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RESEARCH ARTICLE

Income inequality in later years: occupational trajectories or initial social characteristics?

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This study focuses on the constitution of financial reserves in Switzerland from a longitudinal perspective. Personal income after retirement derives from financial reserves whose constitution depends both on positional factors, such as sex and birth cohorts, and processual factors, such as occupational trajectories, in the institutional context of the Swiss pension system (structural factors). We hypothesise that some processual, positional and structural factors interact with each other to shape financial reserves available in old age. We assess this set of factors and their interactions using the occupational trajectory types stemming from optimal matching analysis (OMA) combined with the hierarchical clustering and regression tree methods. We used the retrospective biographic data SHARELIFE gathered during the third wave of the SHARE survey in 2009. The results show that occupational trajectories are influential factors accounting for much of the financial reserves available in later life. However, these processual factors interact with positional factors such as sex and birth cohort. The retirement schemes generalised in Switzerland during the period under consideration add up to the effect of positional factors on the constitution of financial reserves.

Key words constitution of financial reserves • personal income after retirement • occupational trajectories • social characteristics • retirement scheme • SHARELIFE

Key messages
- The constitution of financial reserves occurs by the simultaneous effect of a series of factors considering individual social characteristics, occupational careers and institutional context of the pension system.
- The individual occupational trajectories strongly impact the constitution of financial reserves but positional factors, especially sex and birth cohort, impact the development of occupational trajectories.

- Access to occupational benefit provisions promotes the constitution of large financial reserves, but marginally compensates for inequalities related to positional factors such as sex and birth cohort.

Introduction

The risk of lacking adequate financial assets to sustain a fulfilling life in old age is a pressing concern in advanced post-industrial societies, including the wealthiest countries of the world (Ebbinghaus, 2021). There has been a long-standing interest in the effects of resource accumulation on life outcomes in the life course literature. The notion of *life course capital* developed by O'Rand (2006: 146) defines such capital as 'multiple [and interdependent] stocks of resources that can be converted and exchanged to meet human needs and wants'. Multiple forms of resources interact across the life course to condition the emergence of divergent educational pathways, economic attainment or health maintenance. More recently, life course research has emphasised the critical role of reserves of various types (Cullati et al, 2018) in overcoming life challenges, such as demanding transitions that contribute to tempering vulnerability processes (Spini et al, 2017).

Although previous studies have identified several factors responsible for the constitution of financial reserves, little is known about how these factors interact with each other over the life course. For instance, in the status attainment model, early attainment and background characteristics – namely, sex and birth cohort – were considered determinants of the positions held in later occupational careers (Henretta and Campbell, 1976; Warren et al, 2002). They were then said to be reinforced by labour market processes that accentuate inequality as lives unfold (Allison et al, 1982; DiPrete and Eirich, 2006; Dannefer, 2009). However, from a processual perspective, it is stressed that life course events and transitions often change this initial configuration (Settersten and Thogmartin, 2018). Labour market processes generate a heterogeneity of career paths and wage attainment due to different patterns of employment sequences, job-to-job linkages, occupational positions and organisational structures (DiPrete and Nonnemaker, 1997; DiPrete and Eirich, 2006). While some previous studies (Fasang, 2012; Madero-Cabib and Fasang, 2016; Cheng, 2021) combine individual social positions and occupational trajectories to assess pension incomes, the various ways by which positional, processual and institutional factors (de Coninck and Godard, 1990) interact with each other in individual trajectories to shape financial reserves after retirement have not yet been systematically explored. In this paper, we investigate the conjoint influence of initial social characteristics (positional factors) and occupational trajectories (processual factors) on the accumulation of available income after retirement. Following de Coninck and Godard's understanding of causality in life course research (1990), we assume that the study of the interaction between positional and processual factors should also consider the institutional context of the Swiss

retirement system (structural factor). These three factors should be considered in an overarching life course logic of development as they are likely to constantly interact with one another throughout individual trajectories (Abbott, 2016). We consider the income after retirement as a reserve as its constitution results from contributions made by individuals during their whole occupational career and its use is lagged by the legal age of retirement. We focus on long-term past occupational trajectories or the *midcourse* period of life (between 45 and 70 years). The *midcourse* corresponds to the period starting when people are in late adulthood and begin to consider how and when to disengage from work and educational responsibilities (Moen, 2003; Wall and Aboim, 2015). This period of life is hence dynamically associated with retirement, in whatever forms it may take.

Following de Coninck and Godard (1990), we hypothesise that the influences of initial social characteristics and career factors on income after retirement are hardly separable and should be empirically dealt with using a combination of longitudinal and cross-sectional indicators. We do not presuppose a causal link between positional and processual factors (for example, higher education and full-time employment), rather, we consider the intertwined effects of positional, processual and structural factors as a 'cumulative causation' (Merton, 1968; Dannefer, 2003; Abbott, 2016), which eventually produces differences in retirement income and social inequalities.

