18–38.

Christensen, J.H.E, Hansen, E, Lando, D. 2004: Confidence sets for continuous-time rating transition probabilities. *Journal of Banking and Finance* 28(11):2575–2602.

Christiansen, C, Schröter Joensen, J, Rangvid, J. 2010: The effects of marriage and divorce on financial investments: learning to love or hate risk? CREATES Research Papers 2010-57, School of Economics and Management, University of Aarhus.

Cihak, M and Hesse, H. 2007: Cooperative banks and financial stability. IMF Working Papers n° WP/07/02, SSRN, International Monetary Fund, Washington, D.C.

Claessens, S, Laeven, L. 2005: Financial dependence, banking sector competition, and economic growth. *Journal of the European Economic Association* 3(1):179–207.

Cole, R.A. 1998: The importance of relationships to the availability of credit. *Journal of Banking and Finance* 22:959–977.

Coval, J. D and Moskowitz, T. J. 2001. The geography of investment: informed trading and asset prices. *Journal of Political Economy* 109:811–41.

Coval, J. D and Moskowitz, T. J. 1999: Home bias at home: local equity preference in domestic portfolios. *Journal of Finance* 54:2045–2107.

Cuevas, C and Fischer, K. 2006: Cooperative financial institutions: issues in governance, regulation, and supervision. World Bank Working Paper No. 82, Washington: World Bank.

D'Auria, C, Foglia, A. and Reedtz, P.M. 1999: Bank interest rates and credit relationships in Italy. *Journal of Banking and Finance* 23(7):1067–1093.

Degryse, H and Ongena, S. 2005: Distance, lending relationships, and competition. *Journal of Finance* 60(1):231–66.

Degryse, H and Van Cayseele, P. 2000: Relationship lending within a bank-based system: evidence from European small business data. *Journal of Financial Intermediation* 9:90–109.

Degryse, H, Kim, M and Ongena, S. 2009: Microeconometrics of banking: methods, applications and results. Oxford University Press.

Dlugosh, D and Horn, K. 2014: Relation between equity home bias and ambiguity aversion: an international study. http://ssrn.com/abstract=2431335.

EACB (European Association of Co-operative Banks), 2007: 60 million members in co-operative banks what does it mean ?, Bruxelles. http://www.eacb.coop/en/publications_detail.html.

Edwards, F.R. 1977: Managerial objectives in regulated industries: expense preference behavior in banking. *Journal of Political Economy* 85:147–162.

Egarius, D and Weill, L. 2014: Do cooperative banks have greater market power? *Bankers, Markets & Investors (*Forthcoming).

Farell, J and Klemperer, P. 2007: Coordination and lock-in: competition with switching costs. Handbook of Industrial Organisation, North-Holland, chapter 3:1967–2072.

Fernandez de Guevara, J and Maudos, J. 2007: Explanatory factors of market power in the banking system. *The Manchester School* 75(3):275–296.

Fernandez de Guevara, J, Maudos, J and Perez, F. 2005: Market power in European banking sectors of the European union. *Journal of Financial Services Research* 27(2):109–137.

Fernandez de Guevara, J, Maudos, J and Perez, F. 2007: Integration and competition in the European financial markets. *Journal of International Money and Finance* 26:26–45.

Fernandez, D, McSorley, C, Padilla, A. J, Williams, M and Reyes, T. 2003: Switching costs. Economic Discussion Paper 5, Office of Fair Trading UK.

Ferri, G, Kalmi, P and Kerola, E. 2014: Organizational structure and exposure to crisis among European banks: evidence from rating changes. *Journal of Entrepreneurial and Organizational Diversity* 3(1):35–55.

Fonteyne, W. 2007: Cooperative banks in Europe – Policy issues. IMF Working Paper. G20 (2009a), Global Plan for Recovery and Reform, Communiqué, London, 2 April 2009.

French, K. R and Poterba, J. M. 1991: Investor diversification and international equity markets. *American Economic Review* 81:222–226.

Gehrig, T and Stenbacka, R. 2007: Information sharing and lending market competition with switching costs and poaching. *European Economic Review* 51:77–99.

Girardone, C, Nankervis, J.C, Velentza, E. 2009: Efficiency, ownership and financial structure in European banking. *Managerial Finance* 35:227–245.

Goetzmann, W. N and Kumar, A. 2008: Equity portfolio diversification. *Review of Finance* 12:433–463.

Graham, J, Campbell, H, Hai, H. 2009: Investor competence, trading frequency, and home bias. *Management Science* 55:1094–1106.

Grinblatt, M and Keloharju, M. 2001: Distance, language, and cultural bias: the role of investor sophistication. *Journal of Finance* 46:1053–1073.

Groeneveld H. 2011: The value of European cooperative banks for the future financial system. Working paper. http://www.helsinki.fi/ruralia/ica2011/presentations/Groeneveld.pdf

Groeneveld, H. 2014: Features, facts and figures of European cooperative banking groups over recent cycles. *Journal of Entrepreneurial and Organizational Diversity* 3(1):11–33.

Guitiérrez, E. 2008: The reform of Italian cooperative banks: discussion of proposals. IMF Working Papers n° WP/08/74, SSRN, International Monetary Fund, Washington, D.C.

Hackethal, A, Haliassos, M, Jappelli, T. 2012: Financial Advisors: A case of Babysitters? *Journal of Banking & Finance* 36:509–524.

Hansman, H. 1996: The ownership of enterprise. Cambridge, MA: The Belknap Press of Harvard University Press.

Hasan, I, Lozano-Vivas, A. 2002: Organisational form and expense preference: Spanish experience. *Bulletin of Economic Research* 54:135–150.

Hau, H and Rey, H. 2008: Home bias at the fund level. *American Economic Review* 98(2):333–338.

Heath, C and Tversky, A. 1991: Preference and belief: ambiguity and competence in choice under uncertainty. *Journal of Risk and Uncertainty* 4:5–28.

Hempell, H. S. 2002: Testing for competition among German banks. Economic Research Centre of the Deutsche Bundesbank Discussion Paper n° 04/02.

Holden, S and VanDerhei, J. 2001: Contribution behavior of 401(k) plan participants. EBRI Issue Brief 7(4).

Hong, H, Kubik, J.D, Stein, J. C. 2008: The only game in town: stock-price consequences of bias. *Journal of Financial Economics* 90(1):20–37.

Huberman, G and Sengmueller, P. 2004: Performance and employer stock in 401(k) plans. *Review of Finance* 8:403–443.

Huberman, G. 2001: Familiarity breeds investment. *Review of Financial Studies* 14:659–680.

Iannotta, G, Nocera, G and Sironi, A. 2007: Ownership structure, risk and performance in the European banking industry. *Journal of Banking and Finance* 31:2127–2149.

Iliopoulos, C. and Cook, M.L. 1999: The efficiency of internal resource allocation decisions in customer-owned firms. Paper presented at the 3rd Annual Conference of InternationalSociety for New Institutional Economics, Washington DC.

Inderst, R, Ottaviani, M. 2009: Misselling through Agents. *American Economic Review* 99:883–908.

Ioannidou, V.P and Ongena, S. 2010: "Time for a change": loan conditions and bank behavior when firms switch banks. *Journal of Finance* 65(5):1847–1877.

Ivkovic, Z and Weisbenner, S. 2005: Local does as local is: information content of the geography of individual investors'common stock investments. *Journal of Finance* 60(1):267–306.

Jianakoplos, N.A, Bernasek, A. 1998. Are women more risk averse?. *Economic Inquiry* 36:620–630.

Karlsson, A. and Nordén, L. 2007: Home sweet home: home bias and international diversification among individual investors. *Journal of Banking and Finance* 31:317–333.

Keloharju, M, Knüpfer, S, Linnainmaa, J. 2012: Do investors buy what they know? Product market choices and investment decisions. *Review of Financial Studies* 25(10):2921–2958.

Kim, M, Kliger, D, and Vale, B. 2003: Estimating switching costs: the case of banking. *Journal of Financial Intermediation* 12:25–56.

Kitson, A. 1996: Taking the pulse: ethics and the British cooperative bank. *Journal of Business Ethics* 15:1021–1031.

Klemperer, P. 1995: Competition when consumers have switching costs: An overview with applications to industrial organization, macroeconomics, and international trade. *Review of Economic Studies* 62:515–539.

Kontolaimou, A and Tsekouras, Kostas. 2010: Are cooperatives the weakest link in European banking? A non-parametric metafrontier approach. *Journal of Banking and Finance* 34(8):1946–1957.

Lehmann, E and Neuberger, D. 2001: Do lending relationships matter? Evidence from bank survey data in Germany. *Journal of Economic Behavior and Organization* 45(4):339–359.

