FINAL PROJECT

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Abstract

This work seeks to comprehend the interplay between longitudinal life courses and financial well-being in retirement. To attain previous objective, we compare family-work trajectories of cohorts born between 1930 and 1960 in both Spain, the prototype of a conservative welfare state, and the Netherlands, representing a liberal idiosyncrasy where private pensions play a big role in retirement matters. Using data from SHARE survey, we conduct multi-channel sequence analysis and cluster analysis to identify groups of typical life courses in both states. Afterwards, regression models are built to estimate how similar life courses lead to different retirement outcomes, depending on the pension regime. Findings support that, despite having higher pension payments, the system instituted in the Netherlands intensifies pension penalties for typical female family-work trajectories. Conclusions also encompass the effects of implementing Dutch pension policies in the Spanish context.

Keywords: Pensions, pay-as-you-go system, replacement rate, multi-channel sequence analysis, financial well-being.

Resumen ejecutivo

Este trabajo pretende comprender la relación existente entre las trayectorias vitales y el bienestar financiero en la jubilación. A fin de alcanzar el objetivo previamente descrito, comparamos las trayectorias familiares y profesionales de cohortes nacidos entre 1930 y 1960 en España, prototipo de estado del bienestar conservador, y Holanda, país con una idiosincrasia más liberal que otorga un papel más relevante a la parte privada. A partir de los datos obtenidos de la encuesta SHARE, hemos realizado un análisis secuencial para determinar las trayectorias vitales más comunes en ambos países. Seguidamente, se han construido una serie de modelos de regresión para estimar en qué medida experiencias similares resultan en diferentes niveles de bienestar, dependiendo del régimen de pensiones en cuestión. Nuestros hallazgos respaldan el hecho que, aún proporcionando a sus jubilados pensiones más elevadas, el sistema holandés penaliza, en mayor medida, la trayectoria vital típica de las mujeres. Nuestras conclusiones engloban, además, los efectos potenciales de implementar políticas de pensiones holandesas en el contexto español.

Palabras clave: Pensiones, sistema de reparto, tasa de sustitución, análisis secuencial, bienestar financiero.

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INTRODUCTION

In recent years, retirement has taken a central position in public and academic debate across Spain. Persistent increments in Social Security's deficit and the exhaustion of the reserve fund have raised the alarm and made people worry about their future retirement.

The challenges faced by the current system of intergenerational solidarity emerge from demographic evolution and persistent unemployment. Indeed, a higher dependency ratio[1] derived from population ageing and the decrease in Social Security contributions due to low employment rates; represent a threat for the long-term sustainability of Spanish pensions. In front of this cause for concern, many voices advocate for the necessity to introduce modifications in today's idiosyncrasy, and plenty of proposals for a transition to a new private or mixed system are on the table. Despite the general willingness for an updated pensions' paradigm, experts several times differ in which would be the right path to follow.

Professor Xavier Sala i Martín and the economist Juan Ramón Rallo, ensure the Spanish pension system is unsustainable, arguing that aggregated worker's contribution to Social Security is, by far, lower than the total compensation perceived during retirement years. They both support a scheme based on individual capitalization of savings, where private pension funds compete for offering the best conditions (elEconomista, 2 de diciembre de 2014. "El sistema de pensiones actual es insostenible: así pueden pueden ser las soluciones del futuro"[2]).

Another alternative suggested by experts is the transition to a notional defined contribution model (NDC), grounded in two main principles: the retirement income perceived must be proportional to individual contributions, and the age for retirement should be flexible, with life expectancy considered in the calculation of pension income accrual (Valero, Artís, Ayuso, & García, 2011).

Conversely, arguments in favour of the current pay-as-you-go system appeal to the instability of financial markets, and the impossibility to align them with an instrument that pretends to ensure a stable and safety retirement. (Luis Martínez Noval, 21 de enero de 2011. "En defensa del sistema de reparto". *El País*[3]*)*.

Disparities also arise when looking at European neighbours. Countries in the north, for instance Sweden, The Netherlands, Denmark or United Kingdom, are in favour of a

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[1] The dependency ratio is an age-population ratio of those typically not in the labour force (0 to 15 and 65+) and those typically in the labour force (15 to 64).

[2] Retrieved from "http://www.eleconomista.es/espana/noticias/6293400/12/14/Es-sostenible-el-sistema-publico-de-pensiones-Posibles-soluciones-para-el-futuro.html".

[3] Retrieved from "http://elpais.com/diario/2011/01/21/opinion/1295564412_850215.html".

“personal choice” system, in which the individual is the one who decides to subscribe a public or a private plan. The majority of Eastern Europe has pure private systems, whereas countries in centre, such as Germany, or France, have developed an intermediate version where a compulsory public system coexists with a substantial part privately managed. Finally, southern countries like Italy, Greece, or Portugal, opt for a pay-as-you-go system, similar to the Spanish one.

In light of the above, we aim to discover how the transition to a new model, inspired by one of these alternatives, will affect Spanish retirees’ financial well-being. The bottom line is to identify which determinants within other schemes could be included in a hypothetical Spanish pension reform to secure a growing number of retirees’ financial well-being in an efficient and sustainable way.

One of the most discussed deficits asserted by current system’s detractors concerns the poor development of Spanish private pensions (Hernández de Cos, Jimeno & Ramos, 2017), a phenomenon tightly related with its retirees' excessive dependency on the public party. This fact does not represent a problem itself but, population ageing, added to an increasing demand for pension funds, have sapped expectations about the model's sustainability. Therefore, we pretend to analyse the outcomes of a hypothetical transition to a system with more and high quality private participation.

To achieve this objective, we conduct a study in which the Spanish pension system, that follows a traditional conservative structure, is empirically compared with the Dutch, a liberal alternative with little portion of retirees’ income coming from public sources, but compensated by a high-developed private sector. The methodology employed evaluates potential benefits on retirees’ financial well-being from implementing Dutch alternatives in the Spanish context.

Retirees’ financial well-being has been object of study for a long time by economists and sociologists alike (e.g., Clark, Morrill & Allen, 2011; Disney & Johnson, 2000; Kosloski, Ginsburg & Backman, 1984). Further studies also emphasize the relation between life course trajectories and financial well-being in retirement, often framed within the notion of cumulative advantage or disadvantage (CAD) across the life course (e.g., Blossfeld, Buchholz, & Hofäcker, 2006; Dannefer, 2003; Han & Moen, 1999). In relation to life trajectories, more than a few retirement studies (Buchholz, 2006; Warner and Hofmeister, 2006) stress the importance of including not only working careers, but also family events in individual’s longitudinal life courses. Employment interruptions that usually lead to a lower pension accrual, are closely related to family events such as marrying, childcare etc.

We draw on this strong correlation between family life courses and employment trajectories to analyse how the Spanish and the Dutch pension systems, both endorsed by different interpretations of the welfare state, shape the well-being of retirees with similar

working careers and family conditions. Then, we examine which life courses result in well-off conditions at retirement, and which others are the most disadvantaged in both frameworks. Eventually, the main concern is to analyse the financial well-being provided by the Dutch pension system on typical Spanish family-work trajectories, aiming to detect if this step forward to sustainability will, at the same time, improve living conditions of the majority.

In particular, to conduct the analysis, we compare the cohorts born between 1930 and 1960 that experienced their active family formation and working careers, between 1950 and 2000, in two societies characterized by a strong male-breadwinner context with many cultural similarities.

We make use of the exceptionally rich dataset from SHARELIFE, and employ sequence analysis to build different clusters, for grouping similar family-work trajectories in both societies. SHARELIFE dataset is characterized by going beyond snapshot information with a questionnaire that includes longitudinal life experiences from entire adult's life[4].

Afterwards, the financial well-being of retirees in each cluster is evaluated, under both pension systems, by conducting a regression analysis to see interactions between family-work trajectories and variables representing financial-well-being in retirement.

The methodology employed pursues a double objective. Primarily, the evaluation of a hypothetical reform that brings Spanish pensions closer to the Dutch model. Our second input concerns the identification of cluster groups presenting a high poverty risk in retirement, and propose a set of social policies to mitigate the difficulties these persons encounter in today's system. This second objective is attained by identifying Dutch policies that successfully protect these collectives in risk and, afterwards, assess its applicability in the Spanish system of Social Security.

This work's social perspective is crucial to interpret concluding remarks as the focus is placed on individual's well-being and not on economic efficiency. Rather than an ultimate solution to deal with existing inefficiencies and enhance financial sustainability of pension systems, this work seeks to identify retiree profiles at risk of poverty in the current scenario and evaluate their expected well-being in a hypothetical new paradigm, where private pensions adopt a more determinant role.

Conclusions should be taken into consideration for further structural reforms in pension matters, putting special emphasis on protecting disadvantaged groups with less resources in retirement.

[4] SHARELIFE dataset corresponds to Wave 3 of the SHARE survey.

CHAPTER I. RETIREMENT PENSIONS IN MATURE WELFARE STATES: TWO DIFFERENT PERSPECTIVES

The welfare state was consolidated in developed societies after the second World War, aiming to provide citizens with a safety net by guaranteeing a set of basic services to the whole population. It was conceived as a social project's yearning that pretends to offer protection to individuals not able to maintain a minimum standard of living. This idea of security and prosperity became popular, specially among European countries, devastated after the war; where citizens entrusted their children's education, retirement plans and healthcare to the state.

This initial conception of the welfare state has evolved throughout the second half of the twentieth century, and has reached its maximum splendour nowadays, in democratic countries with capitalist economies. Its glory days arrived not without earlier overcoming strong criticism, specially in economic turndowns such as the oil crisis in 1973. One of the core values of the welfare state, still present nowadays, concerns government intervention in the economy, with the objective to redress imbalances and compensate deficiencies of the private sector[5]. Many neoliberal parties strongly disagreed with the previous statement, blaming this interventionism for economic crises as it strips private firm's earnings and disincentives them for being more efficient.

Without forgetting its chilling effect on the economy, further sections evince that government interventionism is a must do for the system's financing. This involvement is managed by means of a complex network of Social Security regimes, through which the State guarantees an acceptable well-being for the whole population and regulates essential services publicly provided.

According to Beveridge report (1994), the Social Security is defined as a set of measures adopted by the State to protect citizens from particular risks, which are not going to disappear despite an optimal situation in the society. Conceptually, taking into consideration Beveridge's definition, it is possible to argue that a Social Security regime is sustained by two fundamental principles: solidarity and sufficiency.

The origin of these two pillars dates back to Otto Von Bismarck's Prussia in the XIX century and, subsequently, to Great Britain in the forties (Maianti Lázaro & María, 2014). The social insurance was created to abolish indigence in view of little social protection and high inequality between different productive sectors. It pretended to ensure a reasonable well-being for all citizens facing an impossibility or a limitation to access

[5] Keynesian economics inspired the creation of the welfare state in a desire to prevent economic development from being detrimental to social welfare and individuals' well-being.

earnings (divorced people, widowed people, unemployed etc.). The system was conceived to be universal; everyone in risk should be attended despite his ability to pay for the service provided.

This principle of universalism, raised the issue of sustainability. States pretended to attain a financial equilibrium that will have ensured the long-term survival of their Social Security institutions. The mentioned prosperity was achieved by requiring some contributions to the system and with the help of public policy to influence individuals' life-decisions.

It is crucial not to lose sight of these two principles because they lay the foundations of many modern Social Security regimes and are still present in existing legislation. In general, most Social Security systems are in line with these two values: there are some universal compensations destined to satisfy the most basic needs (sufficiency) but also others in which the individual has to contribute to the financial equilibrium of the system (solidarity).

Non-forgetting Beveridge's definition, Social Security systems are, in practice, far from being homogeneous. The pillar of solidarity implies renouncing to own resources for the benefit of the society and indirectly finance services, which might be unnecessary or useless for the individual. While this implication is not well seen in highly individualistic societies, like the US, others more collectivist, like Nordic countries, are predisposed to transfer many competences to the government, at the expense of their own wealth. These ideological differences set the basis for having heterogeneous Social Security regimes in the international context.

Disparities in the desired degree of government implication in individual affairs derive in asymmetries concerning Social Security competences and scope of action. Among the areas of activity shaped by the previously stated cultural and economic differences, is our main concern, retirement pension schemes.

1.1. Pensions in the international context

Pension systems are a consequence of the welfare state implications. In line with the argument presented in previous section, its core objective is to ensure a minimum well-being for individuals facing an impossibility to access earnings. This limitation encompasses a set of eventualities mainly related with retirement, death and disease.

The basic outline for pension schemes is grounded in the theory of the three pillars from Lovaina's Code, strongly related with the previously mentioned principles of solidarity and sufficiency:

Table 1: Summary of the three pillars from Lovaina's code

Social Security systems				
Levels	Collective covered	Financing	Compensations	Management
Basic (1)	• Universal	• General Taxes	• Healthcare • Family aid • Disability • Retirement (minimum compensation) • Unemployment • Orphanage and widower's pension • Social benefits for special needs	• Public
Professional (2)	• Employed • Self-employed • Public servants	• Professional contributions with fiscal benefits	• Complements up to a maximum threshold • Temporal and permanent disability • Complements to retirement • Orphanage and widower's pension • Unemployment	• Public or private with public supervision
Voluntary (3)	• Freelancers • Self-employed • Small farmers, dealers and industries • Employees and public servants (voluntary nature) • Others	• Voluntary contributions with fiscal benefits	• Voluntary complements to the previous levels	• Private sector • Individual prevision plans • Social insurance

Source: Fundación Inverco, 2017

- A first basic level, universal and at the service of all citizens despite their contribution to the system's financing. This level appeals to the principle of sufficiency and implies the provision of basic services to the whole population. Another point worth mentioning is that compensations regarding this first level are financed with general taxes.

- The second level, also named the professional level, concerns contributions of both firms and individuals. Appealing to the solidarity principle, this pillar aims to ensure the long-term sustainability of the system. Individual contributions derive in future compensations to those having performed a professional activity and, ideally, the size of their future benefit should be proportional to the amount of their contributions.

- Finally, a third level is included in which every individual, covered or not by the second level, can contract a prevision plan based on his needs. This contribution has a voluntary nature and every person can contract it individually.

Without forgetting the theoretical basis of the three pillars, disparities in Social Security regimes result in different pension schemes' composition. Each country stablishes its own version of the three pillars by introducing particularities in issues such as the nature of contributions (compulsory or voluntary), the freedom for selecting the risk of retirement investments or retirement income payback.

Therefore and, with an eye on further sections, we are required to build a common framework for evaluating different alternatives in retirement concerns, aiming to highlight both similarities and differences across countries. The idea is to characterize a pension scheme by a set of common dimensions, with the objective to ease both descriptions and comparisons. To achieve this purpose, we appeal to the following four dimensions purposed in a seminary for the Spanish pension reform, convened by the Social Security institution in 2011 (Antolín, 2011):

1. The system's compulsory or voluntary nature
2. How are pensions financed
3. If contributions are subject or not to a labour relationship
4. The ratio between contributions and payments

The first criterion depends directly on legislation, which stablishes if individuals are required (or not) to contract a pension plan for their retirement years.

Regarding pensions' financing, countries employ two main alternatives: pay-as-you-go systems, where retirement pensions are paid with current workers' contributions, or systems financed through individual capitalization of savings.

The third criterion used to classify old-age pension schemes appeals to the existence of a labour relationship when saving for retirement. Therefore, pension plans might be occupational (linked to an employment or professional relationship) or personal (not linked to working life).

Finally, the fourth criterion concerns the replacement rate of pensions[6]. On the one hand, defined benefit schemes (DB) are based on a promise to receive a certain amount of income at retirement. This is the case of the pay-as-you-go system where benefits are linked through a formula to the member's wage, length of employment, or other factors. On the other hand, in defined contribution schemes (DC) future pensions are guaranteed by the investment itself, and the amount perceived depends exclusively on its rate of return.

Apart from this framework hired as a guideline to analyse pensions in an international context, other factors such as fund's ownership are of great importance. Eventually, it is essential to identify the objectives pursued by Social Security institutions within each country; fight poverty, redistribution or simply guarantee a certain amount of savings at retirement.

In relation to the four dimensions described, countries are, in practise, entitled to mixture, in which every alternative is present to some extent. Thence, the point is to analyse the weight of each dimension in pension schemes' composition. Most countries have both public and private pension plans which might be compulsory or voluntary. Likewise, a pay-as-you-go component is present in almost every Social Security system despite the existence of additional complements from other sources. An interesting method to identify these weights is an aggregated bar plot with replacement rates broken down into different categories according to income's origin.

Figures 1, 2 and 3 show the gross replacement rate's composition for workers with a range of different earnings levels: between 0,5 and 1,5 times the average worker earnings (AW)[7]. Replacement rates presented reflect the situation in the year 2014 and onwards. Calculations to obtain the pension system parameters for all pension entitlements show the theoretical retirement benefit of a worker who enters in the system today, at an age of 20, and retires at legal retirement age after a full career. This approach enables us to detect structural differences and compare countries on a systematic basis, forgetting about individual circumstances and economic environment.

Results suggest that complements to mandatory public pensions play a large role in providing incomes for old age, specially in countries presumed among the best well-being providers, such as the Netherlands, Denmark or Iceland. The OECD average for gross replacement rates of an average earner from public schemes alone is 41%, compared with 58% when mandatory private, both DB and DC, and voluntary DC schemes are taken into account.