Methodologically, we first use cluster analysis to build types of occupational trajectories (processual factors) associated with proprieties of pension schemes in Switzerland (structural factors). These are then integrated into a regression tree to reveal the interactions between processual and positional factors. The use of a regression tree suits the design of our study as it captures the simultaneous interdependencies among factors (Abbott, 2016). It hence adds some insight compared to other options used thus far which keep the processual factor effect and explain it by positional factors later (see, for example, Gabriel et al, 2015; Madero-Cabib, 2015; Madero-Cabib and Fasang, 2016; Madero-Cabib et al, 2021). A regression tree associated with sequence analysis (SA) allows a typology to be constructed that directly integrates the degree to which covariates account for differences between types of occupational trajectories and precisely locates the nature and timing of change between them (Studer et al, 2011). Overall, this paper reveals how the accumulation of assets through the development of occupational trajectories in the Swiss institutional context is closely connected with initial social positions, such as sex and birth cohort, and lays the foundation for unequal living conditions in later life.

The constitution of financial reserves in the context of retirement schemes in Switzerland

The institutionalisation of the life course has generated a variety of regulations regarding retirement and economic independence in old age (Kohli, 2007; Steiber and Kohli, 2017). Each country has its own system with specific rules, rights and expectations. In Switzerland, people's retirement benefits mostly depend on the contributions that they have paid over their entire professional career (Gognalons-Nicolet and Le Goff, 2001; Bonoli, 2006a; Madero-Cabib et al, 2016). Such retirement schemes are telling examples of a situation where the financial well-being of a retiree is dependent on the continuity of their occupational career and income level.

The contributive character of the pension scheme in Switzerland favours the dependence of retirement benefits on processual factors, as such benefits depend on

the amount and duration of personal contributions to a pension scheme. Indeed, retirement benefits in Switzerland include three pillars – namely, universal insurance (AVS),[1] occupational benefit provision with contribution to a pension plan (PP)[2] and private insurance. Universal insurance (AVS) in Switzerland provides a state allowance to all individuals after reaching the mandatory age (legally fixed in 2019 to 64 years for women and 65 years for men). Although this insurance remains income-related, it is also mandatory for unemployed persons. In Switzerland's highly gendered institutional arrangements (Krüger and Levy, 2001), a husband's subscription fulfils the contributions for his unemployed wife. This insurance aims to cover the basic economic needs of individuals. In the case of divorce and widowhood, never-employed women have the right to claim a portion of the allowance, calculated according to the marriage duration and the corresponding contribution made by their husbands.

Occupational benefit provision with a contribution to the PP has been mandatory in Switzerland since 1985 for workers earning more than CHF 21,330 per year (as of 2019). Contributions to the PP depend on individual income for the duration of one's working life and complete the basic, universal AVS retirement benefits. Therefore, the prevalence of part-time work among married women, which is associated with childcare, excludes many women from occupational pension schemes when they earn less than the annual threshold above which workers are qualified to contribute. In Switzerland in 2012, 55% of women contributed to the PP compared to 78% of men (OFS News, 2014).

The access of women to the PP is constrained by the unpaid domestic and care work that they undertake for the benefit of their families, close ones and, more broadly, for society (Ginn and Arber, 1993). Women who do not contribute to the PP depend financially on their partners when they retire. Although married women may receive partial benefits from their husbands' occupational pensions after retirement, a widow receives approximately 60% of her deceased husband's pensions depending on her age at the moment of her husband's death, the matrimonial regime and having dependent children.[3] According to the Swiss civil code,[4] divorced women may claim half of their ex-husbands' occupational pension accumulated during the marriage and until the initiation of the divorce procedure. Hence, PPs are based to some extent on the duration and level of earnings, thus making individuals with lower wages and interrupted careers (mostly women) more likely to receive a lower level of retirement benefits than those with higher wages and continuous careers (mostly men). Self-employed individuals have no access to the PP and, as such, must contribute to private insurance to secure adequate income later in life. However, in contrast to the two previous pillars, private insurance is not mandatory. This means that retirement benefits in Switzerland may strongly depend on processual factors, such as the stability of and the level of integration in the labour market, as well as their corresponding wages (Rosende and Schoeni, 2012; Madero-Cabib and Fasang, 2016).