Lerner, A.P., 1934: The concept of monopoly and the measurement of market power. *Review of Economic Studies* 1:157–175.

Llewellyn, D.T. 2005: Competition and profitability in European banking: why are British banks profitable?. *Economic Notes by Banca Monte dei Paschi di Siena SpA* 34(3):279–311.

Love, D.A. 2010: The effects of marital status and children on savings and portfolio choice. *Review of Financial Studies* 23(1):385–432.

Lusardi, A and Mitchell, O.S. 2007: Baby boomers retirements security: the role of planning, financial literacy and housing wealth. *Journal of Monetary Economics* 54:205–224.

Markowitz, H. 1952: Portfolio selection. *Journal of Finance* 7:77–91.

Markowitz, H. 1959: Portfolio selection: efficient diversification of investments. John Wiley, New York.

Mason, E., 1939: Price and production policies of large-scale enterprise. *American Economic Review* 20:61–74.

Maudos, J and Fernandez de Guevara, J. 2004: Factors explaining the interest margin in the banking sectors of the European union. *Journal of Banking and Finance* 28:2259–2281.

Maudos, J and Fernandez de Guevara, J. 2011: Banking competition and economic growth: cross-country evidence. *European Journal of Finance* 17:739–764.

McKillop, D, McCarthy, O, Ward, M, Briscoe, R, Ferguson, C. 2002: Women in the Irish credit union movement: North and South. Oak Tree, Cork.

Meulbroek, L. 2005: Company stock in pension plans: how costly is it? *Journal of Law and Economics* 8(4):443–74.

Mitchell, O. S and Utkus, S. P. 2004: The role of company stock in defined contribution plans. In The pension challenge: Risk transfers and retirement income security, ed. Olivia Mitchell and Kent Smetters, 33-70. Oxford: Oxford University Press.

Ory, J. N, Jaeger, M and Gurtner, E. 2006: La banque à forme coopérative peut-elle soutenir durablement la compétition avec la banque SA ? *Finance-Contrôle-Stratégie* 9(2):121–157.

Petersen, M.A and Rajan, R.G. 1994: The benefits of lending relationships: evidence from small business data. *Journal of Finance* 49(1):367–1400.

Petersen, W and Rajan, R. 1995: The effect of credit market competition on lending relationships, *Quarterly Journal of Economics* 110:407–443.

Pool, V. K, Stoffman, N, Yonker, S. E. 2012: No place like home: familiarity in mutual fund manager portfolio choice. *Review of Financial Studies* 25(8):2563–2599.

Rasmussen, E. 1988: Mutual banks and stock banks. *Journal of Law and Economics* 31(2):395–421.

Remund, D.L.2010: Financial literacy explicated: the case for a clearer definition in an increasingly complex economy. *Journal of Consumer Affairs* 44:276–295.

Santos, J and Winton, A. 2008: Bank loans, bonds, and information monopolies across the business cycle. *The Journal of Finance* 63(3):1315–1359.

Seasholes, M and Zhu, N. 2010: Individual investors and local bias. *Journal of Finance* 65:1987–2010.

Shaffer, S., 1983: Non-structural measures of competition: toward a synthesis of alternatives. *Economic Letters* 12:349–353.

Shaffer, S., 2004: Patterns of competition in banking. *Journal of Economics and Business* 56:287–313.

Sharpe, S.A. 1990: Asymmetric information, bank lending and implicit contracts: a stylized model of customer relationships. *Journal of Finance* 45:1069–1087.

Sharpe, S.A. 1997: The effect of consumer switching costs on prices: a theory and its applications to the bank deposit market. *Review of Industrial Organization* 12:79–94.

Sharpe, W.1963: A simplified model for portfolio analysis. *Management Science* 9(2):277–93.

Shy, O. 1996: Industrial organization: theory and applications. The MIT Press, Cambridge, MA.

Shy, O. 2002: A quick-and-easy method for estimating switching costs. *International Journal of Industrial Organization* 20:71–87.

Spear R. 2004: Governance in democratic member-based organisations. *Annals of Public and Cooperative Economics* 75(1):33–59.

Stango, V. 2002: Pricing with consumer switching costs: evidence from the credit card market. *Journal of Industrial Economics* 50(4):475–492.

Stiglitz, J. E and Weiss, A. 1981: Credit rationing in markets with imperfect information. *American Economic Review* 71(3):393–410.

Sundén, A. E and Surette, B. J.1998: Gender differences in the allocation of assets in retirements savings plans. *American Economic Review* 88:207–211.

Tesar, L. L and Werner, I. M. 1995: Home bias and high turnover. *Journal of International Money and Finance*. 14:467–92.

Uzzi, B. 1999: Embeddedness in the making of financial capital: how social relations and networks benefit firms seeking financing. *American Sociological Review* 64(4):481–505.

Vissing-Jorgensen, A. 2003: Perspectives on behavioral finance: does "irrationality" disappear with wealth? Evidence from expectations and actions. NBER Macroeconomics Annual: 139-194.

Weill, L. 2011: Do Islamic banks have greater market power? *Comparative Economic Studies* 53:291–306.

Weill, L. 2013. Bank competition in the EU: how has it evolved? *Journal of International Financial Markets, Institutions and Money* 26:100–112.

Yoong, J. 2011: Financial illiteracy and stock market participation: evidence from the RAND American life panel. In A. Lusardi & O. S. Mitchell (Eds.), Financial Literacy: Implications for Retirement Security and the Financial Marketplace: Oxford University Press.

Appendix: Sample description and selection process

1. The initial sample

The sample comes from a French cooperative bank. We have the coverage for Alsace, a French region populated by 1.8 million inhabitants in 01/2013 (INSEE). The primary sample contains financial portfolios of 653,281 clients that are located across 132 local branches over the period 08/2011-08/2012.

Table 1: Main variables and descriptions

This table gives the description of the main variables of the primary data source.

Variables	Type (Numerical/Character)	Name	Comments
IDNTEDS	Character	Bank branches' ID	The sample contains 132 branches.
NUMCL	Numerical	Client's ID	
NUMDOSSIER	Character	Household ID	Clients with the same number come from the same family (child) or live together
DATEARRVRES	Numerical	Arrival date	First security/Product opened
GENRE	Character	Gender	
ANNNAIS	Numerical	Date of birth	
DATEDECS	Numerical	Date of death	
CODECOMMNAIS	Character	Code of the place of birth	Post code of the place of birth
COMNAIS	Character	Name of the place of birth	
PAYSNAIS	Character	Country of birth	
REGMAT	Character	Marital contract type	Gives the nature of the marital contract if the client is married
SITFAML	Character	Marital status	Married, civil union, single, widowed, divorced
LOCALISATION	Character	Address	Post code and city/village's name
CODETYPERETRPTT	Character	Code of return post	Different from 0 if the client has moved to another place

CODECSP	Character	Socio professional category code	Corresponds to the occupation number of the French National Institute of Statistics and Economic Studies (INSEE)
EMPLOI	Character	Job position	
PERSRES	Character	Person specifically registered by the bank	Current or retired employees, child and partner of employees
NATURERES	Character	Primary residence	Home owner, rental, lodge free of charge
VALRNET	Character	Bale 2 scoring of clients	Values go from 0 to 9 (from less to high risky client) J : New account opened ? : if client's historic is lower than 6 months X: payment default CX, DX and RX : Doubtful or disputed client
CODEPDT	Character	Financial product's code	Different from the ISIN Code
PRODUIT	Character	Financial product's name	
MONTMMYYYY	Numerical	Monthly deposits (from 08/2011 to 08/2012)	Gives the end-of-month deposits (by products) for each client
DATEOUVERTURE	Numerical	Date of purchase of financial product	The date is not filled for stocks, bonds and members shares
DATECHEANCE	Numerical	Date of maturity	The date is only filled for life insurance policies

Table 2: Deposits in the sample

This table displays the structure of the sample for 9 clients over the period 08/2011-11/2011. NUMCL, indicates client's ID, CODEPDT gives the code of securities, PRODUIT indicates the name of securities. MONT08/2011 to MONT11/2011 give the end-of-month value of deposits (in euros) per client for each financial security/product.