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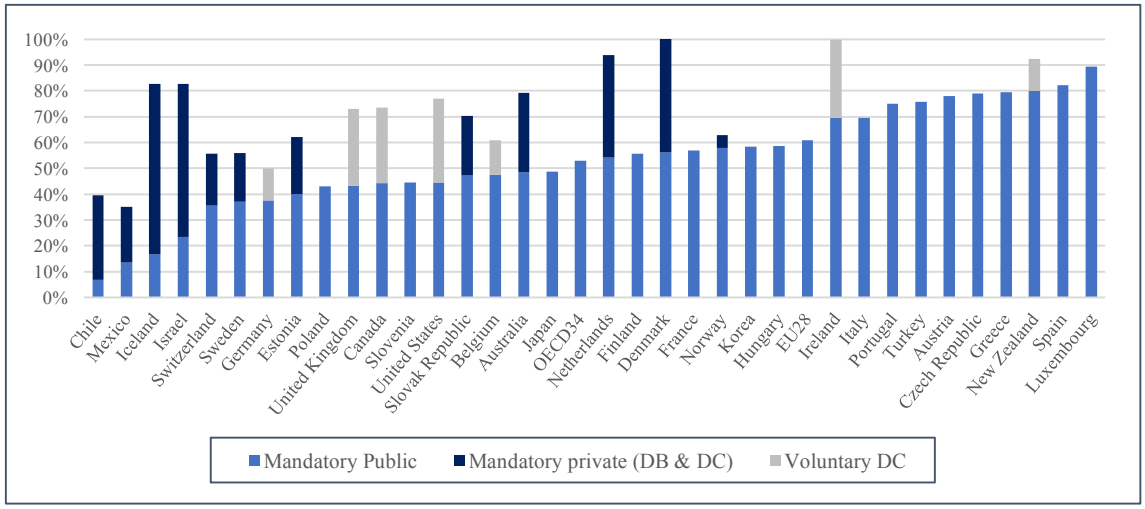
[6] The replacement rate is calculated as the average first pension as a share of the average wage at retirement.

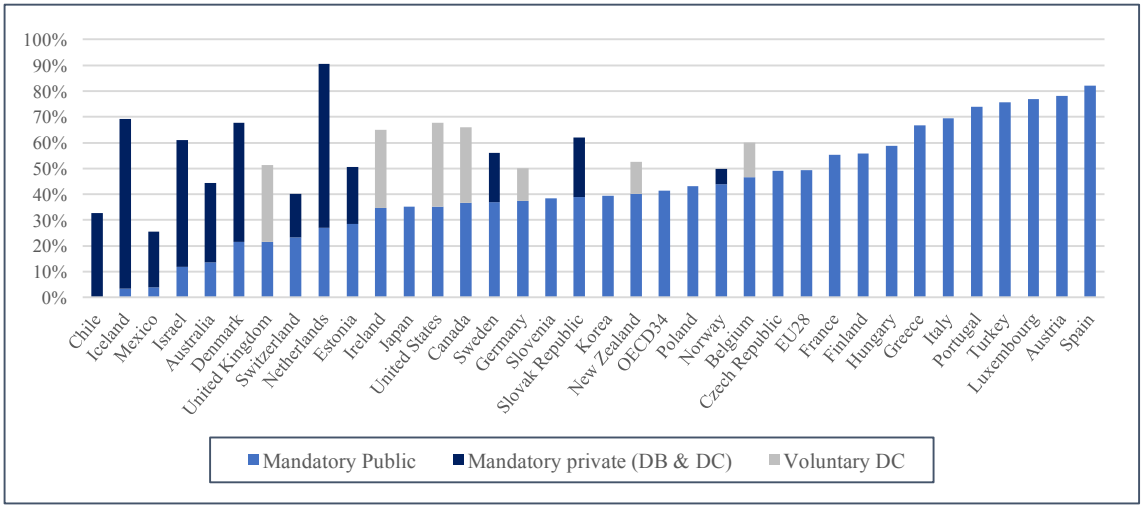
[7] Pension entitlements presented include reforms before June 2015.

Figure 1: Pension entitlement in OECD countries for workers earning 0.5 times AW



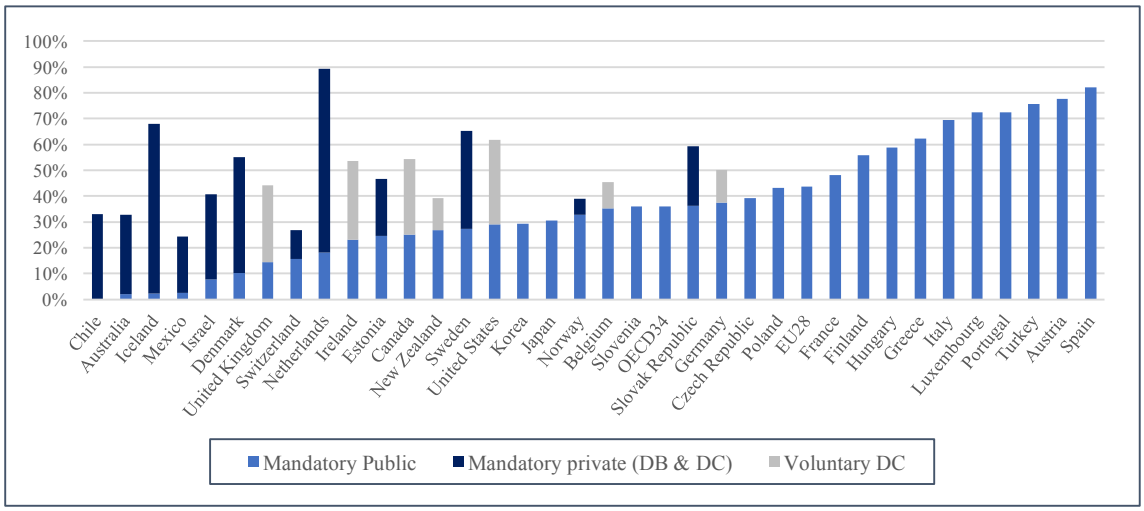
Source: Adapted from OECD (2015), Pensions at Glance

Figure 2: Pension entitlement in OECD countries for AW



Source: Adapted from OECD (2015), Pensions at Glance

Figure 3: Pension entitlement in OECD countries for workers earning 1.5 times AW



Source: Adapted from OECD (2015), Pensions at Glance

Furthermore, in OECD countries where voluntary DC pensions are widespread the average replacement rate is 59% for an average earner compared with 36% when only mandatory schemes are considered.

Nevertheless, mandatory public schemes are still attractive in many States as they offer considerably high replacement rates entitled in a secure investment (this is the case of Spain, Austria, Luxembourg, Greece etc.). These countries' pension schemes architecture offers a presumably optimal financial situation for future retiree's. Their main and only concern is if it will be possible to maintain this level of welfare for around forty-five years until this individual, entering today in the labour force, finishes his working career.

Projections are not optimistic; many countries have, in recent years, implemented a set of reforms to strengthen the financial situation of their pension systems by tightening eligibility rules and decreasing pension benefits. Therefore, a decline in pension paybacks is expected for the next years, as a consequence of these reforms' negative impact on pensions generosity.

Table 2 depicts the projection of gross average replacement rate's composition in EU member states according to the Ageing report (2015) developed by the European Commission. The projection horizon considered goes from 2013 to 2060, and replacement rates shown, account for current retirees' pension income[8].

At a EU level, the public pension replacement ratio would decrease around 12 percentage points to a value near 35%. For earnings-related pensions a 39% is projected with wide differences across member states. Furthermore, latter remark is that the decline mentioned is stronger in countries where public pension replacement rates are very high, in general, or in comparison to others (e.g. Spain, Portugal or Poland). Results endorse the fact that governments in these countries have the political goal of reducing financial pressure on their pension systems, in view of a structure impossible to be sustained on the long run. This progressive decadence of public pensions could have a strongly negative effect on individuals if no other sources of pension entitlements are created; since mandatory public schemes are still the sustain for the majority in these countries.

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[8] Public pension earnings-related refers to old age earnings related pension. Public pensions aggregate includes disability, survivor and non- earnings-related benefits. All pension aggregate includes private occupational and private individual benefit and it is only reported when private pensions have been provided.

The 'Gross Average Replacement Rate' is calculated as the average first pension as a share of the average wage at retirement, as reported by the Member States in the pension questionnaire.

FR: disability schemes and non-earning-related schemes are not taken into account in the "public pensions" replacement rate calculation.

LV: 2015 values taken as starting point for the gross average replacement rates. UK: new pensions (and therefore replacement ratios) have not been provided.

Table 2: Gross average replacements rates at 2013 and 2060's projections

	Gross Average Replacement Rate (%)								
	Public pensions earnings-related			Public pensions			All pensions		
	2013	2060	p.p. Change	2013	2060	p.p. Change	2013	2060	p.p. Change
BE	39,5	38,8	-0,7						
BG	35,8	36,7	0,9	29,5	31,9	2,4			
CZ	43,3	49,3	6,1	32,2	33,7	1,5			
DK	53,7	60,6	7	39,7	32,8	-6,9	57,4	59,4	1,9
DE	38,9	33,9	-5	42,5	35,5	-7			
EE	40,1	25,2	-14,9	40,1	25,2	-14,9	40,4	44,1	3,7
IE	33,9	30,4	-3,5	31,2	28,7	-2,4			
EL	45	26,7	-18,3	38,7	22,3	-16,4	40,7	27,5	-13,2
ES	81,9	49,7	-32,2	79	48,6	-30,4			
FR	58,3	48,9	-9,4	50,6	39,2	-11,4			
HR	35,3	18,7	-16,7	27,9	16,5	-11,4	27,9	20,7	-7,1
IT	59,9	51,8	-8						
CY	44,2	49,2	5						
LV	38,1	19,1	-18,9	33,4	18,1	-15,3			
LT	34,9	34,8	-0,1	35	48,6	13,6			
LU	77,7	64,6	-13,1						
HU	45,5	45,2	-0,3	33	29,1	-3,9			
MT	53,6	47,4	-6,1	49,4	45,6	-3,9			
NL	28,3	27,4	-0,9	29,8	28,3	-1,4	52,4	52	-0,3
AT	42,9	41	-1,9	51	44,7	-6,3			
PL	53	28,7	-24,4						
PT	57,5	30,7	-26,7	55,8	36,6	-19,2			
RO	35,6	33,7	-1,9						
SI	36,1	34,1	-2,1						
SK	51,7	49,4	-2,4	51,7	49,4	-2,4	51,7	53,1	1,3
FI	42,6	42	-0,6	46	44,1	-1,9			
SE	35	23,7	-11,3	35,6	29	-6,7	40,9	35,2	-5,7
UK									
NO	43,7	36,2	-7,5						
EU*	43,8	36	-7,8	47,5	35,3	-12,3			
EA*	53	44,2	-8,9	47,9	35,3	-12,6			
EU**	45,7	39	-6,8	68	53,4	-9			
EA**	47,6	39,2	-8,4	72	56,7	-9,4			

** Weighted average. ** Simple average.*

Source: Ageing Report, 2015

In light of the above, the main conclusion regarding the situation of pensions in the international environment would be that, even with a presumably good architecture, public schemes are suffering from high pressure on their financial structure. Their financing channels have not adapted to the new era, and are not flexible enough to deal with new demographic tendencies and a more volatile economy, in which changes occur faster and consequences are more dramatic. Accordingly, these systems are needed for a reform to insufflate a dose of flexibility in their Social Security institutions, aiming to increase pension entitlement.

Among the several existing ways to build pension entitlement in states strongly dependent on public provisions, this work places the focus on shifting pension accumulation, from the first pillar to the second and third, and a bet for private sector development. These are the most differential issues between the two systems being analysed in further sections, the Dutch and the Spanish one.

As it is mentioned previously, numerous reforms have been implemented not by a few countries to deal with financial sustainability concerns. However, social or political challenges could have been triggered by these measures, or could still emerge on all fronts.

In line with this reasoning, further chapters assess the effectiveness of pension systems in terms of pension adequacy. Rather than evaluating technical aspects of structural elements, we seek to comprehend the effect that choosing one or other alternative, within our framework boundaries, has on real people's financial well-being. We expect further work to answer questions that arose in this section such as if private involvement is the key answer to solve the sustainability issue and if it does not imply, at the same, a detriment of some population groups' welfare. The crucial assumption is to evaluate if it is possible to reach everyone with a private system under a competition regime; always from a social perspective and bearing in mind that the sustainability objective should be achieved without harming anyone in the society.

1.2. The case of Spain: a conservative-corporatist perspective

The first pension system presented, treated as a benchmark for comparisons, is the one currently into effect in Spain. Spain represents the prototype of a conservative-corporatist welfare regime with an active regulative state securing a high degree of de-commodification[9]. Obsession with market efficiency has never been preeminent, and the focus is placed on the granting of social rights.

[9] De-commodification describes a process when a service is rendered as a matter of right, and when a person can maintain a livelihood without reliance on the market

In pension matters, this idiosyncrasy enhances regulatory competences to displace the market, resulting in marginal private insurance share (Ebbinghaus, 2006; Esping-Andersen, 1990; Hall & Soskice, 2001; Mayer, 1997).

1.2.1. Institutional framework in Spain

The origin of social protection policies in Spain dates to 1883, with the creation of the Social Reforms Commission. This institution had the mission of improving the working-class welfare through actions in social protection matters. After a few years, in 1900, the first social insurance was created, being this one, the trigger factor to the establishment of new insurances for specific purposes, such as unemployment or disability.

However, the poor protection provided by public instruments led to the appearance of other mechanisms managed by insurance companies on a sector basis. Before long, discrimination in social protection conditions between different productive sectors, forced the government to implement a unique and integrated Social Security regime, enclosed in the General Social Security Law in 1966. Despite this allegory to egalitarianism, the reality was that social benefits were far from being adequate, as the law proved unable to adapt the previous structure to that time requirements.

It was not until the approval of the Spanish Constitution, in 1978, that the Social Security became appropriately configured. The current system has its roots in article 41, from the Constitution, which stablishes that "*the public powers must maintain a public regime of Social Security, for all citizens, that guarantees assistance and enough provisions to those in need, specially in unemployment situations. Complementary assistance and provisions are voluntary*".

Taking into consideration the previously exposed facts, it is possible to argue that the Spanish pension system is relatively young, in comparison to the ones instituted in other countries. In the majority of Europe, modern Social Security systems were stablished between the 50s and the 60s, whereas in Spain it did not happened until late 70s. In consequence, it is hard to find nowadays individuals with complete working careers. This reality is an important issue to mention, since the replacement rate promised for an individual with a full career, remember 82,1%, will rarely be achieved by today's retirees. Nevertheless, as time goes by, upcoming retirees will start having complete working careers, and the real replacement rate will converge to the 82,1%. This phenomenon represents a threat, in the mid-term, for Social Security pensions' financing, in addition to the widespread ageing population and high unemployment rates in the national territory.

Financial sustainability of pensions has always been into question since 1985, when the government approved the first reform to release the system from an incipient financial pressure, by tightening eligibility criteria. Despite these measures entailed a considerable

relief for the system's financial situation, pensions kept rising and a call for a new reform did not take long to arrive.

1.2.2. The Spanish first pillar: Social Security and the basic pension

The current first pillar of pensions in Spain covers a set of contingencies related to retirement, death and disease. It has two fundamental modalities, a care modality and a contribution modality.

On the one hand, the first one appeals to the principle of sufficiency, and benefits all individuals with income levels under a determined threshold. It is financed with general taxes and compensations are provided on a non-return basis. The non-contributory pension is paid to those individuals lacking sufficient resources for their subsistence, according to the corresponding legally stablished terms. Current legislation set the following conditions to be satisfied for accessing non-contributory pension payments: be over 65 years old, minimum of 10 years of residence in Spain with no interruptions, no access to contributory pensions, annual income below 5.164 euros and no other payments from complementary pensions. The pension perceived ranges from 92,23 to 368,9 euros per month, and depends exclusively on income from the economic unit, and the number of beneficiaries.

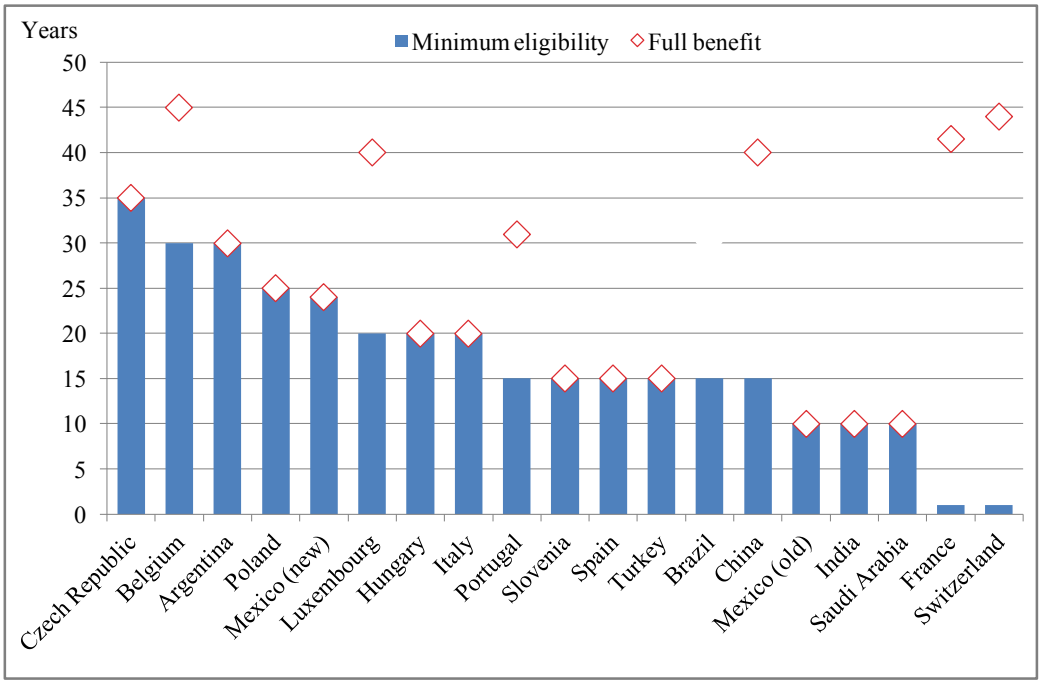
On the other hand, contributory pensions are financed with both active employers and active employees' contributions under a regime of intergenerational solidarity. This means current active cohorts' contributions finance passive cohorts' pensions. The benefit perceived, follows a DB scheme, and is calculated as a function of employment history, accounting for both years of contribution and contribution bases. This modality comprises contribution-based eligibility rules; a minimum of 15 years is stablished, together with a minimum and maximum pension.