Contribution to the PP is therefore a critical dimension to be considered to address income inequality in old age. Compared to previous studies (Madero-Cabib and Fasang, 2016), we added contributions to PPs for the construction of occupational trajectories and their dependence on the employment rate (Madero-Cabib, 2015). Nevertheless, in the context of the liberal welfare state of Switzerland (Esping-Andersen, 1999), with historically modest universalist social protection and a high degree of commodification, the contribution to a PP is a structural factor that may

strongly impact income after retirement. In addition, the traditional male-breadwinner model prevailing in Switzerland in the middle of the 20th century (Levy and Widmer, 2013) may penalise savings and benefits in old age for women (Fasang et al, 2013). It was indeed confirmed in the case of Switzerland that occupational and family trajectories are conditioned by gender-oriented institutional options and constraints (Krüger and Levy, 2001; Levy et al, 2013). Such specific institutional features make the inclusion of the contribution to a PP in the research design a relevant addition to the current literature.

The role of positional, processual and structural factors in the constitution of financial reserves

The study of the constitution of financial reserves is focused on understanding some specific time-related processes and functions associated with life course capital (Cullati et al, 2018). To constitute financial reserves, individuals must save a part of their resources for later use rather than exhaust them in full to maintain their standard of living. Reserves, therefore, stand in contrast with economic, cultural, social or symbolic capital (Bourdieu, 1986), as they require systematic investment to generate returns. In that sense, reserves are defined as the difference between collected resources at any given time and resources directly consumed or invested. As such, individual consumption or investment is postponed for the constitution of reserves, whereas the investment of capital is meant to be continuous. Reserves are accumulated to buffer against difficult or demanding life circumstances such as retirement, which is a stressful life transition (Cullati et al, 2018). As in the case of life course capital, reserves are unequal and their constitution allows individuals the opportunity to cope with critical situations.

Previous studies have shown that inequality from a life course perspective, or 'aggregate inequality' (Cheng, 2021), should consider the following three factors: (1) the positions prevailing before entry into the labour market, such as family background and education; (2) the inequality processes from career entrance to later stages; and (3) the structural-institutional context determining wage inequality. Research indeed suggests that background positions are best at predicting wage inequality in older birth cohorts, while processual career development is a better predictor of wage inequality in recent birth cohorts, as they are characterised by greater variability (for example, further education, unemployment) due to technological shifts (Cheng, 2021).

To understand the interaction between these factors, we refer to the following three complementary models of causality proposed by de Coninck and Godard (1990): *positional*, *processual* and *structural*. In the first model – *positional* – the causal relation posits that an occupational trajectory ensues from the individual social position(s) at the beginning of their career (for example, sex, birth cohort, level of education, socio-economic status of origin). These positional factors are expected to adequately predict the type and amount of personal income an individual has obtained at the end of his/her occupational career. According to the status maintenance model (Blau and Duncan, 1967; Henretta and Campbell, 1976; O'Rand and Henretta, 1999), the resources acquired early in life have persistent effects and help an individual maintain their professional status until retirement. Moreover, initial (dis)advantages tend to be associated with a process through which (dis)advantages accumulate (Dannefer, 2003; DiPrete and Eirich, 2006). For example, individuals with higher levels of education

are more likely to pursue careers characterised by advantaged conditions, including full-time employment along with high income (Radl, 2013). They are the primary candidates for the best jobs and therefore take positions that allow them to benefit from institutional arrangements that promote the constitution of financial reserves and higher life expectancy (Wolbers et al, 2001). Hence, the status attainment model and the model of cumulative (dis)advantage process stress the importance of early life stages in the accumulation of reserves.

The second model – *processual* – posits that life course processes produce similar outcomes for individuals who are characterised by similar life trajectories irrespective of positional factors (Leisering, 2003). From this perspective, events and phases of the life course produce a sequential dynamic of cumulative effects over time, which mainly shapes the flow of an individual's life (Elder et al, 2003; DiPrete and Eirich, 2006; Dannefer, 2009). Processual factors influence the timing of retirement, as, for instance, continuous full-time employment makes early retirement more likely (Madero–Cabib and Fasang, 2016). Since the early 1960s, individual life trajectories have become diversified or destandardised following a change in the timing, sequence and duration of main life stages and transitions, such as entering the labour market, marrying, having children or divorcing (Brückner and Mayer, 2005). However, the greater heterogeneity of occupational trajectories undermines the predictability of pension income, as the labour market amplifies economic inequality (O'Rand and Henretta, 1999; Guillemard, 2000). Furthermore, previous studies do not associate pension income with retirement trajectories but rather with social policies that regulate this process (Fasang, 2012). Thus, the processual development of an occupational career cannot be regarded as the sole factor that predicts income after retirement and, hence, needs to be considered along with the institutional conditions allowing the constitution of financial reserves over time.

