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Départ à la retraite et hétérogénéité des seniors : l'impact des politiques publiques

Annaïg-Charlotte Pedrant

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THÈSE

Pour obtenir le grade de

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Présentée par

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préparée au sein du laboratoire **IREGE - Université Savoie Mont Blanc**
et de l'école doctorale **SISEO**

Départ à la retraite et hétérogénéité des seniors : l'impact des politiques publiques

**Retirement decision and heterogeneity of older workers : the impact of
public policies**

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L'Université de Grenoble n'entend donner aucune approbation, ni improbation aux opinions émises dans cette thèse ; elles doivent être considérées comme propres à leur auteur.

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Introduction générale

Évolution démographique et soutenabilité des systèmes par répartition

"La création d'un nouveau système doit s'accompagner d'un engagement fort sur sa soutenabilité à long terme et sur sa solidité financière. Ce système devra pouvoir s'adapter aux perspectives économiques, aux mutations sociales et aux évolutions démographiques." (Projet de réforme du système de retraite français, 2018)

Cet intérêt de l'État français envers le système de retraite fait suite à l'allongement de l'espérance de vie et au ralentissement de la natalité au sein de la population. Plus qu'une problématique française, les pays développés font face, depuis plusieurs décennies, à ce vieillissement démographique. Selon les projections de l'Organisation de Coopération et de Développement Économique (OCDE), alors que les personnes de plus de 65 ans représentent environ 15% de la population des pays de l'OCDE en 2015, ce taux atteindra 30% en 2050.

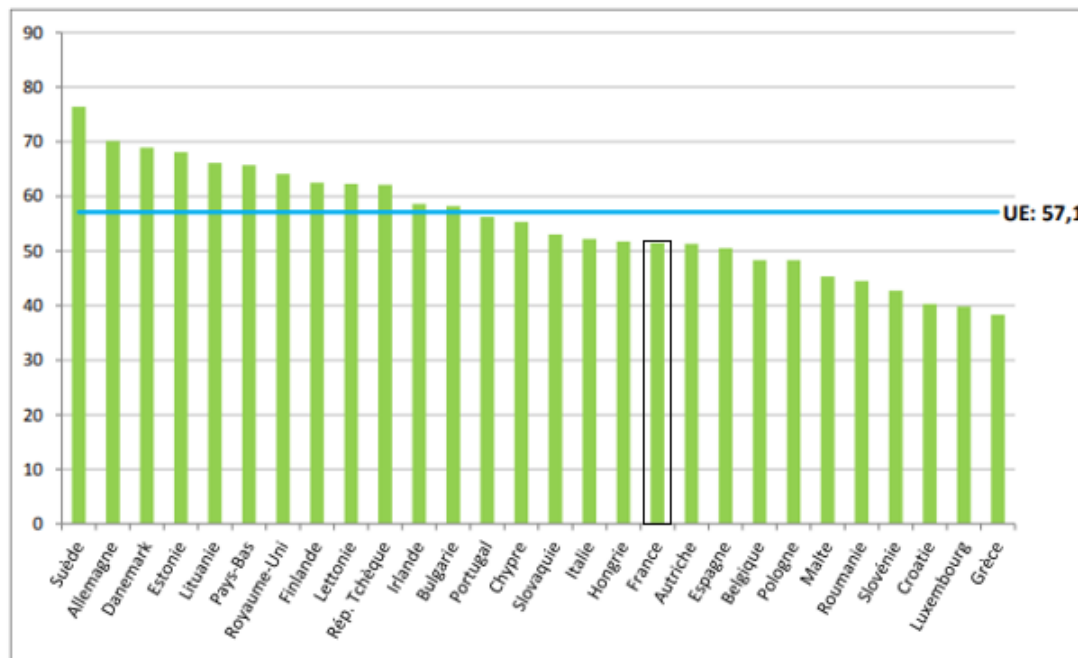
Cette tendance de long terme du vieillissement démographique a des répercussions sur les systèmes de protection sociale européens qui visent à assurer la population contre les risques sociaux. Ces systèmes de sécurité sociale couvrent au minimum les quatre grands risques que sont : maladies, vieillesse, chômage et famille. Cependant, ces systèmes prennent diverses formes sous l'inspiration des principes dits Beverigien et Bismarkien. Ces différentes inspirations se traduisent par deux grandes orientations pour les systèmes de retraite européens.

Premièrement, le système Beverigien est un système de solidarité nationale face

aux risques sociaux. Dans ce système, une pension de retraite de base est accordée à l'ensemble de la population et est financée par l'impôt. Ce type de système est majoritairement présent dans les pays anglo-saxons et certains pays d'Europe du Nord.

Deuxièmement, le système Bismarkien, présent en Europe continentale, se caractérise, quant à lui, par une solidarité professionnelle face aux risques sociaux. L'ouverture des droits à une pension de retraite est ici conditionnelle à la participation au marché du travail. Les pensions sont financées par des cotisations sociales proportionnelles aux salaires. Le système Bismarkien fonctionne donc par répartition : les travailleurs actifs cotisent pour financer les pensions des seniors. Ce principe de solidarité intergénérationnelle fait du taux de dépendance des personnes âgées, qui est le ratio entre nombre de personnes de 65 ans et plus sur le nombre de personnes actives, le fondement même de ces systèmes de retraite.

Or, le vieillissement de la population se traduit par une dégradation, en Europe, de ce taux de dépendance des personnes âgées, questionnant ainsi la soutenabilité financière des systèmes de retraite par répartition. Alors que ce taux de dépendance s'établissait à 28,8% en 2016, soit près de quatre actifs pour un inactif, il pourrait avoisiner 50% dès 2050, soit deux actifs pour un inactif (Eurostat, 2016). En France, le constat est encore plus inquiétant dans la mesure où le taux de dépendance pourrait tendre vers 50% dès 2040. De plus, à l'heure actuelle, ce taux est déjà proche de 50% si l'on considère, pour calculer ce ratio de dépendance, les inactifs de 60 ans et plus (COR, 2010). Cette valeur élevée du ratio de dépendance s'explique par la présence d'un faible taux d'emploi des travailleurs seniors (55-64 ans) en France. En effet, le taux d'emploi des seniors est proche de 51% en 2017 alors que la moyenne de l'Union Européenne s'élève à 57% et que certains pays, comme la Suède, dépassent largement les 60% (Figure 1). Ce faible taux d'emploi des seniors engendre une privation de capital humain, et donc d'un potentiel de croissance, ainsi que la perte de cotisants potentiels au profit de l'augmentation du nombre de pensionnés. Ce phénomène vient donc renforcer le déséquilibre entre actifs cotisants et inactifs pensionnés.

Figure 1 – Taux d’emploi des 55-64 ans par Etat membre de l’UE, en 2017, en %

Source : Eurostat, 2017

Cet enjeu est majeur car il a des conséquences sur le solde financier du système de retraite français qui est alors déficitaire. Les dépenses du système de retraite atteignant 14% du PIB et les recettes 13,8%, les besoins de financement du système de retraite s’élèvent à 0,2% du PIB (COR, 2017). Selon les projections du COR (2017), il faudra attendre au minimum, c’est-à-dire avec un scénario favorable en termes de croissance économique, 2040 pour retrouver un équilibre financier du système de retraite français. Au regard de ce constat financier, réformer le système de retraite est de ce fait un enjeu de politique économique. Selon le rapport annuel du COR (COR, 2017), pour équilibrer financièrement le système de retraite chaque année jusqu’à 2070, trois mesures pourraient être prises dans un scénario de croissance économique annuelle de 1,3% :

- augmenter le taux de prélèvement de 1,3 point en 2070 par rapport à son niveau atteint avec une législation inchangée,
- baisser d’un point la pension relative moyenne,
- reculer l’âge effectif de départ à la retraite à 64,6 ans en 2070.

Ce recul de l'âge légal de départ à la retraite pourrait de plus entrer pleinement dans la *Stratégie Europe 2020* qui encourage l'accroissement du taux d'emploi et notamment celui des seniors. Pour autant, la mise en place de réformes utilisant des leviers efficaces pour encourager les seniors à se maintenir en emploi nécessite cependant d'identifier les déterminants individuels aux choix de départ à la retraite.

La littérature en science économique a porté un fort intérêt à l'identification des déterminants du choix de départ à la retraite. Ainsi, les modèles de cycle de vie (Seater, 1977; Bettendorf & Broer, 2003; Ljunqvist & Sargent, 2008; Hairault *et al.*, 2010) proposent d'analyser la décision de départ à la retraite comme un arbitrage coûts-bénéfices. Basés sur les modèles néo-classiques d'offre de travail, les modèles de cycle de vie considèrent que les agents arbitrent entre consommation et loisir, ce dernier étant défini comme le temps qui n'est pas consacré au travail. La particularité de ces modèles est donc de considérer que les agents maximisent leur utilité sur leur cycle de vie en considérant leur contrainte budgétaire inter-temporelle. En ce sens, la décision de départ à la retraite, considérée comme du loisir ici, est un processus qui dépend de plusieurs déterminants comme :

- les revenus du travail à chaque âge,
- le contexte institutionnel et notamment le montant de la pension retraite alloué à chaque âge,
- et les préférences individuelles pour la consommation et le loisir, qui évoluent dans un environnement non stationnaire.

L'impact de ces déterminants de la décision de départ à la retraite est donc considéré comme dépendant de l'âge. Les individus sont amenés à arbitrer entre leurs préférences pour le départ à la retraite et les conséquences financières de ce dernier, selon le contexte institutionnel. Le choix de convertir les préférences, ou intentions, pour le départ à la retraite en comportement effectif apparaît, ainsi, être le résultat d'une maximisation d'utilité sous contrainte (Becker, 1976).

D'autres approches théoriques ont cependant noté que les institutions pourraient avoir un poids beaucoup plus important que celui de simple déterminant comme dans les modèles de cycle de vie. En structurant le marché du travail, les institutions

pourraient réduire les véritables possibilités de choix de départ à la retraite pour certains seniors. La théorie duale (Doeringer & Piore, 1971) souligne notamment que le marché primaire est associé à des emplois stables avec des salaires élevés et que le marché secondaire est caractérisé par des emplois instables et faiblement rémunérés. Sur ce marché secondaire, les seniors pourraient donc répondre plus difficilement aux exigences du contexte institutionnel (comme la durée de cotisation). Les effets de leurs déterminants propres lors de la décision de départ à la retraite pourraient alors être atténués. Le départ à la retraite de ces seniors pourraient même être contraint, ne résultant alors pas réellement d'un choix individuel. Ces différents niveaux de contraintes auxquels peuvent faire face les individus motivent d'autant plus l'identification des déterminants individuels à la décision de départ à la retraite et la mesure de leurs effets.

Dans ce cadre, les modèles de cycle de vie soulignent l'importance de la relation entre comportements de départ à la retraite et contexte institutionnel. Deux dispositifs pour encourager les seniors en emploi émergent alors de ces modèles : les incitations financières à se maintenir en emploi et le recul de l'âge légal de départ à la retraite.

1. Le premier dispositif vient financièrement inciter les seniors à se maintenir en emploi. Il augmente alors le niveau de pension avec le report de l'âge effectif de départ à la retraite. La présence de ces incitations renforce donc la relation positive entre âge de départ à la retraite et barème de pension. Différer le départ à la retraite, ou ici la période de loisir, vient en ce sens augmenter les gains monétaires que peuvent espérer percevoir les agents à travers le cumul de revenus des périodes d'activité supplémentaires et un niveau de pension croissant avec le recul de l'âge de départ à la retraite. A cet égard, l'utilité des seniors à se maintenir en emploi est affectée par un effet substitution et peut donc se traduire par un report du départ effectif à la retraite (Stock & Wise, 1990).
2. Le second dispositif consiste à augmenter l'âge légal de départ à la retraite. Cette augmentation peut théoriquement produire un double dividende (Hairault

et al., 2010). Le premier effet positif de la mesure tient à une réponse mécanique à l'allongement de l'horizon à l'âge de départ *via* l'augmentation naturelle du nombre de cotisants et la baisse du nombre de pensionnés. Le second effet positif de la mesure passe par son caractère incitatif car, à travers l'allongement de la durée de carrière, ce report encourage les travailleurs seniors à s'investir dans la poursuite de leur carrière et incite les employeurs à embaucher et former ces derniers. Ces auteurs soulignent donc la présence d'un effet horizon à l'âge légal de départ à la retraite.

L'effet positif de ces dispositifs sur le maintien en emploi des seniors est conforté par une étude empirique majeure menée par Gruber & Wise (2007) dans 12 pays¹, dont la France. Cette étude a en effet évalué empiriquement la relation entre le contexte institutionnel et les comportements de départ à la retraite. En dépit de différences institutionnelles, économiques et culturelles, l'instauration d'incitations à se maintenir en emploi a un effet sur les comportements de départ à la retraite. La présence d'une causalité négative entre âge légal de départ à la retraite et décisions de départ à la retraite a notamment été soulignée, venant conforter les prédictions théoriques des modèles de cycle de vie. En moyenne, il est estimé que pour l'ensemble des pays considérés, un recul de 3 ans de l'âge légal de départ à la retraite entraîne une baisse de la proportion de seniors en dehors du marché du travail entre 23% et 36%.

Plusieurs pays ont alors réformé leurs systèmes de retraite en s'appuyant sur ces leviers. En France, trois réformes majeures, du fait de l'importance des modifications qu'elles apportent, ont, entre autres, utilisé ces leviers (tableau 1). La première est la réforme de 1993, dite réforme Balladur, qui avait pour objectifs d'inciter financièrement les seniors à se maintenir en emploi et de baisser le niveau de pension de ces derniers. Cette réforme concerne le régime général des salariés. La seconde réforme, dite réforme Fillon, date de 2003 et avait aussi pour visée d'inciter financièrement le maintien en emploi. Enfin, la troisième réforme majeure, appelée réforme Sarkozy, est celle de 2010 et avait principalement instauré un recul de l'âge légal de départ à la retraite.

1. Allemagne, Belgique, Canada, Danemark, Espagne, Etats Unis, France, Italie, Japon, Pays-Bas, Royaume Uni, Suède.

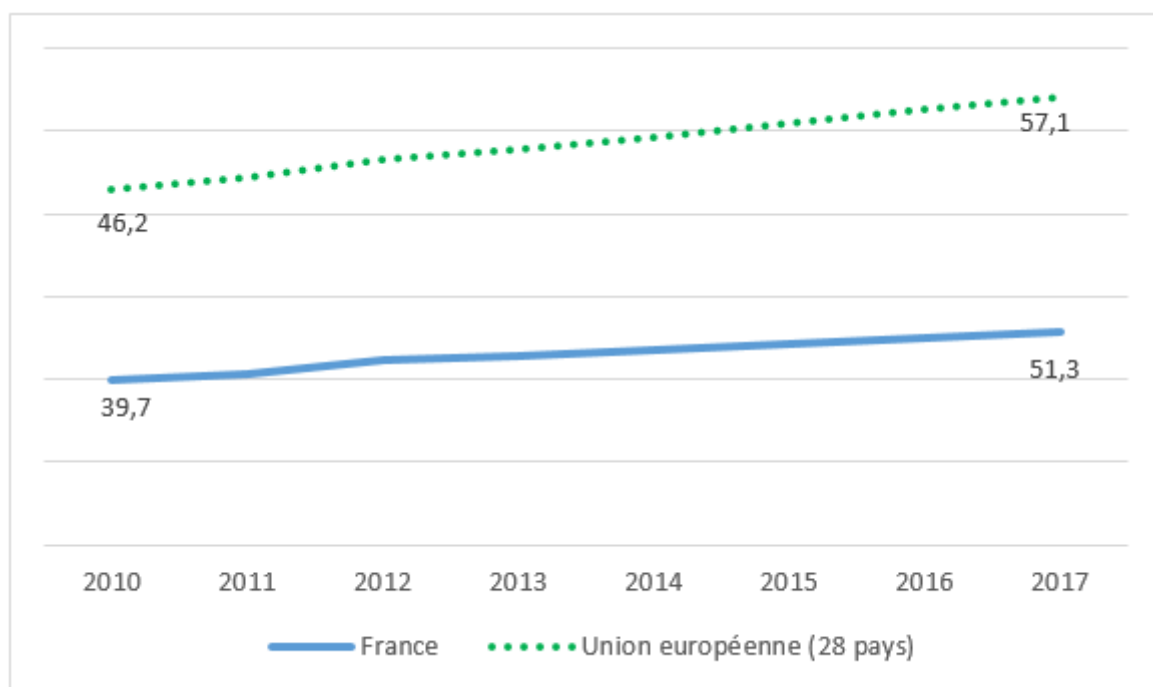
Table 1 – Présentation des réformes principales

Réformes	
1993	Allongement de la durée de cotisation nécessaire pour liquider sa retraite à
dite	taux plein (de 37,5 ans à 40 ans), c'est à dire sans décote du niveau de pension
"Balladur"	Application d'une décote de 2,5% par trimestre de cotisation manquant sur la pension liquidée (limité à 25%)
	Augmentation du nombre d'années de référence pour le calcul du salaire annuel moyen (des 10 meilleures années aux 25 meilleures)
	Modification de la réévaluation des pensions et des années de salaire passées (sur la base de l'évolution des prix, et non plus sur celle des salaires)
2003	Alignement de la durée de cotisation nécessaire pour les fonctionnaires sur
dite	celle des salariés du privé (40 ans)
"Fillon"	Allongement de la durée d'assurance d'un trimestre par an (41 ans en 2012) puis en fonction des gains d'espérance de vie (<i>prolongé par la réforme de 2014</i>)
	Instauration d'un dispositif d'incitation financière au maintien à l'emploi la surcote, qui augmente le niveau de pension de 1.25% par trimestre travaillé au-delà de la durée requise de cotisation pour le taux plein
	Réduction du taux de décote à 1,25% par trimestre manquant
	Création du dispositif de départ pour "carrières longues" (168 trimestres à partir de 56 ans)
2010	
Dite	Instauration d'un recul de l'âge légal de départ à la retraite de 60 ans à 62 ans
"Sarkozy"	

La mise en place de ces réformes s'est traduite par un report des âges effectifs de départ à la retraite (Bozio, 2010 ; Benallah, 2011), participant ainsi à l'accroissement du taux d'emploi des seniors entre 2010 et 2017 (Figure 2). Cependant, cette augmentation est inférieure à l'augmentation moyenne des pays de l'Union Européenne avec respectivement 23% contre 29%. Cela se traduit par le maintien, en France, du taux

d'emploi des seniors à un niveau qui est inférieur à la moyenne des pays de l'Union Européenne (respectivement 51% contre 57% en 2017).

Figure 2 – Taux d'emploi des 55-64 ans en France et dans les pays de l'UE (en %) entre 2010 et 2017

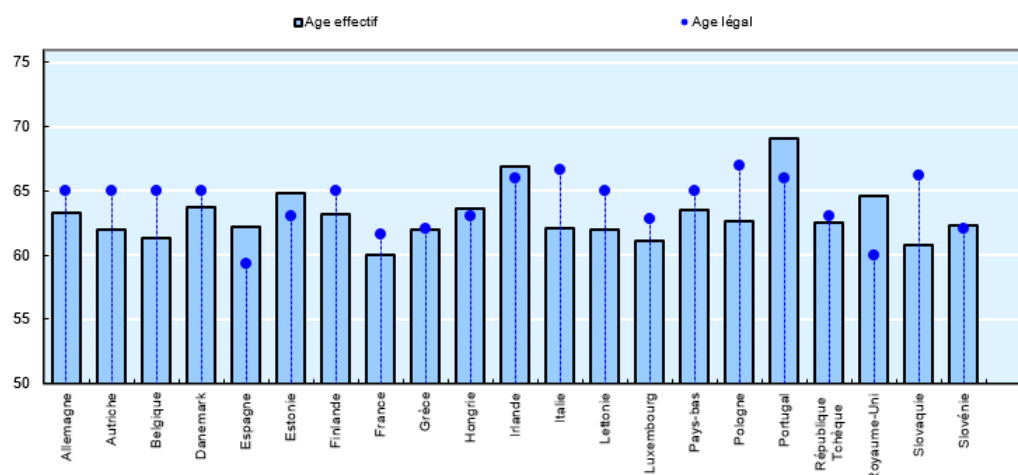


Source : OCDE, 2018

Ce constat questionne sur l'efficacité réelle des réformes mises en place ou le décalage entre l'effet théorique attendu et l'effet réel. Koubi & Dubois (2017) montrent notamment, pour le cas français, que le recul de l'âge légal de départ à la retraite de 60 ans à 62 ans s'est effectivement traduit par une baisse de la probabilité d'être à la retraite mais s'est aussi accompagné d'une hausse des recours aux dispositifs de chômage et aux autres formes d'inactivité. De plus, un rapport du COR (2015) souligne la part importante (30%) de personnes âgées de 60 ans qui se trouvaient, en 2013, dans une situation intermédiaire entre emploi et retraite (chômage, pré-retraite, inactivité). La figure 3, qui met en parallèle âge effectif et âge légal de départ à la retraite, montre aussi que plusieurs pays de l'Union Européenne, dont la France, sont concernés

par un âge effectif de départ à la retraite qui est inférieur à l'âge d'ouverture des droits.

Figure 3 – Ages effectifs de départ à la retraite pour les hommes dans certains pays de l'UE (2011-2016)



Source : OCDE, 2017

Finalement, l'efficacité relative des réformes du système de retraite en France peut s'expliquer par des facteurs portant à la fois sur l'offre et la demande de travail.

1. Du point de vue de l'offre de travail, cette faible évolution du taux d'emploi des seniors peut s'expliquer par la présence de dispositifs institutionnels autorisant les départs anticipés, c'est-à-dire avant l'âge d'ouverture des droits ou avant d'avoir acquis l'ensemble de ses droits à la pleine pension. En France, ces dispositifs de pré-retraite sont d'ailleurs communément utilisés puisqu'ils concernent, en 2012, 43% des pensionnés (Eurostat, 2014). En 2018, les dispositifs permettant de partir avant l'âge légal de départ à la retraite sont pour carrière longue, pénibilité au travail, environnement de travail avec de l'amiante et pour les catégories actives de la fonction publique (sous certaines conditions). D'autres dispositifs, dans le cadre de l'inaptitude ou du handicap, permettent de partir à l'âge légal de départ à la retraite sans décote, donc à taux plein, sans avoir la durée d'assurance requise pour le taux plein.

2. L'offre de travail des seniors peut aussi être affectée par le manque de confiance de la population envers le système de retraite. Selon l'enquête *d'opinion vis-à-vis du système de retraite*, réalisée en 2016 par la DREES, neuf français sur dix se disent inquiets quant à l'avenir du système de retraite. Ce constat peut notamment s'expliquer par la succession des réformes qui créent une incertitude des Français vis-à-vis de leurs conditions de départ à la retraite. Cette incertitude peut encourager les seniors à avoir recours à un départ anticipé pour se garantir certaines conditions lors du départ à la retraite, par exemple en termes de niveau de pension. En France, les seniors âgés de 50 à 59 ans sont d'ailleurs 57% à déclarer souhaiter partir le plus vite possible contre, par exemple, seulement 31% au Danemark (Blanchet & Debrand, 2005).
3. Au regard de la demande de travail, les seniors peuvent aussi faire face à des difficultés pour retrouver un emploi lors d'une période de chômage (Fougère, 2000), ce qui les inciterait à partir en retraite plus tôt. L'une des raisons évoquée comme étant à l'origine de ce phénomène est l'obsolescence des compétences des seniors qui font face à des difficultés pour s'adapter aux nouvelles compétences découlant notamment du progrès technique (Aubert *et al.*, 2006). En conséquence, l'obsolescence des compétences risque de diminuer la productivité marginale des seniors. Leur plus longue expérience professionnelle peut cependant se traduire par un salaire supérieur à leur productivité marginale (Lazear, 1979). Ce décalage attendu par les entreprises peut donc renforcer les pratiques discriminatoires basées sur l'âge dans leurs stratégies d'embauche et de formation de leurs salariés.
4. Enfin, la présence de l'effet horizon à l'âge légal de départ à la retraite (Hairault *et al.*, 2010) peut affecter à la fois la demande et l'offre de travail. Comme mentionné précédemment, cet effet horizon correspond au fait que les employeurs sont désincités à embaucher et former un travailleur senior du fait de sa proximité avec son âge légal de départ à la retraite. Le coût de l'investissement apparaît trop important pour l'employeur au regard des bénéfices qu'il pourra tirer de la période d'emploi du senior. A l'inverse, s'investir dans la recherche d'emploi et le développement de ses compétences peut s'avérer coûteux pour un travailleur senior qui approche de son âge légal de départ à la retraite. La faiblesse des inci-

tations financières à se maintenir en emploi peut décourager les seniors dans leur investissement professionnel en fin de carrière. Cela peut se traduire par l'utilisation d'autres dispositifs de sortie de l'emploi comme l'utilisation de transition *via* le chômage ou par le biais d'autres formes d'inactivités.

Le choix de la date de départ à la retraite, sous contrainte du contexte institutionnel, peut alors dépendre de leurs opportunités sur le marché du travail mais aussi de leurs propres préférences. Ce constat se retrouve dans le rapport du Conseil d'Orientation des Retraites de 2015 (COR, 2015) qui fait notamment émerger le rôle de déterminants autres que institutionnels lors de la décision de départ à la retraite. En effet, dans plus de 60% des cas, les raisons déclarées des départs à la retraite ne sont pas liées aux niveaux des pensions. Le contexte institutionnel apparaît alors comme un cadre dans lequel les individus choisissent leur âge effectif de départ à la retraite mais ce choix semble aussi dépendre de l'environnement propre à l'individu.

Différentes sources d'hétérogénéité possibles entre les individus pourraient alors intervenir dans le calcul inter-temporel coûts-bénéfices des seniors. La littérature a lancé plusieurs pistes sur les sources d'hétérogénéité pouvant affecter les comportements de départ à la retraite des seniors et notamment encourager les départs anticipés.

Hétérogénéité vis à vis de l'environnement professionnel

Au regard du faible taux d'emploi des seniors dans certains pays de l'Union Européenne, Clark *et al.* (2014) souligne le rôle de la qualité de vie au travail dans le choix du recours à un départ à la retraite anticipé.