Figures 4 and 5 show how by contributing to Spanish Social Security for 15 years, benefits in retirement amount to 33,9% of average earnings[10], 10 percentage points above the EU15 average. Furthermore, the minimum and the maximum pension is legally fixed, respectively, at 636,1 and 2.567,28 euros.

Depending on the professional sector, there exists a general, or a special regime to follow. The justification of such division, involves special measures to be adapted for providing and adequate protection to particular sectors such as mining, sea workers or self-employed. Regardless the system joined, contributions are mandatory for all workers, and are calculated as a percentage of the salary base.

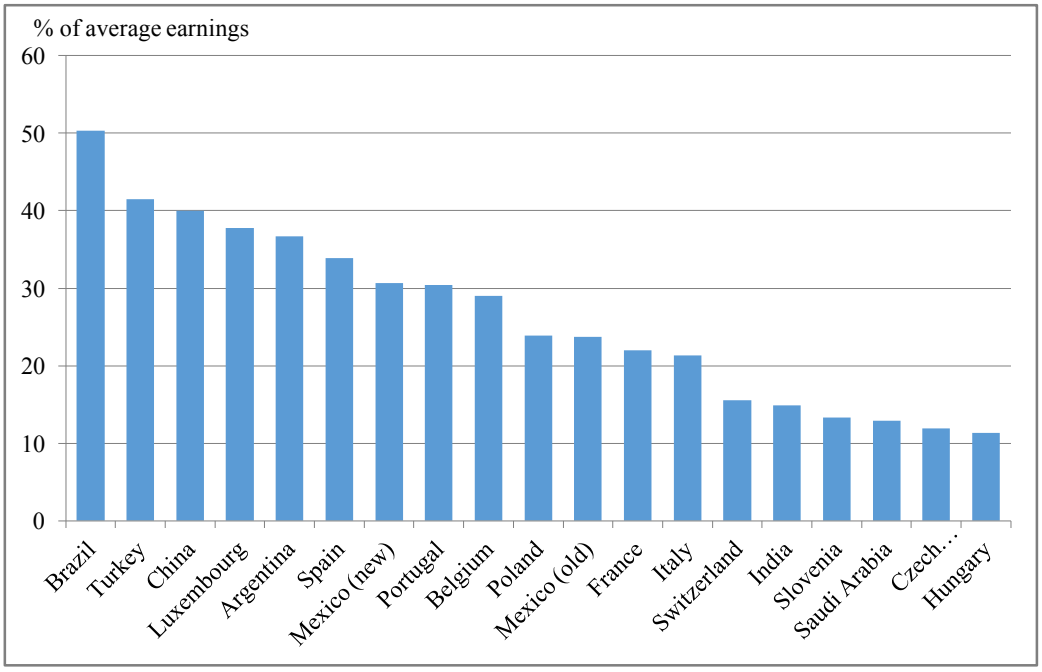
[10] The government offers a complement for those workers who, even having contributed for more than 15 years, its pension accrual is less than the minimum.

Figure 4: Contribution years required for minimum pension[11]



Source: Pensions at Glance, OECD (2015)

Figure 5: Basic pension as percentage of average earnings



Source: Pensions at Glance, OECD (2015)

[11] Minimum pensions refer to either the minimum of a specific scheme or of all schemes combined. The benefit level can take into account other pension income.

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In 2016, General Regime's percentage was a 28,3% of employee's salary, with a minimum and a maximum amount fixed proportionally to the maximum pension of 43.704 euros per year. This wage ceiling prevents workers from incurring in contribution payments outside the monthly range of 216,33 and 1.067,4 euros. Last resort to mention regarding contributions is that, the self-employed can choose their preferred contribution base within a specific range.

Taking into consideration both the contributory and the care modality, total expenditure of the public pension system in Spain amounted to 11,8% of GDP in 2013, slightly higher than the EU average of 10,5%. The non-contributory modality, together with complements for the minimum pension, represent, approximately, 1% of total Spanish GDP. The remaining, corresponds to contributory pensions, from which a 68% goes to retirement matters. Expenditure in contributory pensions increased by 3,1 percentage points in the period between 2007 and 2015, a fact that has led the system to reach a deficit of 1,5% of GDP in 2015.

1.2.3. The Spanish second pillar: Company's social insurance

In some professional sectors, a social insurance is promoted through occupational pension plans from friendly societies or mutual funds.

This second pillar includes those pension plans promoted by companies on a labour relationship basis, whose purpose is to encourage private savings for securing employees' retirement. These schemes are DC with contributions' amount generally chosen freely by the employee. In Spain, however, this sort of pension plans is not widespread, as hiring it does not release workers from the obligation to contribute to the general regime of Social Security.

To illustrate this, according to INE, the total amount of capitalised funds from occupational pension plans accounted for 2,02 million euros, by the end of 2015, covering only a 3,3% of active workers. Expressed as a percentage of GDP, this 2,02 million represent a 3,38%, while the European average is placed around 14,9%.

1.2.4. The Spanish third pillar: Investment

The third pillar is comprised by all complementary insurance products, contracted voluntarily by individuals. As the second pillar, this third is also based on individual capitalization of savings (DC), and its plans are mainly offered by private pension funds and insurance companies. This third pillar enables individuals to increment their saving accounts, progressively on a long run basis.

In view of a potential reduction in public pensions, the State is incentivising this sort of products by offering fiscal savings, up to a maximum, when contributions are realized. However, these products are still unpopular in Spain, due to the obligation to continue to

contribute to Social Security, and a set of drawbacks concerning hard taxes when recovering retirement investments, low returns and high commission fees. Experts estimate that, from the 600 private plans available in Spain, only 23% of them have certainly equalled inflation rates over the previous ten years of activity.

Numbers show how private personal plans have an underlying value of 7,88 million euros, by the end of 2015, representing a 6,29% of Spanish GDP. If compared with the European average, the gap is even higher than in occupational plans, as the average percentage in the EU is around 21,7% for the same year.

1.3. The Dutch case: a liberal perspective

The counter party used in this work to make comparisons is the pension system stablished in the Netherlands. The Dutch alternative has been congratulated with a grade A in the Melbourne Mercer Global index, only surpassed by Denmark. This grading is translated into a fist class and robust retirement income system that delivers good benefits, is sustainable and has a high level of integrity.

The regime in the Netherlands is considered a liberal welfare state, characterized by modest universal transfers and social plans, with its beneficiaries concentrated, mainly, among low-income individuals, working class and state dependents. Its idiosyncrasy limits the welfare state up to the point where marginal propensity to opt for welfare instead of work, is equal. Social rights still play a big role in individual's life but the de-commodification effect is small, giving priority to a fair, but a free market.

1.3.1. Institutional framework in the Netherlands

Public pensions were first stablished in the Netherlands in 1919. The funded scheme was characterized by a strong relation between contributions and benefits received in retirement. Pensions were guaranteed only for those workers over 65 years that surpassed a determined income threshold. The Dutch liberal thinking was strongly present in the roots of its pension system, but the lack of indexed pensions rapidly eroded the real value of retiree's benefits, a phenomenon that immediately led to calls for a reform. To solve this shortcoming, the Dutch government developed, in 1956, a more efficient version of the system instituted in 1919, by introducing a compulsory pay-as-you-go old-age insurance for all residents. Under the 1956 scheme, pension benefits payable at age 65 were not means tested, did not depend on previous contributions and were indexed to contractual wages.

New reforms and increases in public pension benefit became frequent in the following decade but the most revealing fact of what is happening today in the Netherlands, is related to the rapid growth of occupational pensions after World War II. A wage policy that limited increments in salaries, triggered employers to compete in offering better

secondary conditions to hire good labour. Those conditions included occupational pensions, which were initially developed in the Netherlands as a contracting tool but, in front of the tremendous success of getting firms involved in their worker's retirement, the government signed in 1949 the Occupational Pension Act (BFT). This law made the negotiated supplementary pension compulsory, for all firms in a particular sector, if requested by employers' organizations and trade unions. This means that the Occupational Pension Act did not oblige contractually employers to contract pension schemes for their employees, but created the framework to negotiate these occupational pensions through industrial-relation agreements.

Further reforms contributed to an increment in the popularity of occupational pensions by introducing fiscal allowances and incentives to make them more financially attractive.

Despite its adequacy, the Dutch pension system has also suffered recent changes mostly driven by the widespread need to improve fiscal consolidation and financial sustainability of pensions.

1.3.2. The Dutch first pillar: state old-age pension (AOW)

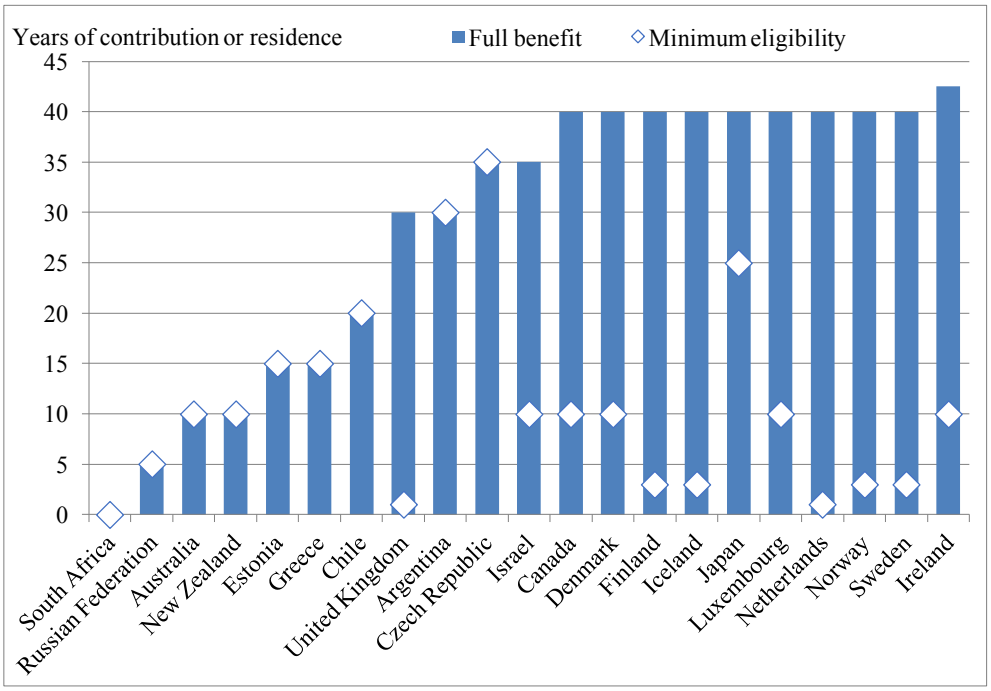
The first pillar of the pension system in the Netherlands is managed by means of state regulations, and provides income to people over 65 years or after decease. In this first level, two forms of old-age provisions are involved:

- General Old-Age Pensions Act (AOW): This statutory (managed by Social Security) old-age pension, benefits all residents in the Netherlands aged 65 and over with a flat-rate positively correlated with years of residence[12].
- Surviving Dependants Act (ANW): This type of pension is a flat-rate benefit payable to the surviving partner after both parents and the other partner die.

Pension rights in the Netherlands regarding this first pillar were conceived to embrace all people aged 65 and over, and entitle them to full pension rights. Theoretically, everybody between 15 and 65 years, with residence in the Dutch territory is insured. This entitlement is accumulated at a rate of 2% for each year of insurance, which is translated into a 2% of the total AOW pension, for each year of residence in the Netherlands. The system is designed in a manner that if an individual stays his full hypothetical working life in the Netherlands, a yearly 2% will lead to 100% entitlement upon reaching the age of 65. We are in front of a case where eligibility rules are residence-based with full benefit around 25% of average earnings, prorated to the number of years of residence.

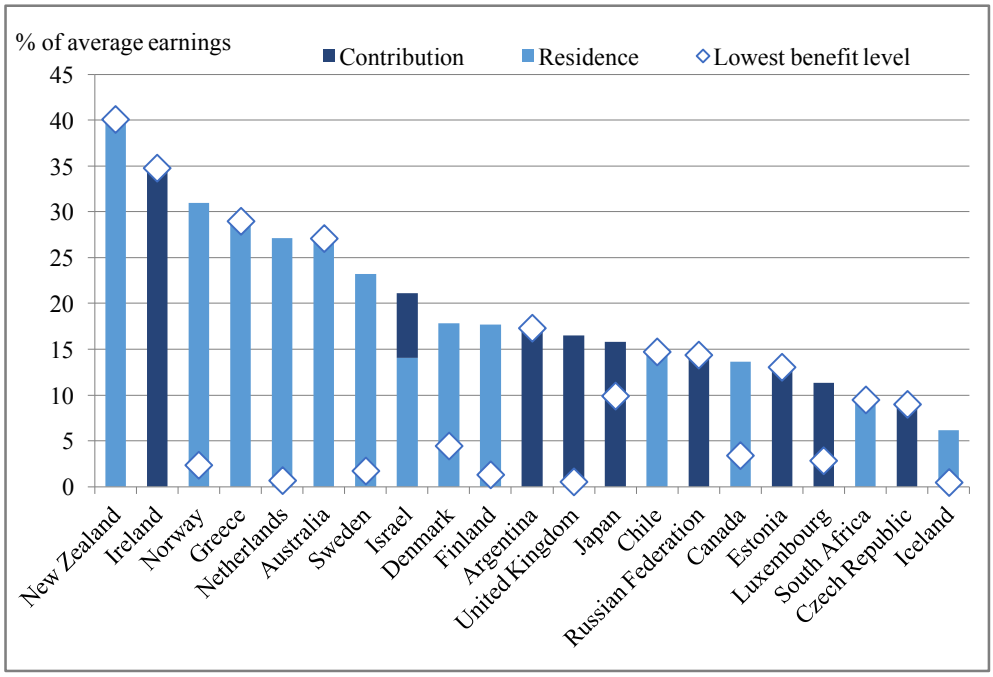
[12] In principle the AOW pensions is conceived to guarantee a 70% of minimum wage

Figure 6: Years of residence or contribution required for basic pension[13]



Source: Pensions at Glance, OECD (2015)

Figure 7: Basic pension as percentage of average earnings



Source: Pensions at Glance, OECD (2015)

[13] For the United Kingdom, the new state pension will require 35 years for the full benefit and 10 years for the minimum.
For Ireland, the 42,5 years reflects entry at age 20 and retirement at age 66 with an average of48 weeks of contributions.
Basic pensions refer to the benefit paid based on either the length of residency or the duration of contribution, irrespective of earnings.

Without regard to the nature of eligibility rules, there is huge heterogeneity among countries in the number of years required both for the full benefit and the minimum eligibility. Moreover, some countries like United Kingdom require a minimum number of years of both residence and contributions. Figure 6 displays clearly how, for instance, Nordic countries require around 40 years of residence for full benefit, while in others, like Australia and New Zealand, only 10 years are needed.

Another determinant, in addition to eligibility rules, is the monetary value of benefits perceived. Controversially, Figure 7 evinces how countries with low profile eligibility rules like Australia, New Zealand or Greece, show considerably high benefit levels. The key to achieve this level of entitlement relies on the fact these countries do not prorate eligibility conditions and their pensions are means-tested. This means that, although it is relative easy to be elected, those individuals that do not surpass the eligibility threshold are left with no pension benefit at all.

In short, the Netherlands embraces a system, which requires long stays to be elected for the full benefit, but minimum eligibility has no requirements at all.

Beyond the heterogeneity in the eligibility criteria, the most remarkable fact, in comparison with the Spanish scheme, is that basic pensions benefits are flat-rates, based on residence years, whereas in Spain, a full minimum pension acts effectively as a top-up payment.

The AOW flat-rate is applied to the net statutory minimum wage to calculate individual compensations. The amount of the benefit does not depend or any former labour relationship or contributions paid, housewives who never worked either paid contributions are also entitled, with minor differences depending on the retiree's domestic situation. Assuming full entitlement, singles receive 70% of statutory minimum wage (1.001 euros) whereas couples (married or living together officially) get 50% of the statutory minimum wage (686 euros). Additionally, until 2015 a supplementary allowance was established for persons aged 65 with a partner under 65 with limited income. Those individuals received 90% of the net minimum wage (1.271 euros).

Finally, as in many pay-as-you-go systems, the AOW is financed by contributions of current workers. The contribution rate is levied on salaries and statutory limited to a maximum of 18,25%. Once this contribution is not enough to cover all AOW-related expenses, the deficit is met with public purse.

1.3.3. The Dutch second pillar: occupational pensions

Occupational schemes are highly developed in the Netherlands, in part, thanks to collective sector agreements that guarantee quasi-mandatory coverage for more than 95% of total employees working in the country. These schemes serve to supplement the AOW pension and constitute the second pillar of the Dutch pension system.

Each year, employees, without regard to their age, sex or income; accrue equal pension rights amounting to a fixed percentage of their salary. These contributions are annually adjusted by wage or price indexation, and is employer the one responsible to deduct pension contributions from his employees' salary, and transfer them to a pension provider. In fact, these payments are no more than a deferred salary to be received in retirement. Another point worth to mention is that an employer may also opt to have the pension scheme administered by an institution for occupational retirement provisions (IORP) with its seat abroad.