NUMCL	CODEPDT	PRODUIT	MONT082011	MONT092011	MONT102011	MONT112011
317236	0030	GROUPE EUROTUNNEL REGROUPT MARCHES DOMES	58.26	57.6	58.9	50.67
317236	0001	LIVRET GRAND FORMAT	13543.56	13543.56	13543.56	13543.56
317236	0006	LDD	5909.94	5909.94	5909.94	5909.94
317236	C859	NUANCES PLUS	68083.18	67990.76	68265.88	68174.44
317236	0030	NATIXIS MARCHES DOMESTIQUES	150.6	128.62	125.05	115.99
317236	0030	LAFARGE MARCHES DOMESTIQUES	726.12	650	736.87	677
317236	0030	GDF SUEZ MARCHES DOMESTIQUES	461.04	471.24	430.8	436.48
317237	0004	COMPTE DE DEPOT	806.77	813	765.8	758.62
317237	0005	LEP	31.54	1.54	1.54	1.54
317237	0000	LIVRET A	1.36	1.36	1.36	1.36
317237	C617	NUANCES 3D	917.51	966.85	1016.3	1065.79
317237	0037	STRASBOURG CENTRE PARIS	20	20	20	20
317238	0000	LIVRET A	1883.66	1883.66	1883.66	1883.66
317239	0004	COMPTE DE DEPOT	1576.45	1226.9	1888.24	1251.87
317239	0000	LIVRET A	1320.5	1320.5	1320.5	1320.5
317239	0037	STRASBOURG CENTRE PARIS	20	20	20	20
317240	0001	LIVRET B	0.07	0.07	0.07	0.07
317241	0000	LIVRET A	43.68	43.68	43.68	43.68
317242	0000	LIVRET A	544.06	544.06	544.06	544.06
317243	0004	COMPTE DE DEPOT	12.66	16.16	15.16	240.66
317243	0000	LIVRET A	1.94	1.94	1.94	1.94
317243	C320	PERP	264.42	262.19	274.92	260.8
317244	0004	COMPTE DE DEPOT	16.66	16.66	16.66	16.66
317244	0037	STRASBOURG CENTRE PARIS	20	20	20	20

Table 3: Deposits (net from overdrafts)

This table gives monthly individual deposits (in euro) net from overdrafts. Date indicates the month and the year of observation, N represents the number of customers observed at a given month. Sum and Mean are respectively the sum of deposits for all customers and the mean of deposits per customers at a given month. St-D, P1, Q1, Me, Q3 and P99 represent the standard deviation, the first percentile, the first quartile, the median, the third quartile and the 99th percentile of the monthly distribution of deposits per customer.

Date	N	Sum	Mean	St- D	P1	Q1	Me	Q3	P99
08/11	639,727	7,645,099,607	11,950.57	40,717.21	-163.64	23.39	385.01	7,254.39	170,967.75
09/11	640,951	7,647,100,449	11,930.87	40,708.23	-173.83	23.25	380.27	7,213.59	170,912.56
10/11	641,993	7,657,703,708	11,928.02	40,745.01	-186.40	23.00	374.34	7,200.20	170,627.21
11/11	642,971	7,653,716,626	11,903.67	40,651.61	-197.21	22.92	369.41	7,183.95	170,484.59
12/11	643,783	7,643,615,688	11,872.97	40,634.44	-203.79	22.71	350.02	7,182.20	170,404.18
01/12	644,897	7,844,079,844	12,163.31	41,247.35	-191.02	23.58	382.00	7,423.41	173,587.43
02/12	645,904	7,875,821,251	12,193.49	41,485.76	-188.74	23.51	382.09	7,393.24	174,339.53
03/12	646,874	7,851,527,062	12,137.65	41,482.20	-241.07	22.89	353.01	7,288.98	174,666.18
04/12	647,740	7,923,693,117	12,232.83	41,713.97	-203.62	23.24	375.03	7,446.60	174,893.97
05/12	648,627	7,886,809,100	12,159.26	41,447.77	-225.28	23.06	370.26	7,353.24	174,528.39
06/12	649,570	7,876,962,195	12,126.43	41,423.41	-264.40	22.60	345.27	7,292.14	174,449.67
07/12	650,403	7,972,300,051	12,257.48	41,709.61	-209.89	23.12	375.43	7,424.42	176,208.55
08/12	651,430	7,993,571,246	12,270.81	41,867.92	-183.79	23.20	378.49	7,377.45	176,703.50

2. Selection process of the sample

The following restrictions are applied on the sample to obtain complete tracking records for each client:

- We delete 8,617 clients who are deceased (from 1974 to 2012).
- We exclude 159,169 clients who have moved and for which the current address is unknown (variables can have missing/false values).
- We delete 80,868 clients under 18 (age of majority in France) because they cannot directly take the decision to purchase or sell any financial products.
- New clients and clients who leave the bank over the period of scrutiny are dropped.
- Clients with less than 2 financial products within the bank are deleted (notice that 98% of them hold only one saving plan with few euros).

These rules conduct to a sample of complete tracking records for 246,120 clients.
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Table 4: Bank branches

This table gives the number of bank branches according to the number of inhabitants. *Number of inhabitants* indicates the number of inhabitants per city (in 2010). *Number of branches* and *Number of cities* give respectively the number of bank branches and the number of cities according to the number of inhabitants. *Branches per city* gives the number of bank branches per city and is calculated as the ratio of the number of bank branches and the number of cities. *Clients per branches* gives the average number of clients per bank branches. Standard deviation are given between parentheses.

Number of inhabitants*	Number of branches	Number of cities	Branches per city	Clients per branches
≤ 2,500	18	18	1	1,045.39 (691.99)
]2,500 ; 5,000]	40	38	1.05	1,438.45 (868.17)
]5,000 ; 10,000]	23	23	1	1,740.24 (736.84)
]10,000 ; 20,000]	18	17	1.06	2,375.11 (1,316.43)
>20,000	33	6	5.5	2,443.33 (1,221.46)
Total	132	102	1.29	1,864.55 (1,074.45)

* From the French National Institute of Geography and Forest Information, (IGN)

Table 5: Descriptive statistics of the sample

This table provides descriptive statistics of clients' portfolios, number of securities/products, housing, job position, demographics and marital status. *Portfolio value* is the individual portfolio value averaged over the period (08/2011-08/2012). *Number of securities* indicates the number of securities/products held by a client within her portfolio. *Home owner* is a dummy variable equal to one if the client owns her residence and zero otherwise. *High qualified occupation* represents high qualified customers according to the French National Institute of Statistics and Economic Studies (socio-professional categories n°: 2, 3, 4). *Low qualified occupation* represents less qualified customers (socio-professional categories n°: 1, 5, 6). *Student* represents customers who are student. *Retired* represents customers who are retired. *Inactive* represents customers who do not have any occupation. *Age* is client's age. *Female* is dummy variable equal to one if the customer is a woman and zero otherwise. *Partner* is a dummy variable equal to one if the customer lives with a partner (married, cohabitation, civil union). *Relationship* measures the length of the relationship between the bank and the client. N, Mean, St-D, P1, Median, P99 display respectively the number of observations, the mean, the standard deviation, the first percentile, the median, the 99 percentile.

Variable	N	Mean	St-D	P1	Median	P99
Portfolio value and housing						
Portfolio value (in euros)	246,120	28,136.31	62,404.05	1.00	8,510.44	270,106.50
Number of securities	246,120	4.90	3.80	2	4	20
Home owner	246,120	0.4567	0.4981	0	0	1
Job position						
High qualified occupation	246,120	0.2007	0.4005	0	0	1
Low qualified occupation	246,120	0.3498	0.4769	0	0	1
Retired	246,120	0.2404	0.4273	0	0	1
Student	246,120	0.6420	0.2451	0	0	1
Inactive	246,120	0.1447	0.3518	0	0	1
Demographics and bank relationship						
Age	246,120	50.02	19.07	18	49	90
Female	246,120	0.5327	0.4989	0	1	1
Partner	246,120	0.5246	0.50	0	1	1
Relationship	246,120	25.66	12.63	1	26	55

Table 6: Deposits across financial products

This table gives clients' deposits for each category of financial securities/product. *N* gives the number of customers who hold at least one product of a given category. *Number of products* gives the average number of financial products held over the period (Tow different stocks are considered as two products). *Total amount* gives the total amount invested (in euros billion) and as a percentage of total deposits in a given category. *Mean* gives the average amount invested per category and *St-D* is the corresponding standard deviation.