La qualité de vie au travail est définie par l'Accord National Interprofessionnel sur l'égalité professionnelle et la qualité de vie au travail (ANI) comme étant "*les conditions dans lesquelles les salariés exercent leur travail, et leur capacité à s'exprimer et à agir sur le contenu de celui-ci, déterminent la perception de la qualité de vie au travail qui en résulte*". A l'échelle des individus, la qualité de vie au travail est donc un concept multidimensionnel dans la mesure où elle est déterminée par différentes dimensions de l'emploi auxquelles l'individu accorde les valorisations qui lui sont propre.

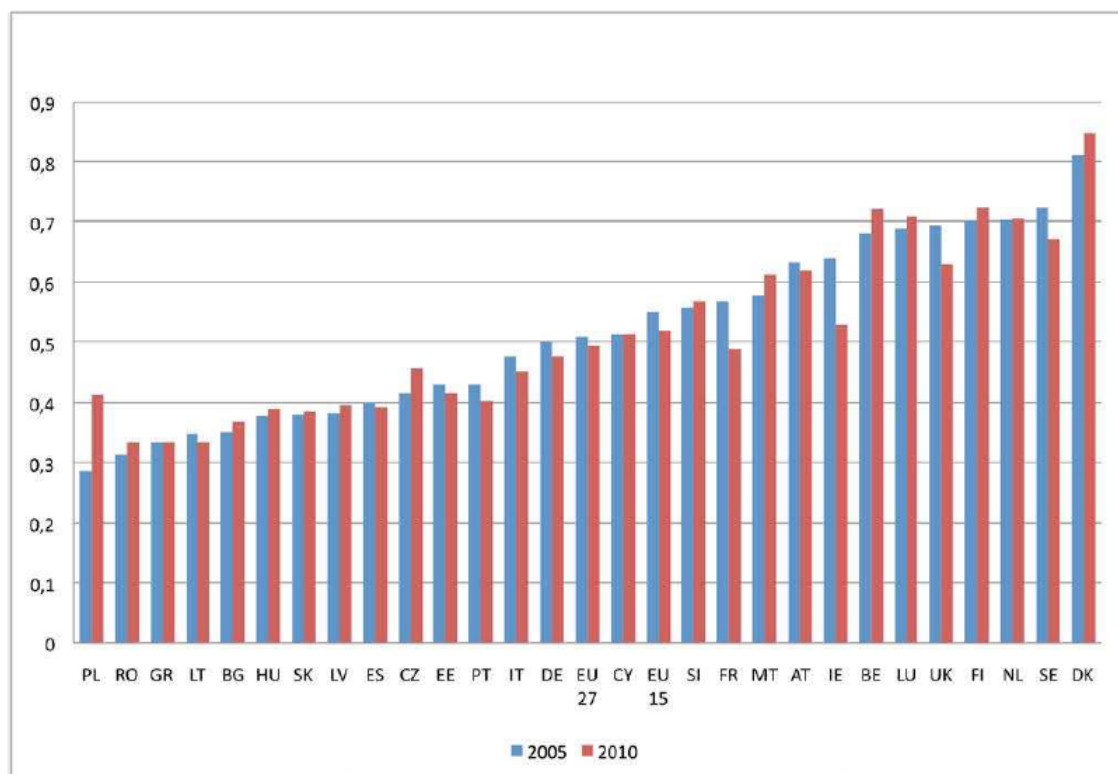
Le rôle de la qualité de vie au travail est aussi mis en avant par les objectifs de

politiques économiques européens puisque la *Stratégie de Lisbonne* pour 2010 a fait de l'amélioration de la qualité de vie au travail l'un des enjeux majeur pour promouvoir l'emploi. En effet, la *Stratégie de Lisbonne*, qui fait suite au Conseil européen de Lisbonne en mars 2000, visait à faire de l'Union Européenne en 2010 "*l'économie de la connaissance la plus compétitive et la plus dynamique du monde, capable d'une croissance économique durable accompagnée d'une amélioration quantitative et qualitative de l'emploi et d'une plus grande cohésion sociale*". La *Stratégie de Lisbonne* pour 2010 a ainsi fait de l'amélioration de la qualité de vie au travail l'un des enjeux majeur pour promouvoir l'emploi.

La figure 5, qui représente un indice de la qualité de vie au travail², souligne cependant la présence, entre 2005 et 2010, de déclin de la qualité de vie au travail dans plusieurs pays de l'Union Européenne (Erhel *et al.*, 2013) et cette tendance négative est particulièrement présente en France. L'étude réalisée par Erhel *et al.* (2013) fait aussi émerger que les seniors sont plus affectés par le risque de détérioration de leur qualité de vie au travail. Ce constat avait d'ailleurs déjà été mis en évidence par Clark (2005) qui soulignait que, au cours des années 90, les seniors étaient parmi les plus concernés par un déclin de la qualité de vie au travail au sein des pays de l'OCDE. Cela apparaît inquiétant au regard de l'enquête *Motivations de départ à la retraite*, réalisée par la DREES en 2016, qui questionne un échantillon de retraités sur les déterminants de leurs départs à la retraite. Les résultats de cette enquête montrent que les motifs liés à l'environnement professionnel sont des déterminants du départ à la retraite cités par les répondants (Benallah *et al.*, 2011). En effet, 12% des retraités interrogés en 2010 déclarent l'insatisfaction vis-à-vis des conditions de travail comme un motif qui a beaucoup joué lors de leur décision de départ.

2. Cet indice, à l'échelle des pays, repose sur l'agrégation de six dimensions de l'emploi qui sont le niveau de salaire, les formes d'emploi précaires (temps partiels imposés et contrats déterminés imposés), l'agencement du temps de travail (rythmes horaires, temps partiels volontaires et satisfaction vis à vis du temps travaillé), les conditions de travail (intensité, autonomie, dimensions physiques de l'emploi et sécurité), les perspectives de développement des compétences et de carrière ainsi que la représentation collective.

Figure 4 – Evolution entre 2005 et 2010 de l'indice de qualité de vie au travail dans l'Union Européenne



Source : Erhel et al, 2013

D'un point de vue théorique, en diminuant le bien-être procuré par l'emploi, une mauvaise qualité de vie au travail peut en effet renforcer les préférences pour le loisir, ici la retraite (Siegrist *et al.*, 2006 ; Clark *et al.*, 2014). Cette relation est analysée dans le modèle en trois phases de Beehr (1986). Dans ce dernier, la décision finale de départ à la retraite est conditionnelle aux préférences, qui sont, pour leur part, influencées par les caractéristiques individuelles et de l'emploi. La décision finale est alors le résultat de la maximisation d'utilité selon les préférences, contraintes et opportunités. A cet égard, l'hétérogénéité des individus en termes d'environnement professionnel affecterait les préférences pour le départ à la retraite des seniors. Le rôle du contexte institutionnel, explicité par les modèles de cycle de vie, se caractérise ici par le cadre que ce dernier offre et dans lequel les préférences sont contraintes, ou non, dans leurs réalisations.

En réponse au modèle en trois phases de Beehr (1986), les études empiriques réalisées se sont particulièrement focalisées sur la relation entre qualité de vie au travail et préférences pour le départ à la retraite (Schnalzenberger *et al.*, 2014; Blanchet & Debrand, 2007). La relation positive entre mauvaise qualité de vie au travail et intentions de départ à la retraite fait d'ailleurs consensus.

Cependant, en raison d'un manque de données, un nombre limité d'analyses ont porté sur la relation entre la qualité de vie au travail et les décisions de départ à la retraite (Clark *et al.*, 2014; Dal Bianco *et al.*, 2015). Il apparaît cependant que l'effet de la qualité de vie au travail sur les préférences est plus important que sur la décision finale de départ à la retraite (Dal Bianco *et al.*, 2015). Comme explicité par Beehr (1986), cela semble aller dans le sens d'un processus de décision séquentiel où le comportement effectif de départ à la retraite est conditionnel aux préférences.

Ainsi, le fait que la décision finale soit conditionnelle aux préférences, qui sont expliquées en partie par la qualité de vie au travail, impliquerait des déterminants au départ à la retraite différents en fonction des préférences. L'absence de prise en compte, par la littérature empirique, de ce processus de décisions ne semble donc pas permettre l'identification de l'ensemble des déterminants à la décision de départ à la retraite.

Le contexte institutionnel pourrait notamment affecter différemment les individus selon leur volonté ou non de quitter le marché du travail. Ainsi, si le contexte institutionnel ne contraint pas la conversion des préférences pour le départ à la retraite en comportements effectifs, cela pourrait se traduire par des départs anticipés. Cela risquerait donc d'affecter négativement le taux d'emploi des seniors. A l'inverse, si le contexte institutionnel contraint réellement la conversion des préférences en départ effectif, cela pourrait engendrer le maintien en emploi de personnes non satisfaites de leur qualité de vie au travail, et donc potentiellement démotivées, ce qui pourrait affecter la productivité des entreprises (Akerlof & Yellen, 1990; Altman, 2000).

Il apparaît donc que prendre en compte ce processus séquentiel de choix permettrait de capter l'effet de l'hétérogénéité des individus en terme d'environnement professionnel sur les comportements de départ à la retraite. Cette démarche est ainsi une piste pour

mieux comprendre les déterminants aux stratégies de départ à la retraite des seniors et notamment mieux appréhender le recours à des départs anticipés.

Hétérogénéité vis-à-vis de l'environnement familial

Parallèlement à la qualité de vie au travail, selon la littérature, la situation familiale de l'individu peut être à l'origine de départs anticipés à la retraite. Le rôle de la situation familiale dans la définition des comportements d'offre de travail a été largement étudié par l'économie de la famille (Chiappori, 1988, 1992, 1997; Bourguignon *et al.*, 1993, Alderman *et al.*, 1995). Dans ce cadre théorique, les décisions des individus en couple ne peuvent être analysées comme provenant d'un unique décideur en raison des interactions avec le partenaire, qui a ses propres préférences. Ces interactions entre les conjoints peuvent favoriser les effets de débordement, c'est-à-dire que la prise en compte de la situation du conjoint, entre les époux, affecte les stratégies individuelles de départ à la retraite (Coile, 2004). Dans le cas des couples, la décision de départ à la retraite pourrait alors être le fruit d'un processus de décisions collectives au sein du ménage en fonction des caractéristiques et du pouvoir de négociation de chacun des époux.

Du fait des interactions entre les époux, ces derniers maximiseraient leur utilité en considérant la situation de leur conjoint et la contrainte budgétaire du ménage. Trois mécanismes ont été identifiés dans la littérature (Hurd, 1990) comme pouvant conduire à une corrélation positive entre les dates de départ à la retraite des époux. Dans un premier temps, la présence de similarité des préférences entre les conjoints peut conduire à une valorisation similaire du loisir. Dans un second temps, les époux peuvent valoriser le temps de loisir partagé ensemble et donc faire preuve de complémentarité pour le loisir (Hurd, 1990). La préférence pour le loisir va alors être renforcée si ce temps peut être partagé avec le conjoint. Enfin, les chocs financiers sur les ressources du ménage peuvent influencer l'allocation des ressources au sein de ce dernier et créer des incitations à interagir (Chiappori, 1997).

L'enquête *Motivations de départ à la retraite* réalisée par la DREES en 2016 semble

supporter l'hypothèse selon laquelle les seniors tiennent compte de la situation de leur conjoint lors de la décision de départ à la retraite. En effet, 21% des retraités interrogés déclarent que le fait d'avoir un conjoint déjà retraité a été un déterminant de leur décision de départ à la retraite (Benallah *et al.*, 2011). Pour 12% d'entre eux, ce déterminant a été central lors de la décision. Plusieurs analyses économétriques sont venues confirmer la présence de ces départs joints au sein des ménages (Gustman & Steinmeier, 2000; Hospido & Zamarro, 2014). Cette présence d'un processus de décisions jointes au sein des couples implique donc la nécessité de considérer l'hétérogénéité familiale lors de l'analyse des comportements de départ à la retraite.

Pourtant, la littérature souligne la présence de fortes asymétries de comportements entre les conjoints. Dans un premier temps, une explication possible à ces asymétries de comportements est la présence de *répartition traditionnelle des rôles* au sein du ménage (Talaga & Beehr, 1995; Dentinger & Clarkberg, 2002; Pozzoli & Ranzani, 2009). Dans cette configuration familiale, le mari est pourvoyeur d'une sécurité financière alors que la femme endosse le rôle de support psychologique et physique. La décision de départ à la retraite du mari exerce alors une forte influence sur celle de son épouse et ce, d'autant plus que ce dernier souffre de problèmes de santé (Johnson & Favreault, 2001; Dentinger & Clarkberg, 2002; Van Rijn *et al.*, 2014). En conséquence, les femmes seraient plus disposées à anticiper leur départ à la retraite pour suivre leurs maris.

Cette répartition traditionnelle des rôles au sein du ménage est toutefois remise en question dans la littérature du fait de carrières plus discontinues pour les femmes, réduisant ainsi leurs opportunités de pensions (Aliaga, 2005; Geraci & Lavigne, 2016). Les femmes sont en effet en moyenne moins âgées que leurs conjoints et partent donc plus jeunes que ces derniers lors d'une coordination des dates de départ. En fonction du contexte institutionnel et notamment de la présence de contraintes financières pour les femmes, les départs joints peuvent donc s'avérer coûteux pour ces dernières (Gustman & Steinmeier, 2000; Coile, 2004).

Le contexte institutionnel apparaît donc pouvoir jouer un rôle important dans la

définition des stratégies de départ à la retraite au sein des couples. Prendre en compte ce processus de décisions simultanées au sein des couples et dans différents environnements institutionnels pourrait donc permettre de mieux identifier les déterminants propres aux comportements des femmes et de leurs conjoints. Ainsi, la meilleure compréhension des asymétries de comportements qui en découlent apporterait une meilleure connaissance des mécanismes en action lors de la mise en place des stratégies de départ à la retraite au sein des couples.

De plus, du fait des interactions entre les conjoints et de leurs préférences pour les départs coordonnés, la mise en place d'une réforme pourrait s'accompagner d'effets directs mais aussi d'effets de débordement, *via* le conjoint, sur la stratégie de départ à la retraite de l'individu. Pourtant, peu d'études ont, à ce jour, mesuré les effets des réformes (Bloemen *et al.*, 2015 ; Stancanelli, 2017) sur les comportements de départ à la retraite au sein des couples. Dans une optique d'accompagnement des décideurs publics, considérer la sphère familiale lors de l'évaluation des politiques publiques apparaît donc être un sujet d'intérêt.

Problématique de la thèse et questions de recherche

La prise en compte des deux sources d'hétérogénéité des seniors, professionnelle et familiale, proposées par la littérature se présente comme un enjeu pour l'analyse des comportements de départ à la retraite de ces derniers. En effet, la qualité de vie au travail et les stratégies de coordination possibles au sein des couples semblent intervenir dans le processus de décision des seniors. Cependant, comme souligné plus haut, la littérature ne permet pas encore d'identifier l'ensemble des déterminants de la décision de départ à la retraite. L'identification de ces déterminants est pourtant d'un grand intérêt afin de guider les décideurs publics lors de la mise en place et lors de l'évaluation des politiques publiques.

Cette thèse a donc pour objectif de comprendre dans quelle mesure l'hétérogénéité des seniors, dans leurs environnements professionnels et familiaux, intervient dans le processus de départ à la retraite de ces derniers.

Pour répondre à cette problématique, ce travail de thèse est organisé autour de trois chapitres.

Le **premier chapitre** analyse le rôle de l'hétérogénéité des individus en termes d'environnement professionnel dans les comportements de départ à la retraite. En effet, ce chapitre propose d'étudier le processus de décision de départ à la retraite à travers deux étapes, lors desquelles la qualité de vie au travail intervient dans la définition des préférences pour la retraite qui sont, dans un second temps, mises en confrontation avec des contraintes, budgétaires et institutionnelles, lors de la prise de décision finale. Ce premier chapitre vise donc à mieux comprendre le processus de décision de départ à la retraite : d'une part, en identifiant les déterminants des préférences pour la retraite, et d'autre part, en estimant si le contexte institutionnel français vient actuellement ralentir le processus de conversion des préférences en décisions.

Le **second chapitre** considère, quant à lui, l'hétérogénéité des individus en terme de situation familiale en questionnant la présence d'un processus de décision au sein des couples. Ce dernier se caractérise par des stratégies de départs coordonnés entre les époux. Ce chapitre permet de mieux comprendre les mécanismes en action qui peuvent se traduire par des départs coordonnés grâce à l'identification des déterminants à la décision de départ à la retraite propres à chacun des conjoints. Cette identification est réalisée pour différents contextes institutionnels.

Dans la continuité du second chapitre, le **troisième chapitre** propose d'évaluer l'efficacité de la réforme française de 2010, qui recule l'âge légal de départ à la retraite, en intégrant la dimension collective du processus de décision de départ à la retraite au sein des couples. L'intégration du processus de décisions jointes permet d'identifier à la fois l'effet direct, induit par l'allongement de la distance à l'âge légal de départ à la retraite, de la réforme sur la décision de départ à la retraite de chacun des époux mais aussi de questionner la présence de potentiels effets de débordement de la réforme, *via*

le conjoint, sur la stratégie de départ à la retraite propre à chacun des conjoints. Ce chapitre mesure donc l'impact total de la réforme qui pourrait combiner un effet direct et un effet indirect qui est lié à la présence de décisions jointes au sein des couples.

Pour clore ce travail de thèse, le chapitre de **Conclusion** revient sur les principaux résultats de la thèse et en déduit, au regard des résultats obtenus au sein des trois différents chapitres de recherche, des pistes de recommandations en terme de politiques publiques. Les limites et perspectives à ce travail seront aussi discutées.

Données et méthodes

Pour répondre à la problématique de la thèse et donc analyser le rôle de l'hétérogénéité des seniors dans les comportements de départ à la retraite, une méthode empirique a été adoptée. Cette dernière se base sur les données des enquêtes Survey of Health, Ageing and Retirement in Europe (SHARE). Les enquêtes SHARE interrogent des individus de 50 ans et plus et contiennent des informations sur les caractéristiques socioéconomiques de ces individus et sur leur situation en emploi. Ces enquêtes ont notamment l'avantage de donner des informations sur l'environnement de travail des individus, leur satisfaction vis-à-vis de leur emploi et leurs intentions de départ à la retraite. Ces informations sont essentielles pour analyser le rôle de l'hétérogénéité en terme d'environnement professionnel dans les stratégies de départ à la retraite des seniors. De plus, les différentes enquêtes de SHARE offrent la possibilité de réaliser des analyses en panel, ce qui nous a permis de considérer le processus séquentiel de décision de départ à la retraite en identifiant les préférences pour le départ à la retraite et la conversion, ou non, en décision finale. Les enquêtes SHARE permettent aussi de prendre en compte l'hétérogénéité en terme d'environnement familial dans la mesure où il est possible d'apparier les membres d'un couple et donc d'obtenir des renseignements riches pour les deux conjoints. Les enquêtes étant réalisées à un niveau européen, cela offre aussi la possibilité de faire des analyses multi-pays. Il a donc été possible de considérer différents contextes institutionnels dans le cadre de notre analyse sur le rôle de la dimension familiale dans la définition des comportements de départ à la retraite des seniors.

Comme souligné précédemment, considérer le rôle de l'hétérogénéité des seniors dans les comportements de départ à la retraite implique de mener une analyse des processus de décision. Il a donc été nécessaire de mettre en place des modèles économétriques permettant d'analyser ces processus de choix.

L'analyse de la qualité de vie au travail dans le processus de décision de départ à la retraite (**chapitre 1**) a nécessité de considérer un processus de choix en deux étapes. La littérature a en effet souligné que la décision finale pouvait être conditionnelle aux préférences, en partie expliquées par la qualité de vie au travail. Pour ce faire, un nested logit model (Mc Fadden, 1978 ; Heiss, 2002) a donc été choisi. Ce modèle permet, en effet, de considérer le processus séquentiel en deux étapes du choix de la décision de départ à la retraite des seniors. Ainsi, les déterminants propres à chacune des étapes du processus sont identifiés.

La prise en compte du processus de décision au sein des couples (**chapitre 2**) a nécessité, quant à lui, de tenir compte de la simultanéité des choix de départ à la retraite entre les deux époux. Un modèle de probit bivarié (Heckman, 1981) a donc été mis en place afin d'estimer simultanément la probabilité d'être retraité de chacun des époux selon des caractéristiques propre à l'individu, au conjoint et au ménage. Ce modèle a également permis d'identifier la présence de corrélations entre les variables inobservables à l'origine de la coordination des départs à la retraite entre les époux.

Afin d'évaluer la réforme de 2010 en considérant la dimension collective de la décision de départ à la retraite au sein des couples (**chapitre 3**), il a été nécessaire d'identifier à la fois les effets directs et de débordement de la réforme sur la décision de départ des seniors. Une méthode de régression avec double discontinuité stricte (Imbens & Lemieux, 2008 ; Lee & Lemieux, 2010) a donc été mise en place. Nous testons donc ici la présence, ou non, d'un renforcement de l'effet individuel dû au fait d'avoir un conjoint concerné par le recul de l'âge légal de départ à la retraite.

Enfin, de manière transversale à tous les chapitres, une attention particulière et continue a été portée aux traitements des problèmes d'endogénéité qui peuvent entacher toute régression économétrique. Dans nos analyses, ce problème a reçu une attention particulière, notamment lorsque la qualité de vie au travail a été étudiée.

Chapitre 1

Retirement decisions and job quality : Opening the black box of choices

1.1 Introduction

In 2016, several European countries experienced employment rates for older workers of less than 50% (Eurostat, 2017). One of the explanations is the use of early retirement, or retirement occurring before the legal retirement age, which creates a negative trend in the employment rate and additional social costs such as a loss of potential social security contributions. For instance, in 2012, 43% of those receiving an old-age pension in France had taken early retirement (Eurostat, 2014). This is a problem as European pension systems are mostly pay-as-you-go (PAYG), depending on a balance between contributors and pensioners. According to Clark (2005), this common use of early retirement may be explained by poor job quality among older workers. In France, the Labour Ministry (DARES, 2011) showed that older workers who experienced consistently poor working conditions during their career were indeed less likely to remain employed than others (almost 65% compared to 75%). However, a slight decline in job quality was seen in European countries from 2005-2010 and has been particularly strong in France (Erhel *et al.*, 2013). If there is in fact a strong relationship between job quality, often measured in the literature through job satisfaction (Clark, 1998),

and retirement, this negative trend could hinder improvement in older workers' employment rates.

This issue has led to a growing number of studies on poor job quality as an important determinant of the decision whether to retire or not (Siegrist *et al.*, 2006; Schnalzenberger *et al.*, 2014; De Wind *et al.*, 2015; Böckerman & Ilmakunnas, 2017). The compensating wages theory (Smith, 1776; Rosen, 1974) claims that offering a higher wage to offset adverse working conditions could lead older workers to remain employed. However, Böckerman & Ilmakunnas (2009) find that very few cases offer full compensation. This lack of appropriate compensation leads older workers to arbitrate according to their relative preferences for job quality and financial incentives. Whereas job quality may affect preferences for retirement, meaning having retirement intentions or not, financial incentives may or may not encourage older workers to convert their intentions into effective retirement. In the theory of planned behaviours (Ajzen & Fishbein, 1977; Ajzen, 1991, Ajzen, 2005), the final decision may result from a process of choices passing first through intentions, with effective behaviour conditional on those intentions. Beehr (1986) and Feldman & Beehr (2011) use this theory to describe the retirement decision-making process. The authors develop a three-phase model of retirement decision-making. In the first step, individuals imagine their future retirement (activities, relationships, etc.) and compare this with their current employment situation¹. In the second step, older workers assess their desire to retire. According to these authors, those preferences for retirement are influenced by personal characteristics and the work environment. In the third step, constraints and opportunities then become part of actual retirement decision-making as they are set against preferences. As highlighted by rational choice models (Becker, 1976), the conversion from retirement intentions to decisions is expected if intentions are constructed on realistic expected outcomes (Ajzen, 2005; Solem *et al.*, 2016). At the same time, the institutional context that regulates behaviour must allow intentions to become actions. Conversely, conversion is expected to be low if preferences are challenged. The choice to convert intentions into effective retirement is therefore the result of utility

1. This step is difficult to measure in an empirical framework as it requires a rich dataset about the retirement expectations of individuals.

maximisation under constraints, leading to an effective retirement behaviour that is conditional on retirement intentions.

The empirical literature has examined some of the factors of this decision-making process. Several authors have analysed job quality as a determinant of retirement intentions (Schnalzenberger *et al.*, 2014; Kautonen *et al.*, 2012; Blanchet & Debrand, 2007). Schnalzenberger *et al.* (2014), using the Survey of Health, Ageing and Retirement in Europe (SHARE) and overall job satisfaction as a measure of job quality (Clark, 1998), show a strong positive relationship between low levels of overall job satisfaction and workers' intention to retire as early as possible. Also using SHARE data, Blanchet & Debrand (2007) find that job satisfaction is a significant determinant of the desire to retire as early as possible. All things being equal, individuals who are on the whole satisfied with their job are 16% less likely to want to retire as soon as possible. Dal Bianco *et al.* (2015) estimate that experiencing high job satisfaction decreases the desire to retire as soon as possible by about 19%.

While the impact of poor job quality on retirement preferences seems to be clear in the literature, few studies have focused on the role of job quality in effective retirement behaviour (Clark *et al.*, 2014; Schnalzenberger *et al.*, 2014) as insufficient data are available. Clark *et al.* (2014), using the panel scope of the Household, Income and Labour Dynamics in Australia (HILDA) survey and the British Household Panel Survey (BHPS), find that dissatisfied workers are 15% more likely to retire in the next period. Dal Bianco *et al.* (2015) examine the effect of poor job quality on the transition to retirement using SHARE data. High job satisfaction is associated with a lower probability (-2%) that men will go into full retirement. Therefore, when decisions and not only preferences are analysed, the effect size of job quality is less clear-cut. In particular, Dal Bianco *et al.* (2015) find that the effect of job quality is stronger on retirement preferences than on retirement decisions.