The third model – *structural* – integrates the respective influence of social structures and institutions on the unfolding of life trajectories over time. According to labour laws, most occupations, but not all, give individuals the opportunity to constitute financial reserves either individually or by employer contributions over the course of their careers to prepare for retirement. However, a significant share of workers in Switzerland has not had such an opportunity because their occupations were excluded from any PP. In such cases, the constitution of financial reserves is only partially institutionalised and is fully incumbent on individuals, a situation that has consequences later in life. On the other hand, it was found that retirement schemes with individualised PPs increase inequalities regarding pension income (Shuey and O'Rand, 2006). Therefore, the liberal pension scheme in Switzerland penalises the pension income of individuals with destandardised occupational trajectories, especially women (Madero–Cabib and Fasang, 2016).

According to de Coninck and Godard (1990), positional, processual and structural factors are interconnected, and their respective effects cannot be isolated from one another. For example, one's level of education or one's sex is a predictor of the continuity of full-time employment during one's professional career. Similarly, positional factors are embedded in structural factors. Birth cohorts are embedded in specific institutional arrangements located in specific historical times and places (Elder, 1995; Elder et al, 2003). With regard to

retirement, this is particularly important, as pension reforms are usually effective for specific birth cohorts and are often enacted with retrospective effects (Fasang, 2012). The individuals belonging to the older birth cohorts (1920–35) benefited from the economic and structural opportunities associated with the economic growth of the period between 1945 and 1975 that characterises most Western countries. In comparison, individuals belonging to the 1950–65 birth cohort were confronted with less social mobility, loss of wages, diminished institutionalised social protection, and decay in consumption (Ryder, 1965; Chauvel, 1998). In Switzerland, individuals born before 1949 have been penalised compared with younger cohorts, as mandatory occupational benefit provision with a contribution to the PP was established only in 1985.

Overall, institutional factors weaken or strengthen the effect of initial positions on the accumulation of reserves, particularly as it relates to upward mobility. Furthermore, during the historical period considered by this research, individuals with low-level occupations have had quite limited access to PPs. Such unequal accumulations of advantages or disadvantages for the constitution of financial reserves generated by positional, processual and structural factors are expected to have generated widespread financial vulnerability in old age, when health is degraded and relationships are challenged (Spini et al, 2017).

Summary

Based on this literature review, we propose the following two hypotheses:

> H1: The impact of positional factors on the constitution of financial reserves is carried out by processual factors such as career development. For instance, the enforcement of the male breadwinner model throughout occupational trajectories reinforces the initial inequality due to sex. Women are less likely to benefit from pension schemes and have fewer opportunities to contribute to the PP, as they are over-represented in part-time occupational activities (Widmer and Ritschard, 2009; Levy and Widmer, 2013). Additionally, women spend significant time out of the labour market due to childcare or family responsibilities (Kuehni et al, 2013; Le Feuvre et al, 2014).
>
> H2: Structural factors (for example, PPs) influence the effect of positional factors on the constitution of financial reserves. Access to a PP as a critical structural factor of the Swiss pension scheme is expected to enhance the constitution of financial reserves of individuals with standard full-time occupational trajectories and penalise individuals with destandardised occupational trajectories, such as part-time employment and unemployment (Fasang, 2012; Madero–Cabib and Fasang, 2016).

To sum up, individuals following full-time occupational trajectories with access to PPs are expected to be financially advantaged after retirement. Likewise, individuals who experience interrupted occupational careers and unemployment and who consequently did not contribute to the PP due to institutional rules regarding retirement in Switzerland present during the historical period considered are expected to have been financially hurt after retirement.

Data, measurement and methods

Data

We used the data from the Survey of Health, Ageing and Retirement in Europe (SHARE), particularly the retrospective biographic data SHARELIFE gathered during its third wave in 2009 (Börsch–Supan, 2022). The SHARELIFE survey provides detailed information about occupational characteristics, contributions to PPs and activity rates over professional careers. The data collection was realised through face-to-face interviews. In the survey questionnaire, life history calendars focused on the chronological organisation of events in the different domains of the life course. We constructed occupational trajectories by considering professional insurance because it depends on the employment rate and current wages and consequently contributes to the accumulation of financial reserves. According to Börsch-Supan and Schröder (2011), SHARELIFE was designed to analyse the role played by institutional reforms in European countries. The representativeness of the national samples is achieved by the target population (individuals aged 50+ in 2006 and alive in 2008), and it considers sex, birth cohort and geographical area.