Category of product	Financial products			Deposits			
	N	Number of products	Number of products (in percent)	Total amount (in euros billion)	Total amount (in %)	Mean	St-D
Deposit accounts	229,738	274,928	22.84%	0.6489	8.80%	2,360.2	7,127.93
Saving plans	234,754	432,164	35.91%	2.0945	28.41%	4,846.59	11,909.43
Housing plans	72,451	89,191	7.41%	0.9340	12.67%	10,471.59	16,779.25
Life insurance policies	90,589	134,877	11.21%	2.7089	36.75%	20,084.28	42,196.96
Mutual fund shares	18,049	44,942	3.73%	0.2270	3.08%	5,050.29	9,320.87
Bonds	18,210	44,043	3.66%	0.4404	5.98%	9,999.11	11,144.1
Stocks	19,010	70,900	5.89%	0.1006	1.36%	1,418.67	7,173.09
Member shares	112,440	112,440	9.34%	0.2170	2.95%	1,903.03	5,276.31
All	246,120	1,203,485	100%	7.3712	100%	6,116.9	18,073.09

Table 7: Financial products opened/closed

This table provides opening (purchase) and closing (sales) of financial products. *N* gives the number of products purchased (first product opened) of a given category. *Total amount* gives the amount invested (in euros million) by clients in a given category of product. *Mean* gives the average amount invested at the opening, *St-D* is the corresponding standard deviation and *median* gives the median.

	Opening					Closing				
Category of product	**N**	**Total amount (in euros million)**	**Mean**	**St-D**	**Median**	**N**	**Total amount (in euros million)**	**Mean**	**St-D**	**Median**
Deposit accounts	21 482	38.09	1,773.26	13,655.97	60.00	14,797	17.51	1,183.32	10,036.31	16.36
Saving plans	28 306	220.16	7,778.01	27,633.01	1,503.45	25,059	106.03	4,230.16	18,556.96	186.94
Housing plans	9 555	41.48	4,340.68	12,982.04	450.00	6,952	80.78	11,619.1	18,074.35	3,776.70
Life insurance policies	11 813	142.38.	12,052.73	40,188.60	784.11	8,572	97.78	11,406.81	39,096.64	2,387.39
Mutual fund shares	2 512	12.18	4,849.97	7,950.92	2,464.50	6,200	30.44	4,910.37	9,092.09	2,227.06
Bonds	5 475	61.86	11,297.97	12,272.63	7,946.98	6,665	69.81	10,473.82	12,462.57	7,186.30
Stocks	5 048	15.76	3,121.15	16,148.61	695.02	7,194	19.30	2,682.58	11,089.94	537.03
Member shares	11 403	10.14	889.59	3,939.09	20.00	2,394	6.27	2,619.63	5,875.06	240

Figure 3: Portfolio value and asset allocation

This figure displays the weight of each category of financial product in total deposits according to portfolio value decile.

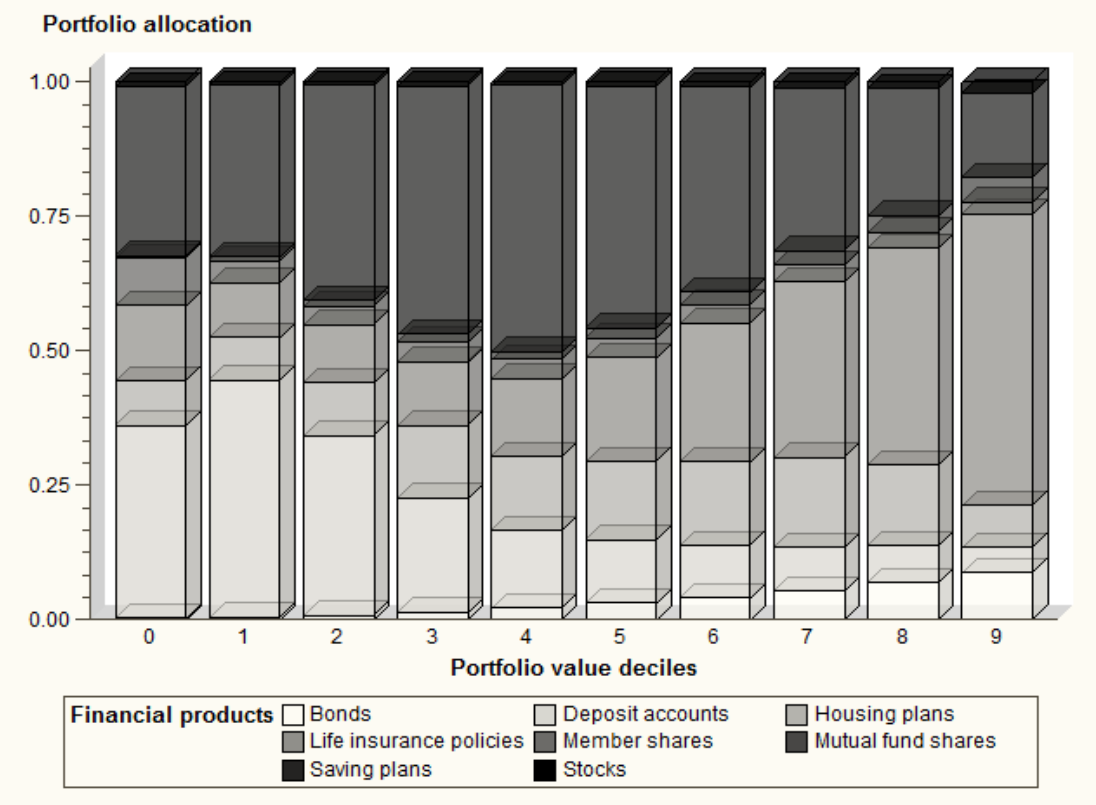

Figure 2: Age classes and asset allocation

This figure displays the weight of category of financial product in total deposits according to age classes.

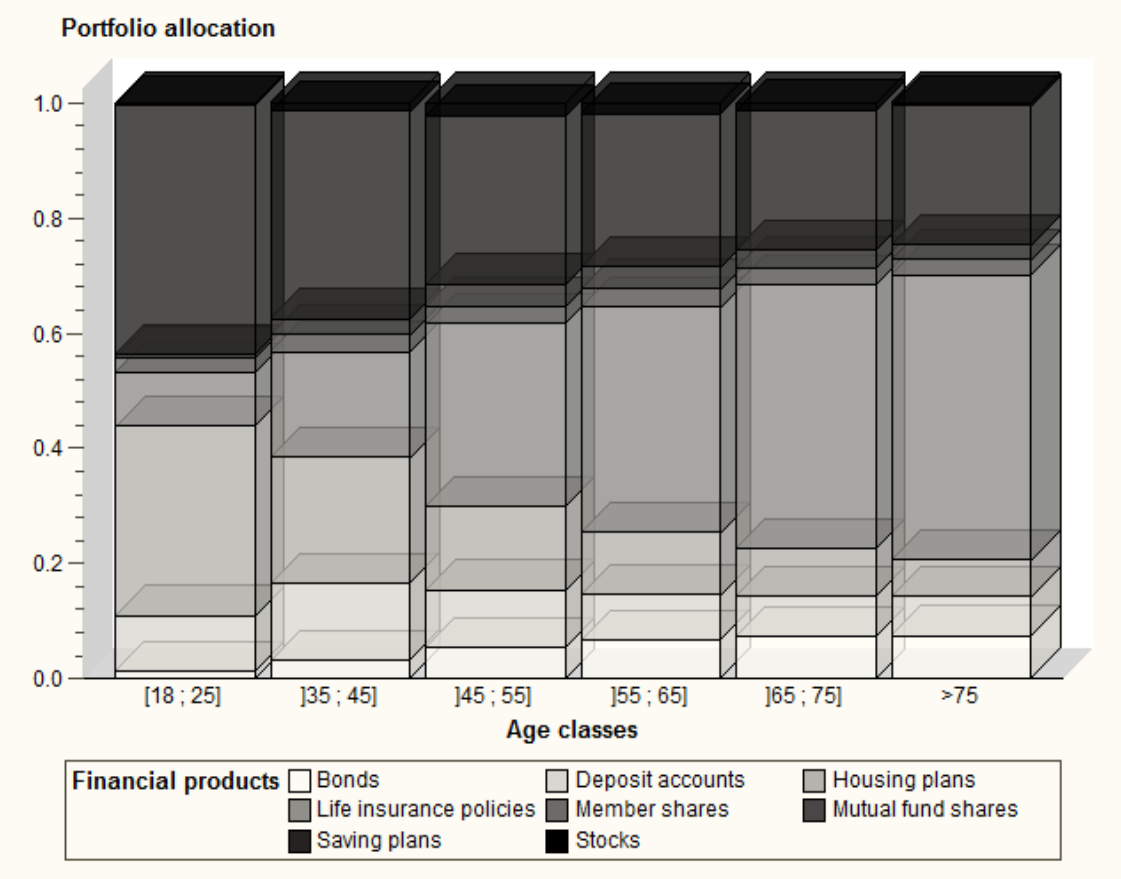

Figure 3: Occupation and asset allocation

This figure displays the weight of each category of financial product in total deposits according to job position.