All these studies seem to support job quality being at least an indirect determinant of retirement decisions through retirement intention. This is even more likely since Solem *et al.* (2016) find, using panel data from the Norwegian Study on Life Course to estimate multinomial logistic regression models, a significant correlation between

retirement intention and behaviour within a five-year period. In that sense, while it appears clear in the literature that job quality affects retirement preferences, its effect on retirement decisions may take place during the conversion from intentions to decisions.

The choice to retire due to job quality thus seems to rise from a sequential process that moves through retirement intention. Only Böckerman & Ilmakunnas (2017) consider the relation between job quality and retirement decisions while taking into account retirement intention. However, their model does not capture the process dimension because it does not allow the presence of different determinants to retirement decisions conditional on the intentions that were first declared.

The empirical literature thus does not account for retirement decisions potentially resulting from a sequential process. Therefore, better understanding of the steps defining the retirement decision-making process is key to appreciating the determinants in action within each step. It is an important challenge to provide guidance to policy-makers and company managers. Indeed, job quality may affect preferences such that dissatisfied older workers may adopt early retirement behaviours, thus affecting the employment rate for older workers. Conversely, through the effects of their preferences, dissatisfied older workers remaining employed are likely to be less motivated, leading to a potential decrease in firm productivity (Akerlof & Yellen, 1990 ; Altman, 2000).

The aim of this study is therefore to capture the determinants of retirement behaviour considering the entire process of retirement decision-making. In particular, we test the role of job satisfaction or job quality on retirement intentions and examine the phenomenon of converting intentions to actual retirement. In Europe, France is concerned by both sizeable intentions to retire as soon as possible (57% of older workers in 2005) and a low employment rate for older workers (47% in 2014). Because of this specific French situation, we focus on France and use Waves 4 and 6 of the SHARE data². To capture the sequentiality of the retirement decision-making process, we estimate a nested logit model (Mc Fadden, 1978). This model allows us to consider older workers'

2. This paper uses data from SHARE Waves 4 and 6 (DOIs : 10.6103/SHARE.w4.611, 10.6103/SHARE.w6.611) ; see Börsch-Supan *et al.* (2013), Borsch-Supan (2018) and Börsch-Supan (2018b) for methodological details.

choices according to the option with the highest utility and find correlations among the choices by nesting them.

To this end, this study provides a better understanding of retirement decision-making through the entire process, from retirement preferences due to job quality to effective retirement decisions, as the empirical method captures the sequentiality of the process. Specifically, we can better understand the role of preferences and barriers such as institutional context in defining retirement decisions and to what extent measures set up to improve job quality or create barriers and opportunities may affect final retirement decisions.

The rest of the article is structured as follows. The next section presents the data and the descriptive statistics. Section 3 explains the empirical method and section 4 the results. Finally, section 5 concludes.

1.2 Data and descriptive statistics

France appears an interesting country to analyse the retirement decision-making process due to several issues the country is facing. First, France is an European country particularly concerned by intentions to retire as soon as possible. In 2005, 57% of the French population aged between 50 and 59 years old declared this desire, whereas this number was 43% in Sweden and Germany and only 31% for the Dutch population (Blanchet & Debrand, 2005). This is an interesting feature regarding the interest of this research as France also experienced a decrease in job quality between 2005 and 2010 (Erhel *et al.*, 2013). Finally, France is one of the European countries most concerned by a low employment rate for older workers, around 47% in 2014, as opposed to more than 57% in OECD countries and even 70% in Sweden (OECD, 2015). As supported by the literature (Schmalzenberger *et al.*, 2014; Blanchet & Debrand, 2007), this negative trend in job quality may explain some expectations about retiring earlier. If the retirement decision-making process is confirmed, the potential conversion of retirement intentions into effective behaviour may in turn explain in part the low

employment rate for older workers. This is thus a key issue for policymakers in France.

To focus on the effect of job quality in the retirement decision process, data from the Survey on Health, Ageing and Retirement in Europe (SHARE) are utilised. SHARE is well suited to assess this process as it includes data from people aged 50 years and up about their retirement intentions and employment status and quality. We match data from Waves 4 (2011) and 6 (2015) of this dataset. Wave 4 (2011) provides data on initial overall job satisfaction and intention to retire, and Wave 6 (2015) lets us identify participants' effective employment status four years afterwards. This four-year time period between both waves appears appropriate as Solem *et al.* (2016) find significant relations between retirement intention and retirement decisions within a five-year period.

We have selected data from French people aged 50 years and up³ who are employed as of Wave 4 (2011) to see their retirement decisions four years later (Wave 6, 2015).

3. Although the early retirement scheme has been revoked, there are still some special cases which allow early retirement : pension buyback schemes, disability, and long tenures in the same job.

Table 1.1 – Characteristics of the sample

Characteristics in 2011 (Wave 4)

VARIABLES	Overall	Women	Men
Gender distribution	747 (100%)	404 (54.1%)	343 (45.9%)
Average age	55.6	55.6	55.7
Status		100 % employed	
Retirement intention (1 = yes)	60.9%	57.1%	65.3%
Overall job satisfaction (1 = satisfied)	90.3%	90.6%	90.1%

Characteristics in 2015 (wave 6)

VARIABLES	Overall	Women	Men
Average retirement age	60.9	61.2	60.5
Status (1 = retired)	31.8%	28.7%	35.5%
Percentage of early retirement	26%	20.7%	31.1%

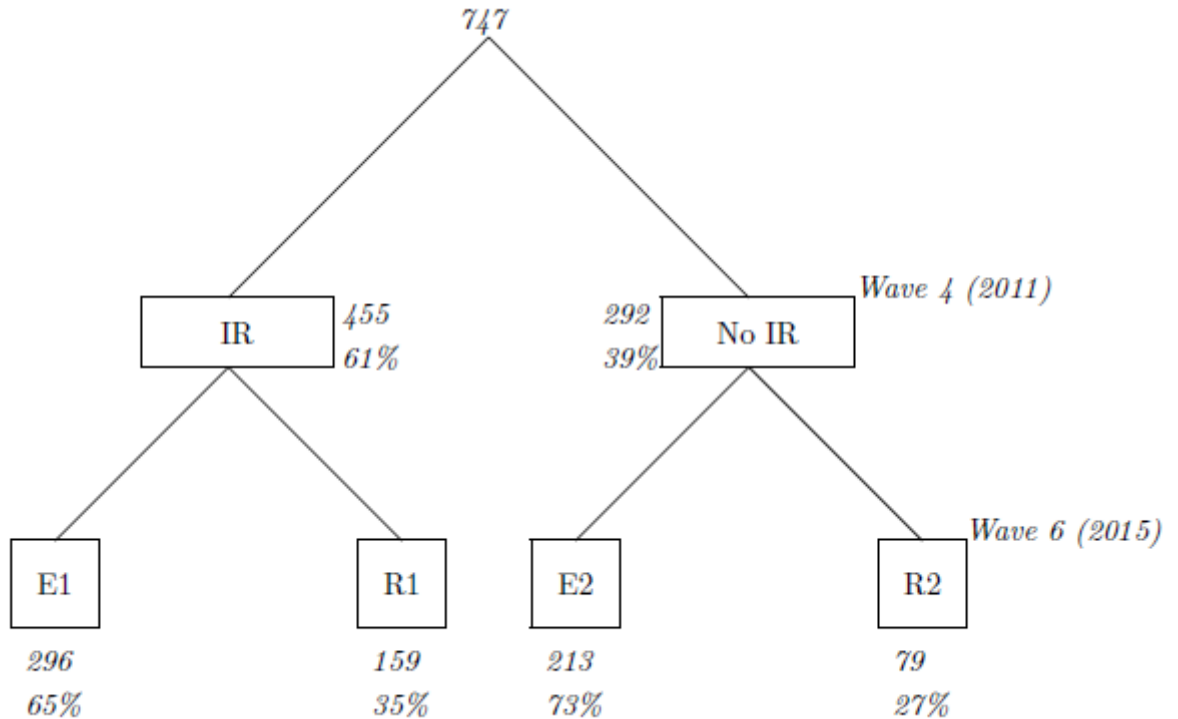
Source : SHARE Survey, Waves 4 (2011) and 6 (2015)

The final sample is thus composed (Table 1) of 747 older workers. In comparison with the general French older worker population (citealpINSEE2016), the percentage of women is slightly higher in our sample (54.1% vs 52 %). The average age in Wave 4 (2011) is 55.6 years and the average retirement age in Wave 6 (2015) is 60.9 years. The 2011 employment rates for older workers are similar for both the general population and the initial sample, at 41.4%. As sample characteristics of both groups are quite similar, the analysis should thus be representative of the population of French older workers.

SHARE data provide information about both retirement intention and retirement decisions. In Wave 4, the data show whether older workers are looking to retire or not. The intention variable is equal to one if workers are looking to retire and otherwise zero. Among our sample, 60.9% of workers declared retirement intentions. This is close to the intention rate in the general French population, while lower rates are found for other countries : 42.3% in Germany, 31.3% in Sweden and 32.8% in Denmark.

The employment status in Wave 6 is equal to one if older workers report being retired and are not working at the same time. The variable is equal to zero if older workers have remained employed since Wave 4. To appreciate the retirement decision-making process and especially the phenomenon of converting intention into effective retirement, we make a two-step analysis. In the first step, the determinants of retirement intentions are analysed. In the second step, conditional on those intentions, the determinants of the final retirement decision are identified. In that respect, older workers first choose between intention to retire (IR) or not (No IR). Then, conditional on their intentions, they decide to retire (R) or remain employed (E). As shown in Figure 1, the retirement decision-making process can therefore be presented as a tree diagram. The number of older workers in each situation is presented in italics next to each box.

Figure 1.1 – Retirement decision process within Waves 4 (2011) and 6 (2015)



Notes : IR represents intention to retire

No IR reflects no intention to retire

E1 and R1 represent, respectively, employed and retired situations, conditional on intention to retire

E2 and R2 are also employed and retired situations, conditional on no intention to retire

As people with retirement intentions may differ in their observable characteristics from those without, Table 2 combines observed characteristics with retirement intentions. With the same reasoning, these characteristics are also combined with the final retirement decision. Each first line is observed characteristics according to intention/decision. Each second line is for the share of intention/decision depending on observed characteristics.

Table 1.2 – Individual characteristics of the sample combined with the two steps of the process (intentions and decision)

VARIABLES	IR		No IR		R1		E1		R2		E2	
	Retirement intention	No retirement intention	Retired conditional on retirement intention	Employed conditional on retirement intention	Retired conditional on no retirement intention	Employed conditional on no retirement intention	Retired conditional on no retirement intention	Employed conditional on no retirement intention	Retired conditional on no retirement intention	Employed conditional on no retirement intention	Retired conditional on no retirement intention	Employed conditional on no retirement intention
Satisfied with overall job	85.5%* 57.6%**	97.9% 42.4%	84.2% 34.4%	85.1% 65.6%	98.7% 27.3%	86.1% 72.7%						
Low education level	15.4% 65.4%	12.6% 34.6%	22.6% 51.4%	11.4% 48.6%	17.7% 37.8%	10.7% 62.2%						
Medium education level	54.9% 64.1%	47.9% 35.9%	45.9% 29.2%	59.8% 70.8%	46.8% 26.4%	48.3% 73.6%						
High education level	25.0% 54.0%	33.2% 46.0%	25.1% 35.0%	25.0% 65.0%	30.3% 24.7%	34.2% 75.3%						
Health status <i>Poor perception</i>	19.1% 71.9%	11.6% 28.1%	20.7% 27.3%	18.2% 44.6%	15.1% 9.9%	10.3% 18.2%						
Distance (<i>in months</i>)	73.4	67.7	35.8	93.8	23.4	84.1						
Income (<i>in €</i>)	54 324	43 729	48 126	57 654	47 657	50 498						
Number of children	2.1	2.3	2.1	2.1	2.1	2.3						
Gender (<i>female = 1</i>)	50.7%	59.2%	46.5%	53.0%	53.1%	61.5%						
<i>Female</i>	57.2%	42.8%	32.0%	68.0%	24.3%	75.7%						
<i>Male</i>	65.3%	34.7%	38.0%	62.0%	31.1%	68.9%						
Married or domestic partnership	74.3% 60.8%	74.6% 39.2%	72.3% 34.0%	75.3% 66.0%	77.2% 28.0%	73.7% 72.0%						

Source : SHARE Survey, Waves 4 (2011) and 6 (2015)

 Note : *Among workers with retirement intentions, 85.5% are satisfied with their overall job.
 ** Among satisfied workers, 57.6% have retirement intentions.

Focusing on the first step of the process, meaning the choice between the intention to retire or not, older workers who report retirement intention (Table 2) are less educated than others⁴. Fewer career opportunities may explain this phenomenon. Moreover, human capital may have a protective effect against poor working conditions (Becker, 1964; ?). Older workers with less education could thus be more likely to experience difficult work environments and health problems, increasing their retirement intentions. This points to an endogeneity issue in that human capital may affect both job quality and retirement intention. This issue will be discussed in the empirical section. Self-perceived health (*Poor - Fair - Good - Very good - Excellent*) is also considered because a perception of poor health may affect the worker's ability to do their job (De Wind *et al.*, 2015). In our dataset, older workers with retirement intentions are also more affected by the perception of poor health (19.1% vs 11.6%).

In the second step of the final decision, life cycle models (Seater, 1977; Bettendorf & Broer, 2003; Ljunqvist & Sargent, 2008; Hairault *et al.*, 2010) support the notion that the institutional context may act as a barrier to retirement. Being further from the legal age of retirement encourages older workers to invest in their careers and firms to hire and train them. To appreciate this *distance effect*, a variable of the French institutional context is used at an individual level. We calculate the (time) distance to the legal age of retirement according to French law, taking into account the reforms of 2010 (Table 4 in the Appendix). The distance is equal to 0 if the person has reached or surpassed the legal age of retirement. The SHARE dataset provides the dates of the interview and the respondent's birth, so we can calculate this distance D_i^j precisely using the individual i 's birth month and year :

$$D_i^j = \text{legal age of retirement}_i^j - \text{age}_i^j \quad (1.1)$$

Individuals with retirement intentions are further from the legal age of retirement but tend to have a higher average income than individuals with no retirement intentions. In our descriptive statistics (Table 2), the distance effect supported by life cycle models

4. This variable is based on the International Standard Classification of Education (ISCED 1997) from UNESCO, with three categories : low (no, preprimary, or primary education), medium (lower secondary/secondary), and high (tertiary) education levels.

seems to be supported as the average distance is higher for employed individuals than retired ones.

In the sample, 61% of Wave 4 (2011) reported they were hoping to retire (Figure 1 and Table 1). Among those individuals, 35% were effectively retired in Wave 6 (2015). Among older workers with no retirement intention, 27% were retired in Wave 6.

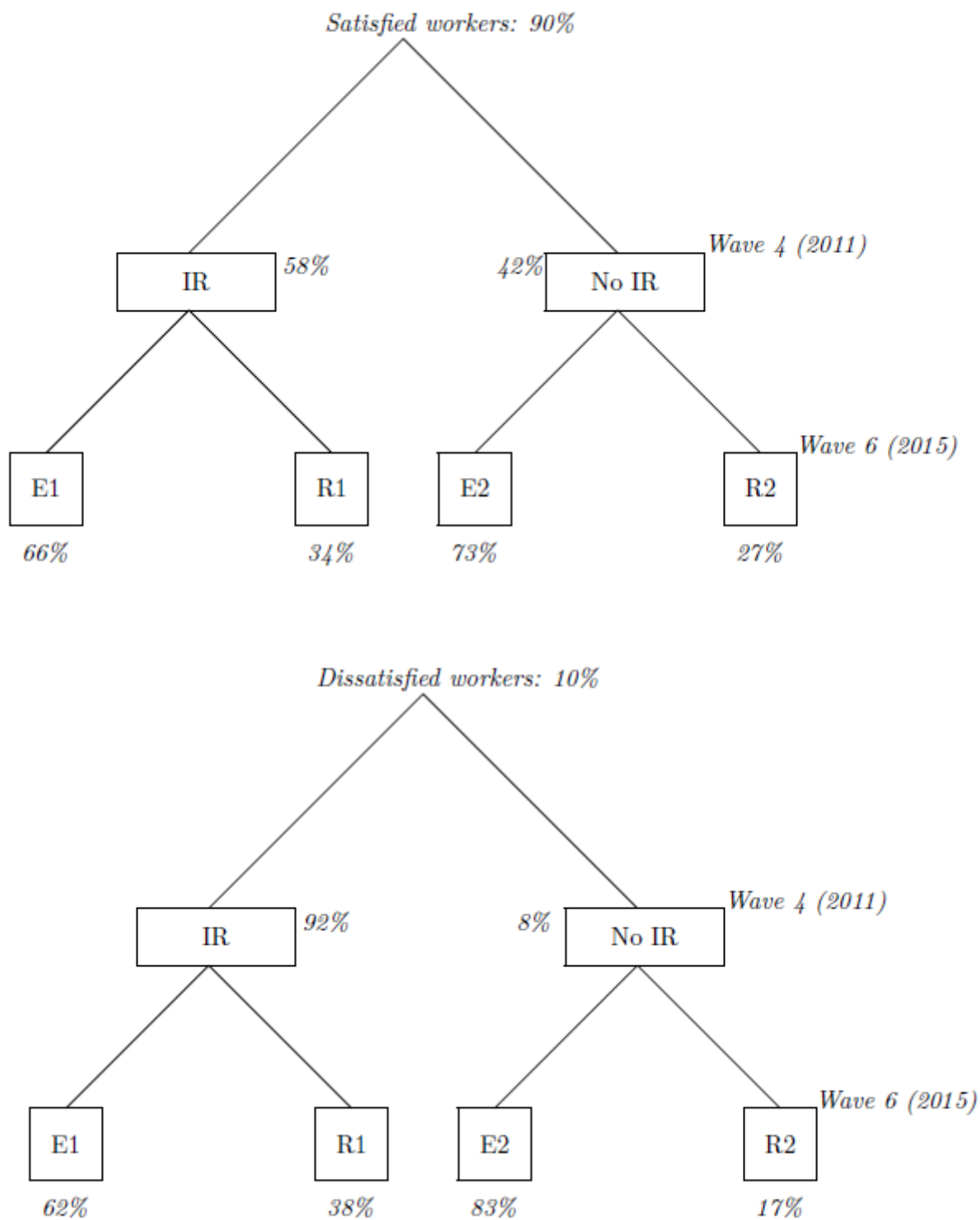
We now investigate whether the decision-making process changes due to job quality by comparing subsamples (Figure 3). Job satisfaction is used to measure job quality, as recommended in much of the literature. Indeed, job satisfaction summarises a great deal of information about jobs and provides information about worker's preferences (Clark, 1998). Locke (1976) provides a commonly used definition of job satisfaction : overall job satisfaction can be thought of as a weighted sum of job outcomes over the different aspects of the job. The weights are the job values, which refer to how much workers care about the different job outcomes (Clark, 2005). Job quality thus depends on both how much workers care about each job outcome and the jobs themselves.

In our data, older workers in Wave 4 (2011) were asked about their satisfaction with their main job⁵. They chose their level of overall job satisfaction according to the scale *strongly agree - agree - disagree - strongly disagree*. We aggregate this scale by dividing it in two levels : *satisfied (strongly agree + agree)* or *dissatisfied (disagree + strongly disagree)* with the job⁶. The variable of overall job satisfaction is therefore equal to one if workers are satisfied and zero if they are dissatisfied.

5. The main job is the current job held or, among several current jobs, the most important one.

6. Results are highly similar without aggregation, but this specification is selected because of the sample size.

Figure 1.2 – Rates of retirement intention in Wave 4 (2011) and retirement decisions in Wave 6 (2015) by overall job satisfaction



Notes : IR represents intention to retire

No IR means no intention to retire

E1 and R1 represent, respectively, employed and retired situations, conditional on intention to retire

E2 and R2 are also employed and retired situations, conditional on no intention to retire

In Wave 4, 90.3% of older workers were satisfied with their job overall (Table 1). Among dissatisfied older workers, 92% were seeking retirement, whereas only 58% of satisfied workers declared the same intention (Table 2 and Figure 3). This seems to show that job quality plays a role in defining preferences for retirement.

Among the 92% of dissatisfied workers with intentions to retire, 38% were effectively retired in Wave 6 (Figure 2), as opposed to 34% of satisfied workers looking to retire. Whereas we could expect that this rate of effective retirement for dissatisfied workers should be higher due to their motivation to retire quickly, it appears close to the rate of satisfied workers.

In order to test the presence of this retirement decision-making process and understand the constraints that hinder conversion from preferences to decisions, especially for older workers with retirement intentions, an econometric model is estimated.

1.3 Empirical method

Complementary to our descriptive statistics, we estimate a nested logit model (Mc Fadden, 1978; Heiss, 2002). This allows us to consider the retirement decision-making process as the result of a multi-step utility maximisation. In our case, we specify a two-level choice model that may be thought of as a tree structure (Figure 1). The choice between retirement intention (IR) and no retirement intention (No IR) is level 1. The next level, concerning retirement decisions conditional on intentions, is level 2. Older workers with retirement intentions decide between being retired (R1) and being employed (E1). Individuals with no retirement intention decide between the same alternatives (R2 and E2). In other words, individuals first report their intentions and then decide between being retired or employed.

The nested logit assumes that individuals have a utility level associated with each alternative and then choose the alternatives that provide the highest utility. If j and d respectively denote intentions (level 1) and decisions conditional on intentions (level 2), with $j = 1, 2$ and $d = 1_j, 2_j$, the two-level random utility is defined as :

$$U_{jd} = V_{jd} + \epsilon_{jd}$$

The nested logit model also considers the correlation of errors within each of the level 2 subgroups. Here, $(\epsilon_{iR1}; \epsilon_{iE1})$ are a bivariate correlated pair of error terms conditional on retirement intentions; $(\epsilon_{iR2}; \epsilon_{iE2})$ is also a bivariate correlated pair but conditional on no retirement intention. Therefore, the variance differs across the groups while maintaining the Independence from Irrelevant Alternatives (IIA) assumption within groups. The nested logit model assumes that error terms are distributed as in Gumbel's multivariate extreme-value distribution (Mc Fadden, 1978).

The probability of choice is therefore based on utility differences :

$$P_{jd} = P(y = d_j) = P(U_{jd} > U_{j-d}) = P(\epsilon_{j-d} - \epsilon_{jd} < U_{jd} - U_{j-d})$$

with the marginal choice probability for alternative d , which is :

$$P_{jd} = P_j \times P_{d|j} = \frac{e^{V_{jd}/\tau_{jd}}}{e^{IV_{jd}}} \times \frac{e^{\tau_{jd}IV_{jd}}}{\sum_{m=1}^{M_j} e^{\tau_m IV_m}}$$

where τ_m represents a measure of the mutual correlation of the error terms of all alternatives within this nest, as in $\tau_m = \sqrt{1 - \rho_m}$. Here, ρ_m is the correlation coefficient, so τ_m is an inverse measure of the correlation, called the dissimilarity parameter, and must be smaller than one. The parameter, τ_{jd} , is specific to the conditional choice probability of choosing alternative d .

The IV_m parameter defines the expected value of the utility individual i obtains from the alternatives in nest m such that :

$$IV_m = \ln \sum_{-d \in j} e^{V_{j-d}/\tau_m}$$

Finally, IV_{jd} is the utility the individual obtains from the conditional choice.

In order to find the determinants of each step, the deterministic terms V_{jd} of the utility function can be detailed such that :

$$U_{ijd} = Z_i^j \alpha_i + X_i^d \beta_{ij} + T'_{ijd} \gamma_{ijd} + \epsilon_{ijd}$$

where

- i indexes the individual ;
- Z_i^j is individual determinants for intention positioning ;
- X_i^d is individual determinants for retirement decisions conditional on intentions ;
- T'_{ijd} is alternative specific regressors defining the final choice.

As recommended in the literature (Clark, 1998 ; Schnalzenberger *et al.*, 2014), individual determinants for the first step of preferences for retirement Z_i^j comprise both the individual and job quality.

Concerning individual characteristics and with regards to the literature and descriptive statistics, self-perceived health (De Wind *et al.*, 2015) and education level (Becker, 1964) are introduced. As women in France are more likely to have discontinuous careers, gender is also included to measure the effect of career constraints on retirement preferences. Family situation is considered, as having a spouse may lead workers to look for joint retirement (Hurd & Mundaca, 1989 ; Chiappori, 1997) because of, for instance, complementarities for leisure. Finally, we take intergenerational ties into account. Older workers generally are not concerned with dependent children, but we introduce the presence of grandchildren as a potentially pertinent factor.

Overall job satisfaction is used to denote job quality (Clark, 1998). As in the literature (Blanchet & Debrand, 2007 ; Schnalzenberger *et al.*, 2014), job quality is assumed to be negatively related to intention to retire. As also highlighted in the literature and through descriptive statistical intuition, the fact that job quality is specific to individual evaluation leads us to suspect an endogeneity issue⁷. As previously seen,

7. A two-stage residual method (Terza *et al.*, 2008) is implemented to confirm the need to correct

job quality is a weighted sum of job outcomes, reflecting working conditions (Locke, 1976; Clark, 2005), so we propose an endogeneity correction using job outcomes. It is thus assumed, like Böckerman & Ilmakunnas (2017), that job outcomes only affect retirement intentions through job quality.

First, a logit model (Table 8 in the Appendix) is used to estimate overall job satisfaction. This estimation introduces five dimensions of job outcomes, identified by Warr (1999) and Clark (2005), as determinants of job quality. These dimensions are adequate earnings, future prospects (promotion and job security), how physical or stressful the job is, job content (interest, prestige, and independence), and interpersonal relationships. A nested logit model with endogeneity correction is then proposed (Table 3), using a two-step method. Predicted probabilities from the estimation of job satisfaction are used as an instrument, in order to isolate the effects of job outcomes. Note that the choice of a two-step correction method could be called into question as it is difficult to test the validity of our instruments (Murphy & Topel, 2002)⁸.