The funding takes places through independent legal entities (industry pension funds, insurance companies, company-specific pension funds, etc.) whose objective is to exploit the potential of intergenerational risk sharing and protect beneficiaries' rights. The system stablished in the Netherlands enables individuals, through their social partners, to decide which coverage level they prefer and which institution will administer their pension assets. In general, the content and nature of pension arrangements are agreed between the employer and the employee through a formal agreement.

Occupational pensions schemes usually include an old-age pension, a partner pension, and a disability pension. Despite the nature of the pension fund, we encounter both defined benefit and defined contribution schemes, being the first ones the most popular among Dutch employees. In both cases, when retirement age is reached, those benefits can be converted into a single payment or an annuity.

Regarding occupational contributions, a fixed percentage of earnings is generally fixed around a 16% of annual gross income. Solidarity is achieved by levying an average contribution: all members pay an equal percentage or an equal contribution to their pension provider, who invest these contributions until the retirement date.

Occupational pensions together with AOW benefits constitute the main sources of income for Dutch retirees, amounting to 70%, on average, of their final pay.

1.3.4. The Dutch third pillar: private pension provisions

The Dutch pension system also includes private individual pensions, that provide income for old age through an annuity or a lump sum payment, encouraged by tax reliefs up to certain limits.

Individuals may choose to supplement their pension via voluntary contributions to a private pension fund, generally offered by banks or insurance companies. These products might be thought as a tool to compensate a pension shortfall though an annuity payment for those unable to access other levels. Similar to the third pillar in Spain, contributions to private pension funds are deductible, although future money inflows will be taxed.

CHAPTER II. DATA, VARIABLES AND METHODOLOGY

Having a big picture of pension schemes' functioning in both countries, this chapter entails the methodology employed to assess how life course patterns are related to financial well-being in retirement. All calculations were conducted using R statistical software (R Core Team, 2012), along with libraries TraMineR for the multi-channel sequence analysis (Gabadinho, et.al., 2011) and WeightedCluster for the cluster analysis (Studer, 2013). Own built scripts used in the analysis are found at: https://github.com/aleixfiblasalgado/TFG-ADE-2017.

2.1. Data

All data utilised is retrieved from the last release 6.0.0. of the Survey of Health, Aging, and Retirement in Europe (SHARE) (Börsch-Supan, 2017). This big database collects multidisciplinary and cross-national microdata on health, socio-economic status and social family networks of approximately 123.000 individuals.

The SHARE target population are persons aged over 50 who have their regular domicile in countries participating in the survey[14], excluding incarcerated, hospitalised, out of the country for the entire survey period, or those unable to speak the country's language(s). Therefore, release 6.0.0. which was collected between 2016-2017, selects individuals born in 1966 or earlier.

Data collection is based on a probability sample and computer-assisted personal interviewing (CAPI). Interviewers conduct face-to-face interviews using a laptop in which the CAPI system is installed, being in this way able to shed light on respondents' doubts during the survey. SHARE applies a concept of ex-ante harmonisation: a common generic questionnaire is translated into national languages with the aim of easing data comparison across countries[15].

Precisely, among all waves available, we use data from wave 1 (Börsch-Supan 2017, Börsch-Supan et. al., 2005; Börsch-Supan and Jürges, 2005; Börsch-Supan et.al., 2013), wave 2 (Börsch-Supan, 2017; Börsch-Supan et.al., 2008; Börsch-Supan et.al., 2013), wave 5 (Börsch-Supan, 2017; Börsch-Supan et.al., 2015; Malter and Börsch-Supan, 2015; Börsch-Supan et.al., 2013) and SHARELIFE (Börsch-Supan, 2017; Börsch-Supan

[14] Countries currently enrolled in the survey are: Austria, Belgium, Czech Republic, Denmark, Estonia, France, Germany, Greece, Hungary, Ireland, Israel, Italy, Luxembourg, the Netherlands, Poland, Portugal, Slovenia, Spain, Sweden and Switzerland.

[15] Despite this harmonization, there are some variables that require country-specific measurements as their indicators differ in form (ISCED, ISCO or NACE codes). SHARE release guide 6.0.0. and further specific wave documentation provides the necessary metadata to deal with this issue of ex-post harmonisation.

et.al., 2011, Schröder, 2011; Börsch-Supan et.al. 2013), the third wave of data collection for SHARE.

Waves 1, 2 and 5 are of similar nature, they both contain current information about retirees' health and socio-economic conditions. On the contrary, wave 3 (SHARELIFE) focuses on life history data, and most of the information collected concerns life circumstances. This survey is done on a specific basis with the aim to link individual's microdata, over the respondent's entire life, with institutional macro data about the welfare state. This study complements the SHARE panel by providing historical data to enhance our understanding about how different events, throughout individuals' life, influence their situation in old age.

To the purpose of this work, SHARELIFE data is used to compare specific birth cohorts in the two countries of study, in order to examine the social context in which these individuals experienced their life courses and retirement. It is important to draw attention to the inter-temporal combination of social policies across individual's life course, as those that affect them during their adult's life might differ a lot from the ones into effect when these cohorts retire. To deal with this issue, we have selected the cohorts born between 1930 and 1960, from the whole sample of Dutch and Spanish individuals. Despite some differences, this sample design enables us to compare the trajectories of the cohorts selected on a similar basis, as social environments across individual's life courses do not differ too much. The bottom line is to have, within our selected data, the less "noise" as possible, avoiding different life course patterns derived from a changing social context. Ideally, the only differential point should be the pension system to which these cohorts are entitled.

2.2. Variables

When accessing SHARE data, each wave is broken into different datasets covering all topics related with the study. At the same time, each of these datasets contains a large list of variables, including an individual id for merging operations. To work with such amount of data, it is extremely important to pay attention to all data documentation, the SHARE release guide and the questionnaires in each wave, in order to be clear on the variables meaning, because many times variable names are not enough for knowing precisely what a variable might represent.

Having said this, next step concerns presenting our variable selection proposal, for both the multi-channel sequence, and the regression analysis.

2.2.1. Joint family-work trajectories

Employment and family trajectories have been used as indicators of individuals' life behaviour. Variables within these dimensions come into play in multi-channel sequence

analysis when building family-work sequences. They are all measured as longitudinal sequences in yearly intervals from ages 15 to 65.

Family variables are found, in both the partner, and the retrospective children section of SHARELIFE dataset. Regarding the partner section, the variables selected are the following ones: (i) *year married, (ii) year of death partner and (iii) year of divorce*[16]. They are used in multi-channel sequence analysis to represent, on a year basis, whether the individual is "single", "married", "widowed" or "divorced". Furthermore, still concerning family trajectories, information in the retrospective children section has also been selected. In this case, the sought variable is the year when individual's first, second and subsequent child was born. These two dimensions are combined into a single state to construct individual family trajectories.

In addition to the family side, it is necessary to include information concerning working careers if we aim to build complete life trajectories. Variables representing employment courses are found in the work history section of the SHARELIFE dataset. In this case, work trajectories are broadly specified, on a three-state basis:

- (1) "out of the labour force": includes people not currently working such as students, homemakers, disabled people and unemployed.
- (2) "full time work": includes employed, civil servants and self-employed working full time.
- (3) "part time work": includes all forms of self-reported part-time work.

To construct yearly working states based on the previous criteria, the following variables, from SHARELIFE dataset, need to be selected: *(i) year started job, (ii) full or part time, (iii) when changed to part-time, (iv) when changed to full-time and (v) year stopped job*.

Resulting joint family-work trajectories are enriched, with both academic, and demographic information encompassed in the demographics and isced modules from SHARE project's wave 1. The variables chosen are: *(i) isced 1997 codes showing the level of education attained, (ii) gender and (iii) nationality.*

2.2.2. Financial well-being in retirement

As indicators of retiree's financial well-being, we mainly consider both individual pension income, and assets. The imputations module, from SHARE waves 1, 2 and 5, aggregates retiree's income data by income source, and is an optimal starting point to construct new variables with even a higher level of aggregation.

[16] All of them might include more than one year accounting for the occurrence of these events (i.e. individuals who married two times)

The three waves are selected because each of their imputations module aggregates individual responses in a different manner. Therefore, depending on the variable demanded, one or another module would be required for its construction. In addition to differences in wave's imputed variables, the form of pension provisions differs a lot from one country to another. In consequence, a variable representing an income source would rarely be comparable across countries, and it will be necessary, as in this case, to figure out homologous sources by looking at the questionnaire and metadata that accompany each wave.

Subsequently, we present the list of variables used as indicators of financial well-being:

- Public: This variable represents the net annual sum of income received from public sources. It includes annual old age, early retirement pension, survivor and war pension, disability pension, sickness benefits and pension, and compensations received from social assistance[17].
- Occupational: This variable accounts for all kinds of annual net private occupational pensions[18].
- Private: Variable "private" corresponds to life insurance payments, private annuity personal pension plans, and long-term care insurances from private insurance companies; all of them after taxes.[19]
- Alimony: Includes income received from alimony and charities[20].
- Hnfass: Household net financial assets (financial assets – financial liabilities).
- Ysrent: Annual income from rent or sublet.
- Hrass: Household real assets.
- Ybabsmf: Annual interest/dividend from bank account, bond stock and mutual funds.
- Yaohm: Annual income from other household members.

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[17] For Spanish cohorts, variable public is the sum of variables ypen1, ypen3 ypen6 from wave 1 imputations module.
For Dutch cohorts, variable public is the sum of variables ypen1, ypen3 and ypen5 from wave 1 imputations module.

[18] For both Spanish and Dutch cohorts, variable occupational is the sum of variables ypen2 in wave 1 imputations module, ypen2 in wave 2 imputations module and all ep_ from the 11th to the 14th in the earnings module.

[19] For both Spanish and Dutch cohorts, variable "private" corresponds to variable yreg1 in wave 1 imputations module.

[20] For both Spanish and Dutch cohorts, variable alimony corresponds to variable yreg2 in wave 1 imputations module.

While the first four variables are handy built according to each one's reference, others are available at SHARE imputations module from one of the three waves introduced in the beginning of the section[21].

In addition to previously stated indicators, generally used as dependent variables in regression analysis, we have selected additional information available at SHARE to enrich the list of independent variables. Complements include: *(i) political orientation*[22]*, (ii) years of education, (iii) years of education of partner and (iv) share of own business.*

2.3. Multi-channel sequence analysis

Firstly, to categorize groups of individuals with similar family-work trajectories we use multi-channel sequence analysis (MCSA) (Gauthier et.al., 2010; Pollock, 2007), a recently developed extension of classical sequence analysis (SA).

Sequence analysis is a technique used to classify sequences of categorical states. It was originally developed in biology for identifying similarities between the very first sequences of the insulin protein. Initial approaches to the method were characterized by the work of Fred Sanger, and his colleagues, in an intend to understand the function of molecules and, subsequently sequence the first DNA-based genome.

At first glance, deciding that two biological sequences are similar is no different from evaluating similarities between two text strings. In its broader definition, a sequence is nothing more than a unidimensional ordered list of elements. Besides its applications in biology, sequence analysis proved to be extremely useful in social science, as many times these disciplines are interested in studying series of events. Marketing researchers might be interested in consumption patterns, sociologists may analyse behaviours, or even economists could serve from this methodology to study the evolution of macroeconomic indicators (Abbot, 1995). Despite the nature of the sequence considered, relationships between character strings are discovered by aligning them together and analysing changes under some defined scoring scheme.

In this work, the sequence employed concerns life trajectories of individuals, providing a double perspective by including both family and work events to determine similarities in individual's lifestyles.

As it is said in previous sections, various empirical studies emphasize the multidimensionality of life trajectories in social studies (Elder, 1985; Kohli, 1986; Levy & Widmer, 2013; Giele & Holst, 2003; Heinz and Marshall, 2003; Mortimer and Shanahan, 2003; Macmillan, 2005). Ideally, life course studies would require the

[21] See SHARE release guide to find which wave contains each variable.

[22] Political orientation is measured on a scale from 0 to 10, in which 0 and 10 represent, respectively, left-wing and right-wing political party.

integration of all life dimensions in a unique empirical model for identifying homologous trajectories. Nevertheless, due to the impossibility to process all data available at SHARE, we have selected life aspects ought to be more influent in retirement outcomes. Precisely, to build family-work trajectories, the dimensions selected concern children events and partner status for the family side, and employment trajectories regarding working careers.

Optimal matching in sequence analysis proved to be successful in identifying homologous life trajectories but has neglected the multidimensionality of such tracks. Therefore, we account for an approach in with these multiple life dimensions are taken into consideration. To fill this gap, Gauthier et. al., 2014 purpose multi-channel sequence analysis, a methodology which makes practical improvements to sequential analysis and allows optimal matching in more than one dimension.

The multi-channel sequence analysis presented systematizes approaches for dealing with multidimensionality by using optimal matching through parallel processes occurring in all life spheres considered. Translated into this study, two character strings of family-work trajectories will be considered homologous only if they are composed of similar events in the two domains, and if those events occur at close time-points along the life of the individual.

Figure 8 displays an example of how family-work sequences within our sample of Spanish and Dutch individuals look like.

Figure 8: Fictitious example of family-work sequences for 5 individuals[23]

Individual/Age	20	21	22	23	24	25	26	27	28	29	30
Arturo	snc	snc	snc	snc	mnc	m1c	m1c	m1c	m1c	m1c	m2c
Sandra	snc	snc	snc	snc	snc	snc	snc	snc	snc	mnc	mnc
Thomas	snc	snc	snc	snc	snc	snc	mnc	mnc	mnc	m1c	m1c
Ben	snc	snc	snc	snc	snc	snc	snc	snc	snc	snc	snc
Diana	snc	snc	snc	snc	snc	snc	mnc	mnc	mnc	mnc	mnc
Individual/Age	31	32	33	34	35	36	37	38	39	40	41
Arturo	m2c	m2c	m2c	m2c	m2c	m2c	m2c	m2c	m2c	m2c	m2c
Sandra	mnc	m1c	m1c	m1c	m1c	m1c	m1c	d1c	d1c	d1c	d1c
Thomas	m1c	m1c	m1c	m1c	m1c	m2c	m2c	m2c	m2c	m2c	m2c
Ben	snc	snc	snc	snc	snc	snc	snc	snc	snc	snc	snc
Diana	mnc	mnc	mnc	mnc	mnc	mnc	mnc	mnc	mnc	m1c	m1c
Individual/Age	42	43	44	45	46	47	48	49	50	51	52
Arturo	m2c	m2c	m2c	m2c	m2c	m2c	m2c	m2c	m2c	w2c	w2c
Sandra	d1c	d1c	d1c	d1c	d1c	d1c	d1c	d1c	m1c	m1c	m1c
Thomas	m2c	m2c	m2c	m2c	m2c	m2c	m2c	m2c	m2c	m2c	m2c
Ben	snc	snc	snc	snc	snc	snc	snc	snc	snc	snc	snc
Diana	m1c	m1c	m1c	m1c	m1c	m1c	m1c	m1c	m1c	m1c	m1c

[23] First figure is related with family events while the second concerns working trajectories.

Individual/Age	20	21	22	23	24	25	26	27	28	29	30
Arturo	olf	olf	olf	olf	olf	ft	ft	ft	ft	ft	ft
Sandra	pt	pt	pt	pt	ft	ft	ft	ft	ft	ft	ft
Thomas	ft	ft	ft	ft	ft	ft	ft	ft	ft	ft	ft
Ben	olf	olf	olf	olf	olf	olf	olf	olf	olf	ft	ft
Diana	olf	olf	olf	olf	olf	olf	olf	olf	olf	olf	olf
Individual/Age	31	32	33	34	35	36	37	38	39	40	41
Arturo	ft	ft	ft	ft	ft	ft	ft	ft	ft	ft	ft
Sandra	ft	olf	olf	olf	olf	olf	olf	olf	pt	pt	pt
Thomas	ft	ft	ft	ft	ft	ft	ft	ft	ft	ft	olf
Ben	ft	ft	ft	ft	ft	ft	ft	ft	ft	ft	ft
Diana	olf	olf	olf	olf	olf	olf	olf	olf	olf	olf	olf
Individual/Age	42	43	44	45	46	47	48	49	50	51	52
Arturo	ft	ft	ft	ft	ft	ft	ft	ft	pt	pt	pt
Sandra	ft	ft	ft	ft	ft	ft	ft	ft	ft	ft	ft
Thomas	olf	olf	olf	pt	pt	pt	pt	pt	pt	pt	pt
Ben	ft	ft	ft	ft	ft	ft	ft	ft	ft	ft	ft
Diana	olf	olf	olf	olf	olf	olf	olf	olf	olf	olf	olf

Family		Work
"s": single	"nc": no children	"olf": out of the labour force
"m": married	"1c": 1 children	"ft": full-time employed
"w": widowed	"2c": 2 or more children[24]	"pt": part-time employed
"d": divorced		

Source: Own elaboration

This fictitious example displays the life trajectories of 4 individuals. Arturo and Thomas got married in their middle twenties and they both had 2 or more children during their respective adult's life, with the difference that Arturo was widowed at the age of 51. Sandra left his job when married but started working again when divorced. Ben is the example of an individual who both married and started working lately. Finally, Diana is a person who never worked and got married also in her middle twenties.

Once character strings representing family-work trajectories for each individual are available, we run MCSA across our sample to first quantify, the distance between individual sequences within the two domains. The output of this first step is a pairwise distance matrix summarizing the mentioned distance between two-dimensional family-work sequences.

There are several ways to compute this pairwise distance between sequences (Aisenbrey & Fasang, 2010; MacIndoe & Abbott, 2004; Madero-Cabib, Gauthier, & Le Goff, 2016).

[24] We consider differences in the number of children from the second onwards have little impact on financial well-being in retirement. Thus, third and subsequent children are included in category "2c".

In this case, we appeal to the Dynamic Hamming Distance (Lesnard, 2006; Lesnard, 2010) which puts special emphasis on similarities in terms of timing.