The third wave of the SHARELIFE (2009) survey was chosen to cover the birth cohorts born before 1949 for several reasons. First, the effect of the reform on occupational benefit provision by making the contribution to a PP compulsory took place only in 1985 in Switzerland, right in the middle of this birth cohort's professional carrier, unlike birth cohorts born after 1949, which entered the labour market with the PP in place or shortly thereafter. The choice of the selected cohort therefore makes it possible to distinguish individuals who have contributed to a PP during their whole career from those who have not. Second, the pre–baby-boomer generation is much more strongly represented in the third wave of the SHARELIFE (2009) survey than in the seventh wave of the SHARE (2017)[5] survey. This generation was born before the end of the Second World War and did not fully benefit from the so–called 'Thirty Glorious' period (1945–75) of full employment and uninterrupted economic growth, contrary to the generation of baby boomers born after 1945, who developed highly standardised occupational trajectories (Kohli, 2007). This situation increases the likelihood of having a diversity of professional trajectories, with direct consequences for financial reserves in later years.

The initial Swiss sample of SHARELIFE (2009) includes 1,296 respondents aged 50 years and older. To capture the most complete occupational trajectories along the *midcourse* period with the transition to retirement, we selected all individuals who were born before 1949 (thus at least 60 years old at the time of data collection in 2009). The resulting sample includes 833 respondents.

Measurement

Occupational trajectories are measured as longitudinal sequences in yearly intervals from ages 45 to 70, corresponding to the *midcourse* period of life (Moen, 2003). This period is clearly detached from youth and early adulthood, allowing the effects of positional and processual factors to be more easily distinguished.

We distinguished six possible occupational states that consider the possible contribution to a PP. The first three states are linked with employment, namely, (1) 'full-time employment with a pension plan', (2) 'full-time employment without a pension plan' and (3) 'part-time employment with and without a pension plan'. The

inclusion of the 'pension plan' condition in the construction of individual occupational trajectories is important for the estimation of the influence of structural factors on the amount of retirement benefits. The next three states describe situations in which individuals are out of the labour market, namely, (4) 'insurance benefits including disability insurance and unemployment insurance', (5) 'at home or occupationally inactive due to personal reasons' and (6) 'in retirement'.

In the SHARELIFE data, any employment spell of a duration of six months or more is recorded. There were no situations in the data at hand in which individuals change their employment status during the same year from full-time to part-time and vice versa.

Financial reserves are derived from the level of income benefits available to individuals immediately after their retirement. It is assessed with the following question: 'Approximately how much was your first total net monthly benefit after taxes from social security or pensions, namely, the sum of all pensions (public, occupational or private)?' The SHARELIFE data do not include information about the level of pension benefits at the time of the survey. However, a previous study supports the assumption that pension income tends to stay fairly stable across the retirement period (Fasang, 2012). The initial pension income corresponds to the reserves accumulated during an occupational career. The initial pension income is therefore a reliable approximation of later life pension income (Madero-Cabib and Fasang, 2016). The response rate to this question was approximately 46% of the sample, which corresponds to 383 individuals. To increase the sample size, we added the individuals whose personal income at the end of their occupational career was less than a full AVS pension (CHF 2,370 per month in 2009) and who did not provide information about the year of exit to retirement. We included these individuals in the analysis, assuming that their early exit to retirement increased the proportion of women because they are usually excluded in analyses of retirement incomes that are limited to samples of people working at age 55 (Madero-Cabib, 2016; Madero-Cabib and Fasang, 2016). This is particularly relevant for countries, such as Switzerland, with universal insurance of the AVS type. Thus, the final number of individuals with pension benefits was 489 (approximately 60% of the sample).

Table 1 presents the positional variables used in the analysis, namely, sex assigned at birth, birth cohort, level of education, professional status at age 30, marital status at age 30, and nationality of origin. Sex has been considered a critical factor of income inequality throughout the life course in a variety of studies, including some carried out in Switzerland (Levy and Widmer, 2013). Whereas education, marital status and the nationality of origin (as a proxy for migration) have also been unambiguously shown to be related to income (Radl, 2013; Heisig et al, 2018), birth cohort is used as a proxy for exposure to changing social contexts (Ryder, 1985), including changing PPs and periods of economic booms versus economic stability or crisis. Indeed, the cohorts of individuals born at the end of the 1940s experienced the full extent of their occupational trajectories with the compulsory PP in the context of an economic boom, which was not the case for individuals from previous cohorts. The professional status and marital status at age 30 were considered initial social characteristics. Due to occupational certification in Switzerland, entry into the labour market and mobility between occupations and jobs are influenced by educational qualifications (Bachmann and Sacchi, 1998).