In the second step of the nested logit model, determinants denoting constraints are introduced to explain decisions. First, constraints related to the individual are introduced as the individual determinant for retirement decisions conditional on intentions (X_i^d). As mentioned in the literature (Hairault *et al.*, 2010), an individual's financial situation could facilitate retirement decisions, so income level in Wave 4 (2011) is included.

Constraints related to the institutional context are alternative specific regressors (T_{ijd}') defining final choice. Information about institutional context is introduced through the distance from the legal age of retirement and the penalty rate for early retirement. The latter is a lower pension level because of anticipated retirement that may act as a barrier to the retirement decision because of the financial costs it implies. Both variables differ according to the individual and the employment situation as they depend on the individual's year of birth and retirement date. The distance is calculated using the individual's birth cohort (see the descriptive statistics section) and will take the value

endogeneity for job quality (Table 9 in Appendix).

8. Using two steps to correct endogeneity may induce bias (Murphy & Topel, 2002) as imperfect probability prediction in the first step can introduce bias in the second step. However, endogeneity correction is not well appreciated in nonlinear models, and this limits how we can control robustness.

0 if the individual has retired. The penalty rate is calculated for each individual according to the 2003 reform (Table 5 in the Appendix) and employment status. In order to reflect how the penalty rate reduces pension levels, we simulate the individual pension penalty. To do that, a pension variable is created according to the average pension level, by gender, in the employment sector (COR, 2017; table 6 in the Appendix). The pension level is then combined with the penalty rate.

1.4 Results

We now turn to the results of the nested logit estimates (Table 3). We have chosen a nested logit model that assumes a retirement decision-making process. The LR tests for IIA (Table 3) show that dissimilarity parameters are significantly different and thus variances differ across nests. Nested logit models therefore appear to be appropriate as final decisions arise from a two-step choice process in which retirement decisions are conditional on retirement preferences. This result shows that the literature fails to consider the process of retirement decision-making by omitting the step of retirement preferences. Wald Chi-Squared tests confirm the global significance of our models (Table 3). The nested logit models we have implemented also appear to succeed in reflecting observed probabilities as predicted values are very close (Table 7 in the Appendix). The models as estimated are thus appropriate to capture individuals' choices. This two-step process allows us to identify the determinants of retirement preferences and constraints to conversion in the final retirement decision.

In the first step, the determinants of retirement intention (the nest "No IR" is used as the baseline here) are identified. First, our estimations show the impact of individual attributes as in the literature. Having a high level of education is negatively and significantly correlated with the probability of reporting the intention to retire. This supports the idea that having a high level of human capital protects workers from poor job quality (Table 8 in the Appendix) and is associated with more career opportunities. For their part, intergenerational ties increase retirement intentions and women appear to have integrated their need to work longer through the significant

and negative effect of being a woman. Self-perceived health condition appears to affect retirement intentions in the base model, but its direct effect is lost when we correct for endogeneity. The effect of health becomes indirect through job quality, highlighting the issue of health endogeneity.

Job quality is also a significant determinant of retirement preferences, and having good job quality is, as in the literature, associated with less intention to retire. Our results thus show that preferences due to job quality first determine the intention to retire and that retirement decisions are then conditional on retirement intention, as found by Beehr (1986) and Feldman & Beehr (2011). The effect of job quality on retirement intention remains significant with endogeneity correction⁹. However, the magnitude of the relationship is cut in half when endogeneity is corrected for (-1.9 as opposed to -0.7). This shows that unobserved heterogeneity affects both job quality and retirement intention. The effect of job quality results from not only individual differences but also work conditions. In terms of policy recommendations, this would imply that older workers may require special management techniques to limit retirement intentions.

To identify constraints to final retirement decisions, the analysis is then moved from intention to retirement decisions conditional on intention. Remaining employed conditional on having no retirement intention is used as the baseline here¹⁰. This situation has been chosen as it is the most neutral state regarding retirement decisions.

First, regarding individual constraints, income level does not appear to be a significant determinant of retirement. It is more the institutional context that affects final retirement decisions. As supported by life cycle models (Seater, 1977; Bettendorf & Broer, 2003; Ljunqvist & Sargent, 2008; Hairault *et al.*, 2010), an important barrier to retirement decisions is the time distance to the legal retirement age. This indeed has a significant and negative effect on the probability of being retired. Regarding penalty rate, the effect is positive on retirement probability. At first glance, this does not seem intuitive but may be explained by the weak consequences of the penalty rate on pension amounts as, on average, individuals lost 10€ of their monthly pension. This

9. The two-stage residual method (Terza *et al.*, 2008) confirms that an endogeneity correction is needed as residuals of the logit model are significant in the based nested logit estimation (Table 9 in the Appendix).

10. This baseline choice does not modify results.

appears insufficient to discourage older workers from retiring. Moreover, the sustained pace of retirement reforms in France has led older workers to fear a tightening of eligibility rules (Blanchet & Debrand, 2007). The relatively low cost of early retirement combined with the wish to protect themselves from expected reform mean that preferences for retirement are expressed in effective retirement. Therefore, the current policy appears not to be effective in keeping older workers employed.

Table 1.3 – Nested logit - Retirement decision-making process by job quality in France

VARIABLES		
<i>Retirement Decisions</i>	Base model	Corrected for endogeneity
Pension * reduced rate	0.034* (0.020)	0.032* (0.018)
Distance from the legal age of retirement	-0.027* (0.014)	-0.030* (0.015)
<i>Retirement intention</i>		
No IR - $P(\text{no intention})$ - Baseline		
IR - $P(\text{intention})$		
Overall job satisfaction	-1.990*** (0.442)	
Predicted overall job satisfaction		-0.711*** (0.090)
Medium education	0.097 (0.224)	0.243 (0.222)
High education	-0.288 (0.252)	-0.522** (0.253)
Health status	0.277*** (0.089)	-0.021 (0.099)
Number of grandchildren	0.081 (0.062)	0.136** (0.064)
Gender (<i>female = 1</i>)	-0.491*** (0.168)	-0.420** (0.167)
Married or domestic partnership	-0.052 (0.205)	-0.154 (0.206)
<i>Retirement decisions conditional on intention</i>		
R1 - $P(\text{retired} \text{intention})$		
Income1	-0.379 (0.0.313)	-0.458 (0.319)
Income2	-0.319 (0.311)	-0.156 (0.316)
Income3	-0.211 (0.310)	0.007 (0.311)
Constant	1.877** (0.726)	1.641** (0.650)
E1 - $P(\text{employed} \text{intention})$		
Income1	-0.269 (0.263)	-0.356 (0.269)
Income2	-0.201 (0.274)	-0.068 (0.281)
Income3	-0.304 (0.302)	-0.078 (0.297)
Constant	2.636*** (0.657)	2.552*** (0.541)
R2 - $P(\text{retired} \text{no intention})$		
Income1	-0.533 (0.413)	-0.638 (0.452)
Income2	-0.375 (0.452)	-0.468 (0.492)
Income3	-0.441 (0.489)	-0.367 (0.481)
Constant	0.292 (0.327)	0.236 (0.325)
E2 - $P(\text{employed} \text{no intention})$ - Baseline		
<i>Dissimilarity parameters</i>		
τ_{NoIR}	-0.758* (0.434)	-0.817* (0.448)
τ_{IR}	-0.505* (0.278)	-0.557* (0.290)
LR test for IIA ($\tau = 1$)	Chi2(2)=23.69	Chi2(2)=25.64
Prob > Chi2	0.000	0.000
Observations	747	747
Wald Chi2(21)	48.07	88.86
Prob > Chi2	0.000	0.000
Log likelihood	-694.834	-719.086

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source : SHARE Survey, Waves 4 (2011) and 6 (2015)

1.5 Conclusion

The aim of this study was to test the effects of job quality on the retirement decision-making process. A two-step choice process, where retirement decisions are conditional on retirement preferences, was implemented. We focused on France and used Waves 4 (2011) and 6 (2015) of SHARE data. To take into account the sequentiality of the retirement decision-making process, we estimated a nested logit model (Mc Fadden, 1978) that allowed us to identify the two steps : preferences for retirement and then the final retirement decision.

Our results confirm the presence of a two-step retirement decision-making process : final retirement decisions are conditional on retirement preferences. Considering the entire process of retirement when analysing the effect of job quality on retirement decisions is therefore needed to better understand retirement behaviour.

The first step of the process captures the determinants of retirement preferences. We found job quality to be a significant determinant of retirement preferences. Job quality thus has an indirect effect on final retirement decisions and the effect remains significant with endogeneity correction, although this process cuts the effect of job quality on retirement intentions in half as several dimensions of job outcomes have a significant effect on job quality. This shows that retirement preferences are the result of not only individual heterogeneity but also working conditions.

The second step of the process allows us to identify constraints to the conversion of preferences into effective retirement decisions. Final retirement decisions appear not to depend on the individual financial situation but rather on the institutional context. The time distance from the legal retirement age is a barrier to the effective conversion of retirement intentions into retirement decisions. Indeed, a distance effect is found : being further from the legal age of retirement decreases the probability of being retired. The presence of a pension penalty rate also affects final retirement decisions but appears not sufficient to discourage the conversion of retirement preferences. Therefore, institutional mechanisms affect older workers' choices as both increasing the distance

to the legal retirement age and the penalty rate decrease the probability of being retired. However, when older workers remain employed despite dissatisfaction, this could lead to a decrease in their productivity (Akerlof & Yellen, 1990 ; Altman, 2000). Regarding the effect of working conditions, promoting special management for older workers including training or adaptation of workstations could be a key issue for consideration.

In conclusion, our results show a retirement decision-making process in two steps : final retirement decisions are conditional on retirement preferences. The latter are affected by job quality through individual heterogeneity and working conditions. However, conversions of retirement intentions are hindered by the institutional context. In order to limit the negative effect on productivity of having dissatisfied older workers, policymakers could not only implement public policies at an individual level but also act on working conditions by promoting special management for older workers.

Finally, these results may mean that older workers are experiencing what is called a *Matthew Effect* (Merton, 1968) in the economics of science literature : Those with poor overall job satisfaction or job quality also appear to be those with the most difficulties to retire, despite their higher retirement intentions.

Appendix

Legal rules

Table 1.4 – Rules for calculating the legal age of retirement

Legal age	Months	Birth cohort
60	720	Before July 1951
60, 4	724	1 July 1951 - 31 December 1951
60, 9	729	1952
61, 2	734	1953
61, 7	739	1954
62	744	1955

The reduced rate affects individuals who have retired without having reached the legally required number of quarters (165 quarters) unless they retired after the full pension age (67 years). However, the pension level still is reduced *prorata* to the number of quarters contributed.

Table 1.5 – Rules for calculating the reduced rate

Birth cohort	Reduced rate
1946	2.125%
1947	2.000%
1948	1.875%
1949	1.750%
1950	1.625%
1951	1.500%
1952	1.375%
After 1952	1.250%

Table 1.6 – Rules for calculating the pension level

Sector	Average pension level in €	
	<i>Women</i>	<i>Men</i>
Employee	900	1670
Civil servant	2120	2550
Self-employed	500	1000

Source : COR, 2017

Empirical results

Table 1.7 – Observed and predicted probabilities

Alternatives	Observed	Predicted - Base model	Predicted - endogeneity correction
<i>Retirement intention</i>			
No IR - $P(\text{no intention})$	39.1%	39.2%	39.2%
IR - $P(\text{intention})$	60.9%	60.8%	60.8%
<i>Retirement decisions conditional on intention</i>			
R1 - $P(\text{retired} \text{intention})$	21.3%	20.6%	20.5%
E1 - $P(\text{employed} \text{intention})$	39.6%	40.1%	40.2%
R2 - $P(\text{retired} \text{no intention})$	10.6%	10.8%	10.9%
E2 - $P(\text{employed} \text{no intention})$	28.5%	28.5%	28.4%
Observations	747	747	747

Source : SHARE Survey, Waves 4 (2011) and 6 (2015)

Table 1.8 – Logit - Overall job satisfaction

VARIABLES	
Number of grandchildren	0.073 (0.059)
Gender	0.365** (0.149)
Married or domestic partnership	-0.059 (0.171)
Medium education	0.349* (0.199)
High education	-0.507** (0.222)
Health status	-0.626*** (0.102)
Afraid health limits ability to work	-1.293** (0.521)
Self-perceived health * health limits	0.242 (0.156)
Job physically demanding	-0.060 (0.156)
Time pressure	-0.294** (0.143)
Little freedom	-0.599*** (0.138)
Develop skills	1.348*** (0.156)
Receive support	0.726*** (0.151)
Receive recognition	1.143*** (0.171)
Adequate earnings	-0.222 (0.161)
Prospect for job advancement	-0.733*** (0.182)
Job security	-0.288 (0.184)
Constant	3.371*** (0.502)
Observations	747
Log pseudolikelihood	-699.866
Pseudo R2	0.261
Wald chi2	301.50
Prob > chi2	0.000

Robust standard errors in parentheses

Source : SHARE Survey, Waves 4 (2011) and 6 (2015)

Table 1.9 – Nested logit - Retirement decision-making process by job quality in France

VARIABLES	
<i>Retirement Decisions</i>	Two-stage residual inclusion
Pension * reduced rate	0.034* (0.019)
Distance to the legal age of retirement	-0.031** (0.015)
<i>Retirement intention</i>	
No IR - $P(\text{no intention})$ - Baseline	
IR - $P(\text{intention})$	
Overall job satisfaction	-3.148*** (0.480)
Medium education	0.237 (0.222)
High education	-0.473* (0.253)
Health status	0.004 (0.101)
Number of grandchildren	0.128** (0.063)
Gender (<i>female = 1</i>)	-0.437*** (0.168)
Married or domestic partnership	-0.133 (0.205)
Residual	0.554*** (0.094)
<i>Retirement decisions conditional on intention</i>	
R1 - $P(\text{retired} \text{intention})$	
Income1	-0.450 (0.325)
Income2	-0.186 (0.321)
Income3	-0.063 (0.315)
Constant	2.546*** (0.761)
E1 - $P(\text{employed} \text{intention})$	
Income1	-0.325 (0.268)
Income2	-0.096 (0.283)
Income3	-0.144 (0.297)
Constant	3.487*** (0.673)
R2 - $P(\text{retired} \text{no intention})$	
Income1	-0.646 (0.453)
Income2	-0.508 (0.513)
Income3	-0.372 (0.486)
Constant	0.248 (0.337)
E2 - $P(\text{employed} \text{no intention})$ - Baseline	
<i>Dissimilarity parameters</i>	
τ_{NoIR}	-0.854 (0.451)
τ_{IR}	-0.582 (0.293)
LR test for IIA ($\tau = 1$)	Chi2(2)=26.45
Prob > Chi2	0.000
Observations	747
Wald Chi2(21)	83.17
Prob > Chi2	0.000
Log likelihood	-718.120

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source : SHARE Survey, wave 4 (2011) and wave 6 (2015)

Chapitre 2

Should I stay or should I go ? An econometric analysis of retirement decisions by couples

This chapter is co-written with B. Legendre and M. Sabatier and published in "Applied Economics" (2018).

2.1 Introduction

The aging of the population and growing doubts about the sustainability of public pension systems have led to several reforms, designed to increase the entitlement retirement age in most developed countries. The success of such policies depends on how people respond to changes in their pension eligibility.

According to life cycle models (Seater, 1977; Bettendorf & Broer, 2003; Ljunqvist & Sargent, 2008; Hairault *et al.*, 2010), postponing the legal age of retirement should reduce the distance effect automatically, thus producing a double dividend. That is, by extending the horizon to retirement age, this policy incites workers to delay their retirement and then incites firms to keep and train older workers for longer.

In reality though, several factors may limit these effects. Cox & Jimenez (1990) demonstrate that the full impact of programs for older workers can be assessed accurately only by taking the behaviors of all other family members into consideration. Accor-

ding to the economics of the family (Chiappori, 1988, 1992, 1997; Bourguignon *et al.*, 1993, Alderman *et al.*, 1995), no individual is a single decision maker, because interactions always take place among various household members with different preferences. These interactions seem particularly important between spouses, especially following the rise of female labor participation and the growth of dual-earner families in developed countries. Interactions between spouses, reflecting both income effects and leisure complementarities, suggest the possibility of spillover effects on the retirement strategies of older workers (Hurd, 1990). Spouses likely time their retirement closely together, leading to *joint retirement* trends among couples (Blau, 1998; Gustman & Steinmeier, 2000, 2014).

Omitting this family context could lead to overestimations of the impact of retirement eligibility rules on retirement decisions (Hospido & Zamarro, 2014). For example, Li & O'Donoghue (2011) report that in Ireland, increasing the minimum age for state pension entitlement from 65 to 70 years would delay retirement by about 1.8 years, according to an individual-based model, but by only about 0.5 years if intra-household interactions are considered. A better understanding of these retirement behaviors by couples thus might provide better guidance for policy makers (van der Klaauw & Wolpin, 2005; Blau & Gilleskie, 2006).

Despite growing literature that studies such joint retirement by spouses, no consensus is available regarding the magnitude of this phenomenon, its determinants, or the potential gender-based asymmetry in retirement behavior (Coile, 2004; Holtmann *et al.*, 2006; Bingley & Lanot, 2007). Men and women respond differently to their household's characteristics and environment (Blau, 1998; Stancanelli & Van Soest, 2012), and determinants of joint retirement also depend on each country's specific social security system (Gustman & Steinmeier, 2004). For example, the basic pension scheme, or pension first pillar (Coile, 2015; Atalay & Barrett, 2016), exerts a powerful effect. In Europe, three main types of first pillars coexist.

First, the Beveridgian welfare state bases pensions on taxes (mainly in Anglo-Saxon and some northern European countries). Second, inspired by a Bismarck view, another first pillar defines earnings-related pensions (e.g., continental Europe). Third, for a first pillar based on notional accounts (e.g., Sweden), each individual invests some

capital that gets converted, at retirement, into an annuity that depends on the retirement age and life expectancy. Different first pillars imply different contributions of the insured. Therefore, a particular pension scheme design might be particularly conducive to individualized decisions or not and thereby affect joint retirement decisions. The basic pension in traditional Beveridgian models is not contributive, which implies less individualized decisions. A basic pension could favor retirement if the amount is sufficient (Banks *et al.*, 2010). With their basis in insurance principles, Bismarckian systems link contribution effort to benefits, which makes those pension schemes a bit more individualized, though joint retirements still could occur, depending on the potential financial support for the couple by a working spouse, which allows the first spouse to take an eligible pension (Stancanelli & Van Soest, 2012). Finally, pension systems based on individual notional accounts clearly are designed to favor individual choices (Selin, 2012).

Regardless of which is the first pillar of a pension system, its operation can be disturbed by other areas of the social system, such as the health care system or family policies. For example, older workers tend to have higher expected medical expenditures (Kapur & Rogowski, 2007, Coe & Zamarro, 2011), so good health policies can offer appropriate solutions if one spouse falls ill, including benefits to favor early retirement or home-based care options.

In this context, this article seeks to analyze the joint retirement process for couples in a multi-country setting. We test not only if joint retirement exists, after accounting for all other factors that might explain retirement decisions, but also whether the potential for joint retirement differs according to the rules imposed by distinct social security systems and pension schemes. To consider those differences, we thus turn to micro-econometric analyses within countries (Gruber and Wise, 2002). This also allows us to embed reform programs which are specific to each country and potential differences in spouses' response to a given incentive across countries.

To do so, we turn to the SHARE survey¹ which describes couples and their retirement

1. This paper uses data from SHARE Waves 5 (DOIs : 10.6103/SHARE.w5.500), for methodological details, see Börsch-Supan *et al.* (2013 Börsch-Supan *et al.* (2013), 2015 Börsch-Supan *et al.* (2015)) and Malter and Börsch-Supan (2015 Malter & Börsch-Supan (2015)). The SHARE data collection was funded primarily by the European Commission through FP5 (QLK6 - CT - 2001 - 00360), FP6 (SHARE - I3 : RII - CT - 2006 - 062193, COMPARE : CIT5 - CT - 2005 - 028857, SHARELIFE : CIT4 - CT - 2006 - 028812) and FP7 (SHARE - PREP : Nř211909, SHARE - LEAP : Nř227822, SHAREM4 : Nř261982).

decisions across several countries. We focus attention on three : Denmark, France, and Sweden. These countries present some similarities but also distinct social security systems, which makes the comparison of households' behaviors in these three countries relevant for testing the joint retirement hypothesis. For example, Denmark, France, and Sweden all score relatively high on gender equality, compared with other European countries (Mills et al., 2014a ; Mills et al., 2014b). They all reach the Lisbon target in terms of female employment rate (60%) and have relatively more equal earnings structures than other European countries. On the social policy side, Denmark, France, and Sweden also have embraced relatively equilateral and generous approaches. Finally, all three countries have adopted a pay-as-you-go pension system. Yet we also observe key differences in the first pillar. The Danish pension system is based on a basic pension, financed by general tax revenues and reduced for high income earners. Denmark thus seems to adopt a Beveridge view. French retirees instead receive an earning-related public pension, complemented by a compulsory occupational pension, offering a good example of the Bismarck tradition. Finally, Sweden represents an alternative scheme, in that it implemented notional accounts in 1998. Moreover, in all three countries, the health care systems are relatively generous, yet differences with regard to allowances for taking care of ill relatives are notable.

To test for joint retirement by spouses in these different institutional contexts, we estimate bivariate probit models for each country. As explanatory variables, we include the age difference between spouses, household outcomes and composition, and two variables that act on both spouses' decisions : distance to legal retirement age and health indicators. We find strong interactions by couples in their retirement decisions, whatever the country. However, the determinants of joint retirement differ across countries, due to institutional differences.

The rest of the article is structured as follows. The next section precises the theoretical framework of joint retirement into couples. Section 3 presents the data and the empirical analysis and section 4 concludes.

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2.2 Joint retirement by couples : a brief review

Retirement decisions often get analyzed as an individual trade-off between the costs and benefits of retirement versus remaining in employment, without considering how family dimensions might affect such decisions. This purely individual view, as manifested in life cycle models (Modigliani & Brumberg, 1954; Merton, 1971), is challenged by theory regarding the economics of the family (Chiappori, 1988, 1992, 1997; Bourguignon *et al.*, 1993, Bourguignon *et al.*, 2009; Browning, 2000; Browning & Gortz, 2012), which shows that most decisions take place at a collective level within households, depending on the characteristics and bargaining power of each spouse. The economics of the family thus fills an important literature gap, revealing that retirement decisions depend on the collaboration among household members, who have different preferences. By collaborating, households' members can allocate their time, between remaining at work and retiring. In this conceptual framework, three main sources lead to retirement coordination by couples (Hurd, 1990).

First, due to their similar preferences, spouses may value retirement planning similarly. According to Goux & Maurin (2003), people tend to marry partners with similar socio-economic characteristics and personal preferences. Such marital homogamy could create positive assortative mating trends (Mascie-Taylor & Vandenberg, 1988) and lead to favor joint retirement.

Second, joint retirement can be linked to leisure complementarities between spouses, which occur if both spouses value their partner's presence and want to spend their leisure time together (Hurd, 1990). Each spouse's utility thus depends on the partner's status, which influences the trade-off between the cost and expected benefits of all household members (Gustman & Steinmeier, 2000; Michaud & Vermeulen, 2010). This leisure complementarity between spouses also could lead to retirement coordination, to maximize individual utility in the form of shared time.

Third, a retirement decision may depend on financial incentives, such as public retirement or health policies. A change in these incentives could generate a common shock on the household's budget and the bargaining power of each spouse (Chiappori, 1988, 1992, 1997; Bourguignon *et al.*, 1993; Manski, 1993; Dahl *et al.*, 2010). Thus, it may influence the efficient allocation of resources and create cross-spouse incentives (Hurd,

1990 ; Coile, 2004).

Together, these three mechanisms should lead to a positive correlation of the retirement dates of couples (Becker, 1973 ; Hurd, 1990 ; Manski, 1993), as is confirmed in several empirical studies (Hurd, 1990 ; Gustman & Steinmeier, 2000). Recently, Hospido & Zamarro (2014) find that the probability of women leaving the labor force increases by 16–18 percentage points when their husbands also stop working ; a similar but less precise effect arises for men. They also estimate that controlling for spouses' working status reduces the impact of one's own eligibility for retirement pensions on the probability of leaving the labor force by 3 or 4 percentage points for early retirement and by 6 or 3 percentage points for full retirement pensions for men and women, respectively. But extant empirical literature does not explain why such joint retirement exists and what mechanisms cause it. Empirical studies confront a major difficulty, due to the strong asymmetrical behaviors that appear within couples. For example, Stanca & Van Soest (2012) study leisure complementary and conclude that a husband's retirement does not increase the joint leisure hours of the couple, but the retirement of the wife significantly does. *Traditional gender roles* within households might explain why the determinants of retirement timing differ for each spouse (Talaga & Beehr, 1995 ; Dentinger & Clarkberg, 2002 ; Pozzoli & Ranzani, 2009). In settings marked by traditional roles, men provide financial support for the household, whereas women offer more psychological or physical assistance. In this framework, men's retirement decisions exert a greater influence on women's decisions, and the influence is even stronger if a spouse suffers health problems (Johnson & Favreault, 2001 ; Van Rijn *et al.*, 2014). Dentinger & Clarkberg (2002) show, using U.S. data, that wives caring for their husbands are five times more likely to retire than women who are not caregivers, whereas husbands caring for their wives are substantially slower to retire. However, the prevalence of this caregiver role for women is decreasing. Because their careers in labor markets often are incomplete, women have fewer pension opportunities (O'Rand & Henretta, 1982 ; Aliaga, 2005). Most women marry older men, so wives would retire at a younger age than their husbands if they coordinated their retirement timing (Ruhm, 1996). In this sense, joint retirement could be a very costly option for women. In the United States, Johnson & Favreault (2001) report that household members are less

likely to retire if their spouse leaves the labor force because of health problems, especially if that spouse is not yet eligible for Social Security retirement benefits. Finally, because women face more financial constraints than men, spouses perceive financial retirement incentives in asymmetrical ways, related to their partner situation (Blau, 1998; Coile, 2004). The retirement incentives of each spouse affect their own retirement decisions and their spouses. If men seem sensitive to spillover effects from their spouses (Coile, 2004), the same might not be true of women. Instead, women appear influenced more by their own economic variables when making retirement decisions, not merely following their husbands (Gustman & Steinmeier, 2000; Coile, 2004). According to Bloemen *et al.* (2015), wives respond to husbands' choices at ages when they are likely eligible for early retirement programs. Only social systems limiting the financial constraints of women can encourage joint retirement in this case.