To further identification of cluster groups that represent similar life course trajectories, it is first needed to determine the most appropriate number of clusters. To achieve this objective, we serve from different cluster cut-off criteria and, with the help of WeightedCluster package in R (Studer and Matthias, 2013) we build Figures 9, 10 and 11 in Appendix 1, showing values for a range of quality measures under different number of clusters. Additionally, Table 3 describes each quality measure, together with its possible range of values and a criteria min/max, proportional to cluster's quality.

It is usually easier to detect the optimal number of clusters by standardizing scores. For this reason, we also include Figures 12, 13 and 14 representing standardized values of the three previous plots. An interesting remark is that the optimal number of clusters, taking into consideration only family and work spheres separately, is placed around 4 for both dimensions (Figures 12 and 13). Conversely, if joint states are considered, the optimal seems to be higher; a logical result bearing in mind that the combination of both aspects leads to more dissimilar life course sequences.

In selecting the number of clusters, our aim is to choose the one in which more measures coincide to be the optimum. Accordingly, results suggest eight clusters as the best grouping.

This number is used in Figure 15 where eight groups of family-work trajectories are illustrated as state distribution graphs (Gabadinho et.al., 2011). Trajectories displayed comprehend the entire adult's life (from 15 to 65 years old) and show the proportion of individuals in a determined sequence state within each cluster. Different colours are assigned to clearly identify every categorical state from family and work dimensions (see legend). These joint work and family trajectories exhibited go beyond single indicators in the two domains and successfully display the life course outcomes of two similar contexts.

Once every individual is properly assigned a cluster, it is recommended to conduct descriptive analysis for identifying each group's characteristics. The dimensions evaluated do not have to be the constitutive elements used in the grouping process. On the contrary, it is possible to introduce other variables for describing each cluster such as gender, average years of education, nationality etc. The objective is to define more precisely cluster profiles. Ultimately, we pursue to identify the typical family-work trajectories in both countries by looking at the cluster containing more nationals[25].

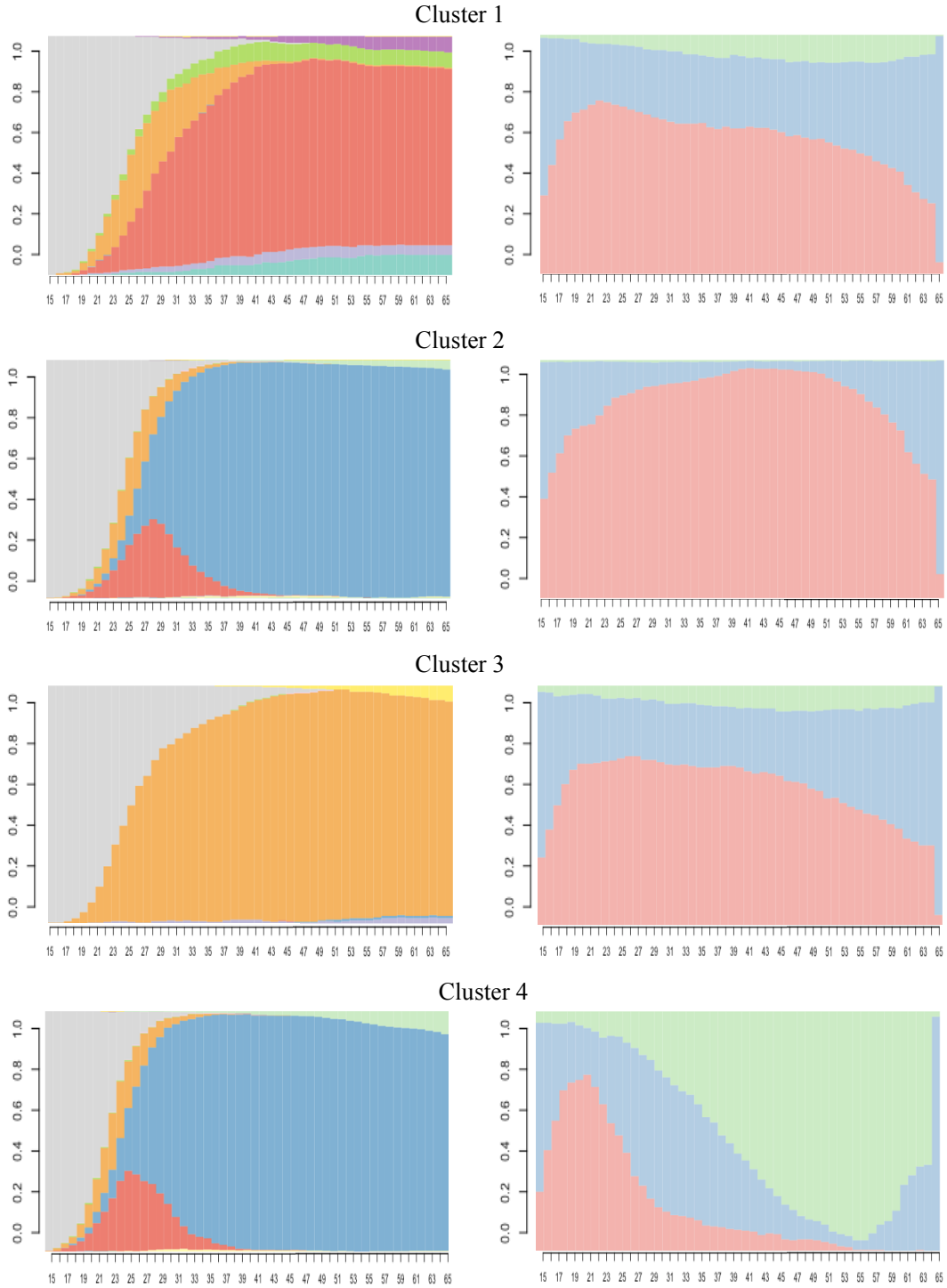
[25] Ideally, the typical family-work trajectory in each country should be identified by looking at population data. However, due to limitations in population data access we assume that sample strata composition reflects truthfully family-work trajectories in the population.

Subsequently, our descriptive analysis on eight clusters from Figure 15 is presented. The variables generated in Table 4 are summary statistics within strata defined by the cluster belonging[26].

- (1) Cluster 1 is the third largest in size accounting for a 10,46% of the sample. Dutch women are the majority, but the gap with men or Spaniards is not excessively large, resulting an equitably distributed cluster in terms of gender and nationality. Despite a high proportion of individuals in first education levels, the number having finished tertiary education is slightly higher than in other clusters. Furthermore, full-time jobs are the mainstream, specially in early life stages, but years out of the labour force and part-time employment become more visible in mature ages. This fact is correlated with family trajectories as the norm for the most is one child, accompanied by "married" status; both events taking place in the same years where working interruptions occur.
- (2) Cluster 2 is the largest in size for both countries with a relative weight in the sample of 38,5%. It is not irrational that the most widespread life trajectory is the same in both societies, as they share a similar cultural context. Spanish predominate in this cluster, characterized by long full-time employment periods representing, on average, 41 years of individual's life. Part-time jobs are almost inexistent and years not working are concentrated in early and later life stages. Regarding family events, the majority married at middle twenties and had two or more children immediately after. Therefore, we are in front of complete working careers (no interruptions) for individuals coming from all education levels. Last point worth mentioning concerns gender discrimination, a reality in this cluster as men represent almost 80% of individuals.
- (3) Cluster 3 goes immediately after Cluster 1 in terms of size, and both cluster's composition is similar in many aspects such as education, employment trajectories or marriage timing. The main difference, and most representative characteristic of Cluster 3 is the absence of children. Comparing both countries, the majority of individuals married with no children is clearly from the Netherlands.

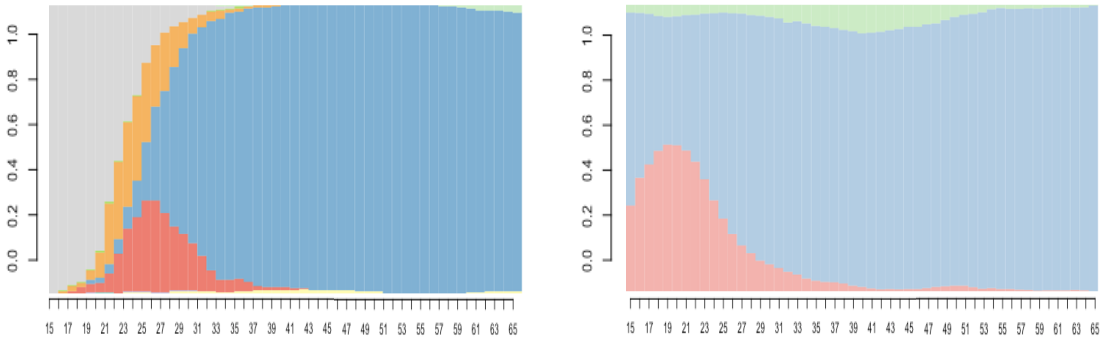
[26] Missing values in education variables have been ignored, then the sum of individuals with education data available does not match the total in the cluster.

Figure 15: Eight clusters of family-work trajectories in Spain and the Netherlands[27]

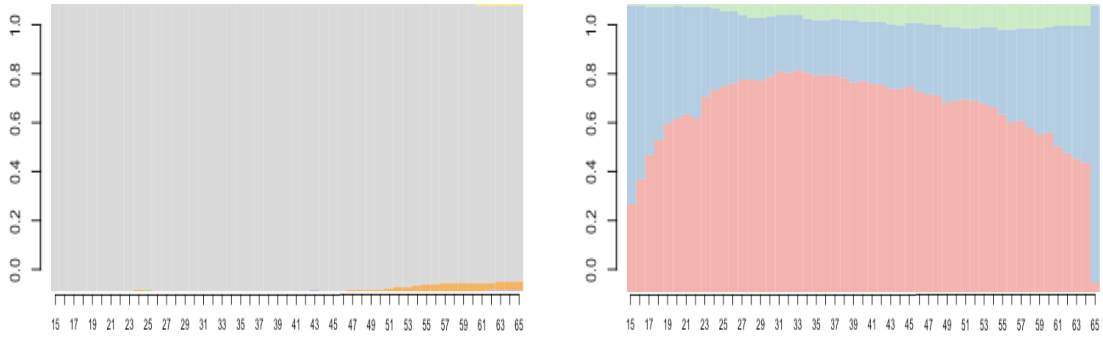


[27] The work trajectories are displayed on the right side, whereas the corresponding family life courses are placed on the left-hand side.

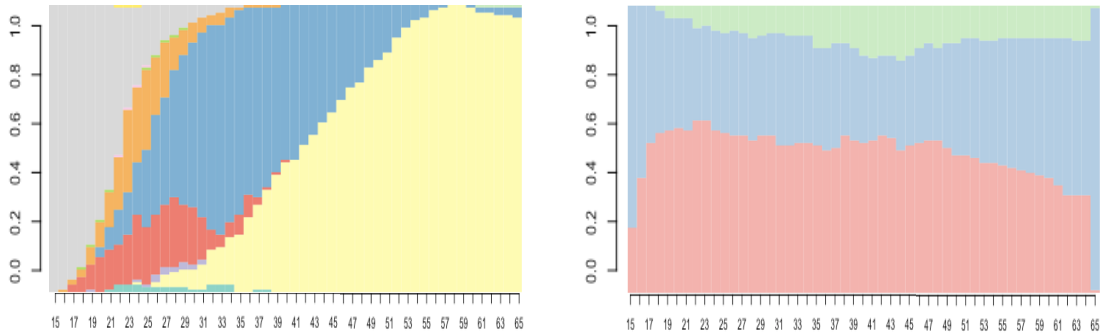
Cluster 5



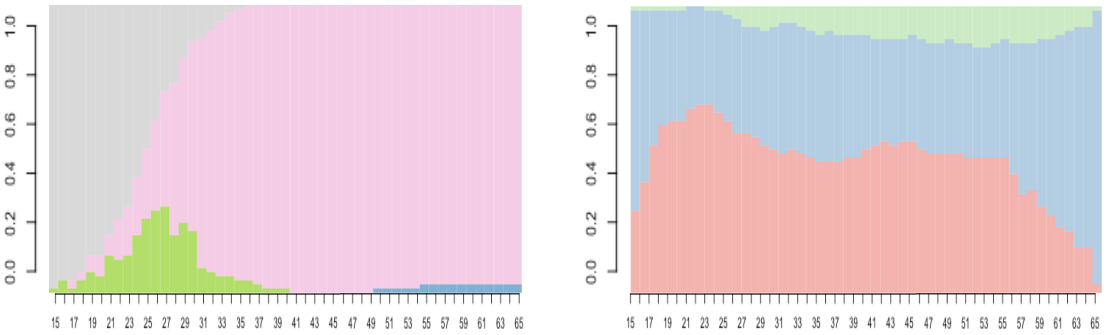
Cluster 6

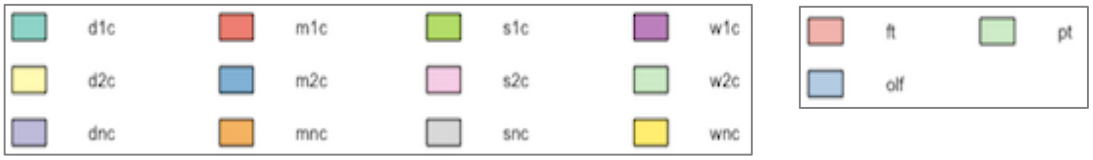


Cluster 7



Cluster 8





Source: Own Elaboration

Table 4: Descriptive analysis on eight clusters of family-work trajectories

Cluster (#)	1	2	3	4	5	6	7	8
Number of individuals	393	1447	316	276	926	214	115	70
Men (%)	0,453	0,794	0,443	0,080	0,037	0,589	0,374	0,371
Women (%)	0,547	0,206	0,557	0,920	0,963	0,411	0,626	0,629
Nationality								
Spanish (# of individuals)	179	788	118	31	506	121	17	13
Dutch (# of individuals)	214	659	198	245	420	93	98	57
Spanish (%)	0,455	0,546	0,373	0,112	0,546	0,565	0,148	0,186
Dutch (%)	0,546	0,455	0,626	0,887	0,454	0,435	0,852	0,814
Education[28]								
Isced level 1 (1997)	62	254	41	18	193	38	10	6
Isced_level 2(1997)	83	221	66	80	240	32	28	20
Isced level 3 (1997)	47	182	32	39	85	26	15	9
Isced level 4 (1997)	0	0	0	0	0	0	0	0
Isced level 5 (1997)	46	188	40	43	36	25	23	9
Isced level 6 (1997)	0	0	0	0	0	0	0	0
Still school	1	1	0	0	0	1	0	0
Other	1	8	0	0	8	0	0	0
Employment state, mean duration in years								
Out of the labour force	18,40	9,18	18,32	15,87	42,89	15,97	20,92	23,40
Part-time employed	3,98	0,28	3,83	25,48	2,24	2,64	5,47	4,13
Full-time employed	28,62	41,54	28,85	9,65	5,87	32,39	24,61	23,47
Family state, mean duration in years								
Single no children	11,20	10,14	12,44	8,30	8,08	50,57	8,09	10,50
Single one children	2,64	0,07	0,02	0,06	0,06	0,00	0,08	2,74
Single two or more children	0,01	0,06	0,02	0,00	0,06	0,00	0,03	37,37
Married no children	3,87	1,90	37,12	2,36	1,79	0,37	2,20	0,00
Married one children	28,26	3,04	0,01	2,67	3,07	0,00	2,75	0,00
Married two or more children	0,01	35,00	0,16	37,18	36,58	0,00	13,83	0,39
Widowed no children	0,07	0,02	0,69	0,00	0,00	0,02	0,03	0,00
Widowed one children	1,15	0,00	0,00	0,00	0,01	0,00	0,00	0,00
Widowed two or more children	0,00	0,49	0,00	0,14	1,17	0,00	0,04	0,00
Divorced no children	1,55	0,03	0,54	0,03	0,00	0,02	0,16	0,00
Divorced one children	2,24	0,04	0,00	0,01	0,00	0,00	0,29	0,00
Divorced two or more children	0,00	0,21	0,00	0,25	0,15	0,00	23,51	0,00

Source: Own elaboration

[28] Education levels are represented in terms of isced codes to facilitate country comparison. The correspondent education level to each code can be found at http://www.uis.unesco.org/Library/Documents/isced97-en.pdf

- (4) Cluster 4 is small in size and almost entirely comprised by Dutch women. It represents individuals who changed to part-time positions at fatherhood or motherhood. The mainstream for families are early marriages and two or more children that coincide in time with many transitions from full to part time employment, being the last the predominant working status (more years working part time on average) for people in this cluster. We also appreciate gender disparities in Cluster 4 as women are the predominant group incurring in employment interruptions for childcare, whereas men continue working.
- (5) Cluster 5 is the second largest in size and represents people who rarely worked ever, or started full-time jobs but left as soon as they marry and had the first child. Gender discrimination becomes evident in this group as 96% of persons who never worked or left it for childcare are women, predominantly from Spain. Family trajectories are similar to those in Clusters 2 and 4; people got married in their middle twenties and had two or more children. The main difference to highlight, specially with Cluster 2, is that while men have almost complete working careers, women experienced most of their supposedly working years out of the labour force. Furthermore, education is concentrated in low levels, a phenomenon endorsing the fact that men had easier access to both education and labour markets.
- (6) Cluster 6 is the third in size, starting from the bottom. Spanish men are slightly predominant, and individuals show a typical working career, being full-time employment the mainstream. The big difference with other clusters and most representative characteristic of individuals in this cluster is that they never neither got married nor had children. Consequently, the most common family status with an average mean duration of 50 years is "single no children".
- (7) Cluster 7 is the penultimate in terms of size, comprised by a clear majority of Dutch women. Divorces are the most differential issue in this group together with a working trajectory that remains constant all along the period of analysis. The most common working state is "full-time employed" although others are substantially elevated, specially as individuals get close to retirement.
- (8) Last cluster is the smallest in size and contains individuals who never married but had children (the majority had two or more). As in Cluster 7, most of them are women from the Netherlands concentrated in low education levels. Working careers are unsteady, with "full-time employed" and "out of the labour force" categories showing a similar number of years on average.