Table 1: Descriptive statistics of the positional variables used in the analysis

Characteristics of the sample	N	%
Sex: men	382	46
Sex: women	451	54
Birth cohort: born before 1929	134	18
Birth cohort: born in the 1930–39 period	271	33
Birth cohort: born in the 1940–49 period	393	49
Level of education: primary	114	14
Level of education: secondary	165	20
Level of education: apprenticeship	298	37
Level of education: high professional and university	236	29
Professional status: workers (machine operators, elementary occupation)	187	23
Professional status: professional workers (skill service, craft, agricultural)	246	30
Professional status: clerks	187	23
Professional status: superior professional (legislators, professionals, associate's professionals)	193	24
Marital status: married	611	75
Marital status: widowed, divorced	21	3
Marital status: single	175	22
Nationality of origin: Swiss	811	97
Nationality of origin: foreign	22	3

Research design and methods

To assess the interactions of the three factors, described earlier, to account for pension income, we first build a typology of individual occupational trajectories using optimal matching analysis (OMA) (Blanchard et al, 2014). Hierarchical cluster analysis (Ward, 1963) is applied to the inter–individual distance matrix to bring together the most similar sequences into homogeneous groups. These groups correspond to statistically meaningful types of occupational trajectories. Based on a standard clustering quality criterion (Rousseeuw, 1987), we retain a four-group typology (average silhouette index = 0.69). The typology of occupational trajectories results in the influence of processual and structural factors on career development, stating stages of employment and contributions to PPs.

We then used this typology of occupational trajectories (categorical variable) along with socio–demographic variables as covariates in a regression tree classification (Studer et al, 2011). The partition into groups is achieved through discrepancy analysis[6] on the basis of the relationship between the distance matrix produced by SA and a series of covariates operationalised by processual and structural factors (the types of occupational trajectories with PP contributions), as well as by positional factors (the socio–demographic characteristics of respondents). Starting with the full distance matrix, the model first searches for the modality of the covariate associated with the highest pseudo-R2, which represents the share of the total variability of distances among sequences or sequence discrepancy that is accounted for by a covariate. The initial sample is then split according to this modality. The same procedure is performed iteratively on each group produced by the successive splits until either all covariates have been used or a certain depth (number of splits) is reached. We kept the solution with a 0.05 significance stopping rule and produced nine groups with a maximal tree depth of four.

Finally, we compared net income after retirement among these groups by comparing the median income and variation of income in the first and third quartiles. We consider income after retirement to correspond to reserves accumulated throughout the occupational career. First, we drew a series of box plots to investigate the dispersion of income in each of the nine regression groups. Second, we estimated a linear model of the logarithm of individual income after retirement with this typology as independent variables to investigate the dispersion of income among the different types (log-linear model). We used the logarithm of personal income after retirement to reduce the skewness of the net income variable and to obtain a continuous variable that is normally distributed. Individuals with missing values on income are not taken into account. A pre-analysis showed us that missing data are related to persons born before 1940, whatever the group they belong to (and the income they earn).

Computations and estimations are made in the R environment for statistical computing (R Core Team, 2021). SA and regression tree groups were computed using the TraMineR package (Gabadinho et al, 2011).

Results

The typology of occupational trajectories

Figure 1 presents the four types of occupational trajectories characterising the end of a professional career and transition to retirement.

The first type – 'full-time employment with PP contributions' (32% of the sample) – includes individuals who have been continuously employed full-time and have contributed to a PP during most of their adult lives. This pattern represents highly standardised trajectories of both occupational career and transition to retirement. Individuals who had this type of trajectory rarely experienced unemployment or disability during their career; only a small number of the most advanced members of this cohort anticipated their retirement at the age of 57.

The second type – 'full-time employment without PP contributions' (26% of the sample) – includes individuals who have been continuously employed full-time but who have not contributed to a PP. This pattern presents less standardised trajectories of occupational career and retirement. For the individuals belonging to this cluster, the process of the transition to seniority started as early as 45 years of age, and one third of the individuals belonging to this group left the labour market before the legal AVS age either through part-time employment or occupational inactivity.

The third type – 'part-time employment with and without PP contributions' (19% of the sample) – includes individuals who have been employed part-time irrespective of whether they contribute to a PP. This pattern also presents less standardised trajectories of occupational career and retirement. The transition to occupational inactivity due to unemployment, disability and/or occupational inactivity occurred most often around age 60, that is, shortly before retirement age.

The fourth type – 'out-of-labour-market' (23% of the sample) – includes individuals who have been occupationally inactive in the long run. This pattern presents destandardised trajectories of occupational career and retirement. At the mandatory retirement age, which is 64 for women and 65 for men, only half of individuals declare they are retired, while the other half continue to consider themselves occupationally inactive after that age. This underscores the high level of institutional exclusion these individuals are facing.