As this literature reveals, joint retirement clearly exists among couples, but gender asymmetries in behaviors and the impact of institutional systems and incentives make it difficult to identify the specific determinants of this coordination. By exploiting data from an European survey, we attempt to overcome this theoretical gap with a multi-country study.

2.3 Data and descriptive statistics

We use the last wave (Wave 5, 2013) of the Survey on Health, Ageing and Retirement in Europe (SHARE), which includes people belonging to households with at least one member who is 50 years of age or older. For several reasons, SHARE is well-suited to assess elder couples' behaviors across countries. First, the cross-national panel database includes 20 European countries. Second, it provides information about couples, by matching each respondent with his or her partner. Third, SHARE indicates the economic situation of the respondents, their health status, and some sociological data. To account for the impact of the institutional context, we conduct a multi-country analysis of Denmark, France, and Sweden. As noted previously, these countries feature some social similarities, such as gender equality in employment, achieved through reforms that were designed to decrease disincentives to female labor force participation. In

2010, all three countries nearly reached the Barcelona targets² in terms of childcare indicators, making them European leaders when it comes to these social politics (Mills et al., 2014a). Furthermore, they all have reached the Lisbon target in terms of female employment rate (60%), with relatively higher female labor force participation rates than other European countries : 76% in Denmark, 67% in France, and 79% in Sweden, versus 62% on average in OECD countries (2014 data). Denmark, France, and Sweden also feature relatively more equal earnings structures across couples than other European countries. According to Mills et al. (2014b), the shares of male sole provider households in these three countries are among the lowest in Europe (7% in Denmark, 12% in France, and 8% in Sweden, compared with 21% in UE27 in 2010). The share of relatively equal earnings structures accordingly is higher too : 43% in Denmark, 36% in France, and 35% in Sweden, compared with 28% in UE27 (2010 data).

On the social policy side, Denmark, France, and Sweden also have adopted relatively equilateral, generous systems compared with other developed countries. For their pension systems, all three countries rely on pay-as-you-go systems. However, institutional differences may influence retirement decisions. For example, the Danish pension system includes a public basic scheme, complemented by individual contributions. A compulsory occupational scheme, negotiated as part of collective agreements, also complements the base pension. The French retirement system primarily reflects a state pension scheme, depending on the sector of activity. The state pension is calculated on the basis of the personal wage, rate of contribution, and length of contribution. Supplementary schemes also complement this general state regime. In Denmark and France, recent reforms moved the legal retirement age³. Specifically, Denmark's 2011 pension reform postponed the legal retirement at 67 years for those born after June 1960. In France, with its 2010 pension reform, the legal retirement age became 62 for people born after 1955, compared with 60 before (The Appendix contains the reform agendas in France and Denmark). In contrast, the Swedish pension system is based on

2. The Barcelona targets, defined in March 2002, recommend providing childcare to encourage gender equality and promote female labor participation. The specific targets for 2010 were to provide childcare to at least 90% of children between 3 years of age and the mandatory school age, as well as to at least 33% of children younger than 3 years.

3. The legal retirement age corresponds here to the earliest age from which individuals are eligible to retire.

defined contribution schemes, such that individual contributions get virtually capitalized in accounts that earn a notional rate of return, set by the government. In the end, each worker acquires points according to his individual behavior in the labor market (activity or not, full-time work or not, etc.) and thus the calculation of the points is perfectly individualized. Since 1994, Swedish people have been authorized to retire at the age of 61 years.

Finally, all three countries have generous health care systems, which is important for studies of elderly citizens, and they offer benefits to take care of ill relatives. But again, some differences emerge. In Denmark, the care allowance represents almost 50% of men's wages and 60% of women's earnings. In France, the health system grants family solidarity leave and an allowance of 55 euros per day, nearly the French minimum wage. Additional allowances may be added, such as pensions for disabled adults. Sweden's scheme is the most generous, in that municipalities compensate family caregivers directly by employing them, for an allowance of nearly 30 euros per hour of work, higher than the hourly median wage of just less than 20 euros.

In each country, we select a sample of married couples living together who both responded to the survey. Due to our focus on spouses' choices to remain at work or retire, we exclude inactive, unemployed, and disabled respondents. We thus gather information about 1008 couples in Denmark, representing 48.8% of the original Danish sample; 902 French couples, or 40.6% of the initial French sample; and 1071 Swedish households, corresponding to 42.3% of the sample. Tables 1 details some household and individual characteristics, respectively.

Our key variables pertain to the activity status of each partner in the household. Let y_i^m and y_i^w define the status of men (m) and women (w) in a given household i . These binary variables are equal to 1 when an individual j (where $j = m, w$), in couple i is retired and 0 if employed. Descriptive statistics (see the Appendix) reveal some country differences. In the Danish sample for example, 52% of respondents are retired, but 66% are in Sweden and 70% are in France. The proportion of retirees thus appears lower in Denmark, which might reflect the age composition of the respondents. People younger than 60 years represent 37.5% of the Danish sample, versus 26.5% in France and 19.5% in Sweden.

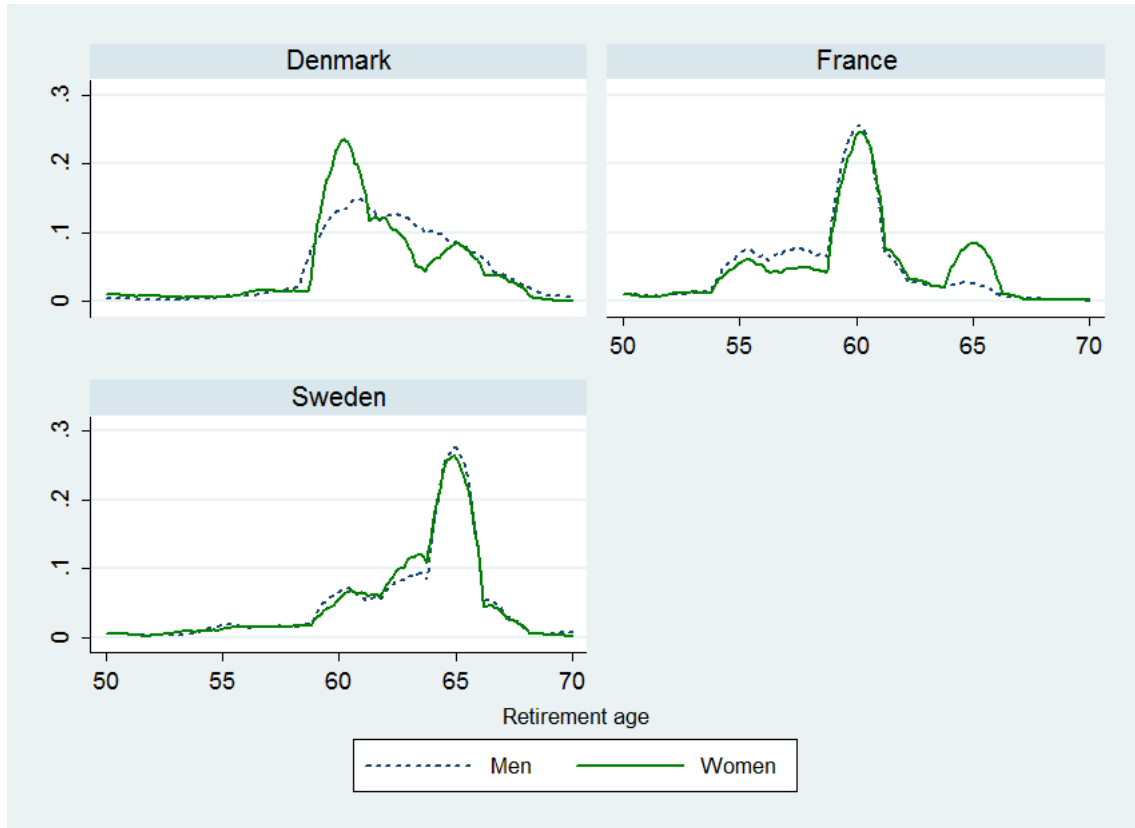
More interesting are the statistics by gender. The retirement ages of men and women are similar in all three countries, though women appear to be three years younger than their spouses on average (Table 1). But the age difference at retirement is less than two years, and more than 15% of couples exit the labor force the same year. This finding suggests coordination in spouses' retirement timing, as well as that women retire younger.

Table 2.1 – Average age and average age of retirement

Countries	Denmark		France		Sweden	
	Men	Women	Men	Women	Men	Women
Average age	65.81	63.22	67.63	65.03	69.45	66.74
Observations	1008	1008	902	902	1071	1071
Average age of retirement	62.48	61.07	58.86	59.66	63.27	62.74
Observations	532	519	675	599	742	692

Source : SHARE Survey, 2013

To add nuance to this finding, we also analyze of retirement age density by gender in each country (Figure 1). It appears that the average age of retirement hides disparity by gender. For instance, in France, two polarized peaks are highlighted for women around 55 and 65 years. Earlier departures may probably concerned women involved in a joint retirement, as women are often younger than there husband, whereas the second one may reflected financial constraints.

Figure 2.1 – Density of the retirement age by country

Source : SHARE Survey, 2013

According to these descriptive findings, the coordination of retirement decisions seems particularly evident in Denmark, but less so in France or Sweden. Institutional differences could explain these findings. That is, in Denmark, the retirement age distributions of men and women differ, with a peak around 60 years (i.e., before the legal retirement age of 65 years), yet this peak is much more pronounced for women. Danish women thus seem to retire earlier than men, which may indicate joint retirement by couples and perhaps women's tendency to assume caregiving roles through early retirement. Bingley *et al.* (2004) similarly show that several Danish institutional schemes allow for early retirement (e.g., public employment pension, post-employment wage pension), without strong financial sanctions. In France, the retirement age distributions indicate a peak around the legal retirement age of 60 years, but more women (than men) wait to reach 65 years, and thus the full rate pension, to withdraw. Wo-

men tend to have more discontinuous careers, so French women might be incited to remain at work to maximize their financial retirement planning (Aliaga, 2005). Financial constraints seemingly exert a strong influence on retirement decisions in France. Finally, in Sweden, a larger portion of women (than men) tends to retire between 62 and 65 years, signaling potential joint retirement. But retirement age distributions are centered around 65 years, for both men and women. This finding aligns with the Swedish pension system, that is, an individualized contributory system based on notional accounts, such that it favors individual behaviors.

To support those intuitions, we implement an econometric method and these influential institutional differences motivate our multi-country analysis. To identify potential joint decisions, we estimate three (one for each country) bivariate probit models⁴ (Heckman, 1978), in which we analyze the husband's and wife's probabilities of being retired (y_i^j with $j = m, w$) simultaneously, according to individual, spouse, household, and institutional variables. This model not only allows to estimate the effect of observable variables on retirement decisions of each spouse but also to identify the presence of links on unobservable variables that produce joint effects on retirement decisions. Indeed, the bivariate probit model also test the correlation (ρ) of the unobservables. This coefficient ρ reflects the correlation between spouses' retirement decisions within the couple, to capture the potential spillover effect (Gustman & Steinmeier, 2000; Coile, 2004; Li & O'Donoghue, 2011). Specifically,

$$\begin{cases} Prob(y_i^m = 1) = \beta'_m X_i^m + \delta_m Z_i + \lambda_m T_i^w + \epsilon_i^m \\ Prob(y_i^w = 1) = \beta'_w X_i^w + \delta_w Z_i + \lambda_w T_i^m + \epsilon_i^w \end{cases} \quad (2.1)$$

Where :

- m, w and i index respectively men, women and couples ;
- X_i^j includes individual attributes at the time of the interview ;
- Z_i^j contains household's characteristics ;
- T_i^m is a vector of partner' attributes ;
- ϵ_i^m and ϵ_i^w are errors terms supposed to be drawn from a bivariate normal distribution with :

4. Multinomial logit models also have been implemented.

$$\text{Cov}[\epsilon_i^m, \epsilon_i^w \mid x_i^m, x_i^w] = \rho$$

With regard to the observed variables included to explain retirement decisions (vectors X_i^j and T_i^j), we include education to capture the effects of human capital, which proxies for income and consequently the bargaining power of spouses within the household. This variable is based on the International Standard Classification of Education (ISCED 1997) from UNESCO, with three categories : low (none, preprimary, and primary education), medium (lower secondary/secondary), and high (tertiary) education. We also introduce a health indicator, because health problems have direct effects on retirement decisions and on the spouse's decision, according to who takes the caregiver role. We choose an objective health indicator, namely, the number of chronic diseases (e.g., diabetes, hypertension, arthritis). Finally, we estimate separate equations for each country to capture institutional differences, but we also account for the institutional context from an individual perspective, which likely has a strong impact on retirement decisions, according to both life cycle models and Figure 1. That is, as an explanatory variable, we include the (time) distance to the legal age of retirement, calculated according to the legal rules in each country, and equal to 0 if the person is already retired. The SHARE data set provides the dates of the interview and the respondent's birth, so we can calculate this distance D_i^j precisely, using individual i 's birth month and year :

$$D_i^j = \text{legal age of retirement}_i^j - \text{age}_i^j \quad (2.2)$$

In addition to individual variables, we consider household attributes (Z_i^j) as explanatory factors. In particular, the age difference between spouses could act as a barrier to the joint retirement process, especially when it comes to pension rights. A household budget constraint also is included, according to the household's gross financial assets per capita. Finally, we take intergenerational ties into account. Older workers generally are not concerned with the presence of dependent children, but we introduce the presence of grandchildren as a potentially pertinent factor.

To robustly identify our results, we estimate conditional odds ratios to compare the

impact of some key explanatory variables on retirement estimated probabilities. This allows us to test the significant difference between spouses' behaviors.

2.4 Results

The results from the bivariate probit models are in Table 2. Each column presents the results for Denmark, France, and Sweden. The robustness of the findings is affirmed by the correct prediction rates, which are greater than 80% for all three countries. The marginal effects and conditional odds ratios are in the Appendix.

To compare the results from the three countries, we begin with how individual characteristics affect retirement decisions (X_i^j). Human capital has a role, especially in Sweden (both men and women) and France (men only). The most educated are less likely to retire, probably because they have more employment opportunities. We also find a significant distance effect, such that retirement decisions depend on the person's own distance to the legal retirement age : The shorter the distance, the higher the retirement probability. Thus, postponing the legal retirement age should incite people to delay their retirement. However, this reform also could affect spouses in some countries. Health influences retirement decisions too, such that people suffering from chronic diseases are more likely to retire, due to their strong labor disutility or need for care. Moreover, health sometimes interacts with the distance effect, especially for women. The effects of this interaction differ according to the country studied though, so they may be linked to institutional differences in social care systems.

Table 2.2 – Probability of being retired considering the spouse situation as endogenous

Models VARIABLES	Bivariate probit : Denmark		Bivariate probit : France		Bivariate probit : Sweden	
	Men	Women	Men	Women	Men	Women
Age difference	0.065** (0.032)	-0.014 (0.023)	0.074** (0.034)	-0.008 (0.020)	0.096*** (0.018)	-0.048*** (0.014)
Having grand-children	0.162 (0.174)	0.469** (0.213)	0.249 (0.170)	0.095 (0.179)	0.248 (0.155)	0.178 (0.175)
Household gross financial assets (<i>per capita</i>)	-0.187*** (0.040)	-0.122** (0.050)	0.015 (0.032)	-0.035 (0.035)	-0.107** (0.045)	-0.064 (0.043)
<i>Men</i>						
Distance to the legal age of retirement	-0.021*** (0.005)	0.000 (0.003)	-0.027*** (0.006)	-0.002 (0.004)	-0.127*** (0.027)	-0.044*** (0.012)
Medium education	-0.091 (0.264)		-0.458** (0.202)		-0.408*** (0.146)	
High education	-0.302 (0.270)		-0.914*** (0.216)		-0.345** (0.145)	
Number of chronic diseases	0.149** (0.064)	0.162** (0.065)	0.058 (0.066)	0.026 (0.052)	0.145*** (0.045)	0.042 (0.039)
Distance * Chronic diseases	-0.001 (0.001)	-0.003** (0.001)	0.003 (0.002)	-0.001 (0.002)	0.034*** (0.007)	0.014** (0.006)
<i>Women</i>						
Distance to the legal age of retirement	-0.008** (0.003)	-0.035*** (0.004)	-0.008*** (0.003)	-0.029*** (0.003)	-0.019*** (0.003)	-0.067*** (0.014)
Medium education		-0.124 (0.372)		0.080 (0.154)		-0.670*** (0.188)
High education		-0.391 (0.372)		0.209 (0.208)		-0.660*** (0.190)
Number of chronic diseases	0.099 (0.080)	0.140 (0.114)	0.163*** (0.054)	0.308*** (0.077)	0.190*** (0.054)	0.233*** (0.048)
Distance * Chronic diseases	-0.002* (0.001)	-0.000 (0.001)	-0.002 (0.001)	-0.010*** (0.003)	-0.007*** (0.002)	0.006** (0.002)
Constant	2.968*** (0.524)	2.618*** (0.686)	1.357*** (0.395)	1.323*** (0.397)	1.673*** (0.533)	1.863*** (0.526)
Rho		0.456 (0.107)		0.529 (0.096)		0.638 (0.062)
Wald test of rho = 0		chi2(1) = 13.113		chi2(1) = 19.417		chi2(1) = 51.123
Observations	1,008	1,008	902	902	1,071	1,071
Log likelihood		-374.686		-374.347		-583.952

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source : SHARE Survey, 2013

But the major result of our study is to highlight that retirement decisions depend not only on individual attributes but also on household characteristics (Z_i^j).

In turn, we note that household gross financial assets can influence individual retirement decisions, though not in all countries. We find a significant, negative effect of this characteristic in Denmark (men and women) and Sweden (men only), but not in France. In the two first countries, some of the pension system is based on individual contributions, so remaining employed could increase these contributions, especially if the household has substantial assets. This may be explained by two mechanisms. First, financial assets can signal a high quality of previously employed jobs, comprising more opportunities such as promotions, which have ensured high income flows. Quality and opportunities into jobs probably have a net benefit in delaying retirement. Second, knowing that replacement rates are lower than the unit, the transition is often synonymous with a loss of income. The richest households are even more concerned since the rate is often significantly lower for executives (who normally have higher financial assets) and this can then encourage the richest households to delay the retirement age (OECD, 2017). But in France, where the system is based on public pensions and mandatory occupational schemes, household gross financial assets are not significant for either spouse. Our results are in line with Blanchet & Debrand (2007) : Depending on the pension system, the scale of pension rights is a major determinant of retirement planning. This result could be due to the existence of a large number of compulsory occupational schemes, particularly among executives in France who can significantly smooth income at retirement date and thus avoid individuals suffering a significant loss of income.

Having grand-children seems to exert a weak effect (cf. Denmark), but retirement decisions depend strongly on the spouse's status and attributes. In all three countries, we note the strong correlation of retirement choices between spouses. The error terms for the spouses' equations are significantly and positively correlated ($\rho > 0$), indicating the presence of common unobservable preferences and a joint retirement process by couples (Hurd, 1990).

In all countries, but particularly in Sweden, the pension system is more individualized, but the spouse's situation directly affects both men's and women's retirement deci-

sions. Thus, both observable spouse attributes and unobservable member preferences influence retirement choices, despite the strong country heterogeneity.

Delving deeper into this interesting finding, we consider the spouse's attributes that may influence individual retirement decisions (T_i^j). To start, for health status, we observe vast differences by gender but also across the three countries. In Denmark, a *traditional role* framework seems to apply, such that women adopt caregiver roles, and the probability that both spouses are retired increases by 3.6% when the husband suffers from poor health (see the marginal effects in the Appendix). The husband's probability of being retired instead decreases significantly when his ill wife is farther from her legal retirement age, suggesting that men provide financial support for the household. In France, and in contrast with Denmark, men assume a caregiver role. The probability of both spouses being retired increases by 11.2% when the wife has poor health; the husband's health is not significant. Finally, in Sweden, a spouse's poor health is a significant, positive determinant of retirement for both men and women. The probability of both spouses being retired increases by 2.7% and 7.1%, respectively, when the husband or wife is in poor health. Women's health status has a stronger impact on the probability of joint retirement. Finally, husbands average three years older than their wives, suggesting a greater probability that men are closer to their own legal age of retirement. Thus retirement may be more likely when his wife experiences serious health troubles.

Those results are confirmed by conditional odds ratios, expected for Denmark where there is not significant difference between spouses' responses to the health of the partner⁵.

Country differences in the estimated impacts of spouses' health can be attributed to differences in the health care system. The generosity of the Swedish health care system allows both husbands and wives to display altruistic behaviors. If one spouse becomes ill, the public allowance compensates for the financial losses for the caregiver. In Denmark and France, the existing financial incentives seem insufficient to encourage altruistic behaviors. Because women face more financial constraints than men, they appear unable to respond to those incentives.

5. This only capture the own effect of the health variable and not the cross effect with the distance to the legal age.

The legal retirement age also influences partners' decisions. In Denmark and France, we find strong gender asymmetry when it comes to the distance to retirement. In Denmark, a higher distance to the legal age of retirement for the wife decreases the probability that her husband is retired. Even though women tend to marry older men, husbands seemingly wait for their wives, to achieve joint retirement. When both spouses are retired, the marginal effect of the wife's distance is twice that of her husband's. Along similar lines, in France, the distance of the wife to retirement significantly decreases the probability that the husband is retired; the reverse is not significant. Women experience serious constraints on their access to pension rights, which induces these asymmetrical spousal spillover effects. In this sense, women appear influenced mainly by their own economic features when making retirement decisions. The distance of the wife decreases the probability of being simultaneously retired by 1%. However, conditional odds ratios does not support the significant difference between spouses' behaviors because the magnitude of the effects for both spouses are too close.

Here again, Sweden is distinct, revealing no such asymmetry. The probability of both spouses being retired decreases with distance to the legal age of retirement of the spouse : 2.5% for the distance of the husband and 1.5% for the wife. Joint behaviors are dominant among Swedish couples. Public family policy appears to encourage this choice, thereby counteracting the individualized pension system. For example, one spouse may choose to transfer funded pension rights to the other, to facilitate early retirement for the younger partner. Thus joint retirement can be made easily accessible through a policy that complements pension rights systems.

2.5 Conclusion

This article tests predictions of joint retirement by couples in a multi-country setting. Using SHARE data from Denmark, France, and Sweden — three countries with relatively equilateral and generous public, social, and retirement systems — we confirm the existence of a joint retirement process by couples, due to both observed and unobserved variables. Thus research must account for the family environment in individual retirement decisions, as recommended by the economics of family (Chiappori, 1992;

Bourguignon *et al.*, 1993).

We also highlight some strong asymmetries by gender, mainly related to institutional differences in social security systems. Men and women respond differently to incentives, according to each country's social system. Retirement rules influence spouses' decisions, but so do the rules of the health care system. Finally, when the social system seeks to incite spouses to be altruistic by giving a generous allowance to caregivers, both men and women coordinate their retirement timing. If public subsidies instead are low, only the spouse with lower financial constraints can anticipate retirement. Then, particularly for women in France, individual economic motivations dominate, and retirement occurs only upon the legal retirement age, and even for spouses who would prefer to retire together.

Our work thus suggests two key conclusions. First, retirement decisions must be viewed as a result of a collective decision process by couples. Neglecting this status could bias evaluations of the impact of public policies, with strong negative effects for people who are highly sensitive to these policies. Second, both pension rules and the health care system matter. An individualized pension system combined with a generous caregiver allowance (e.g., Sweden) can grant incentives to remain employed, exhibit altruism, and reduce the financial constraints faced by women. In contrast, a pay-as-you-go system (as in Denmark or even more so in France) could reinforce inequalities in couples, especially if any health problems occurs. Our results thus argue for the inclusion of the family dimension in defining social policies and coordinating these policies.

A possible extension of this work would be to conduct a specific study on retirement behavior among couples in countries with more Beveridgian pension systems. This would require a considerable change in the empirical strategy since the determinants of retirement are then very different as retirements depend on the capitalization made for retirement. Likewise, private health insurance, the absence of a legal retirement date, and the very wide possibility of combined employment and retirement should be taken into account.