Notably, Cluster 2 is the largest in number of nationals for both countries and, accordingly, presumed to encompass the "traditional" life trajectories in the two states. Nevertheless, results in Table 4 also evince that life courses are strongly gendered thus,

it might be erroneous to consider as the norm, a cluster with such a large gender disproportion.

In line with previous argument, on the one hand, gender discrimination is not a big deal in determining the "traditional" family trajectory. The pattern regarding family occurrences is similar in the two biggest clusters and shared by both Spanish and Dutch individuals. Results suggest "married with two or more children" as the predominant status, being middle twenties the average age for marrying and the year after marriage when first children born.

However, on the other hand, disparities arise when turning to employment trajectories. Clusters with more than 50 percent men are characterized by full-time employment (Cluster 2) whereas in clusters of more than 90 percent women the 'traditional' family trajectory is coupled with extended periods out of the labour force (Cluster 5) or with part-time work (Cluster 4).

It is crucial not to forget this gender discrimination because in further procedures the emphasis would not be only placed in trajectories from Cluster 2, but also Clusters 4 and 5 should be taken into account. If not, we might incur in the mistake of considering measures only in men's benefit while forgetting about the big collectives of women in Clusters 4 and 5.

In conclusion, both societies are characterized by strong male breadwinner contexts during the years which our study cohorts experienced their work and family formation. Furthermore, instead of one standard life trajectory, the mentioned context promotes two ideal-typical gendered life-courses. On the one hand, male life courses correspond to the tripartite model proposed by Kohli and Meyer (1986), i.e. access to education, then full-time employment in continuous occupational careers, and retirement. On the other hand, female life courses are characterised by poor education, then full-time work in early life stages, but as soon as they marry and enter motherhood, they tend to leave the labour market, and then rarely return to work, or return mainly in part-time positions (Levy & Widmer, 2013).

2.4. Regression analysis

The second step in the analysis estimates whether same family-work trajectories in both countries lead to different retirement outcomes. The characterization of life course patterns is attained in previous section, by conducting multi-channel sequence analysis on our study cohorts. Subsequently, we employ regression analysis to interact family-work clusters in the form of dummies with variables representing financial well-being in retirement.

Multiple regression models allow to explicitly control for many factors that simultaneously affect the dependent variable, in this case indicators of financial well-being in retirement. Relevant information about family-work trajectories is captured by binary variables, accounting for individual's belonging to previously built clusters. Additionally, more regressors are included in the model, representing other life spheres presumably related to financial well-being such as political orientation, education level, gender or business ownership.

Before estimating regression parameters through ordinary least squares (OLS) it is required to adjust models for incorporating binary information. Including as many dummies as categories in a factor variable would introduce perfect collinearity ($cluster1_i + cluster2_i + cluster3_i + cluster4_i + cluster5_i + + cluster6_i + cluster7_i + cluster8_i = 1$), which means, in this example, that each variable $cluster_i$ is a perfect linear combination of the others. This is colloquially known as the dummy trap and, to avoid it, we are required to determine a benchmark or base group, for each dummy, that is the group against which comparisons are made. The reference group is not included in the model, being the intercept its expected value, and other dummy coefficients the differential effect in intercepts between each category.

Regarding models included in this section, we are required to define base categories for both binary variables "gender" and "cluster". As a matter of fact, to ease comparisons, the reference group set are men belonging to cluster 2, which could be interpreted as the traditional life course for men in both countries. In consequence, the generic model is defined as:

$$\begin{aligned} Y_i = \ \alpha + \ \gamma_0 female_i + \gamma_1 cluster1_i + \gamma_2 cluster3_i + \gamma_3 cluster4_i + \gamma_4 cluster5_i \\ + \gamma_5 cluster6_i + \gamma_6 cluster7_i + \gamma_7 cluster8_i + \beta_0 politics_i + \beta_1 edu_i \\ + \beta_2 business_i + \beta_3 edu2_i + e_i, \end{aligned}$$

in which Y_i is an indicator of financial well-being in retirement, $female_i$ is a binary variable that indicates individual's gender, $clusterX_i$ accounts for cluster's belonging, and remaining variables are of quantitative nature corresponding to *(i) political orientation*[29]*, (ii) years of education, (iii) share of own business and (iv) years of education of partner;* previously defined in section 2.2.

Appendixes 2 to 8 display regression results for different indicators of financial wealth in retirement. The dataset has been split by nationality, although is possible to encode it as a dummy, for having more visually attractive results and enable immediate comparisons between two pension systems.

[29] Political orientation is measured on a scale from 0 to 10, in which 0 and 10 represent, respectively, left-wing and right-wing political party.

Appendixes are structured by means of different financial well-off indicators. Two big categories are distinguished:

- Appendixes 2 to 7, in which financial well-being is assessed through both individual and household annual pension payments[30].
- Appendix 8 and 9, in which financial well-being is assessed through individual and household net wealth at retirement.

Overall, findings support greater pension penalties for typical female life courses in the liberal Dutch pension system. Furthermore, as expected, women tend to have lower pension income than men, around 1.500 euros, irrespective of their family-work trajectories.

The first thing that calls our attention about total pension income in both countries (Appendixes 2 and 3), is that Dutch pensions amount two times the ones in Spain. Someone might initially appeal to differences in standards of living to account for this gap. However, while the median equivalised disposable income[31] is 1,57 times higher in the Netherlands (Eurostat Statistical Books, 2014), our results evince that this proportion is not maintained for retirees' pension payments. Consequently, it is reasonable to argue that the pension system in the Netherlands provides Dutch retirees with a higher purchasing power in comparison to the one instituted in Spain.

Other relevant covariates evince that the highest penalty is held by those individuals that experienced extended periods out of the labour force (cluster 5), being this drawback higher in the Netherlands. Furthermore, still concerning cluster's belonging, the most benefited group in the Netherlands are singles, regardless of whether they had children or not, whereas in Spain, the current scheme offers higher well-off conditions to those that had no children, regardless they civil status.

Regarding other variables not involved into family-work trajectories, results reveal that education is more imperative in the Netherlands. On average, the marginal benefit, reflected in individual's pensions, from an additional year of education is 230,69 euros per year in the Netherlands, whereas in Spain, the same extra year increases annual pension payments, by only 117,68 euros. The "politics" variable (remember encoded as a 0 to 10 scale) show how in Spain rightist sympathisers own higher pensions, while in the Netherlands, the situation is just the opposite.

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[30] The amount considered represents after-tax pension payments.

[31] Total income of a household, after tax and other deductions, that is available for spending or saving, divided by the number of household members converted into equalised adults; household members are equalised or made equivalent by weighting each according to their age, using the so-called modified OECD equivalence scale.

The previously mentioned differences are also reflected in household income, with the exception that, in the Netherlands, female part-time jobs are sufficiently awarded to enable women, who followed this pathway, to contribute to household income. On the contrary, in Spain, those part-time workers have little pension benefits.

In addition to total income, we have also computed regressions on specific sources, aiming to highlight the effects of each separately and analyse their relative importance in both pension schemes.

Results noticeably support descriptions provided in chapter I. Public pensions represent the main sustain for Spanish retirees, whereas in the Netherlands, they account for less than half of total income perceived in retirement. Conversely, occupational pensions, marginal in Spain, are the largest in size for Dutch retirees. Ultimately, private personal plans are still marginal in both countries, although there are some interesting points to remark.

Focusing now on public pensions, regression outcomes in Appendix 4 demonstrate how this instrument enhances gender equality in both countries. This phenomenon is better appreciated in the Netherlands, as public pensions are residence-based, but the "female" covariate for Spanish retiree's, is also lower than the one resulting from regressions on total income. The absence of children is again the best status for having higher retirement payments, and women in cluster 5 still bear the greatest part of the pain, but in a lower proportion. Another interesting point to remark is that education does not contribute to higher public pensions in neither Spain, nor the Netherlands.

Turning to occupational pensions, the most important revealing fact is that these plans are the major cause of inequality among Dutch retirees. Individuals in cluster 5, who experienced extended periods out of the labour force, are, understandably, the most harmed. Differences between the educated and the non-educated population are also more visible in occupational pensions from both countries, being the Netherlands the one where this factor is more critical.

There is nothing much to say about private pensions, as they account for little portion of retirees' income, in both countries. Nevertheless, a relevant fact is persons in cluster 5, remember mostly women, are the most benefited from this income source. There is no information available about the contributor but, even in the case that relatives are the ones contributing to these individuals' private pension plans, they are good tool for those who cannot access other levels.

Ultimately, the two last Appendixes consider, as an indicator of well-being, total assets accumulated at retirement. In general, results, for both individuals and households, evince that the patrimony is not that related to family-work trajectories, but to other factors such as education, political orientation or share of own business. These complementary variables are more significant in predicting retirees' net wealth, specially in the

Netherlands. A curious phenomenon in Spain is that the lowest individual patrimonies are found among cluster 5 individuals but, aggregating all household members' wealth, the same individuals are placed among the ones with highest net wealth. Therefore, this result might be a sign that, among Spanish well-off families, it is more common that women do not work. Finally, as it previously suggested, high inequality is found among Dutch retiree's net wealth. In line with the principles of a liberal welfare state, education level, political orientation or share of own business play a greater role in determining retirees' net wealth and, consequently, results are more extreme, in comparison to a conservative welfare state such as the Spanish one.

CONCLUDING REMARKS

The extent to which different pension alternatives can secure retirees is extremely important, in view of aging populations and low employment rates among older workers. With our analysis on SHARE data, we have compared how the liberal Dutch and the conservative Spanish system have differentially rewarded or penalized life courses of their respective retirees.

Overall, findings show how the standard family profile of married with two children is not rewarded with the highest benefit in neither Spain, nor the Netherlands. Thence, both pension systems fail in providing the highest protection levels to typical family-work trajectories. Furthermore, penalties are particularly hard for typical female life courses in cluster 5, being these drawbacks stronger in the Netherlands.

Despite this mentioned drawback, the Dutch pension system proved to provide higher absolute benefits in comparison to the Spanish one. Dutch retirees have a higher purchasing power, in part, due to the lack of salary ceilings in their occupational quotes. Eliminating, or at least increasing, the legally fixed range for contributions is highly recommended in Spain, as it will enable pensions' growth to depend exclusively on nominal salaries, for all earning levels. This measure achieves higher intergenerational transfers, preventing, at the same time, modifications in the contribution rate[32].

Not losing sight of individuals in cluster 5, results also evince that the presence of children is an important detriment of pensions in Spain. Besides the reality that, irrespective to gender, having 2 or more children is the typical conduct for cohorts in both countries, it appears controversial to benefit more individuals with no children, when at the same time population ageing is probably the highest threat for pension schemes' in the midterm. Without forgetting about possible higher pension complements for the economic unit, in the presence of children, in the long-term, however, equalizing the capacity of individuals with children to accrue pensions independently, through employment, is a more sustainable strategy. This fact is also a reality in the Netherlands, especially harmful for divorced individuals, but softer penalties are set on absence of children coupled with stable marriage.

Previous argument, reinforces the hypothesis that working interruptions are extremely damaging, and new reforms are needed to narrow this gap. A good idea concerns enabling part-time workers to contribute to household pension income to a major extent, in addition to pension recognition of family care. Those measures have been deeply rooted in the Netherlands but not in Spain yet. Access to pension benefits in part-time or temporary

[32] The current 28,3% contribution rate is presumed high and modifying it might trigger distortions in the labour market.

jobs will become crucial in the future, as globalization is moving us towards a more interconnected and volatile economy, where previously common long working careers in the same firm, will be unusual. Therefore, Spanish authorities should set new reforms to adapt the current scenario to a more flexible organization of labour.

Another point worth to mention is that the first pillar in the Netherlands, proved to be the most optimal to promote gender egalitarianism. Non-contributory pensions in Spain are still marginal in terms of expenditure, and amounts provided, in the better case, are hardly enough to ensure subsistence. Therefore, it would be more reasonable to increase replacement rates of residence-based pensions in Spain, up to a determined threshold between the current maximum non-contributory and the minimum pension. In this way, expenditure on basic complements to the minimum pension will be shifted to the non-contributory level, promoting higher equality quotes and improving the living conditions of low earners. The justification behind this reform concerns the fact that, likewise stablishing a maximum, at some point in the individual's life, the marginal benefit obtained from working an extra year will be zero, in the presence of complements to the minimum pension. Moreover, required funding to enable non-contributory pensions to embrace a higher percentage of the population, and increase replacement rates, might be obtained from this minimum complement through increasing minimum years of contribution up to the point where employees payback equals the minimum pension with no other complements required.

To conclude, results evince that Dutch pensions generate larger inequalities, except for the first pillar. These inequalities are particularly notorious when looking at pension benefits from women in cluster 5, but are also appreciated in terms of net wealth and access to occupational pensions. Prominence of occupational pensions, through DC schemes get extra factors involved in retirement outcomes, which contribute to exacerbate inequality between individuals with different education levels or those with interrupted working lives. In Spain, the transition to a system where defined contributions plans increase in size, looks like the natural path to follow to diversify pensions' financing, in view of how a more mature welfare state, such as the Dutch one, is organized. In fact, the conversion process has virtually started with the last reform but, it is vital to bear in mind that these systems are grounded on considerably high employability. In consequence, this new scenario will require deeper structural reforms on the Spanish labour market, as it is vital for it to progress in line with pensions.

This study should be understood as a first step to further research on family-work trajectories and retirement matters. The methodology employed could be extended to other life spheres and, with the increasing longitudinal data available, the targets considered might be enriched with new empirical insights and theory development.

BIBLIOGRAPHY

Abbott, A. (1995). Sequence analysis: New methods for old ideas. Annual Review of Sociology, 21, 93–113.

Aisenbrey, S., & Fasang, A. E. (2010). New life for old ideas: The ‘‘second wave’’ of sequence analysis. Bringing the ‘‘course’’ back into the life course. Sociological Methods & Research, 38(3), 420–462.

Antolín, P. (2011). El sistema de pensiones español en el contexto internacional. Seminario “La reforma del sistema de pensiones en España”. Santander 2011, pp. 5-23.

Australian Centre for Financial Studies & Mercer. (2016). Melbourne Mercer Global Pension Index 2016.

Blossfeld, H-P., Buchholz, S. & Hofäcker, D. (2006). Globalization, Uncertainity, and Youth in Society. Routledge, London.

Börsch-Supan, A. and H. Jürges (Eds.). (2005). The Survey of Health, Ageing and Retirement in Europe – Methodology. Mannheim: Mannheim Research Institute for the Economics of Aging (MEA).

Börsch-Supan, A., A. Brugiavini, H. Jürges, J. Mackenbach, J. Siegrist and G. Weber. (2005). Health, ageing and retirement in Europe – First results from the Survey of Health, Ageing and Retirement in Europe. Mannheim: Mannheim Research Institute for the Economics of Aging (MEA).

Börsch-Supan, A., A. Brugiavini, H. Jürges, A. Kapteyn, J. Mackenbach, J. Siegrist and G. Weber. (2008). First results from the Survey of Health, Ageing and Retirement in Europe (2004-2007). Starting the longitudinal dimension. Mannheim: Mannheim Research Institute for the Economics of Aging (MEA).

Börsch-Supan, A., M. Brandt, K. Hank and M. Schröder (Eds). (2011). The individual and the welfare state. Life histories in Europe. Heidelberg: Springer.

Börsch-Supan, A., Brandt, M., Hunkler, C., Kneip, T., Korbmacher, J., Malter, F., Schaan, B., Stuck, S., Zuber, S. (2013). Data Resource Profile: The Survey of Health, Ageing and Retirement in Europe (SHARE). International Journal of Epidemiology DOI: 10.1093/ije/dyt088.

Börsch-Supan, A., Brandt, M., Hunkler, C., Kneip, T., Korbmacher, J., Malter, F., Schaan, B., Stuck, S., Zuber, S. (2013). Data Resource Profile: The Survey of Health, Ageing and Retirement in Europe (SHARE). International Journal of Epidemiology DOI: 10.1093/ije/dyt088.

Börsch-Supan, A., Brandt, M., Hunkler, C., Kneip, T., Korbmacher, J., Malter, F., Schaan, B., Stuck, S., Zuber, S. (2013). Data Resource Profile: The Survey of Health, Ageing and Retirement in Europe (SHARE). International Journal of Epidemiology DOI: 10.1093/ije/dyt088.

Börsch-Supan, A., Brandt, M., Hunkler, C., Kneip, T., Korbmacher, J., Malter, F., Schaan, B., Stuck, S. and Zuber, S. (2013). Data Resource Profile: The Survey of Health, Ageing and Retirement in Europe (SHARE). International Journal of Epidemiology DOI: 10.1093/ije/dyt088.

Börsch-Supan, A., T. Kneip, H. Litwin, M. Myck, G. Weber (Eds.) (2015). Ageing in Europe - Supporting Policies for an Inclusive Society. Berlin: De Gruyter.

Börsch-Supan, A. (2017). Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 1. Release version: 6.0.0. SHARE-ERIC. Data set. DOI: 10.6103/SHARE.w1.600.

Börsch-Supan, A. (2017). Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 2. Release version: 6.0.0. SHARE-ERIC. Data set. DOI: 10.6103/SHARE.w2.600.

Börsch-Supan, A. (2017). Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 3 SHARELIFE. Release version: 6.0.0. SHARE-ERIC. Data set. DOI: 10.6103/SHARE.w3.600.