**Figure 1:** Types of occupation-to-retirement trajectories
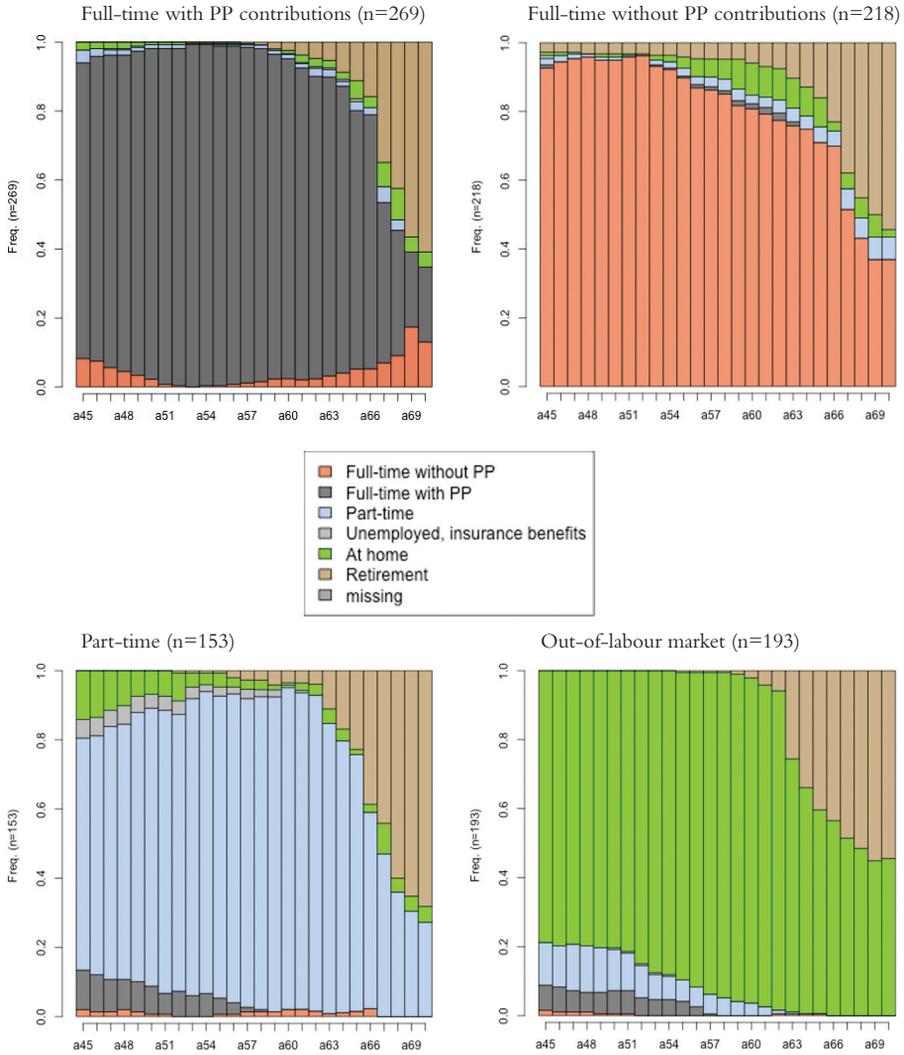
Overall, cluster analysis distinguishes between groups of individuals who have different occupational trajectories and consequently different opportunities to accumulate financial reserves encapsulated in available income after retirement. Individuals with full-time employment trajectories and PP contributions have more capacity to save for retirement than those who did not contribute to a PP or were either employed part–time or were unemployed.

Role of positional, processual and structural factors in the discrimination of individual occupational trajectories

Figure 2 shows the interaction between processual factors (the types of occupational trajectories) and the selection of positional factors through the use of a regression tree. Each node shows the plot of the individual occupational trajectories, as well as