Appendices

A Variables

B Statistics

Table 2.4 – Characteristics of individuals and households : Denmark

Employment situations of couple VARIABLES	All couples		Both spouses employed		Both spouses retired		Husband retired - Wife employed		Husband employed - Wife retired	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Retired = 1	52.78%	51.49%								
Age difference	2.58	2.49	2.50	2.50	7.30	7.30	-1.89	-1.89		
<i>Husband age minus wife age (years)</i>										
Having grand-children = 1	70.24%	44.66%	92.46%	92.46%	69.12%	69.12%	80.00%	80.00%		
Household gross financial assets (<i>Per capita</i>)	86 507	100 931	69 647	69 647	82 028	82 028	123 871	123 871		
Distance to the legal age of retirement <i>Legal age of retirement minus age (months)</i>	50.29	68.73	109.74	141.50	2.27	5.99	16.72	85.00	41.92	20.81
Small education = 1	6.25%	8.43%	1.19%	0.24%	11.21%	16.81%	7.35%	2.94%	1.82%	7.27%
Medium education = 1	50.40%	41.77%	47.74%	35.87%	53.88%	47.20%	50.00%	44.12%	41.82%	38.18%
High education = 1	42.66%	49.50%	49.64%	63.42%	34.70%	35.78%	42.65%	52.94%	56.36%	54.55%
Number of chronic diseases	1.54	1.42	1.08	0.88	1.96	1.96	1.70	0.94	1.25	1.67
Observations	1008 (100%)	1008 (100%)	421 (41.77%)	421 (41.77%)	464 (46.03%)	464 (46.03%)	68 (6.74%)	68 (6.74%)	55 (5.46%)	55 (5.46%)

Source : SHARE Survey, 2013

Table 2.5 – Characteristics of individuals and households : France

Employment situations of couple VARIABLES	All couples		Both spouses employed		Both spouses retired		Husband retired - Wife employed		Husband employed - Wife retired	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Retired = 1	74.50%	66.19%								
Age difference	2.60		2.74		2.16		6.37		-2.83	
<i>Husband age minus wife age (years)</i>										
Having grand-children = 1	76.27%		46.63%		88.04%		72.32%		64.86%	
Household gross financial assets (Per capita)	30 665		31 326		31 555		28 655		19 825	
Distance to the legal age of retirement	19.34	33.19	72.03	105.18	0.96	1.85	12.39	72.20	43.83	13.91
<i>Legal age of retirement minus age (months)</i>										
Small education = 1	28.71%	32.15%	8.81%	8.81%	37.50%	42.86%	26.79%	25.00%	5.41%	13.51%
Medium education = 1	47.67%	45.57%	60.62%	56.99%	40.89%	39.29%	58.04%	56.25%	51.35%	48.65%
High education = 1	23.61%	22.28%	30.57%	34.20%	21.61%	17.86%	15.18%	18.75%	43.24%	37.84%
Number of chronic diseases	1.68	1.54	0.90	0.84	1.98	1.90	1.70	1.05	1.24	1.27
Observations	902 (100%)	902 (100%)	193 (21.40%)	193 (21.40%)	560 (62.08%)	560 (62.08%)	112 (12.42%)	112 (12.42%)	37 (4.10%)	37 (4.10%)

Source : SHARE Survey, 2013

Table 2.6 – Characteristics of individuals and households : Sweden

Employment situations of couple VARIABLES	All couples		Both spouses employed		Both spouses retired		Husband retired - Wife employed		Husband employed - Wife retired	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Retired = 1	69.28%	64.61%								
Age difference	2.72		3.00		2.36		6.25		-1.34	
<i>Husband age minus wife age (years)</i>										
Having grand-children = 1	80.95%		58.78%		90.65%		82.00%		78.00%	
Household gross financial assets (<i>Per capita</i>)	62 155		60 624		61 121		67 161		73 953	
Distance to the legal age of retirement	10.55	20.14	38.65	68.66	0.04	0.21	1.25	21.34	7.32	2.84
<i>Legal age of retirement minus age (months)</i>										
Small education = 1	24.93%	16.06%	5.73%	2.51%	33.49%	24.30%	29.00%	4.00%	14.00%	10.00%
Medium education = 1	35.29%	39.68%	46.95%	38.35%	29.75%	38.32%	36.00%	51.00%	40.00%	42.00%
High education = 1	38.84%	43.51%	45.88%	56.99%	36.14%	37.23%	35.00%	45.00%	42.00%	46.00%
Number of chronic diseases	1.63	1.61	1.03	0.98	1.86	2.00	1.91	0.94	1.44	1.50
Observations	1071 (100%)	1071 (100%)	279 (26.05%)	279 (26.05%)	642 (59.94%)	642 (59.94%)	100 (9.34%)	100 (9.34%)	50 (4.67%)	50 (4.67%)

Source : SHARE Survey, 2013

C Results

Table 2.7 – Marginal effects after the bivariate probit : Denmark

Retirement planning VARIABLES	Both employed $y = 0.563$	Both retired $y = 0.132$	Husband retired - Wife employed $y = 0.212$	Husband employed - Wife retired $y = 0.091$
Age difference	-0.015 (0.010)	0.003 (0.005)	0.019** (0.009)	-0.008* (0.004)
Having grand-children	-0.111* (0.057)	0.073** (0.029)	-0.015 (0.054)	0.052** (0.028)
Household gross financial assets (<i>per capita</i>)	0.069*** (0.015)	-0.033*** (0.010)	-0.034*** (0.011)	-0.001 (0.007)
<i>Men</i>				
Distance to the legal age of retirement	0.005*** (0.001)	-0.001** (0.000)	-0.005*** (0.001)	0.002*** (0.000)
Medium education	0.025 (0.072)	-0.008 (0.024)	-0.025 (0.072)	0.008 (0.024)
High education	0.081 (0.071)	-0.027 (0.024)	-0.081 (0.071)	0.027 (0.024)
Number of chronic diseases	-0.065*** (0.022)	0.036*** (0.012)	0.018 (0.018)	0.011 (0.011)
Distance * Chronic diseases	0.001 (0.000)	-0.001* (0.000)	0.000 (0.000)	-0.000 (0.000)
<i>Women</i>				
Distance to the legal age of retirement	0.007*** (0.001)	-0.005*** (0.000)	0.002** (0.001)	-0.004*** (0.000)
Medium education	0.018 (0.056)	-0.017 (0.050)	0.017 (0.050)	-0.018 (0.056)
High education	0.060 (0.059)	-0.053 (0.051)	0.053 (0.051)	-0.060 (0.059)
Number of chronic diseases	-0.048 (0.035)	0.028 (0.021)	0.007 (0.019)	0.012 (0.016)
Distance * Chronic diseases	0.001 (0.000)	-0.000 (0.000)	-0.001 (0.000)	0.000 (0.000)

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source : SHARE Survey, 2013

Table 2.8 – Marginal effects after the bivariate probit : France

Retirement planning VARIABLES	Both employed $y = 0.115$	Both retired $y = 0.580$	Husband retired - Wife employed $y = 0.255$	Husband employed - Wife retired $y = 0.049$
Age difference	-0.010** (0.005)	0.005 (0.007)	0.013* (0.007)	-0.008** (0.003)
Having grand-children	-0.045 (0.033)	0.056 (0.062)	0.008 (0.056)	-0.020 (0.021)
Household gross financial assets (<i>per capita</i>)	0.000 (0.005)	-0.009 (0.012)	0.013 (0.011)	-0.003 (0.003)
<i>Men</i>				
Distance to the legal age of retirement	0.004** (0.001)	-0.003** (0.001)	-0.003* (0.001)	0.002*** (0.000)
Medium education	0.066** (0.029)	-0.048** (0.022)	-0.066*** (0.029)	0.048** (0.022)
High education	0.141*** (0.035)	-0.132*** (0.042)	-0.141*** (0.035)	0.132*** (0.042)
Number of chronic diseases	-0.010 (0.010)	0.014 (0.018)	0.000 (0.017)	-0.004 (0.007)
Distance * Chronic diseases	-0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)
<i>Women</i>				
Distance to the legal age of retirement	0.003*** (0.000)	-0.010*** (0.001)	0.008*** (0.001)	-0.001** (0.007)
Medium education	-0.005 (0.10)	0.025 (0.047)	-0.025 (0.047)	0.005 (0.010)
High education	-0.014 (0.014)	0.063 (0.060)	-0.063 (0.060)	0.014 (0.014)
Number of chronic diseases	-0.043*** (0.009)	0.112*** (0.024)	-0.072*** (0.024)	0.003 (0.007)
Distance * Chronic diseases	0.001*** (0.000)	-0.003*** (0.001)	0.002*** (0.001)	-0.001* (0.000)

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source : SHARE Survey, 2013

Table 2.9 – Marginal effects after the bivariate probit : Sweden

Retirement planning VARIABLES	Both employed $y = 0.486$	Both retired $y = 0.238$	Husband retired - Wife employed $y = 0.183$	Husband employed - Wife retired $y = 0.091$
Age difference	-0.016* (0.010)	0.003 (0.006)	0.034*** (0.008)	-0.020*** (0.007)
Having grand-children	-0.092* (0.058)	0.064 (0.042)	0.030 (0.041)	-0.002 (0.029)
Household gross financial assets (<i>per capita</i>)	0.038** (0.016)	-0.026** (0.013)	-0.015 (0.012)	0.003 (0.007)
<i>Men</i>				
Distance to the legal age of retirement	0.040*** (0.007)	-0.025*** (0.006)	-0.024*** (0.006)	0.009 (0.006)
Medium education	0.100** (0.042)	-0.056** (0.027)	-0.100** (0.042)	0.056** (0.027)
High education	0.086** (0.040)	-0.046* (0.025)	-0.086** (0.040)	0.046* (0.025)
Number of chronic diseases	-0.044*** (0.016)	0.027*** (0.012)	0.028* (0.014)	-0.012 (0.008)
Distance * Chronic diseases	-0.011*** (0.002)	0.007*** (0.001)	0.006*** (0.001)	-0.002 (0.001)
<i>Women</i>				
Distance to the legal age of retirement	0.016*** (0.002)	-0.015*** (0.003)	0.008*** (0.003)	-0.008*** (0.002)
Medium education	0.101** (0.002)	-0.129*** (0.003)	0.129*** (0.003)	-0.101** (0.002)
High education	0.103** (0.045)	-0.127*** (0.044)	0.127*** (0.045)	-0.103** (0.044)
Number of chronic diseases	-0.087*** (0.019)	0.071*** (0.018)	0.003 (0.014)	0.013 (0.009)
Distance * Chronic diseases	0.000 (0.000)	0.000 (0.001)	-0.003*** (0.000)	0.001*** (0.000)

Robust standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Source : SHARE Survey, 2013

Table 2.10 – Conditional odds ratios

	$\frac{Prob(y_i^w = 1) Health_i^m}{Prob(y_i^m = 1) Health_i^w}$	$\frac{Prob(y_i^m = 1) Health_i^w}{Prob(y_i^w = 1) Health_i^m}$
Denmark	1.066 (0.116)	0.937 (0.102)
France	0.872 (0.066)*	1.146 (0.087)*
Sweden	0.863 (0.055)**	1.158 (0.073)**

	$\frac{Prob(y_i^w = 1) D_i^m}{Prob(y_i^m = 1) D_i^w}$	$\frac{Prob(y_i^m = 1) D_i^w}{Prob(y_i^w = 1) D_i^m}$
Denmark	1.009 (0.005)**	0.990 (0.005)**
France	1.006 (0.005)	0.993 (0.005)
Sweden	0.975 (0.012)*	1.024 (0.013)*

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source : SHARE Survey, 2013

Chapitre 3

The effects of postponing the legal retirement age on couples' retirement decisions : The case of the French 2010 reform

3.1 Introduction

Nowadays, the ageing of the population in developed countries creates an imbalance between active workers and retired. This increases doubts about sustainability of pay-as-you-go (PAYG) pension systems, leading to several reforms designed to increase the effective retirement age. The success of such policies however depends on how people respond to changes in their pension eligibility.

To understand the relationship between institutional context and retirement decisions, a major study concerning twelve countries has been implemented (Gruber & Wise, 2004; Gruber & Wise, 2007). This study questions the presence of a distance effect, defined by life cycle models (Seater, 1977; Bettendorf & Broer, 2003; Ljunqvist & Sargent, 2008; Hairault *et al.*, 2010) : an increase of the distance to the legal retirement age, meaning the age at which pensions are available, incites workers to delay their retirement and firms to keep and train older workers for longer. Results

highlighted a strong positive causality between the legal retirement age and the proportion of older persons out of the labor force across countries. When Gruber & Wise (2007) consider the average across all countries, they estimate that a reform which delays legal retirement age by three years would likely reduce the proportion of men, aged from 56 to 65 years old, out of the labor force between 28% and 36%. Staubli & Zweimuller (2013) also support the positive causality between the legal retirement age and employment behaviors. Authors exploit the two pension reforms in Austria which increased the legal retirement age from 60 to 62 years for men and from 55 to 58.25 years for women and using the Austrian Social Security Database (ASSD) for the period 1997 to 2010. They estimated that raising the legal retirement age increased employment by 9.75 percentage points among affected men and by 11 percentage points among affected women.

Several studies have also been implemented for the French case as this country suffers from a weak older workers' employment rate. Especially, older workers commonly use early retirement, meaning before the legal retirement age. Bozio (2010) estimated, using double-differences method, the effect of the 1993 French reform, which progressively increased the length of contribution to attain full pension benefits, on the out of employment postponement. For each additional year of contribution needed, men delay their exit by 9 months and women by 5 months. Benallah (2011) focused on the effect of the 2003 French reform which has implemented a premium rate after both attaining the legal number of quarters required and the legal age of retirement. Using the matching methodology with data from the French Old Age Pension Fund (CNAV), the author found a postponement of retirement by two months and an increase by 16% of the probability of being in employment over the legal retirement age of 60 years.

If all this empirical literature seems to show that the labor force participation of older workers appears significantly affected by the institutional context, the retirement decision is treated as an individual process. However, according to the economics of the family (Chiappori, 1988, 1997; Bourguignon *et al.*, 1993; Alderman *et al.*, 1995), there are interactions between spouses, suggesting the possibility of spillover effects (Gust-

man & Steinmeier, 2000; Coile, 2004) on their retirement strategies. The institutional context may thus affect not only individual decisions but affect the joint utility function of spouses. It could finally generate a common shock on the household's budget and the bargaining power of each spouse (Chiappori, 1988, 1992, 1997; Hurd, 1990). Several empirical studies support the presence of spillover effects by showing that the effects of the age at which pension are available on labor market behaviors not only concern individual but also the partner. For instance, Lalive & Parrotta (2017) investigated, with the Swiss Federal Population Census database (1990 and 2000), how legal retirement age affects labor supply in couples using the discontinuous change in pension eligibility with respect to age of both partners. Authors found that women reduce their labor force participation by 2 to 3 percentage points as their partner reaches legal retirement age.

Due to those cross-spouse incentives, Cox & Jimenez (1990) demonstrated that the full impact of reforms can be assessed accurately only by taking the behaviors of all other family members into consideration. In that way, some empirical studies focused on the effects of reforms into couples. Bloemen *et al.* (2015), using Dutch administrative micro panel data and an instrumental variable approach, found that early retirement opportunities of husbands increased the wives' probability to retire by 24.6 percentage points. Stancanelli (2017) estimated the direct and indirect effects of the 1993 French pension reform, that increases the duration of contributions, on both spouses' retirement decision. The French Labor-Force Survey is used to implement a sharp regression-discontinuity framework. The author found that husband's retirement probability drops immediately by one percentage point if the wife is affected by the reform, while her retirement probability does not respond immediately if he is affected.

Joint retirement phenomenon, that have been widely reported by economics of the family, thus leads reforms to have both direct and spillover effects on retirement probabilities of spouses. However, very few empirical studies consider that retirement strategies into couples may also be determined by individual attributes of both spouses and household's characteristics that affect bargaining power and resources allocation

between spouses. Indeed, some other determinants may lead to spillover effects between spouses. For instance, Legendre *et al.* (2018) found that spouses consider health status of the partner in their retirement strategies. To neglect those determinants may thus induce overestimation of spillover effects from the reform. Moreover, this neglects potential gender-based asymmetry highlighted by the empirical literature (Gustman & Steinmeier, 2000; Coile, 2004; Legendre *et al.*, 2018). Households may indeed be marked by traditional roles where husbands provide financial support for the household, whereas women offer more psychological or physical assistance (Talaga & Beehr, 1995). This framework is however questioned as women often face more discontinuous careers and thus have fewer pension opportunities (O'Rand & Henretta, 1982; Aliaga, 2005). Instead, women appear influenced more by their own economic variables when making retirement decisions. Different spillover effects may thus affect men and women, leading to specific indirect effects of the reform according to the gender.

The objective of this study is thus to measure direct and spillover effects of a public policy concerning legal retirement age on retirement probabilities but by taking into account characteristics of each spouse and their household.

To evaluate the total impact of postponing the legal retirement age, the case of the 2010 French reform is studied. This reform progressively postpone the legal retirement age from 60 to 62 years old for both women and men born between July 1951 and 1955. The study uses SHARE data which allow to match both members of a couple and to have consistent informations about spouses and household characteristics. SHARE data thus allows to have a complete profile of each partner that is not possible with other data. In line with Stanca (2017), a sharp regression discontinuity design approach is implemented to evaluate both direct and spillover effects of the last postponement of the retirement age. But in contrast with Stanca (2017), estimation of reform's effects is implemented by considering spouses and household covariates for both husbands and wives. This allows to understand gender-based asymmetry within couples' retirement-making process (Talaga & Beehr, 1995; Legendre *et al.*, 2018). To this end, the study provides a better understanding of the effects of reforms concerning legal retirement age on retirement behaviors of both spouses.

The rest of the article is structured as follows. The next section presents the data and the descriptive statistics. Section 3 explains the empirical method and section 4 the results. Finally, section 5 concludes.

3.2 Data and descriptive statistics

In order to analyse the total impact of postponing the legal retirement age on employment by taking into account potential spillover effects, we exploit the natural experiment of the major 2010 French reform. Announced in October 2010 and effective in July 2011, this reform postponed the age from which people can retire, meaning the legal retirement age, from 60 to 62 years old. Both women and men are similarly concerned and changes in eligibility rules have been progressive¹. People born from July 1951 to 1954 are increasingly concerned until those born from 1955 are fully concerned (table 1 and Figure 1).

Table 3.1 – Rules for calculation of the legal age of retirement

Legal age	Birth cohort	Reform assignment
60	Before july 1951	Not concerned
60, 4	1 july 1951 - 31 december 1951	increasingly concerned
60, 9	1952	-
61, 2	1953	-
61, 7	1954	-
62	1955	Fully concerned

In order to analyse direct and spillover effects of the French 2010 reform on retirement behaviors, the Survey of Health, Ageing and Retirement (SHARE) is used. The wave

1. The reform also concerned the mandatory retirement age by pushing it, in the same way, from 65 to 67 years old.

5 (2013) and the wave 6 (2015)² permit to have, for both men and women, individuals concerned by the reform (born from July 1951). The second major advantage of those data is that they allow to implement the analysis at the couple level as it is possible to match both members of a couple and, currently, this is the only survey that allows such matching for French data. SHARE thus allows to have data about the household as earnings and family composition and also for each spouse such as employment status, health states and educational level. As we focus on the effects of the reform on the probabilities to retire of spouses, only married couples with spouses employed or retired are selected.

The final sample is thus composed by 1180 couples, including 369 couples where both spouses are concerned by the reform and 152 couples where at least one spouse is concerned (table 2)³.

Table 3.2 – Situations, regarding reform, of the 1180 couples

Husbands	Wives		
	Not concerned	Concerned	Total
Not concerned	659	120	779
Concerned	32	369	401
Total	691	489	1180

As in the French population, women are in average 2.5 years younger than their husbands. The age difference is very similar when isolating people not concerned and concerned by the reform with respectively 2.3 and 2.7 years. Both probabilities of retirement of men and women appear higher when the partner is retired although women are in average younger than their spouse. This may reflect the phenomenon of joint retirement, suggesting potential spillover effects on the retirement strategies of spouses. This is going along the lines of potential spillover effects of having a spouse concerned

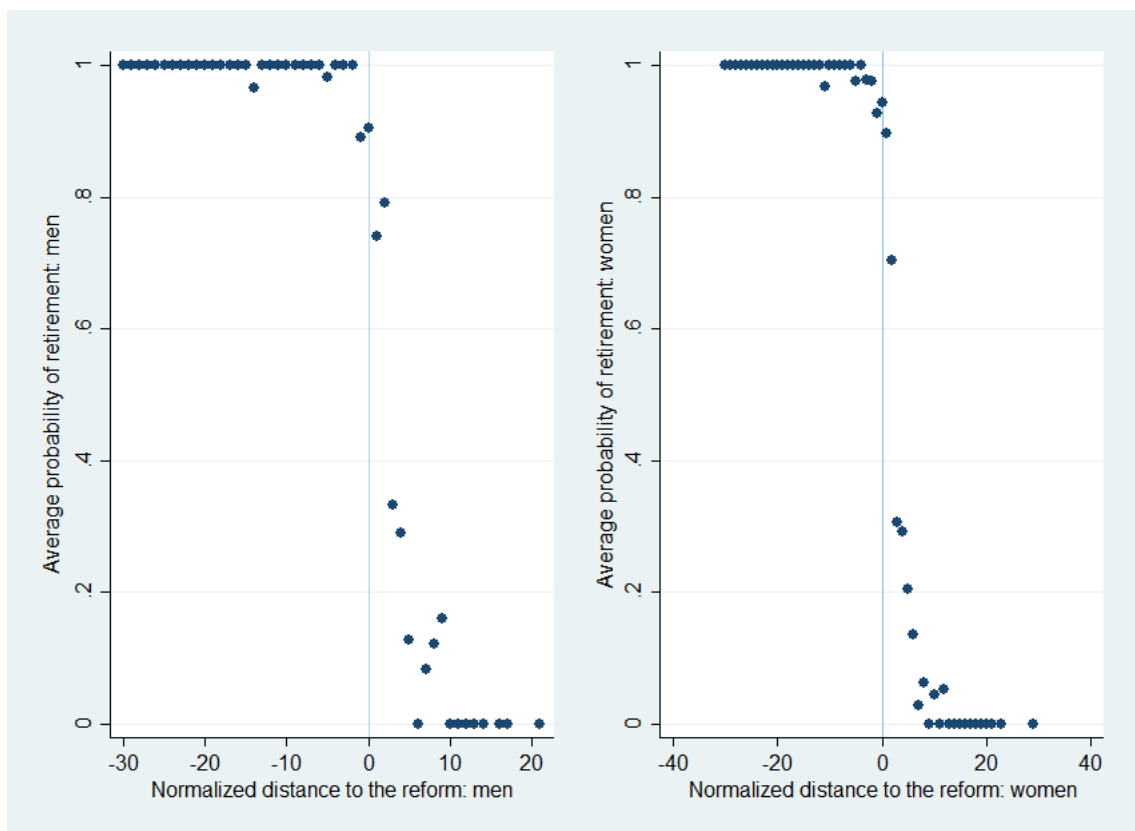
2. This paper uses data from SHARE Waves 5 and 6 (DOIs : 10.6103/*SHARE.w5.610*, 1.6103/*SHARE.w6.610*) (see Börsch-Supan *et al.*, 2013; Börsch-Supan, 2018a; Börsch-Supan, 2018a for methodological details).

3. This is noted that the subsamples are quite unbalanced.

by the reform on the own probability to retire.

In order to have first intuitions about the effect of the reform on own retirement probabilities of men and women, a graphical analysis (figure 1) of the retirement probabilities according to birth cohort is implemented. With the aim of highlight behaviors before and from the reform, the birth cohort is normalized around the threshold, meaning individuals born from July to December 1951. Values are then positive for individuals concerned and increase with the birth cohort. In the same way, values are negative if individuals are not concerned.

Figure 3.1 – Average probability of retirement according to being concerned by the reform



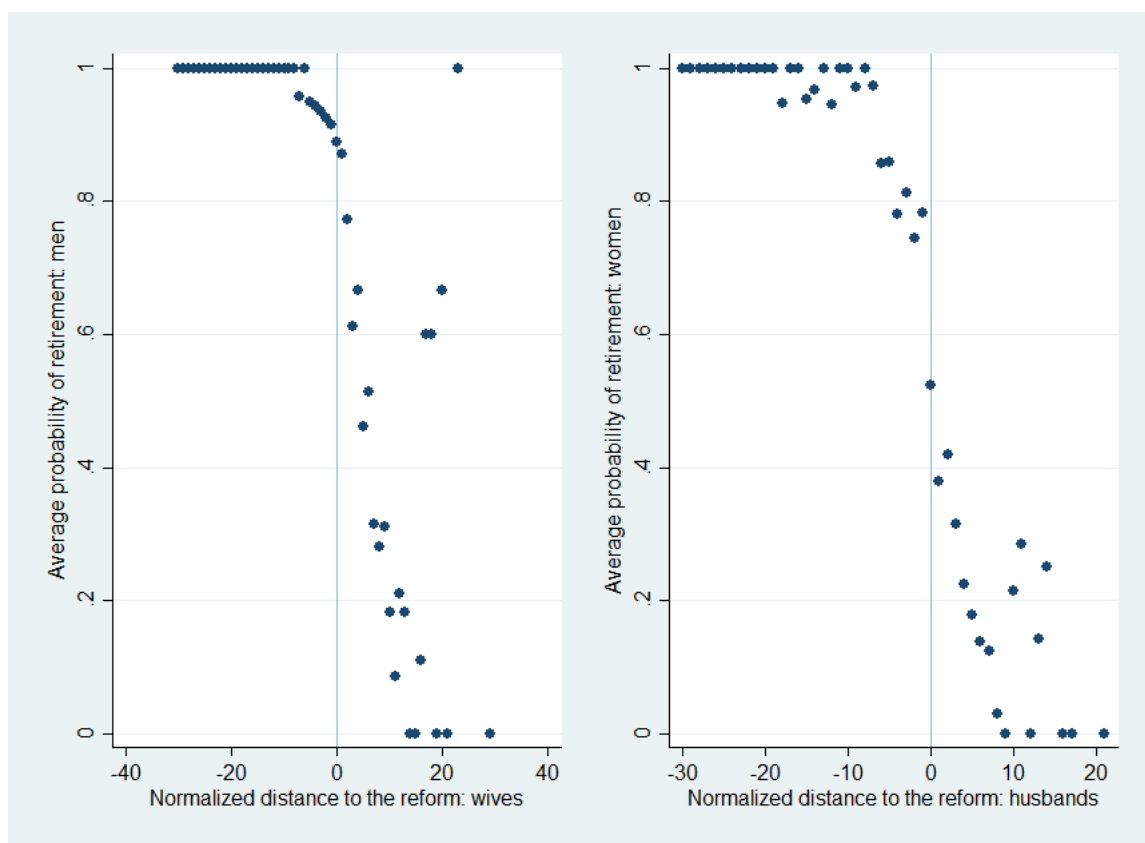
Source : *SHARE Survey, 2013 and 2015*

According to the birth cohort, every graphics show a progressive decrease of the ave-

rage probability of retirement. A major feature is the pronounced cut-off from the discontinuity threshold. It seems that changes with eligibility rules affect retirement probabilities of both men and women.

A second graphic (figure 2) is also proposed to see the evolution of own retirement probabilities according to having a spouse concerned or not by the reform.