Börsch-Supan, A. (2017). Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 5. Release version: 6.0.0. SHARE-ERIC. Data set. DOI: 10.6103/SHARE.w5.600.

Buchholz, S. (2006). Women's employment in West Germany. In: Blossfeld, H-P., Buchholz, S., Hofäcker, D. (eds) Globalization. Uncertainity, and Late Careers in Society. Routledge, pp. 1-23.

Giele, J. Z., & Holst, E. (2003). Introduction: Changing life patterns in Western industrial societies. Advances in Life Course Research, 8, XV–XX.

Clark, Robert L., Morril, M. & Allen, Steven G.(2011). The role of financial literacy in determining retirement plans. Economic Inquiry, 2012, Vol. 50 (4), pp. 851-866.

Cobo-Reyes, R. & Díaz-Saavedra, J.(2009). La percepción de los trabajadores de la normativa del sistema público de pensiones, el caso español. Revista Internacional de Sociología (RIS), vol. 68, pp. 775-795.

Dannefer, D. (2003). Toward a global geography of the life course, In J. Mortimer & M. Shanahan (Eds.), Handbook of the life course, pp. 647-659, New York: Kluwer.

Disney, R., & Johnson, P. (2001). Pension systems and retirement incomes across OECD countries. Cheltenham: Edward Elgar.

Ebbinghaus, B. (2006). Reforming Early Retirement in Europe, Japan and the USA. Oxford University Press.

Elder, G. (1985). Perspectives on the life course. In G. Elder (Ed.), Life course dynamics: Trajectories and transitions, 1968–1980 (pp. 23–49). New York: Cornell University Press.

Esping-Andersen, G. (1990). The three worlds of Welfare Capitalism. Cambridge Polity Press, pp. 9-54.

European Commission (2015). The 2015 Ageing Report. Economic and budgetary projections for the 28 EU Member States (2013-2060). Publications Office of the European Union, 2015.

Eurostat Statistical Books (2014). Living conditions in Europe. Publications Office of the European Union, 2014.

Fundación Inverco (2017). Sistemas de pensiones, seguridad social y sistemas complementarios: medidas para impulsar los planes de pensiones.

Gabadinho, A., Ritschard, G., Müller, N., & Studer, M. (2011). Analyzing and visualizing state sequences in R with TraMineR. Journal of Statistical Software, 40, pp. 1–37.

García López, J.M. & Pérez Forniés, C. (1997). La seguridad social española: los problemas del sistema de pensiones. Acciones e investigaciones sociales, 1997, Issue 6, pp.109-126.

Gauthier, J.-A., Widmer, E., Bucher, P., & Notredame, C. (2010). Multichannel sequence analysis applied to social science data. Sociological Methodology, 40, pp. 1–38.

Gauthier, J.-A., Blanchard, P., & Bühlmann, F. (2014). Introduction: Sequence analysis in 2014. In P. Blanchard, F. Bühlmann, J.-A. Gauthier (Eds.), Advances in sequence analysis: Methods, theories and applications (pp. 1–17). Netherlands: Springer.

Graham, John W. (1986). International differences in saving rates and the life cycle hypothesis. European Economic Review, 31, pp. 1509-1529.

Hall, P., & Soskice, D. (2001). Varieties of capitalism: The institutional foundations of comparative advantage. Oxford: Oxford University Press.

Han, S.K. & Moen, P. (1999a). Work and family over time: A life course approach. The Annals of the American Academy of Political and Social Sciences, 56, 2, pp. 98-110.

Harvey S. Rosen & Gayer, T. (2010), Public Finance 9th Edition. Publisher: McGraw-Hill/Higher Education.

Heinz, W.R. & Marshall, V.W. (2003). Social dynamics of the life course: Transitions, institutions and interrelations. New York, NY: Aldine de Gruyter.

Hernández de Cos, P., Jimeno, J.F. & Ramos, R. (2017). El sistema público de pensiones 2017 en España: situación actual, retos y alternativas de reforma. Banco de España, documento ocasional nº 1701.

Kohli, M. (1986). The world we forgot: A historical review of the life course. In V.W. Marshatll (Ed.), Later life: The social psychology of aging, pp. 271-303. Beberly Hills, CA: Sage.

Kohli, M., & Meyer, J. (1986). Social structure and social construction of life stages. Human Development, 29, 145–149.

Kosloski, K., Ginsburg, G., & Backman, C. W. (1984). Retirement as a process of active role transition. In V. L. Allen & E. V. d. Vliert (Eds.), Role transitions: Explorations and explanations, pp. 331–341. New York: Plenum Press.

Lesnard, L. (2006). Optimal matching and social sciences. Paris: Institut National de la Statistique et des Etudes Economiques (CREST-INSEE Working papers).

Lesnard, L. (2010). Setting cost in optimal matching to uncover contemporaneous socio-temporal patterns. Sociological Methods & Research, 38(3), 389–419.

Levy, R., & Widmer, E. (2013). Gendered life courses between individualization and standardization. Wien: LIT Verlag.

MacIndoe, H., & Abbott, A. (2004). Sequence analysis and optimal matching techniques for social science data. In M. Hardy & A. Bryman (Eds.), Handbook of data analysis (pp. 387–406). London: Sage Publications.

Macmillan, R. (2005). The structure of the life course: Classic issues and current controversies. Advances in Life Course Research, 9, 3–24.

Madero-Cabib, I., Gauthier, J.-A., & Le Goff, J.-M. (2016). The influence of interlocked employment-family trajectories on retirement timing. Work, Aging and Retirement, Vol. 2 (1), pp. 38–53.

Madero-Cabib, I. & Fasang, A.E. (2015). Gendered work-family life courses and financial well-being in retirement. Advances in Life Course Research, 27 (2), 43-50.

Maianti Lázaro, M., & María. (n.d.). El sistema de pensiones en España. RECERCAT (Dipòsit de La Recerca de Catalunya). Retrieved from http://www.recercat.cat/handle/2072/222746.

Malter, F. and A. Börsch-Supan (Eds.) (2015). SHARE Wave 5: Innovations & Methodology. Munich: MEA, Max Planck Institute for Social Law and Social Policy.

Martínez-Aldama, A. (2013). Sistemas de Pensiones: Experiencia Internacional. Pensiones: una reforma medular: reinventar la Seguridad Social para impulsar el bienestar y el crecimiento, pp. 157-174.

Martínez Díaz, W.A. (2013). Estado de Bienestar. Revista Electrónica de Investigación en Ciéncias Económicas (REICE), 1(2).

Mayer, K.-U. (1997). Comparative political economy of life courses. Comparative Social Research, 16, 203–226.

Meier, V & Werding, M. (2010). Ageing and the welfare state: securing sustainability. Oxford Review of Economic Policy, 2010, Vol. 26 (4), pp. 655-673.

Mortimer, J. T., & Shanahan, M. J. (Eds.). (2003). Handbook of the life course. New York: Kluwer Academic/Plenum Publishers.

Natali, D. & Rhodes, M. (2004). The "New Politics" of the Bismarckian Welfare State: Pension Reforms in Continental Europe. EUI Working Paper SPS No. 2004/10.

OECD. (2015), Pensions at a Glance 2015: OECD and G20 Indicators. OECD Publishing, updated 2016.

Pollock, G. (2007). Holistic trajectories: A study of combined employment, housing and family careers by using multiple-sequence analysis. Journal of the Royal Statistical Society: Series A (Statistics in Society), 170(1), 167–183.

R Core Team. (2012). R: A language and environment for statistical computing. Vienna, Austria: R Foundation for Statistical Computing www.R-project.org (Available on, Accessed 15.09.15).

Schröder, M. (2011). Retrospective data collection in the Survey of Health, Ageing and Retirement in Europe. SHARELIFE methodology. Mannheim: Mannheim Research Institute for the Economics of Aging (MEA).

Studer, M. (2013). WeightedCluster library manual: A practical guide to creating typologies of trajectories in the social sciences with R. LIVES Working Papers, 24. Geneva, Switzerland: University of Geneva Institute for Demographic and Life Course Studies.

Valero, D., Artís, M., Ayuso, M., & García, J. (2011). Una propuesta de reforma del sistema de pensiones Español basada en un modelo de contribución definida nocional. Revista de Metodos Cuantitativos Para La Economia Y La Empresa, 11(1), pp. 91–113.

Warner, D. F., & Hofmeister, H. (2006). Late career transitions among men and women in the United States. In H.-P. Blossfeld, S. Buchholz, & D. Hofäcker (Eds.), Globalization, uncertainty and late careers in society, pp. 141–181. London: Routledge.

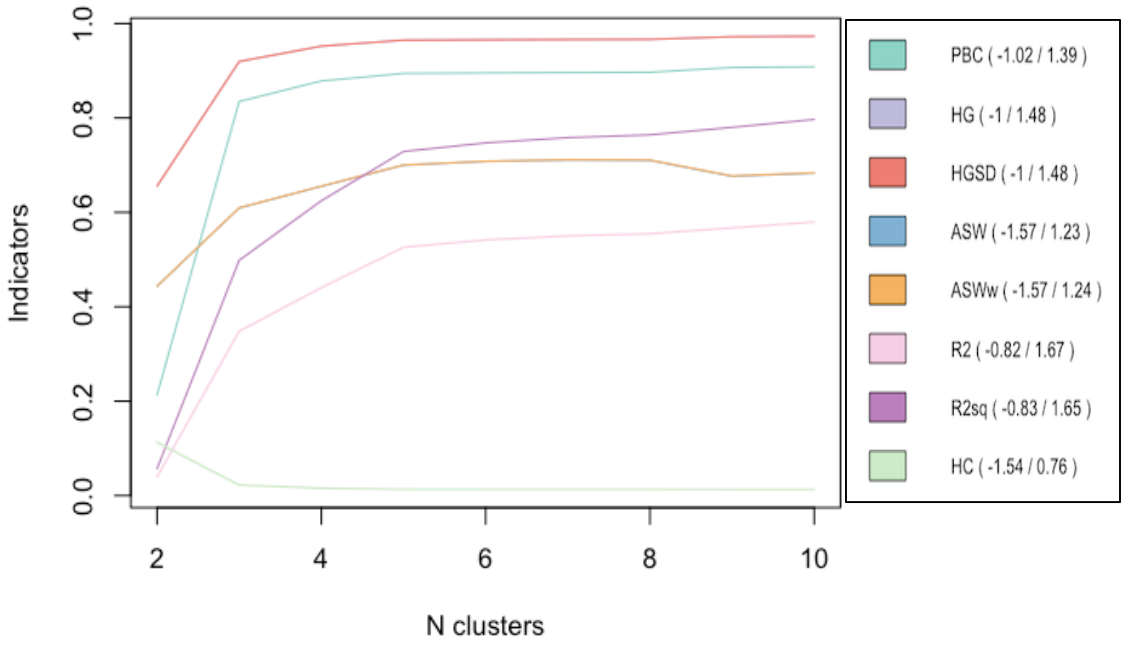
A.1. Appendix 1: Optimal Number of Clusters

Table 3: Available quality measures at WeightedCluster R package.

Available quality measures				
Name	**Abrv.**	**Range**	**Min/Max**	**Interpretation**
Point Biserial Correlation	PBC	[-1;1]	Max	Capacity of the clustering to reproduce the original distance matrix.
Hubert's Gamma	HG	[-1;1]	Max	Capacity of the clustering to reproduce the original distance matrix (Order of magnitude).
Hubert's Somers D	HGSD	[-1;1]	Max	Same as above, taking into account ties in the distance matrix.
Hubert's C	HC	[0;1]	**Min**	Gap between the current quality of clustering and the best possible quality for this distance matrix and number of groups.
Average Silouette Width	ASW	[-1;1]	Max	Coherence of the assignments. A high coherence indicates high between groups distances and high intra group homogeneity.
Calinski-Harabasz index	CH	[0; +∞[	Max	Pseudo F computed from the distances.
Calinski-Harabasz index	CHsq	[0; +∞[	Max	Idem, using the *squared* distances.
Pseudo R^2	R^2	[0;1]	Max	Share of the discrepancy explained by the clustering.
Pseudo R^2	R^2sq	[0;1]	Max	Idem, using the *squared* distances.

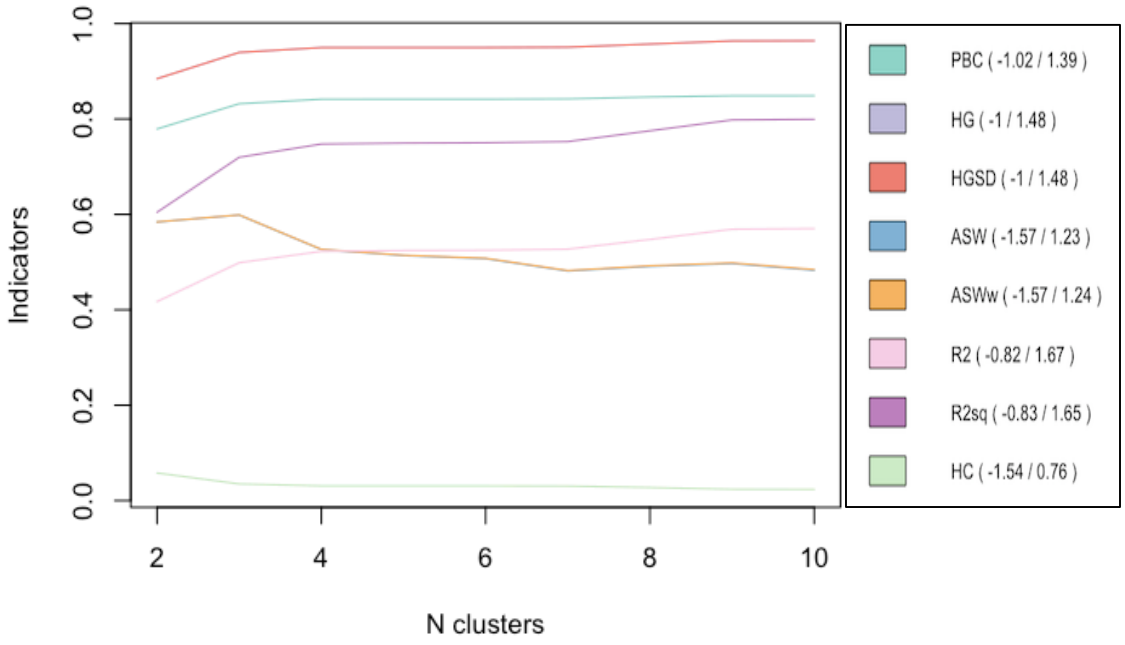
Source: Studer & Matthias, 2013

Figure 9: Average cluster cut-off quality on pairwise distance matrix obtained with sequence analysis on family trajectories



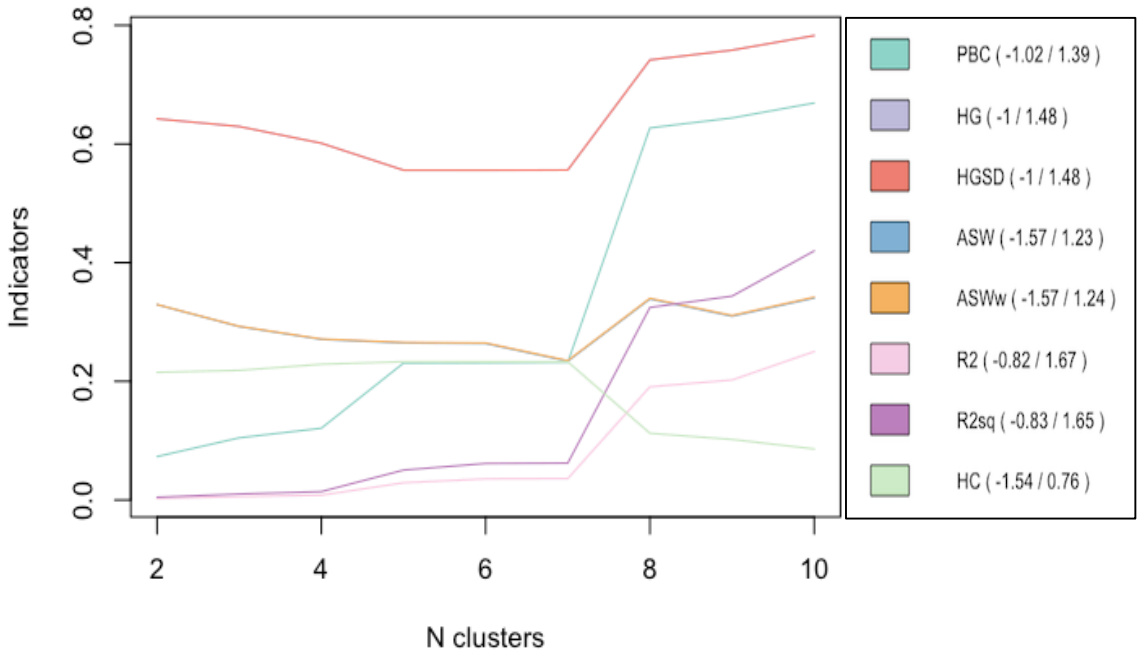
Source: Own elaboration

Figure 10: Average cluster cut-off quality on pairwise distance matrix obtained with sequence analysis on work trajectories