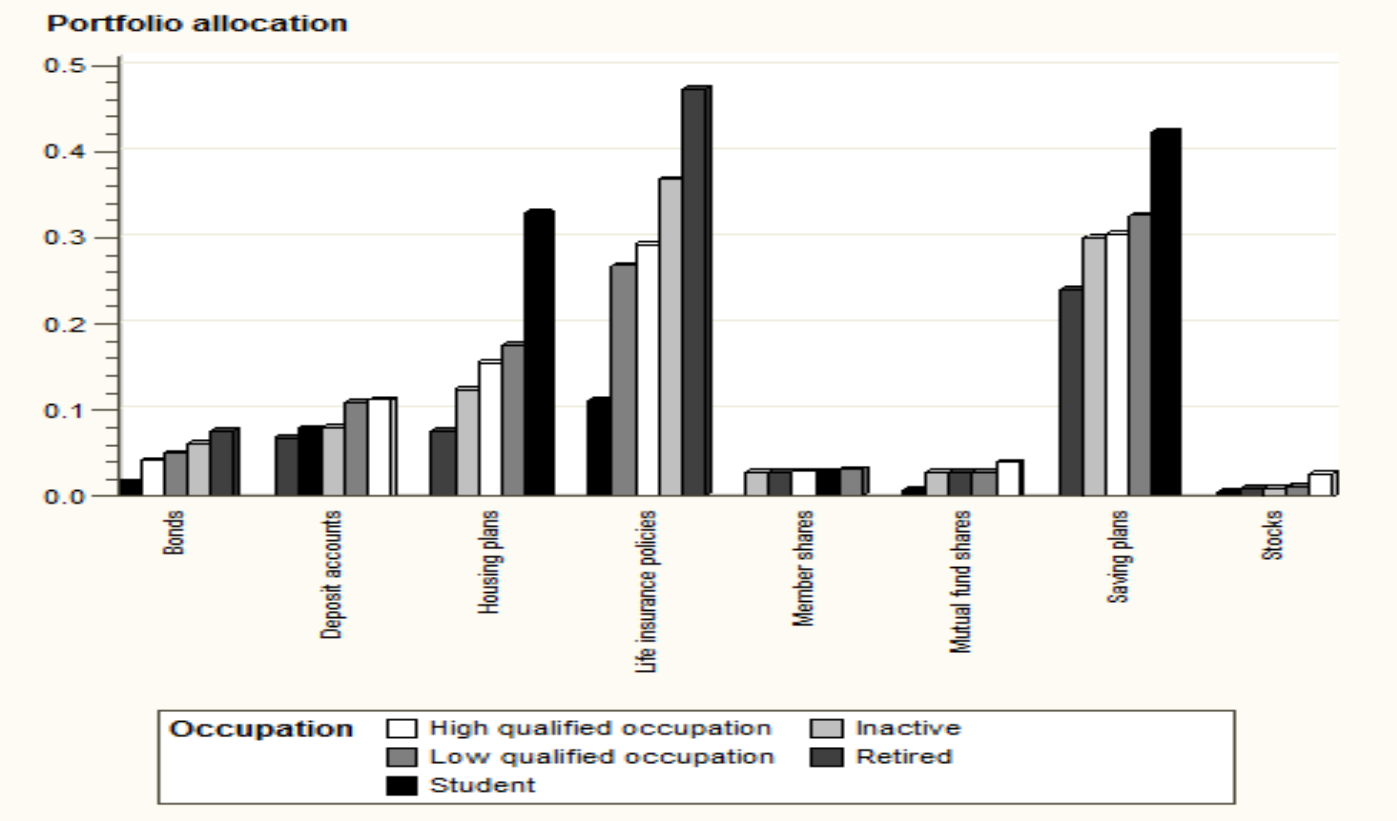

Table of contents

Résumé de la thèse en français

Les banques mutualistes occupent une place importante dans le paysage bancaire européen mais les spécificités de leur gouvernance sont méconnues. Ce travail de recherche a pour objectif de pallier à ce vide de connaissance. Les deux premiers chapitres se rattachent aux thématiques de l'économie bancaire et les deux derniers portent sur des thématiques de finance comportementale. Ces travaux contribuent à la littérature existante sur la concurrence bancaire et le comportement des parties prenantes (employés et membres) des banques coopératives.

Notre contribution à la littérature se décline en trois points. Dans un premier point nous montrons en quoi la gouvernance des banques coopératives impacte la concurrence bancaire. En effet, le mode de fonctionnement des banques coopératives qui repose sur l'existence d'un client propriétaire de sa banque, représenté par des membres élus, constitue la particularité de ces banques. Ces structures ont également développé de vastes réseaux constitués d'agences bancaires implantées localement qui ont connu d'importantes modifications et restructurations dans les récentes décennies. Nous mettons en évidence que cette structure de gouvernance est bénéfique à la concurrence et au client grâce à des prix plus faibles. Nous étudions également l'intensité des « switching costs » pour le client et montrons que les banques coopératives ne profitent pas de la proximité avec leurs clients (« capture informationnelle ») pour pratiquer des prix plus importants. Ces résultats corroborent l'idée que les banques coopératives poursuivent des objectifs qui ne sont pas uniquement ceux d'une rentabilité financière mais cherchent à assurer le bien-être de leurs clients.

Dans un second point cette recherche s'intéresse aux motivations d'achat des parts sociales. Ces dernières sont des titres de capital non cotés, elles constituent la spécificité légale des institutions coopératives. Elles permettent aux clients de participer à la gouvernance par l'application du principe « un homme = une voix » et d'élire leurs représentants. Cette thèse met en lumière que les préférences financières ont un rôle prépondérant dans la décision d'achat des parts sociales. Ces résultats s'opposent aux motifs non-financiers avancés par l'Association Internationale des Banques Coopératives (AIBC) pour expliquer l'adhésion des clients à leur coopérative.

En dernier lieu cette recherche contribue à la littérature portant sur le biais de familiarité. Nous comparons les portefeuilles d'actifs des employés de banque

coopérative à ceux des clients et montrons que le biais de familiarité influence les décisions financières prises par les employés et que la connaissance financière ne semble pas réduire ce biais.

Chapitre I : Les banques coopératives ont-elles un pouvoir de marché plus important ?

Ce chapitre[37] compare le pouvoir de marché des banques coopératives à celui des autres structures bancaires non-coopératives.

La théorie microéconomique standard admet qu'un pouvoir de marché important conduit à l'extraction de rentes par la banque et à une réduction de la concurrence, ce qui est néfaste au bien-être du consommateur (Degryse et Ongena, 2005; Carbo et al., 2009). Au niveau macroéconomique plus de concurrence peut influencer positivement le développement économique par un meilleur accès aux crédits et des taux plus faibles (Claessens et Laeven, 2005).

Les banques coopératives sont détenues par leurs clients qui prennent part à la gouvernance en votant pour leurs représentants lors des assemblées générales. Par ailleurs elles ont des objectifs qui ne sont pas uniquement la poursuite de profits et cherchent à garantir le bien-être de leurs clients et à contribuer au développement économique local via d'importants réseaux bancaires (Cihak et Hesse, 2007; Ayadi et al., 2010).

Dans ce chapitre nous testons l'hypothèse si les banques coopératives ont un pouvoir de marché plus faible que les banques commerciales en raison de la spécificité de leur gouvernance.

En lien avec les récentes études sur la concurrence bancaire (Carbo et al., 2009; Weill, 2011) nous utilisons l'indice de Lerner. Cette mesure de concurrence représente la différence entre le prix pratiqué par une banque et son coût marginal rapporté à son prix. Ainsi, cet indicateur donne la capacité d'une banque à tarifer au-delà de ses coûts marginaux. Un indice de Lerner de 0 indique un marché fortement concurrentiel alors qu'une convergence vers 1 indique un pouvoir de marché important.

[37] Ce chapitre correspond à l'article en publication dans *Bankers, Markets & Investors* coécrit avec Laurent Weill.

Nous utilisons une méthodologie similaire à celle de Fernandez de Guevara, Maudos et Perez, (2005, 2007). Les prix sont approximés pour chaque banque par le rapport entre les revenus totaux et l'actif total. Les coûts marginaux sont déterminés en estimant une fonction de coût intertemporelle qui inclut le prix de trois inputs (le travail, le capital et le prix des fonds empruntés).

Nous calculons l'indice de Lerner en utilisant des données financières de Bankscope qui portent sur les états financiers des banques coopératives, commerciales et des caisses d'épargne pour l'Allemagne, l'Autriche, la France[38], l'Italie et le Danemark sur la période 2002-2008.