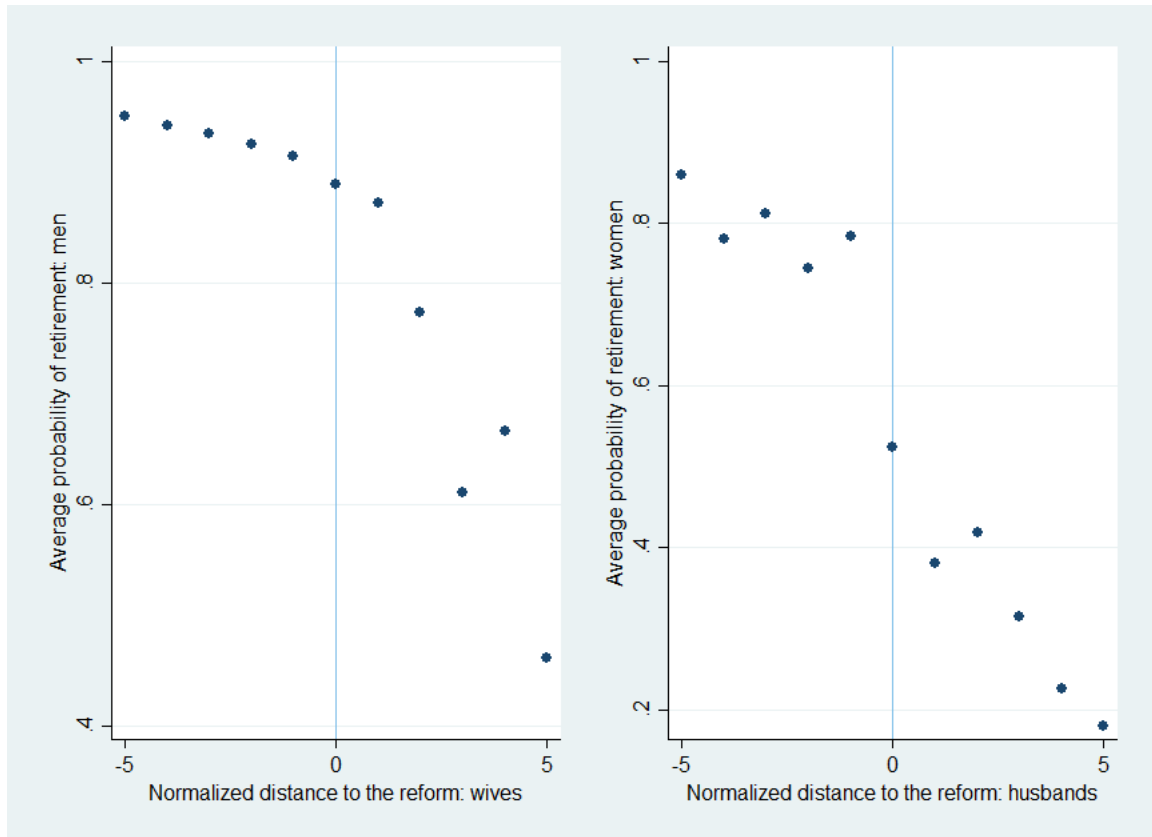
Figure 3.2 – Average probability of retirement according to having a partner concerned by the reform



Source : SHARE Survey, 2013 and 2015

Women seems also concerned by spillover effects of having a husband concerned by the reform whereas the reverse appears not clearly. In order to see those spillover effects just before and from the beginning of the reform, the bandwidths are reduced to the 5 years of the reform implementation (Figure 3).

Figure 3.3 – Average probability of retirement according to having a partner concerned by the reform : bandwidths of 5 years



Source : SHARE Survey, 2013 and 2015

Once again, a cut-off is clearly marked for women but the presence of spillover effects of having a wife concerned by the reform on the husband retirement probability still not obvious. To definitively conclude about the effects of being concerned by the reform on own retirement probabilities of both women and men, and also on the presence of spillover effects of having a spouse affected by the reform, an econometric analysis must be implemented.

3.3 Empirical method

As we shown in previous graphics (Figure 1), the French 2010 reform creates a sharp discontinuity as people born from July 1951 have a probability of one to being concer-

ned by the reform whereas people born before have a probability of zero. In order to implement this econometric analysis, a sharp regression discontinuity design approach is therefore chosen (Imbens & Lemieux, 2008 ; Lee & Lemieux, 2010). Individuals are thus considered as treated if they are concerned by the reform, meaning they are born from the threshold July 1951. Despite the announce of the reform in October, the window till July is expected to be too short to have anticipations. The effects of the reform should thus be identified from the cut-off July 1951. The fact that the probability of being concerned by the reform is a discontinuous function of the birth cohort which can not be manipulate by people confirm the suitability of using this approach.

As the analysis focuses on couples and that age difference between spouses is around 2 years, this allows to identify two discontinuities (Cattaneo *et al.*, 2016 ; Stancanelli, 2017). First discontinuity is the direct effect of being concerned by the reform on own retirement probability. Second discontinuity is the effect of having a spouse concerned by the reform on the own retirement probabilities, meaning spillover effects of the reform through the partner.

Both discontinuities are thus exploited to have respectively the direct and spillover effects of the reform on the own retirement probability. Let $R_{i(j)}$ denotes the probability of retirement of individual i . In order to estimate spillover effects from the partner, individual i is matched to his/her spouse j . Informations of both spouses in each couples are therefore identified. The goal is thus to estimate the average impact of treatments on retirement probability of individual i such as :

$$\beta = E[R_i^1 - R_i^0]$$

The running variables Z_i and Z_j are the normalized variables of birth cohorts, respectively for individual i and his/her spouse j . Those variables are calculated such as $Z = (\text{Birth cohort} - \text{First birth cohort concerned})$ (table 3).

Table 3.3 – Rules for calculation of the normalized variable of birth cohort

Normalization	Birth cohort	Treatment	Age in 2013	Age in 2015
...
-5	1946	0	67	69
-4	1947	0	66	68
-3	1948	0	65	67
-2	1949	0	64	66
-1	1950 - june 1951	0	63	65
0	july 1951 - december 1951	1	62	64
1	1952	1	61	63
2	1953	1	60	62
3	1954	1	59	61
4	1955	1	58	60
5	1956	1	57	59
...

The treatments T_i and T_j are respectively being concerned by the postponment of the legal retirement age and having a spouse also concerned by the reform such as $T_i = 1(Z_i \geq 0)$ and $T_j = 1(Z_j \geq 0)$. Direct effects of the reform on own probability of retirement are thus estimated with βT_i . Spillover effects through the partner are for their parts given by ϕT_j . Considering a spline linear regression as recommended by Baraton *et al.* (2011)⁴, the sharp regression discontinuity design with two discontinuities may thus be defined as :

$$R_{i(j)} = \beta T_i + Z_i + \gamma T_i Z_i + \phi T_j + Z_j + \lambda T_j Z_j + \mu X_{i(j)} + \psi X_i + \omega X_j + \epsilon_{i(j)}$$

In contrast with previous literature and in order to consider individual heterogeneity, that may notably affect bargaining power of spouses, covariates are also included in

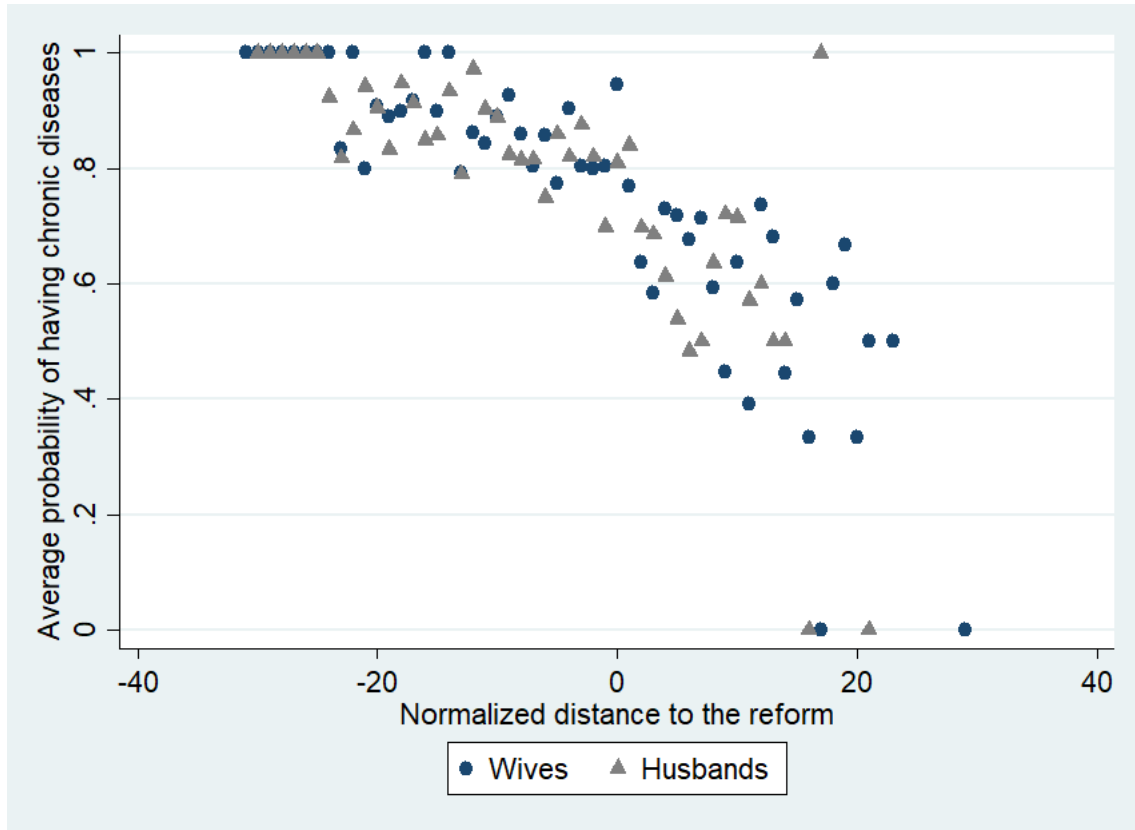
4. Several other models design are implemented to robustly identify the effects of the reform, namely a linear and quadratic forms (table 6 in Appendix). Considering the restricted sample size and in order to be closer to the threshold when estimating reform effect, another spline linear specification is also proposed with the bandwidth reduced by two (table 4 and 5 in Results section).

terms X for each spouse. Because of spouses interactions, it is assumed that retirement probabilities may be affected by personal $X_{(i)}$ and spouse $X_{(j)}$ observable characteristics. The model includes education to capture the effects of human capital (Becker, 1964), which proxies for income and consequently the bargaining power of spouses within the household. This variable is based on the International Standard Classification of Education (ISCED 1997) from UNESCO, with three categories : low (none, preprimary, and primary education), medium (lower secondary/secondary), and high (tertiary) education. We also introduce a health indicator, because health problems may have direct effects on retirement decisions and on the spouse's decision, according to who takes the caregiver role (Legendre *et al.*, 2018). We choose an objective health indicator, namely, the number of chronic diseases (e.g., diabetes, hypertension, arthritis). As spouses share some characteristics through household that lead to interactions between them, heterogeneity between couples is also considered with family observable characteristics ($X_{i(j)}$). The joint retirement process may be limited by age difference between spouses, especially when it comes to pension rights. Ability to retire of spouses may also be affected by the household budget constraint. The household's gross financial assets per capita is thus included. Finally, we take intergenerational ties into account. Older workers generally are not concerned with the presence of dependent children, but we introduce the presence of grandchildren as a potentially pertinent factor.

A variable to control for wave affiliation is also introduced as the probability of having individuals concerned by the reform is higher with the wave 6 (2015) than with the wave 5 (2013). In order to robustly identify treatments effects on retirement probabilities, covariates have to be continuous around the threshold. However, some of our covariables may be correlated with ageing such as having chronic diseases (Figure 4) but are continuous around the threshold as individuals born just before and after July 1951 follow the same ageing trend. We also implement models to identify that treatments do not affect explanatory variables. Results confirm the absence of relation between treatments and explanatory variables⁵.

5. Results are available upon request.

Figure 3.4 – Average probability of having chonic diseases according to birth cohort



Source : SHARE Survey, 2013 and 2015

To evaluate the direct and spillover effects of the reform, the first model must not include covariate X in order to compare with previous literature (model 1). The second model is estimated for all the sample and considers characteristics of spouses and their household. The third model is for each member of couples by distinguishing husbands and wives. The estimations for wives and husbands allow to capture gender-base asymmetry and to better understand retirement strategies between spouses. In models 4 and 5, the same model is estimated but the bandwidth around the treshold is reduced by two (model 4) and a bootstrap approach is then applied (model 5).

Finally, a sensitive analysis is proposed as in France women often face more discontinuous careers and that graphic analysis appear to highlight stronger reactions to partner situation than for men. This analysis focuses on wives born from 1955 and who have husbands born from July 1951 to December 1954 is also implemented (Appendix

section, tables 7 and 8) to robustly identified their retirement strategies. Indeed, this allows to estimate if spillover effect remains present even if women are more concerned by the postponment of their legal retirement age than their husbands.

3.4 Results

Let us now turn to results (table 4 and 5). First, models appear to have a good explanatory power as shown by the Fisher tests that are strongly significant and the coefficients of determination⁶ that are between 0.644 and 0.724. Second, to implement the analysis by gender allows to more clearly identify determinants and magnitudes of effects for each spouse (tables 4 and 5).

Table 3.4 – Regression discontinuity models : direct and spillover effects of the 2010 reform on both spouses' retirement probabilities

Models	Model 1	Model 2	Model 3		Model 4		Model 5	
	All individuals	All individuals	Men	Women	Men	Women	Men	Women
Direct effects	-0.309*** (0.029)	-0.309*** (0.028)	-0.248*** (0.041)	-0.317*** (0.040)	-0.213*** (0.043)	-0.213*** (0.042)	-0.213*** (0.044)	-0.213*** (0.041)
Spillover effects	-0.058** (0.025)	-0.041* (0.025)	-0.019 (0.031)	-0.134*** (0.040)	-0.002 (0.034)	-0.143*** (0.042)	-0.002 (0.035)	-0.143*** (0.042)
Observations	2360	2360	1180	1180	900	900	900	900
Replications							2000	2000
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000		
Prob > Chi2							0.000	0.000
R ²	0.685	0.694	0.673	0.724	0.651	0.698	0.644	0.693

Robust standard errors in parentheses

**** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$*

Data source : SHARE Survey, 2013 and 2015

Regression discontinuity model for all individuals (table 4) highlights the presence of negative direct effect of the reform. As supported by life cycle models (Seater, 1977; Bettendorf & Broer, 2003; Ljunqvist & Sargent, 2008; Hairault *et al.*, 2010), retirement strategies of spouses are impacted by the postponment of the legal retirement age. Moreover, results show negative spillover effects of the reform. The total impact

6. Results are consistent between specifications (table 6 in Appendix).

of the reform is therefore strengthened because of joint retirement strategies between spouses. The effects of the French 2010 reform are thus supported and are even stronger because of joint retirement phenomenon.

By comparing models 1 and 2, findings support the need to consider spouses and households' characteristics in order to evaluate the total impact of postponing the legal retirement age. Indeed, not taking into account covariates, as in the previous literature, leads to overestimate spillover effect of the reform by 41%.

Regarding covariates, individual heterogeneity affects retirement probabilities of both spouses through a human capital effect (table 5). Both spouses are however concerned in an opposite way (model 3, 4 and 5). Having a medium level of education for women is associated with lower probability of retirement than with a higher one. Using human capital as proxy for income, this negative effect may reflect a potential financial need. This supports that women focus on their own economic variable when defining retirement strategies. Conversely, lower human capital is associated with a higher probability of retirement for men, traducing may be harder working conditions. The opposite sense of the effects between husbands and wives may therefore reflect that men enjoy facilitated access to retirement than their wives, that is consistent with their smoother careers.

The implementation of regression discontinuity models for each partner allows to have a more accurate knowledge about reform's effects on spouses. Magnitude of the effects are commented from models with reduced bandwidth (4 and 5). Both husbands and wives are similarly concerned by a direct effect. Indeed, by postponing the legal retirement age from 60 to 62 years old, the 2010 reform decreases in average the probabilities of retirement by around 21.3% for each spouse. The effects estimated are closed to those found by Gruber & Wise (2007). However, gender-based asymmetry is highlighted. Indeed, spillover effects appear to only affect women who postpone their retirement by around 14.3% when their husbands are concerned by the reform. A sensitive analysis (tables 7 and 8 in Appendix) highlights that spillover effects from husbands maintain even if women are more concerned by the reform than their husbands. Therefore, effects of the French 2010 reform are stronger for women because of

the accumulation of direct and spillover effects.

The opposite results found regarding Stancanelli (2017), where spillover effects concern husbands and not wives, may be explained by reforms analysed. The 1993 reform expands the duration of contribution to obtain a full pension and women are in France more concerned by the need to postpone their retirement to the full pension age than men because of their more discontinuous careers. The direct effect of the reform is indeed stronger on women than on men. To have a husband concerned by the reform therefore ought not to affect their more constrained retirement behaviours whereas husbands have more flexibility on their retirement age. In the case of the 2010 reform, this is the age at which both spouses are allowed to retire that is affected. The postponement is therefore similar for both husbands and wives, regardless of their careers. This may thus leads to different consequences of joint retirement on the impact of the reform.

Table 3.5 – Regression discontinuity models with covariates

Models	Model 2		Model 3		Model 4		Model 5	
	All individuals	Men	Women	Men	Women	Men	Women	
Number of grand children	0.001 (0.001)	0.003 (0.021)	-0.003 (0.020)	-0.005 (0.026)	-0.011 (0.023)	-0.005 (0.026)	-0.011 (0.022)	
Household gross financial assets	-0.002 (0.001)	-0.000 (0.003)	-0.002 (0.003)	-0.001 (0.004)	-0.003 (0.004)	-0.001 (0.004)	-0.003 (0.004)	
Age difference	0.028 (0.028)	-0.037 (0.040)	0.070 (0.050)	-0.034 (0.041)	0.067 (0.049)	-0.034 (0.042)	0.067 (0.050)	
Wave 6 (Wave 6=1)	0.077*** (0.011)	0.069*** (0.017)	0.067*** (0.017)	0.077*** (0.024)	0.082*** (0.025)	0.077*** (0.024)	0.082*** (0.025)	
<i>Individual i</i>								
Treatment	-0.309*** ^d (0.028)	-0.248*** ^d (0.041)	-0.134*** ^s (0.040)	-0.213*** ^d (0.043)	-0.143*** ^s (0.042)	-0.213*** ^d (0.044)	-0.143*** ^s (0.042)	
Year of birth normalized	0.027 (0.028)	0.035 (0.040)	-0.069 (0.051)	0.030 (0.042)	-0.065 (0.050)	0.030 (0.042)	-0.065 (0.050)	
(Year of birth normalized) * (Treatment)	-0.050*** (0.003)	-0.062*** (0.005)	0.002 (0.004)	-0.065*** (0.006)	0.014** (0.006)	-0.065*** (0.007)	0.014** (0.006)	
Having chronic diseases (yes=1)	0.037** (0.014)	0.042** (0.020)	0.005 (0.019)	0.037 (0.024)	-0.000 (0.022)	0.037 (0.023)	-0.000 (0.022)	
Small education	0.010 (0.017)	0.063*** (0.017)	-0.018 (0.018)	0.082*** (0.022)	-0.028 (0.025)	0.082*** (0.022)	-0.028 (0.025)	
Medium education	-0.014 (0.015)	0.062*** (0.015)	0.011 (0.016)	0.065*** (0.019)	0.013 (0.021)	0.065*** (0.019)	0.013 (0.021)	
<i>Partner j</i>								
Treatment	-0.041* ^s (0.025)	-0.019 ^s (0.031)	-0.317*** ^d (0.040)	-0.002 ^s (0.034)	-0.213*** ^d (0.042)	-0.002 ^s (0.035)	-0.213*** ^d (0.041)	
Year of birth normalized	-0.027 (0.028)	-0.035 (0.040)	0.068 (0.051)	-0.030 (0.042)	0.063 (0.050)	-0.030 (0.043)	0.063 (0.051)	
(Year of birth normalized) * (Treatment)	-0.004 (0.003)	-0.006 (0.004)	-0.044*** (0.004)	-0.013** (0.006)	-0.070*** (0.006)	-0.013** (0.006)	-0.070*** (0.006)	
Having chronic diseases (yes=1)	-0.000 (0.014)	-0.000 (0.020)	0.028 (0.020)	-0.11 (0.024)	0.030 (0.023)	-0.11 (0.024)	0.030 (0.022)	
Small education	0.019 (0.017)	0.012 (0.016)	-0.019 (0.016)	0.017 (0.021)	-0.015 (0.021)	0.017 (0.021)	-0.015 (0.020)	
Medium education	0.022 (0.015)	0.014 (0.017)	-0.058*** (0.017)	0.021 (0.020)	-0.059*** (0.020)	0.021 (0.020)	-0.059*** (0.020)	
Constant	0.899*** (0.032)	0.842*** (0.061)	0.974*** (0.059)	0.852*** (0.072)	0.977*** (0.068)	0.852*** (0.072)	0.977*** (0.069)	
Observations	2360	1180	1180	900	900	900	900	
Replications						2000	2000	
Prob > F	0.000	0.000	0.000	0.000	0.000			
Prob > Chi2						0.000	0.000	
R ²	0.694	0.673	0.724	0.651	0.698	0.644	0.693	

Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

^d : direct effect

^s : spillover effect

Data source : SHARE Survey, 2013 and 2015

3.5 Conclusion

This article analyses the effects of postponing the legal retirement age, through the French 2010 reform, on retirement probability by taking into account couples' retirement-making process. Whereas effects of postponing the legal retirement age are usually analysed at an individual level, this study questions about spillover effects between spouses. This analysis thus evaluates direct and spillover effects of postponing the legal retirement age on spouses and considers, for the first time, characteristics and preferences of each spouse. Using wave 5 and 6 of SHARE data and regression discontinuity design approach, results show that postponing the legal retirement age not only has direct effects but also affects retirement probabilities of older workers through spillover effects. To take into account household and spouses' characteristics allows to not overestimate spillover effects on retirement decisions.

Retirement strategies of spouses appear directly affect by eligibility rules as postponing the legal retirement age decreases own retirement probability by around 21.3% for each spouse. By rising this distance effect from the legal retirement age, results thus support life cycle models (Seater, 1977 ; Bettendorf & Broer, 2003 ; Ljunqvist & Sargent, 2008 ; Hairault *et al.*, 2010).

To implement models by gender allows to show that probabilities to retire of women significantly decrease by 14.3% when their husbands are concerned by the reform. Effects of the French 2010 reform are thus stronger for women because of the accumulation of direct and spillover effects.

As supported by economics of the family (Chiappori, 1988, 1997 ; Bourguignon *et al.*, 1993 ; Alderman *et al.*, 1995), retirement strategies of spouses appear thus also concerned by joint retirement phenomenon.

To take into account individual characteristics however rise that women are more constrained in defining their retirement strategies. They are indeed less financially secure than men and are thus more affected by their own economic variable.

This work thus suggests three key conclusions. First, total impact of the reform is

both composed by individual and spillover effects because of distance effect and joint retirement phenomenon. Second, women are more affected by the postponment of the legal retirement age than men. Indeed, men are only affected by a direct effect whereas women are also concerned by spillover effects. Third, women remain more constrained than men in defining their retirement strategies, rising gender inequalities. Taken together, results rise that to postpone the legal retirement age is more effective than anticipated because of spillover effects from husbands on wives and encourage to consider family environment in defining and evaluating social policies but also to pay special attention on women situations.

Appendix

Results

Table 3.6 – Regression discontinuity models : direct and spillover effects of the 2010 reform on both spouses' retirement probabilities

Models	h(.) linear		h(.) quadratique	
	Men	Women	Men	Women
Number of grand children	0.081*** (0.024)	0.060*** (0.021)	0.020 (0.022)	0.013 (0.021)
Household gross financial assets	0.003 (0.004)	-0.000 (0.004)	-0.000 (0.004)	-0.001 (0.004)
Age difference	-0.051 (0.045)	-0.027 (0.054)	-0.040 (0.043)	0.035 (0.053)
Wave 6 (Wave 6=1)	0.066*** (0.019)	0.070*** (0.018)	0.064*** (0.017)	0.067*** (0.017)
<i>Men</i>				
Treatment	-0.473*** ^d (0.037)	-0.278*** ^s (0.040)	-0.260*** ^d (0.044)	-0.177*** ^s (0.043)
Year of birth normalized	0.041 (0.045)	-0.014 (0.055)	0.007 (0.043)	-0.031 (0.053)
(Year of birth normalized) ²			-0.001*** (0.000)	-0.000 (0.000)
Having chronic diseases (yes=1)	0.064*** (0.023)	0.016 (0.020)	0.045** (0.021)	0.008 (0.019)
Small education	0.036* (0.020)	-0.037* (0.020)	0.058*** (0.018)	-0.022 (0.019)
Medium education	0.041** (0.017)	-0.006 (0.017)	0.056*** (0.016)	-0.004 (0.017)
<i>Women</i>				
Treatment	-0.016 ^s (0.033)	-0.344*** ^d (0.042)	0.043 ^s (0.033)	-0.296*** ^d (0.043)
Year of birth normalized	-0.049 (0.046)	0.005 (0.055)	-0.043 (0.043)	0.010 (0.053)
(Year of birth normalized) ²			-0.000 (0.000)	-0.000*** (0.000)
Having chronic diseases (yes=1)	0.003 (0.023)	0.039* (0.021)	0.003 (0.021)	0.032 (0.020)
Small education	0.028 (0.018)	-0.015 (0.017)	0.014 (0.017)	-0.020 (0.016)
Medium education	0.020 (0.019)	-0.054*** (0.018)	0.013 (0.018)	-0.060*** (0.017)
Constant	0.636*** (0.068)	0.833*** (0.067)	0.666*** (0.064)	0.874*** (0.061)
Observations	1180	1180	1180	1180
Prob > F	0.000	0.000	0.000	0.000
R ²	0.574	0.677	0.642	0.703

Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

^d : direct effect

^s : spillover effect

Data source : SHARE Survey, 2013 and 2015

Sensitive analysis

Considering more discontinuous careers of women, the robust presence of spillover effects of having a husband concerned by the reform on wives retirement probabilities questioned about still having those effects if wives are fully concerned by the reform whereas their husbands are partially concerned by the latter. In order to implement this analysis, the new model focuses on retirement probabilities of women fully concerned, meaning born from 1955 (table 1), thus implying an homogeneous sample of 141 observations.