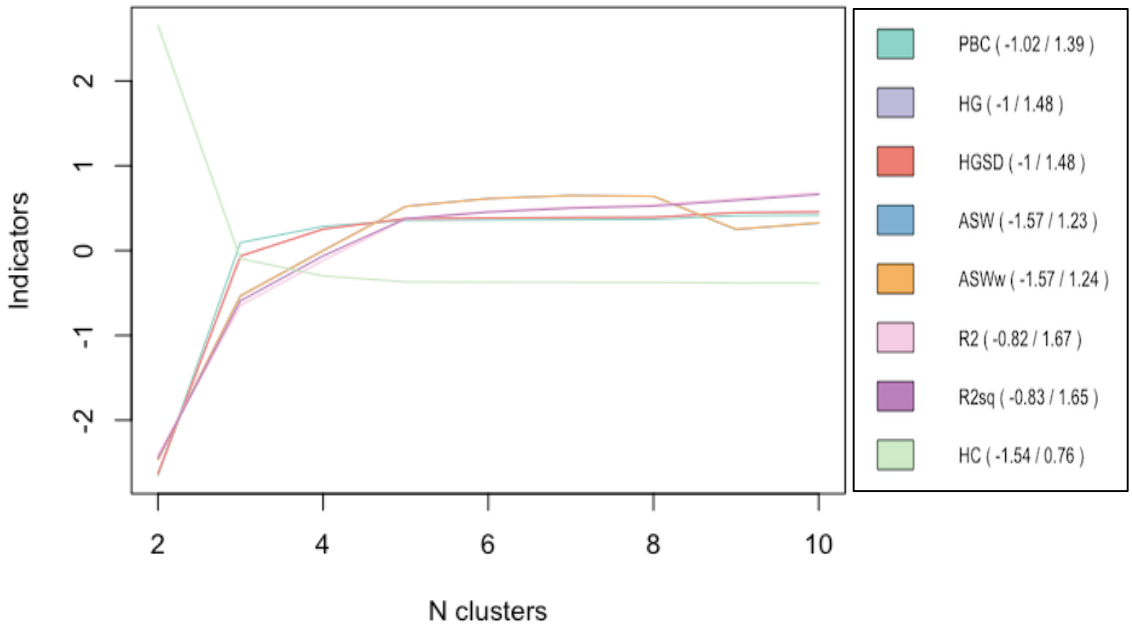
Source: Own elaboration

Figure 11: Average cluster cut-off quality on pairwise distance matrix obtained with multi-channel sequence analysis



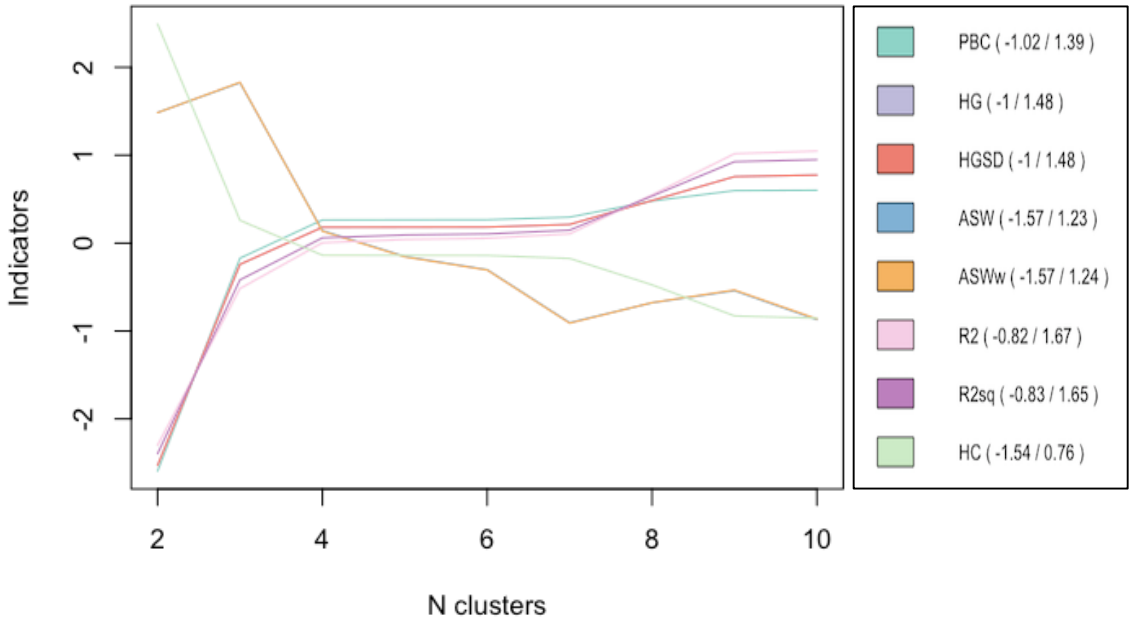
Source: Own elaboration

Figure 12: Average cluster cut-off quality on pairwise distance matrix obtained with sequence analysis on family trajectories (standardized scores)



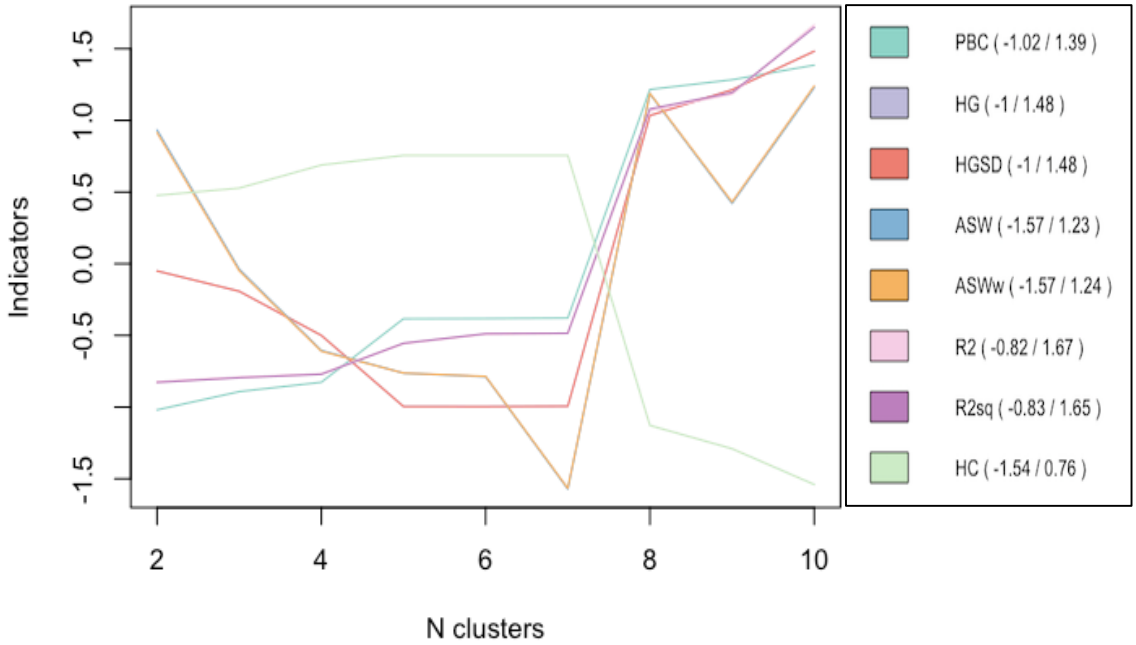
Source: Own elaboration

Figure 13: Average cluster cut-off quality on pairwise distance matrix obtained with sequence analysis on working trajectories (standardized scores)



Source: Own elaboration

Figure 14: Average cluster cut-off quality on pairwise distance matrix obtained with multi-channel sequence analysis (standardized scores)



Source: Own elaboration

A.2. Appendix 2: Linear regression models on total individual pension income

Covariates	*Model 1: Spain*	*Model 2: Netherlands*
(Intercept)	4.897,07***	9.858,43*
Female	-1.475,86**	-1.490,62
Male (base)	NA	NA
Cluster1	1.068,46	3.829,50
Cluster2 (base)	NA	NA
Cluster3	2.283,61	-1.202,73
Cluster4	-706,66	-86,42
Cluster5	-2.119,59**	-6.847,83*
Cluster6	41,55	1.637,84
Cluster7	-1.770,86	-5.493,49
Cluster8	-1.794,64	12.255,29*
Politics	8,22	68,12
Edu	117,68	230,39
Business	4,58	-17,33
Edu2	-52,672	-446,56**

MODEL 1
Signif. codes: 0 '***' 0,001 '**' 0,01 '*' 0,05 '.' 0,1 ' ' 1
Residual standard error: 8555 on 721 degrees of freedom
Multiple R-squared: 0,0182; Adjusted R-squared: 0,001855
F-statistic: 1,114 on 12 and 721 DF; p-value: 0,3454

MODEL 2
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
Residual standard error: 23780 on 844 degrees of freedom
Multiple R-squared: 0,02237; Adjusted R-squared: 0,008575
F-statistic: 1,61 on 12 and 844 DF; p-value: 0,08355

A.3. Appendix 3: Linear regression models on total household pension income

Covariates	*Model 1: Spain*	*Model 2: Netherlands*
(Intercept)	4.872,15***	10.577,57*
Female	611,28**	-868,73
Male (base)	NA	NA
Cluster1	-1.663,00	5.070,90
Cluster2 (base)	NA	NA
Cluster3	1.054,14	-542,54
Cluster4	-3.918,10	272,11
Cluster5	-1.097,72	-10.410,49*
Cluster6	-1.315,60	2.843,27
Cluster7	-1.770,86	-5.014,09
Cluster8	-4.690,85	9.286,60
Politics	253,65	439,60
Edu	238,23*	321,20
Business	-0,90	22,93
Edu2	-30,83	-337,54 .

MODEL 1
Signif. codes: 0 '***' 0,001 '**' 0,01 '*' 0,05 '.' 0,1 ' ' 1
Residual standard error: 11190 on 721 degrees of freedom
Multiple R-squared: 0,0182; Adjusted R-squared: 0,001855
F-statistic: 1,047 on 12 and 721 DF; p-value: 0,4036

MODEL 2
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
Residual standard error: 29010 on 844 degrees of freedom
Multiple R-squared: 0,01745; Adjusted R-squared: 0,003484
F-statistic: 1,25 on 12 and 844 DF; p-value: 0,2443

A.4. Appendix 4: Linear regression models on individual public pension income

Covariates	*Model 1: Spain*	*Model 2: Netherlands*
(Intercept)	5.505,03***	4.271,57*
Female	-850,27 .	-33,03
Male (base)	NA	NA
Cluster1	-255,74	-300,43
Cluster2 (base)	NA	NA
Cluster3	1.893,02	769,08
Cluster4	-418,65	-515,74
Cluster5	-1.250,90	-2.030,53
Cluster6	25,38	-367,30
Cluster7	-1.237,05	-1.327,68
Cluster8	-1.996,91	-180,43
Politics	-135,38	198,76
Edu	-34,22	-28,28
Business	-3,79	-19,40
Edu2	14,17	-3,40

MODEL 1
Signif. codes: 0 '***' 0,001 '**' 0,01 '*' 0,05 '.' 0,1 ' ' 1
Residual standard error: 7655 on 721 degrees of freedom
Multiple R-squared: 0,01053; Adjusted R-squared: 0,005934
F-statistic: 0,6397 on 12 and 721 DF; p-value: 0,809

MODEL 2
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
Residual standard error: 9497 on 844 degrees of freedom
Multiple R-squared: 0,007794; Adjusted R-squared: 0,006313
F-statistic: 0,5525 on 12 and 844 DF; p-value: 0,8803

A.5. Appendix 5: Linear regression models on individual occupational pension income

Covariates	*Model 1: Spain*	*Model 2: Netherlands*
(Intercept)	-593,65	5.720,23 .
Female	-616,56	-1.472,75
Male (base)	NA	NA
Cluster1	820,57	4.117,29
Cluster2 (base)	NA	NA
Cluster3	399,37	-1.958,03
Cluster4	-280,83	456,31
Cluster5	-862,65	-5.184,71 .
Cluster6	2,06	1.999,51
Cluster7	-527,02	-4.198,00
Cluster8	165,63	12.337,89**
Politics	141,29*	-136,83
Edu	150,27***	255,65
Business	8,26	2,55
Edu2	-67,69 .	-449,98**

MODEL 1
Signif. codes: 0 '***' 0,001 '**' 0,01 '*' 0,05 '.' 0,1 ' ' 1
Residual standard error: 3.939 on 721 degrees of freedom
Multiple R-squared: 0,04138; Adjusted R-squared: 0,02543
F-statistic: 2,594 on 12 and 721 DF; p-value: 0,002201

MODEL 2
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
Residual standard error: 21.890 on 844 degrees of freedom
Multiple R-squared: 0,02521; Adjusted R-squared: 0,01135
F-statistic: 1,819 on 12 and 844 DF; p-value: 0,0413

A.6. Appendix 6: Linear regression models on individual private pension income

Covariates	*Model 1: Spain*	*Model 2: Netherlands*
(Intercept)	-14,31*	-133,37*
Female	-9,03	15,16
Male (base)	NA	NA
Cluster1	-7,88	12,64
Cluster2 (base)	NA	NA
Cluster3	-8,78	-13,78
Cluster4	-7,18	-26,99
Cluster5	-6,03	367,41***
Cluster6	14,10	5,62
Cluster7	-6,78	32,19
Cluster8	6,65	97,83
Politics	2,30	6,19
Edu	1,63	3,02
Business	0,11	-0,48
Edu2	0,85	6,82*

MODEL 1
Signif. codes: 0 '***' 0,001 '**' 0,01 '*' 0,05 '.' 0,1 ' ' 1
Residual standard error: 146,7 on 721 degrees of freedom
Multiple R-squared: 0,00838; Adjusted R-squared: 0,008124
F-statistic: 0,5077 on 12 and 721 DF; p-value: 0,9105

MODEL 2
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
Residual standard error: 389,8 on 844 degrees of freedom
Multiple R-squared: 0,04572; Adjusted R-squared: 0,03216
F-statistic: 3,37 on 12 and 844 DF; p-value: 0,00007957

A.7. Appendix 7: Linear regression models on individual income from other sources

Covariates	*Model 1: Spain*	*Model 2: Netherlands*
(Intercept)	-110,11	-958,01 .
Female	196,58	-278,48
Male (base)	NA	NA
Cluster1	583,02	151,16
Cluster2 (base)	NA	NA
Cluster3	-119,53	372,60
Cluster4	-451,69	-14,71
Cluster5	-191,98	856,38
Cluster6	-176,69	34,47
Cluster7	401,93	-485,97
Cluster8	-352,45	1.392,92 .
Politics	61,75	38,07
Edu	9,99	176,27***
Business	3,61	15,99**
Edu2	6,30	-0,26

MODEL 1
Signif. codes: 0 '***' 0,001 '**' 0,01 '*' 0,05 '.' 0,1 ' ' 1
Residual standard error: 2.621 on 721 degrees of freedom
Multiple R-squared: 0,01204; Adjusted R-squared: 0,004402
F-statistic: 0,7323 on 12 and 721 DF; p-value: 0,7203

MODEL 2
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
Residual standard error: 3.614 on 844 degrees of freedom
Multiple R-squared: 0,04804; Adjusted R-squared: 0,0345
F-statistic: 3,549 on 12 and 844 DF; p-value: $3{,}609 \cdot 10^{-5}$

A.8. Appendix 8: Linear regression models on individual net wealth in retirement

Covariates	*Model 1: Spain*	*Model 2: Netherlands*
(Intercept)	68.721,8**	-90.662,3**
Female	27.870,9 .	11.778,3 .
Male (base)	NA	NA
Cluster1	-24.130,8	-40.382,1*
Cluster2 (base)	NA	NA
Cluster3	-71.339,8*	-36.510,0
Cluster4	-27.905	-7.365,8
Cluster5	-93.096,7**	-28.338,0
Cluster6	-4.250,8	-2.059,7
Cluster7	-18.952,1	-28.045,6
Cluster8	-46.202,5	-19.792,4
Politics	6.716,9**	10.719,8***
Edu	9.841,7***	14.446,0***
Business	343,3	1.550,1***
Edu2	2.840,2*	10.023,9***

MODEL 1
Signif. codes: 0 '***' 0,001 '**' 0,01 '*' 0,05 '.' 0,1 ' ' 1
Residual standard error: 212.900 on 721 degrees of freedom
Multiple R-squared: 0,07492; Adjusted R-squared: 0,05952
F-statistic: 4,866 on 12 and 721 DF; p-value: $9{,}604 \cdot 10^{-8}$

MODEL 2
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
Residual standard error: 186.600 on 844 degrees of freedom
Multiple R-squared: 0,1988; Adjusted R-squared: 0,1874
F-statistic: 17,45 on 12 and 844 DF; p-value: $< 2{,}2 \cdot 10^{-16}$

A.9. Appendix 9: Linear regression models on household net wealth in retirement

Covariates	*Model 1: Spain*	*Model 2: Netherlands*
(Intercept)	71.596*	-72.164
Female	18.358,4 .	111.490
Male (base)	NA	NA
Cluster1	-30.114,4	-165.683
Cluster2 (base)	NA	NA
Cluster3	-61.450,1	-196.410
Cluster4	-26.819,6	-229.985*
Cluster5	10.621,3	-200.688*
Cluster6	-19.489,9	-125.984
Cluster7	-95.385,3*	-89.633*
Cluster8	-52.924,5	-150.074
Politics	6.314,7 .	15.091
Edu	11.269***	10.568
Business	1.565,4***	7.101***
Edu2	2.785,9*	18.839**

MODEL 1
Signif. codes: 0 '***' 0,001 '**' 0,01 '*' 0,05 '.' 0,1 ' ' 1
Residual standard error: 228.400 on 721 degrees of freedom
Multiple R-squared: 0,1133; Adjusted R-squared: 0,09858
F-statistic: 7,68 on 12 and 721 DF; p-value: $1{,}626 \cdot 10^{-13}$

MODEL 2
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
Residual standard error: 832.000 on 844 degrees of freedom
Multiple R-squared: 0,05978; Adjusted R-squared: 0,04641
F-statistic: 4,472 on 12 and 844 DF; p-value: $5{,}414 \cdot 10^{-7}$