Nos résultats indiquent que les banques coopératives ont un pouvoir de marché significativement plus faible que les banques commerciales. Une étude comparative des coûts marginaux et des prix montre que les banques coopératives ne sont pas moins efficientes que les banques commerciales. Les différences s'expliquent davantage par des prix qui sont en moyenne plus faibles pour les banques coopératives.

Pour valider ces résultats et tenir compte d'autres facteurs pouvant influencer le pouvoir de marché nous estimons un modèle linéaire généralisé avec effets aléatoires (robuste pour l'heteroscedasticité et l'autocorrélation) dans lequel des variables binaires sont incluses pour distinguer les banques coopératives des autres institutions. A l'instar d'Angelini et Cetorelli (2003) plusieurs variables de contrôle sont ajoutées afin de tester la robustesse des résultats. Ainsi, nous considérons plusieurs variables individuelles comme la taille de la banque, l'activité bancaire et la structure de capital mais aussi plusieurs variables macroéconomiques comme l'inflation, la croissance économique et la concentration du marché dans lequel la banque évolue.

Nous trouvons un coefficient négatif et significatif entre la variable banque coopérative et le pouvoir de marché. Cette estimation va dans le sens des analyses univariées et confirme que les banques coopératives ont un pouvoir de marché plus faible, ce qui est compatible avec la gouvernance de ces institutions.

Plusieurs études mettent en avant que les droits de propriété (parts sociales) des banques coopératives, qui ne sont pas librement cessibles sur un marché, vont créer une perte de contrôle des membres sur leurs managers en raison d'un manque de discipline du marché (Rasmusen, 1988). Les managers sont donc tentés de maximiser leur propre

[38] Les caisses d'épargne françaises sont devenues coopératives en 1999 mais sont considérées dans ce chapitre comme non-coopératives

utilité au détriment des membres propriétaires en augmentant les dépenses de personnels, les salaires et les bonus (Edwards, 1977; Kontolaimou et Tsekouras, 2010). Nos résultats infirment l'existence de ce type de comportement de la part des managers des banques coopératives.

En dernier lieu, nous trouvons que les Caisses d'épargne ont un pouvoir de marché plus faible que les banques coopératives et les banques commerciales. Ceci met en lumière que les banques coopératives et les caisses d'épargne sont différentes malgré leur ressemblance concernant leur implantation et structure en réseau. Nous expliquons ces différences par l'existence, pour les caisses d'épargne, de mandats légaux de contribution à leur communauté et à leur clientèle (Ayadi et al., 2009). Ces différences s'expliquent aussi par leur capital qui est souvent détenu par les municipalités et les communautés locales.

Chapitre II : « Switching costs » et pouvoir de marché dans l'industrie bancaire: le cas des banques coopératives

Dans ce second chapitre[39] nous déterminons si les « switching costs » des clients des banques coopératives sont supérieurs à ceux des clients des banques non-coopératives.

Les « switching costs » se définissent comme des coûts financiers et psychologiques (utilité) supportés par les clients lorsqu'ils décident de changer de firme ou de marque (Klemperer, 1995). La présence de ces coûts sur le marché a pour effet de réduire la concurrence et d'augmenter les prix pratiqués par le producteur. En effet, les clients qui présentent des « switching costs » importants ont une mobilité réduite et leur producteur peut profiter de la situation pour pratiquer des prix plus importants (Fernandez et al., 2003). Ainsi, cette faible mobilité du consommateur, connue du producteur, peut entrainer des comportements opportunistes de « hold-up » de la part du producteur. Par ailleurs Baronne et al. (2011) montrent qu'une firme est partagée entre l'incitation à pratiquer des prix faibles pour ses nouveaux clients, dans le but d'augmenter ses parts de marché, et pratiquer des prix élevés sur ses clients existants et peu mobiles

[39] Ce chapitre correspond à l'article coécrit avec Laurent Weill

Sur le marché des prêts bancaires les « switching costs » peuvent être importants en raison d'un fort degré d'asymétrie informationnelle qui existe entre l'emprunteur et sa banque (Kim et al. (2003)). Selon Sharpe (1990), lors du processus de prêt, la banque apprend à connaitre ses clients ce qui réduit l'asymétrie informationnelle et peut avoir un effet positif sur les taux de prêt pratiqués. Les banques concurrentes ne sont quant à elles pas incitées à abaisser leurs taux au risque d'attirer des mauvais emprunteurs (Gehrig et Stenbacka, 2007). Dans ce cas le client qui décide de changer de banque peut perdre les avantages de la relation bancaire et supporter des coûts de prêt plus importants chez la banque concurrente. L'estimation de ce coût potentiel représente le « switching cost » du client.

Empiriquement la question de l'existence du phénomène de « hold-up » de la part de la banque sur le client reste débattue. Certaines études montrent que la relation bancaire durable réduit le coût du crédit pour le client (Berger et Udell, 1995, Berger et al, 2007). Au contraire Ioannidou et Ongena (2010) montrent que les entreprises qui décident de changer de banque bénéficient de conditions plus avantageuses ce qui met en doute les bénéfices de la relation bancaire.

Les banques coopératives ont la caractéristique d'être ancrées localement et de développer des relations de proximité avec leurs clients. D'un côté la relation bancaire peut générer des « switching costs » importants et entrainer des comportements opportunistes de la banque sur son client. D'un autre coté le modèle coopératif fondé sur l'existence d'un pouvoir de gouvernance du client devrait limiter ces comportements dans la mesure où l'intérêt du client devrait s'aligner sur celui du manager.

Ceci nous conduit à tester deux hypothèses: les clients des banques coopératives supportent des « switching costs » plus faibles en raison de la gouvernance de ces banques.

Enfin, les banques dans lesquelles les clients supportent des « switching costs » élevés sont incitées à profiter de cette situation et pratiquent des prix plus importants ce qui a un effet négatif sur la concurrence.

Les « switching costs » sont estimés par la méthode de Shy (2002) qui permet d'obtenir une mesure individuelle (par banque) des « switching costs ». Dans le modèle de Shy (2002) les consommateurs ont des « switching costs » et les firmes se font une concurrence en prix (oligopole de Bertrand). Ces dernières adoptent un comportement qui

consiste à tarifer de sorte à maximiser leurs profits mais à un niveau de prix suffisamment faible pour qu'il ne soit pas rentable pour la firme concurrente de tarifer à un prix inférieur dans le but de récupérer tous les clients.

Pour estimer l'effet des « switching costs » sur la concurrence nous utilisons l'indice de Lerner comme mesure de pouvoir de marché (voir supra). Les « switching costs » et l'indice de Lerner sont déterminés en utilisant des données de Bankscope sur les états financiers des banques coopératives, commerciales et les caisses d'épargne allemandes, françaises et italiennes sur la période 2006-2012.

En premier lieu, les résultats indiquent que les « switching costs » varient dans le temps et dans l'espace. Pour chaque pays, nous montrons que les clients des banques coopératives supportent des « switching costs » plus faibles que les clients d'autres catégories de banque (commerciales et caisses d'épargne). Ce résultat peut être rapproché de celui de Stango (2002) qui trouve que les clients des Credit Unions irlandaises supportent des « switching costs » plus faibles car ces institutions ont des objectifs différents que la seule maximisation des profits (« non-profit institutions »).

Enfin, pour mesurer l'effet des « switching costs » sur le pouvoir de marché nous utilisons un modèle linéaire généralisé avec effets aléatoires en incluant plusieurs variables de contrôle comme la taille de la banque, l'activité bancaire et la structure de capital de la banque. Nous trouvons que les « switching costs » sont positivement et significativement corrélés au pouvoir de marché, ce qui indique qu'ils ont un effet négatif sur la concurrence bancaire et donc potentiellement sur le bien-être du client.

Nos résultats indiquent que les « switching costs » sont un frein à la concurrence bancaire et que la gouvernance des banques coopératives, basée sur des relations de long terme et de proximité, favorise la réduction de ces coûts.

Chapitre III : Être membre d'une banque coopérative: une décision financière ou éthique ?

Le troisième chapitre[40] de cette thèse explore les motifs d'achat des parts sociales par les clients des banques coopératives. La part sociale apporte au client le statut de membre de sa banque et lui donne l'opportunité de participer à sa gouvernance. Les parts sociales représentent le capital (hors réserves) des banques coopératives et ont comme caractéristiques d'avoir une rémunération limitée au taux moyen de rendement des obligations des sociétés privées (TMO) et un prix fixe dans le temps. Par ailleurs elles sont le lien qui existe entre le membre et sa banque. L'existence de membres/clients de leur banque distingue les banques coopératives des structures non-coopératives (Fonteyne, 2007; Cuevas et Fisher, 2006).