The new and only treatment T_h is now having a husband (h) partially (p) concerned by the reform, so born between July 1951 and December 1954, knowing that the wife (w) is fully (f).

All determinants are maintained in relation to previous specifications, only the variable being 60 years old is also introduced to capture the effect of the old legal norm. Assuming a spline linear form, the new regression discontinuity may thus be defined as (model 6) :

$$R_{w(h)}^f = \beta T_h^p + Z_h^p + \gamma T_h^p Z_h^p + \mu X_{w(h)} + \psi X_w + \omega X_h + \epsilon_{w(h)}$$

As the sample is small, bootstrap method with 2000 replications is also used (model 7) to correct biases on standard errors and support results (table 7 and 8).

Results show that spillover effects still present despite wives are more concerned than husbands by the 2010 French reform. This highlights the important role of spillover effects of the reform, through husbands, on women.

Table 3.7 – Regression discontinuity models : effect of having a husband partially concerned by the reform on wife retirement probability

Models	Model 6	Model 7
	Women	Women
Spillover effects	-0.166*	-0.166*
	(0.086)	(0.092)
Observations	141	141
Replications		2000
Prob > F	0.022	
Prob > Chi2		0.021

Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Data source : SHARE Survey, 2013 and 2015

Table 3.8 – Regression discontinuity models : effect of having a husband partially concerned by the reform on wife retirement probability

Models	Model 6	Model 7
Spillover effects	-0.166* (0.086)	-0.166* (0.092)
Husband : year of birth normalized	0.018 (0.011)	0.018 (0.014)
(Husband : year of birth normalized) * (Treatment)	-0.029 (0.030)	-0.029 (0.032)
Being 60 years old (yes=1)	0.228** (0.109)	0.228** (0.109)
Age difference	-0.011** (0.004)	-0.011** (0.005)
Number of grand children	0.025 (0.016)	0.025 (0.018)
Household gross financial assets	0.004 (0.010)	0.004 (0.011)
Having chronic diseases (yes=1)	-0.060 (0.052)	-0.060 (0.052)
Small education	-0.062 (0.056)	-0.062 (0.057)
Medium education	-0.180*** (0.059)	-0.180*** (0.062)
Husband : having chronic diseases	-0.002 (0.057)	-0.002 (0.057)
Husband : small education	-0.011 (0.059)	-0.011 (0.061)
Husband : medium education	-0.066 (0.060)	-0.066 (0.062)
Constant	0.420** (0.179)	0.420** (0.195)
Observations	141	141
Replications		2000
Prob > F	0.022	
Prob > Chi2		0.021

Robust standard errors in parentheses

**** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$*

Data source : SHARE Survey, 2013 and 2015

Conclusion générale

Le vieillissement démographique auquel font face les pays développés met en difficulté la soutenabilité financière des systèmes par répartition. En France, le solde financier du système de retraite est déjà déficitaire, soulignant un réel enjeu de politique économique. Pour réduire ce déséquilibre, un des objectifs de politique publique est d'encourager les seniors à se maintenir en emploi et ainsi capter des cotisants potentiels. Les modèles de cycle de vie (Seater, 1977 ; Bettendorf & Broer, 2003 ; Ljunqvist & Sargent, 2008 ; Hairault *et al.*, 2010) ont explicité la relation entre comportements de départ à la retraite et contexte institutionnel. Les politiques publiques ont alors grandement fait appel aux incitations financières et au recul de l'horizon à l'âge légal de départ à la retraite pour encourager les seniors à retarder leurs départs effectifs. Néanmoins, l'efficacité de ces réformes reste relative, notamment en France. Ce constat reflète la limite à considérer le contexte institutionnel comme unique déterminant du départ à la retraite. La littérature a notamment proposé deux sources d'hétérogénéité des seniors qui peuvent aussi intervenir dans le processus de décision départ à la retraite et ainsi expliquer le recours à des départs anticipés.

1. La première source d'hétérogénéité entre les seniors est l'environnement professionnel (Clark *et al.*, 2014). Beehr (1986) souligne que l'environnement professionnel impacte les préférences pour le départ à la retraite et que la décision finale est conditionnelle à ces préférences. La littérature empirique fait consensus sur le rôle positif de la mauvaise qualité de vie au travail sur les préférences pour le départ à la retraite (Schnalzenberger *et al.*, 2014 ; Blanchet & Debrand, 2007) mais le rôle de la qualité de vie au travail sur la décision finale n'est pas encore clairement identifié.
2. La seconde source d'hétérogénéité est l'environnement familial (Chiappori, 1988,

1992, 1997 ; Bourguignon *et al.*, 1993 ; Alderman *et al.*, 1995). En raison des interactions entre les conjoints, la décision de départ à la retraite se fait en considérant la situation du partenaire. Particulièrement, la présence de coordination des dates de départ à la retraite est confirmée dans la littérature empirique (Gustman & Steinmeier, 2000 ; Hospido & Zamarro, 2014). Les déterminants propres à chacun des conjoints ne sont cependant pas encore bien identifiés.

La littérature ne permet donc pas encore d'identifier l'ensemble des déterminants à la décision de départ à la retraite. Cette thèse avait ainsi pour objectif de comprendre dans quelle mesure l'hétérogénéité des individus, en termes d'environnements professionnels et familiaux, a un effet sur les stratégies de départ à la retraite des seniors.

Ce travail de thèse interrogeait donc, dans un premier temps, la présence d'un processus de décision de départ à la retraite en deux étapes, où la qualité de vie au travail intervient dans la définition des préférences pour la retraite qui sont, dans un second temps, mises en confrontation avec des contraintes, tel que budgétaires et institutionnelles, lors de la prise de décision finale.

Dans un second temps, ce travail questionnait la présence d'un processus de décisions jointes au sein des couples qui se caractérise par des stratégies de départs coordonnés entre les conjoints.

Résultats et contribution à la littérature

Pour prendre en compte l'hétérogénéité des seniors dans le processus de décision de départ à la retraite, une méthode empirique basée sur les outils de microéconométrie appliquée, telles que les méthodes d'économétrie des variables qualitatives et d'évaluation de politiques publiques, a été mobilisée en s'appuyant sur les données des enquêtes SHARE. Les résultats issus de la prise en compte des processus de décision lors des analyses empiriques permettent de mieux identifier les déterminants à la décision de départ à la retraite dans un contexte d'hétérogénéité des seniors.

1. En modélisant le processus de décision en deux étapes, où la décision de départ à la retraite est conditionnelle aux préférences pour la retraite, le **premier chapitre** a permis d'identifier les déterminants de chacune des étapes du processus

de décision dans le cadre d'un arbitrage coûts-bénéfices. Ce processus a été analysé, avec les enquêtes de 2011 et de 2015 de SHARE, grâce à l'estimation d'un modèle de type nested logit (Mc Fadden, 1978 ; Heiss, 2002) qui permet d'identifier les deux étapes de ce dernier.

Les résultats supportent le choix de ce processus de décision en deux étapes et renforcent la littérature existante en soulignant l'importance de le considérer lors de l'analyse des comportements de départ à la retraite des seniors.

La prise en compte du processus permet ainsi d'identifier que les préférences pour la retraite sont notamment expliquées par la qualité de vie au travail qui, de ce fait, a un effet indirect sur la décision finale de départ. En effet, être satisfait vis-à-vis de son emploi diminue de près de 2% les intentions de départ à la retraite. La prise en compte de l'endogénéité de la qualité de vie au travail conduit cependant à un effet de cette dernière sur les préférences pour le départ à la retraite qui devient inférieur à 1%. Par rapport à la littérature existante, ces résultats soulignent que l'ampleur de l'effet de qualité de vie au travail sur la décision finale est moindre quand le processus est entièrement considéré. Les préférences pour le départ à la retraite sont néanmoins à la fois le résultat de l'hétérogénéité individuelle mais aussi en termes de conditions de travail, ce qui supporte le rôle de l'hétérogénéité en termes d'environnement professionnel dans les stratégies de départ à la retraite.

Enfin, nos résultats ont permis de conforter le rôle du contexte institutionnel comme contrainte à la décision de départ à la retraite. A ce titre et comme supporté par les modèles de cycle de vie, le contexte institutionnel joue donc un rôle majeur dans le processus de décision de départ à la retraite des seniors et limite les départs anticipés. Toutefois, ces résultats ont mis en avant l'existence de décalages entre les préférences pour le départ à la retraite et les décisions finales. En contraignant la conversion des préférences en décision effective, les règles institutionnelles encouragent les seniors à se maintenir en emploi malgré une mauvaise qualité de vie au travail ressentie. Ce décalage peut donc se traduire par une potentielle démotivation de ces seniors, ce qui peut s'avérer néfaste pour la productivité des entreprises.

2. La prise en compte, dans le **second chapitre**, d'un processus de départs joints au sein des ménages grâce à l'estimation de probit bivariés (Heckman, 1978) a permis d'identifier les déterminants de la décision de départ à la retraite de chacun des conjoints.

Ce travail est venu confirmer la présence d'interactions entre les conjoints. L'utilité de chacun des membres du couple est alors dépendante de la situation du conjoint. Cela se traduit par la présence de coordinations des stratégies de départ à la retraite des époux en raison de variables observées, comme la santé ou la distance à l'âge légal de départ à la retraite, mais aussi inobservées. Nos résultats ont donc souligné le rôle déterminant de l'hétérogénéité des individus en terme de situation familiale dans les stratégies de départ à la retraite des seniors.

Ce chapitre a également permis de mieux comprendre les asymétries de comportements entre les conjoints, asymétries qui s'expliquent par le contexte institutionnel dans lequel évolue le couple. En effet, l'analyse multi-pays adoptée dans ce chapitre apporte à la littérature en montrant que lorsque les prestations à la fois du système de retraite mais aussi du système de santé sont insuffisantes, alors seul l'époux avec le moins de contraintes financières peut anticiper son départ à la retraite dans l'optique d'une coordination des dates de départ au sein du couple. Ce phénomène peut se traduire par un renforcement des inégalités, majoritairement en défaveur des femmes, au sein des couples. En France, les femmes se voient plus contraintes que les hommes à retarder leurs départs à la retraite. A l'inverse, en Suède, bien que le système de retraite soit individualisé, l'existence d'un système de santé généreux incite les seniors à se maintenir en emploi tout en réduisant les inégalités entre les époux et en facilitant les comportements altruistes, notamment lorsque l'un des conjoints souffre de problème de santé.

3. Au regard de la présence confirmée d'un processus de décisions jointes au sein des ménages, le **troisième chapitre** a analysé les effets de la coordination des stratégies de départ à la retraite au sein des couples sur l'impact des politiques publiques.

L'évaluation de la réforme de 2010, qui recule l'âge légal de départ à la retraite,

a confirmé la présence d'un effet direct de la réforme avec un report de l'âge effectif de départ des conjoints. L'effet direct moyen de la réforme est de même ampleur pour les hommes et les femmes avec une baisse de la probabilité d'être retraité de 21,3%.

La prise en compte de la dimension familiale, via l'estimation d'un modèle de régression par double discontinuité (Imbens & Lemieux, 2008 ; Lee & Lemieux, 2010), a aussi révélé la présence d'un effet de débordement de la réforme *via* le conjoint. Ce résultat enrichit la littérature en montrant qu'une analyse purement individuelle sous estime l'effet de l'allongement de la vie active induit par le recul de l'âge légal de départ à la retraite. En effet, la coordination des dates de départ à la retraite se traduit par un renforcement de 14,3% de l'effet direct pour les femmes lorsque leur conjoint est concerné par la réforme. Toutefois, aucun effet de débordement n'est présent pour les hommes. L'effet de la réforme de 2010 est donc plus important pour les femmes du fait de la combinaison d'effets individuels et de débordement. Ce travail permet donc d'explicitier la présence d'asymétrie des effets du recul de l'âge légal selon le genre.

Enfin, l'intégration des caractéristiques et des préférences des époux dans nos modèles est venue souligner le fait que les femmes restent cependant plus contraintes financièrement que leurs maris. Ces dernières ont alors une concentration plus importante sur leur situation économique et cela souligne de nouveau la présence d'inégalités, en défaveur des femmes, au sein des couples.

Recommandations de politiques économiques

Si les résultats établis dans chacun des trois chapitres contribuent à la littérature académique sur les déterminants à la décision de départ à la retraite, ces résultats permettent également de proposer des pistes de recommandation de politique économique.

Tout au long de ce travail de thèse, l'analyse du processus de décision de départ à la retraite a confirmé la présence d'effets des règles institutionnelles, et notamment de l'âge légal de départ à la retraite, sur la décision finale. Les résultats soulignent d'ailleurs une forte sensibilité des individus à ces dispositifs, même lorsqu'ils ne sont

pas touchés directement. En effet, la coordination des dates de départ à la retraite des conjoints impliquent des effets de débordement, *via* le partenaire, entre les stratégies de départ à la retraite.

La sensibilité des décisions aux réformes reste cependant dépendante de l'environnement dans lequel les individus évoluent et deux grands risques peuvent émerger :

1. Des inégalités liées à la situation familiale ont été soulignées en défaveur des femmes (**chapitre 2** et **chapitre 3**). Ces dernières sont plus contraintes financièrement que leurs conjoints et cela se traduit par des asymétries de comportements, lors du départ à la retraite, entre les époux. La construction de politiques ciblées envers les femmes est alors recommandée, notamment pour lisser les conséquences financières de leurs carrières plus discontinues. Une piste de réflexion est le développement de la coordination des politiques sociales. Une complémentarité entre ces politiques a été effectivement mise en avant dans ce travail (**chapitre 2**) et s'étend aussi aux systèmes de santé. En effet, les règles d'éligibilité à la retraite mais aussi le système de santé influencent conjointement les comportements de départ à la retraite des seniors. Ces résultats encouragent donc à la coordination des politiques sociales de retraite, de santé et de la famille, pour ainsi réduire les inégalités soulignées entre les conjoints.
2. Des inégalités en termes de marché du travail ont également été mises en lumière (**chapitre 1**). La contrepartie induite par le rôle de contrainte du contexte institutionnel dans le processus de décision de départ à la retraite est le risque d'avoir un éloignement entre les préférences pour la retraite des individus qui ont une mauvaise qualité de vie au travail ressentie et la décision effective de départ. A ce titre, le choix contraint de se maintenir en emploi pour les seniors insatisfaits de leur qualité de vie au travail peut se traduire par une démotivation de ces derniers, ce qui peut affecter leur productivité et donc celle des entreprises. En raison du rôle des conditions de travail dans la définition des préférences pour la retraite, il apparaît que les décideurs publics devraient considérer la qualité de vie au travail des individus non seulement en mettant en place des politiques à

un niveau individuel, comme les comptes pénibilité, mais aussi en promouvant un management spécifique pour les seniors, comme une adaptation des postes de travail et de la formation continue, afin d'agir sur leur qualité de vie au travail.

Limites et perspectives

Comme tout travail de recherche, ce travail de thèse n'est pas exempt de limites qui permettent cependant d'aboutir à une réflexion sur les perspectives en termes de recherches futures.

Le travail de recherche réalisé dans cette thèse s'est focalisé sur une démarche empirique à l'aide des données riches des enquêtes SHARE. Il a permis de mettre en évidence le rôle de l'hétérogénéité des seniors dans la compréhension des décisions de départ à la retraite. Cependant, les analyses économétriques de ces comportements menées dans cette thèse nous ont confronté à certaines difficultés. Ces dernières sont de quatre ordres : les données, la méthode, l'identification et la temporalité.

1. Bien que les enquêtes SHARE soient particulièrement adaptées pour l'analyse des stratégies de départ à la retraite, notamment au sein des couples, ces dernières souffrent d'un important phénomène d'attrition entre les différentes vagues. Ce dernier a limité nos possibilités d'analyse et a impacté la taille de nos échantillons :

- Le problème d'attrition limite en effet les possibilités d'analyses en panel. Pour cette raison, une analyse dynamique des stratégies de départ à la retraite au sein des couples n'a pas pu être effectuée. Il serait pourtant intéressant de voir l'évolution de ces stratégies dans le temps, en raison des modifications possibles de la contrainte budgétaire du ménage, de la situation propre à chacun des époux et des préférences (Browning & Bonke, 2006). Ce serait une opportunité pour notamment mieux appréhender l'évolution, dans le temps, du pouvoir de négociation de chacun des époux au sein du ménage et les conséquences sur le processus de départ à la retraite des conjoints. Il apparaît cependant que les deux plus récentes vagues de

SHARE souffrent dans une moindre mesure de ce phénomène d'attrition, ce qui permettrait donc de pouvoir réaliser à terme cette analyse.

- Ce problème d'attrition a aussi eu des conséquences sur la taille de notre échantillon lors de l'analyse du rôle de la qualité de vie au travail dans le processus de décision de départ à la retraite. Le travail réalisé au niveau du couple a également grandement diminué la taille de nos échantillons. Or, la faible taille de nos échantillons peut conduire à des problèmes d'efficacité des estimateurs et limite notre capacité à proposer différentes spécifications pour renforcer la robustesse de nos résultats. Réitérer ces études sur des échantillons plus conséquents serait une opportunité pour conforter nos résultats.
2. La robustesse de nos résultats, lors de l'analyse du processus séquentiel de décision de départ à la retraite, est aussi mise en difficulté par la technique adoptée pour corriger les problèmes d'endogénéité. Cette technique de contrôle de l'endogénéité en deux étapes peut en effet réduire la robustesse de nos résultats en raison d'une possible accumulation de biais. Pour limiter cette accumulation de biais, une correction en une seule étape pourrait être implémentée dans notre modèle de type nested logit.
 3. Bien que la technique économétrique adoptée pour évaluer l'impact du recul de l'âge légal de départ à la retraite soit adaptée au cas traité, une difficulté d'identification de l'effet de ce recul peut être soulevée. En effet, il est difficile d'isoler les effets de l'augmentation de l'âge légal de l'effet des autres dispositifs mis en place au même moment, comme les départs anticipés pour pénibilité et pour carrière longue⁷.
 4. Enfin, la proximité temporelle de la réforme française de 2010 a limité de deux manières nos analyses :
 - La temporalité récente de la réforme a contraint l'évaluation de cette dernière en raison de la disponibilité des données. En effet, malgré le caractère récent de nos données (2013 et 2015), les cohortes autour de la réforme sont

7. Les règles de calcul des retraites des mères évoluent aussi, le minimum vieillesse est revalorisé et un rapprochement des dispositifs pour la fonction publique et le secteur privé est appliqué.

encore peu représentées parmi les seniors interrogés. Les possibilités pour réaliser des analyses sur l'effet du recul de l'âge légal à long terme sont donc limitées. La réforme prenant effet pour les cohortes dès juillet 1951, une analyse en mois aurait aussi permis d'être plus précis lors de l'implémentation du modèle et pour la mesure de l'effet moyen de la réforme. Ces contraintes de données ne sont cependant pas sans issue future étant donné que les prochaines vagues de l'enquête SHARE pourraient permettre de renforcer notre échantillon et donc d'apporter des analyses plus complètes.

- Le caractère récent de la réforme de 2010 nous a imposé une seconde limite. En effet, cette réforme a augmenté l'âge légal de départ à la retraite de 60 à 62 ans mais a aussi maintenu le droit au départ à la retraite à 60 ans, à taux plein et sans décote, pour les seniors dont l'état de santé est dégradé à la suite d'expositions à des facteurs de pénibilité (Lasfargues, 2005 ; Héas, 2005 ; Debrand & Lengagne, 2007). Ces facteurs correspondent à des contraintes physiques marquées, à un environnement physique agressif ou à certains rythmes de travail. En conséquence, cette réforme offre l'opportunité de mener une évaluation de politique publique qui porte sur l'environnement de travail, en posant la question de l'effet de ce dispositif institutionnel lors de la conversion des préférences pour la retraite en décision effective. Les enquêtes SHARE permettent par ailleurs d'avoir l'information sur le recours à ce dispositif lors du départ à la retraite. Cependant, le caractère récent de la réforme implique que très peu de seniors interrogés étaient éligibles et donc très peu d'individus concernés sont représentés. Une fois encore, les futures enquêtes SHARE permettraient de pouvoir mener à bien cette analyse et d'apporter de nouvelles réponses sur le rôle de l'environnement de travail dans le processus de départ à la retraite.

Une autre perspective de recherche est issue de l'analyse du rôle de l'hétérogénéité en termes d'environnement professionnel dans le processus de décision de départ à la retraite. Le **chapitre 1** de ce travail a en effet souligné la présence potentielle d'un effet *Saint Mathieu* (Merton, 1968). Les seniors qui font l'expérience d'une qualité

de vie au travail dégradée apparaissent ainsi être ceux qui semblent avoir le plus de difficultés à partir à la retraite, et ce, malgré leurs préférences plus marquées pour la retraite. Il serait intéressant d’approfondir l’analyse de ce phénomène car cela semble aller dans le sens d’une accumulation des inégalités pour certains seniors, avec des conséquences qui pourraient impacter leurs comportements sur le marché du travail et en emploi. On peut notamment se poser la question du recours à d’autres types de sorties de l’emploi, comme le chômage, pour pallier à la difficulté d’accès à la retraite (DARES, 2011). L’enquête sur *la santé et la protection sociale* proposée par l’IRDES est une piste en terme de données pour répondre à cette problématique de la présence d’un effet *Saint Mathieu*. En effet, cette enquête est un panel depuis 1988 et contient des informations sur la situation professionnelle et les conditions de travail en emploi des ménages. Nous portons donc actuellement une attention particulière à ces données.

Au delà des questionnements empiriques sur le travail mené, de nombreuses perspectives de recherche s’ouvrent d’un point de vue théorique. Une telle modélisation aurait pour avantage de permettre d’identifier les mécanismes sous-jacents. A ce titre il serait possible d’amender les modèles de cycle de vie de deux manières :

1. Au regard des résultats du **chapitre 1**, amender les modèles de cycle de vie (Hairault *et al.*, 2010) en introduisant la qualité de vie au travail est une première piste de réflexion. En effet, il serait possible de considérer un paramètre représentant un niveau de désutilité différent selon que les individus ont une bonne ou une mauvaise qualité de vie au travail. Une mauvaise qualité de vie au travail serait alors un déterminant dégradant l’utilité des individus à se maintenir en emploi.
2. Les résultats du **chapitre 3** apportent une seconde voix de réflexion pour amender les modèles de cycle de vie. Il serait notamment possible d’intégrer à la dimension inter-temporelle des décisions le caractère collectif des choix au sein des couples. En effet, les modèles de décisions collectives sont jusqu’à présent statiques en ne considérant qu’une période de décision entre les conjoints. Or, cela ne permet pas d’évaluer l’effet des politiques publiques qui sont caractérisées par une dimension temporelle et de comprendre l’évolution du processus de

décision au sein des couples (Chiappori & Mazzocco, 2018 ; Molina *et al.*, 2018).

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Résumé

Le vieillissement de la population dans les pays développés remet en question la soutenabilité des systèmes de retraite par répartition. Plusieurs réformes ont donc été engagées pour faire face à ce défi démographique. Cependant, les effets des réformes mises en place ont été questionnés. Leur efficacité dépend en effet de la manière dont les seniors répondent aux réformes. Or, les seniors présentent des profils très différents qui résultent notamment de deux dimensions : l'environnement de travail et la situation familiale. A ce jour, ces caractéristiques restent négligées par la littérature.

Pour pallier à cette absence de prise en compte de l'hétérogénéité entre les seniors, ce travail de thèse analyse les déterminants du processus de décision de départ à la retraite en considérant cette dernière. Trois essais empiriques sont proposés. Dans un premier temps, l'hétérogénéité en terme d'environnement de travail est prise en compte en analysant le rôle de la qualité de vie au travail sur les préférences pour le départ à la retraite et sur la décision finale de départ des seniors. Dans un second temps, l'hétérogénéité familiale est étudiée en questionnant la présence d'un processus de décisions jointes de départ à la retraite au sein des couples. Les déterminants à ce processus joint sont identifiés pour chacun des conjoints. Enfin, les effets de la coordination des stratégies de départ à la retraite au sein des couples sur l'impact des politiques publiques sont analysés en interrogeant la présence d'effets directs et de débordement, via le partenaire, d'une réforme sur les décisions de départ à la retraite de chacun des conjoints.

Les résultats soulignent le rôle important des deux sources d'hétérogénéité entre les seniors, qualité de vie au travail et situation familiale, lors de la décision de départ à la retraite. Ces résultats encouragent donc la prise en compte, par les décideurs publics, de cette hétérogénéité des seniors. A cet égard, la coordination des politiques sociales liées à la retraite, la famille et la qualité de vie au travail est une piste de réflexion intéressante.

Mots-clés : décisions de départ à la retraite, hétérogénéité des seniors, politiques publiques

Abstract

The aging of the population calls into question the sustainability of Pay-As-You-Go pension system, especially in Europe. Therefore, several reforms have been implemented to face this demographic challenge. However, the effects of those reforms have been questioned. Indeed, the success of such policies depends on how people respond to changes in their pension eligibility. In reality though, retirement behaviours depend on individuals' environments, in particular in terms of job quality and family. These characteristics remains yet often neglected in literature.

Hence, this thesis aims at fulfilling this gap and at analysing determinants of retirement decisions making process by considering this individuals' heterogeneity. Three empirical essays are proposed. First, the heterogeneity within work environment is taken into account by analysing the role of job quality on the retirement preferences and final decisions of older workers. Second, the family heterogeneity is studied by questioning joint retirement process into couples and determinants of this process for each spouse. Third, effects of strategies coordination into couples on impact of public policies are analysed by questioning the presence of direct and spillover effects, through the partner, of a reform on spouses' retirement strategies.

Results highlight the significant role of both sources of heterogeneity, job quality and family, between older workers during retirement decision. Those findings thus encourage policy makers to take into account this individuals' heterogeneity. The coordination of social policies relate to retirement, family and job quality is a key issue for reflection.

Keywords : retirement decisions, heterogeneity of older workers, public policies