Les instances représentatives des banques coopératives comme l'Association Européenne des Banques Coopératives (AEBC) ou encore l'Association Internationale des Banques Coopératives (AIBC) indiquent que l'achat de parts sociales est motivé par des préférences non-financières et de libre adhésion à la structure coopérative. Cependant, les taux de participation aux assemblées générales sont très faibles. Par exemple, McKillop et al. (2002) trouvent des taux de participation de 2% dans les Credit Unions irlandaises. En France, Caire et Nivoix (2012) montrent que les taux de participation varient de 1% à 7% avec une moyenne de 3.68%. Partant de ce constat, nous cherchons à déterminer des pistes alternatives pouvant expliquer pourquoi les clients décident de devenir membres de leur banque coopérative.

Dans ce chapitre nous testons l'hypothèse suivante: les clients considèrent les parts sociales comme n'importe quel autre actif financier

Pour tester cette hypothèse une base de données unique, constituée des dépôts de 246.120 clients d'une banque coopérative française sur une période de 13 mois allant du 08/2011 au 08/2012 est utilisée.

Dans cette banque coopérative le prix d'une part sociale est de 20€, les intérêts payés ne peuvent pas excéder le TMO et sont calculés par mois complet de détention. Par ailleurs, une vente de parts sociales avant la tenue de l'assemblée générale ne donne pas droit à rémunération.

[40] Ce chapitre correspond à l'article coécrit avec Patrick Roger

Notre analyse se concentre sur les 26.788 clients qui procèdent à des transactions (achats/ventes) en parts sociales sur la période. Ces clients réalisent 40.000 (3000) transactions du côté des achats (ventes) pour une moyenne de 43 (214) parts sociales achetées (vendues) par client. Sur la période étudiée le nombre de parts sociales détenues par les membres augmente de 10.24%. Sur une période plus longue, allant de 2007 à 2010, ce nombre augmente de 135%, ce qui suggère une importante activité de trading de parts sociales.

Du coté achat, nos résultats indiquent une forte corrélation positive et significative entre le montant de parts sociales achetées et le patrimoine financier du client. De plus les acheteurs de parts sociales sont plus riches que les autres clients. Ces résultats mettent en lumière que l'achat de parts sociales est encouragé par des motifs financiers.

Les ventes de parts sociales semblent quant à elles expliquées par des chocs de liquidité. En effet, les clients vendeurs présentent un patrimoine financier plus faible et sont plus souvent à découvert bancaire sur leur compte courant. De plus, l'argent des parts sociales n'est pas replacé sur un autre actif financier au sein de la banque ce qui vient souligner que la vente est motivée par d'autres besoins.

Cette étude relève d'autres arguments qui vont à l'encontre d'un sociétariat au sens de l'AIBC. Nous trouvons qu'un client devient sociétaire en moyenne 20 ans après être entré dans la banque et que seulement 21.74% des nouveaux clients décident d'acheter des parts sociales lorsqu'ils rejoignent la banque. Ces résultats vont dans le sens d'un sociétariat dont les motivations sont surtout financières en opposition aux principes de l'IACB.

D'un autre coté ceci démontre également que les banques coopératives réussissent à augmenter leurs fonds propres en période de crise financière malgré leur accès limité au marché des capitaux.

Chapitre IV : La connaissance financière réduit-elle le biais de familiarité ? Le cas des employés de banque

Ce quatrième chapitre s'intéresse à l'effet de la connaissance financière sur le biais de familiarité.

Le biais de familiarité se définie comme une préférence de l'investisseur pour les actifs dont il se sent proche psychologiquement (Heath et Tversky, 1991). Il conduit l'investisseur à surestimer les performances futures des actifs financiers familiers et à en sous-estimer le risque. Ce biais comportemental explique pourquoi les investisseurs ne diversifient pas leur portefeuille d'actifs internationalement conformément aux prédictions de la théorie financière standard (Markowitz, 1952, 1959 ; Sharpe, 1963).

En effet, plusieurs études ont montré que les investisseurs détenaient des portefeuilles concentrés en actifs nationaux (French et Poterba, 1991), en actions des sociétés dont les sièges sont proches de leur lieu d'habitation (Seacholes et Zhu, 2010 ; Grinblatt et Keloharju, 2001), ou en actions des entreprises dans lesquelles ils travaillent (Huberman et Sengmuller, 2004 ; Holden et VanDerrhei, 2001).

En allouant une part conséquente de leur portefeuille sur les actifs locaux, les investisseurs renoncent à des performances plus importantes en investissant dans d'autres titres (Meulbroeck, 2005). De plus, lorsqu'ils concentrent leur épargne sur les actifs de l'entreprise dans laquelle ils travaillent, ces derniers prennent le risque de perdre à la fois leur emploi et leur argent en cas de faillite de leur firme (Bernatzi et al., 2007). Enfin, les investisseurs soumis à ce biais sous-diversifient fortement leur portefeuille d'actifs (Cao et al., 2011).

Le biais de familiarité semble varier selon les caractéristiques démographiques des individus et leur degré de connaissance financière et d'éducation. A cet effet, Graham et al. (2009) et Karlsson et Nordén (2007) ont montré que les investisseurs ayant un degré d'éducation plus important sont plus enclins à placer leur argent dans des titres de sociétés basées à l'étranger. Pool et al. (2012) montrent que les managers de fonds sont également soumis au biais de familiarité mais trouvent qu'il est plus faible pour les managers expérimentés.

Aucune étude n'a montré si les employés de banque étaient soumis à ce biais. Cette question peut se poser pour deux raisons: d'un côté les employés de banque

devraient être au courant que détenir des portefeuilles concentrés en actifs de la banque dans laquelle ils travaillent est plus risqué que la détention de portefeuilles diversifiés. D'un autre coté la littérature rapporte que les employés ont tendance à surestimer la performance et sous-estimer le risque des actifs de leur entreprise.

Dans ce chapitre nous testons l'hypothèse suivante: les employés de banque sont moins soumis au biais de familiarité en raison d'une degré de connaissance financière plus important.

Pour tester notre hypothèse nous utilisons une base de données composée de 244.962 clients et 1158 employés d'une banque coopérative française. Pour chacun d'eux nous disposons du portefeuille financier détaillé par produits financiers (actions, assurances-vie, livrets, obligations, parts sociales…) sur la période 08/2011-08/2012. Les actions, les obligations et les parts sociales émises par la banque et ses filiales sont considérées comme trois actifs familiers. Nous étudions le comportement et les choix d'investissement des employés dans ces actifs et les comparons à ceux des clients.

Nos résultats indiquent que 72% des employés détiennent au moins un de ces actifs alors que cela concerne 49% des clients. En contrôlant pour plusieurs variables comme le genre, l'âge, le nombre d'actifs (autres que familiers), le patrimoine et la préférence pour le risque nous trouvons que les employés ont 1.4 fois plus de chance que les clients ordinaires d'avoir des actifs familiers en portefeuille. Par ailleurs, les employés ont une préférence pour les actions de la banque dans laquelle ils travaillent et ont 4 fois plus de chance que les clients de détenir cet actif.

L'intensité du biais de familiarité, mesurée par le montant investi dans les actifs familiers rapporté à la valeur du portefeuille (somme des dépôts), montre que les employés investissent une part de leur portefeuille relativement plus faible que les clients. Cependant la préférence qu'ont les employés pour les actions familières les conduit à sous-diversifier leur portefeuille d'actifs risqués. En effet, les employés détenteurs d'actions investissent 59.05% de leur portefeuille de titres dans les actions de leur banque contre 57.60% pour les clients.

Cette étude met en exergue que le biais de familiarité est un biais comportemental important que la connaissance financière ne réduit pas. Par ailleurs à l'instar de Karlson et Nordén (2007) nos résultats indiquent que le biais de familiarité est plus important pour

les hommes, les personnes âgées et les investisseurs qui détiennent une faible épargne financière.

Bibliographie mentionnée dans le résumé

Angelini, P and Cetorelli, N. 2003: The effects of regulatory reform on competition in the banking industry. *Journal of Money, Credit and Banking* 35(5):663–684.

Ayadi, R, Arbak, E, Carbo Valverde, S, Rodriguez Fernandez, F, Schmidt, R.H. 2009: Investigating diversity in the banking sector in Europe: the performance and role of savings banks. Brussels: Centre for European Policy Studies.

Ayadi, R, Llewellyn, D.T, Schmidt, R.H, Arbak, E, De Goen, W.P. 2010: Investing diversity in the banking sector in Europe key developments, performance and role of cooperative banks. Brussels: Centre for European Policy Studies.

Barone, G, Felici, R and Pagnini, M. 2011: Switching costs in local credit markets. International *Journal of Industrial Organization* 29(6):694–704.

Berger, A.N and Udell, G. F. 1995: Relationship lending and lines of credit in small firm finance. *Journal of Business*, 68(3):351–382.

Berger, A.N, Rosen, R. J and Udell, G. F. 2007: Does market size structure affect competition: The case of small business lending. *Journal of Banking and Finance*, 31(1):11–33.

Benartzi, S, Thaler, R.H, Utkus, S.P, Sunstein, C. R. 2007: The law and economics of company stock in 401(k) plans. *Journal of Law and Economics* 50(1):45–79.

Caire, G and Nivoix, S. 2012: La Démocratie Sociétariale « vue d'en bas » Observations sur des Assemblées Générales Locales de Banques Coopératives. *Revue française de gestion* 220(1):17–30.

Cao, H.H, Han, B, Hirshleifer, B and Zhang, H.H. 2011: Fear of the unknown: familiarity and economic decisions. *Review of Finance* 15:173–206.

Carbo-Valverde, S, Rodriguez-Fernandez F. and G. Udell 2009: Bank market power and SME financing constraints. *Review of Finance* 13:309–340.

Claessens, S, Laeven, L. 2005: Financial dependence, banking sector competition, and economic growth. *Journal of the European Economic Association* 3(1):179–207.

Cuevas, C and Fischer, K. 2006: Cooperative Financial Institutions: Issues in Governance, Regulation, and Supervision. World Bank Working Paper No. 82, Washington: World Bank

Degryse, H and Ongena, S. 2005: Distance, lending relationships, and competition. *Journal of Finance* 60(1):231–66.

Edwards, F.R. 1977: Managerial objectives in regulated industries: Expense preference behavior in banking. *Journal of Political Economy* 85:147–162.

Fernandez de Guevara, J, Maudos, J and Perez, F. 2005: Market power in European banking sectors. *Journal of Financial Services Research* 27(2):109–137.

Fernandez de Guevara, J, Maudos, J and Perez, F. 2007: Integration and competition in the European financial markets. *Journal of International Money and Finance* 26:26-45.

Fernandez, D, McSorley, C, Padilla, A. J, Williams, M and Reyes, T. 2003: Switching costs. Economic Discussion Paper 5, Office of Fair Trading UK.

Fonteyne, W. 2007: Cooperative Banks in Europe – Policy issues. IMF Working Paper. G20 (2009a), Global Plan for Recovery and Reform, Communiqué, London, 2 April 2009.

French, K. R and Poterba, J. M. 1991: Investor diversification and international equity markets. *American Economic Review* 81:222–226.

Gehrig, T and Stenbacka, R. 2007: Information sharing and lending market competition with switching costs and poaching. *European Economic Review* 51:77-99.

Graham, J, Campbell, H, Hai, H. 2009: Investor competence, trading frequency, and home bias. *Management Science* 55: 1094-1106.

Grinblatt, M and Keloharju, M. 2001: Distance, language, and cultural bias: the role of investor sophistication. *Journal of Finance* 46:1053–1073.

Heath, C and Tversky, A. 1991: Preference and belief: ambiguity and competence in choice under uncertainty. *Journal of Risk and Uncertainty* 4:5-28.

Holden, S and VanDerhei, J. 2001: Contribution behavior of 401(k) plan participants. EBRI Issue Brief 7(4).

Huberman, G and Sengmueller, P. 2004: Performance and employer stock in 401(k) plans. *Review of Finance* 8:403–443.

Ioannidou, V.P and Ongena, S. 2010: "Time for a change": Loan conditions and bank behavior when firms switch banks. *Journal of Finance* 65(5):1847–1877.

Karlsson, A. and Nordén, L. 2007: Home sweet home: home bias and international diversification among individual investors. *Journal of Banking and Finance* 31:317–333.

Kim, M, Kliger, D, and Vale, B. 2003: Estimating switching costs: The case of banking. *Journal of Financial Intermediation* 12:25–56.

Klemperer, P. 1995: Competition when consumers have switching costs: An overview with applications to industrial organization, macroeconomics, and international trade. *Review of Economic Studies* 62:515–539.

Kontolaimou, A and Tsekouras, Kostas. 2010: Are cooperatives the weakest link in European banking? A non-parametric metafrontier approach. *Journal of Banking and Finance* 34(8):1946–1957.

Markowitz, H. 1952: Portfolio selection. *Journal of Finance* 7:77–91.

Markowitz, H. 1959: Portfolio selection: Efficient diversification of investments. John Wiley, New York.

McKillop, D, McCarthy, O, Ward, M, Briscoe, R, Ferguson, C. 2002: Women in the Irish Credit Union movement: North and South. Oak Tree, Cork.

Meulbroek, L. 2005: Company stock in pension plans: How costly is it? *Journal of Law and Economics* 8(4):443–74.

Pool, V. K, Stoffman, N, Yonker, S. E. 2012: No place like home: Familiarity in mutual fund manager portfolio choice. *The Review of Financial Studies* 25(8):2563–2599.

Rasmusen, E. 1988: Mutual banks and stocks banks. *Journal of Law and Economics* 31:395–422.

Sharpe, S.A. 1990: Asymmetric information, bank lending and implicit contracts: A stylized model of customer relationships. *Journal of Finance* 45:1069–1087.

Sharpe, W.1963: A simplified model for portfolio analysis. *Management Science* 9(2):277–93.

Seasholes, M and Zhu, N. 2010: Individual investors and local bias. *Journal of Finance* 65:1987–2010.

Shy, O. 2002: A quick-and-easy method for estimating switching costs. *International Journal of Industrial Organization* 20:71–87.

Stango, V. 2002: Pricing with Consumer Switching Costs: Evidence from the Credit Card Market. *Journal of Industrial Economics* 50(4):475–492.

Weill, L. 2011: Do Islamic banks have greater market power? *Comparative Economic Studies* 53:291–306.

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Essais sur les banques coopératives

Aspects concurrentiels et comportement des parties prenantes

Résumé

Cette thèse met en exergue les spécificités de la gouvernance des banques coopératives et du comportement financier de leurs parties prenantes (clients/employés).

Le premier chapitre montre que les banques coopératives européennes (Allemagne, Autriche, Danemark, France, Italie) ont un pouvoir de marché plus faible que les banques commerciales. Les différences s'expliquent par des prix plus faibles pour les banques coopératives. Ces résultats suggèrent que les banques coopératives contribuent à améliorer la concurrence et le bien-être des clients.

Le second chapitre montre que les clients des banques coopératives (Allemagne, France et Italie) supportent des « switching costs » moins élevés que les clients des banques non-coopératives. Ces résultats corroborent la spécificité de la gouvernance des banques coopératives. Cette étude montre que les « switching costs » ont un effet négatif sur la concurrence bancaire.

Le troisième chapitre trouve que les motifs financiers expliquent l'achat des parts sociales. Ces résultats contredisent les « explications officielles » avancées par les instances représentatives des banques coopératives qui indiquent que les parts sociales sont achetées par les clients dans un but non-financier.

Le quatrième chapitre montre que les employés des banques coopératives sont sujets au biais de familiarité et investissent dans les actifs financiers de leur banque (actions, parts sociales, obligations). Nos résultats suggèrent que la connaissance financière ne réduit pas ce biais comportemental.

Mots clés : Economie bancaire ; Finance comportementale ; Banques coopératives ; Concurrence ; Sociétariat Sociétariat

Résumé en anglais

This dissertation deals with the characteristics of cooperative banks' governance and the financial behavior of their stakeholders (clients/employees).

Chapter 1 shows that European cooperative banks (Austria, Denmark, France, Germany, and Italy) have a lower market power than commercial banks. Differences are explained by lower prices for cooperative banks. These results suggest that cooperative banks contribute to enhance competition and customers' welfare.

Chapter 2 stressed that clients of cooperative banks (France, Germany, and Italy) have on average lower switching costs than clients of commercial banks. This result is in line with the governance of cooperative banks. In addition, this study shows that switching costs impact negatively banking competition.

Chapter 3 shows that financial motives explain cooperative member shares purchases. These results contradict the official reasons given by the representative institutions of cooperative banks which indicate that non-financial motives dominate when clients decide to become member of their cooperative bank.

Chapter 4 shows that employees of cooperative banks are prone to familiarity bias and invest in financial assets of their own bank (Bonds, member shares, stocks). Our results suggest that financial literacy does not reduce familiarity bias.

Keywords: Banking economics ; Behavioral finance ; Cooperative banks ; Competition ; Membership ; Familiarity bias