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**Figure 2:** Regression tree of individual occupational trajectories
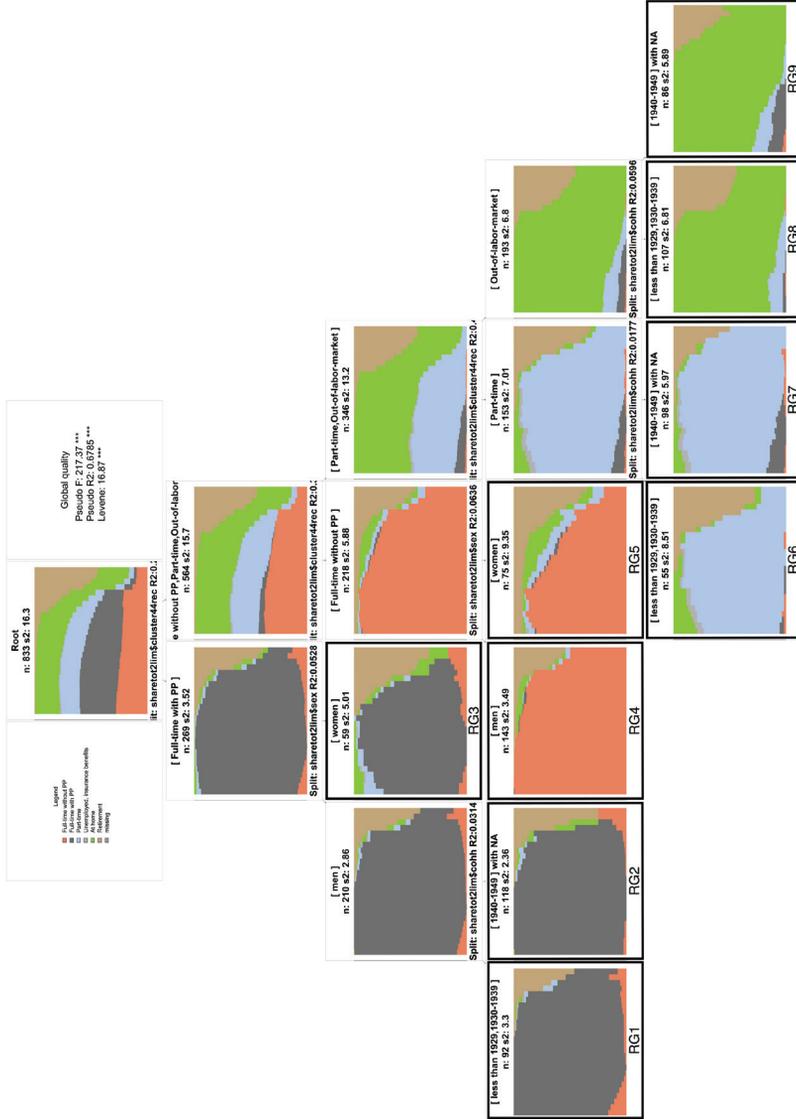
the size of the node and the discrepancy within the node (s2). The split covariate and the discrepancy (R2) explained by the covariate are indicated at the bottom of each succeeding node, while the definition of the binary split is indicated at the top of each node.

The first split features the occupational trajectories (processual and structural factors) and creates the group of full–time employed individuals with PP contributions and the group of individuals with all other types of occupational trajectories. Among full–time employed individuals with PP contributions, the split is based on sex (positional factor) and creates groups of men and women. Among full–time employed men with PP contributions, the split features the birth cohort (positional factor) and creates the group of full–time employed men with PP contributions born before 1940 (RG1; 11% of the sample) and the group of full–time employed men with PP contributions born in the 1940–49 period (RG2; 14% of the sample). Men born in the 1940–49 period retired earlier, and sometimes through unemployment more than men born before 1940. Full–time employed women with PP contributions represent the third group (RG3; 7% of the sample). The occupational trajectories of men are likely to be continuous until retirement, while the occupational trajectories of women are likely to be interrupted early on with premature exit. Regarding the group that includes the individuals with different occupational trajectories (second line, second column of Figure 2), the split is based on the occupational trajectories (processual and structural factors) and creates the group of full–time employed individuals without PP contributions and the group of part–time employed and out–of–the–labour–market individuals. The next split is based on sex (positional factor) and creates the group of full–time employed men without PP contributions (RG4; 17% of the sample) and the group of full–time employed women without PP contributions (RG5; 9% of the sample). Full–time employed women without PP contributions retire earlier through part–time employment or unemployment than full–time employed men without PP contributions. The next split is based on the occupational trajectories (processual and structural factors) and creates the group of part–time employed individuals and the group of unemployed individuals. The next split is based on the birth cohort (positional factor) and creates the group of part–time employed individuals born before 1929 and in the 1930–39 period (RG6; 7% of the sample) and the group of part–time employed individuals born in the 1940–49 period (RG7; 12% of the sample). The latter remained employed until the mandatory retirement age, as opposed to the previous group. The next split is based on the birth cohort (positional factor) and creates the group of the out–of–labour–market individuals born before 1929 and in the 1930–39 period (RG8; 13% of the sample) and the group of out–of–labour–market individuals born in the 1940–49 period (RG9; 10% of the sample). The latter were more often full–time and part–time employed at the beginning of their professional careers than individuals born before 1929 and in the 1930–39 period.

Income inequalities after retirement due to opportunities and constraints resulting from positional, processual and structural factors

Figure 3 provides descriptive statistics about the variation in net personal income after retirement among the regression tree groups, displaying the interquartile distribution, median and outliers. Men who are employed full–time with PP contributions and

Figure 3: Quartile distribution and median net personal income after retirement by regression tree group
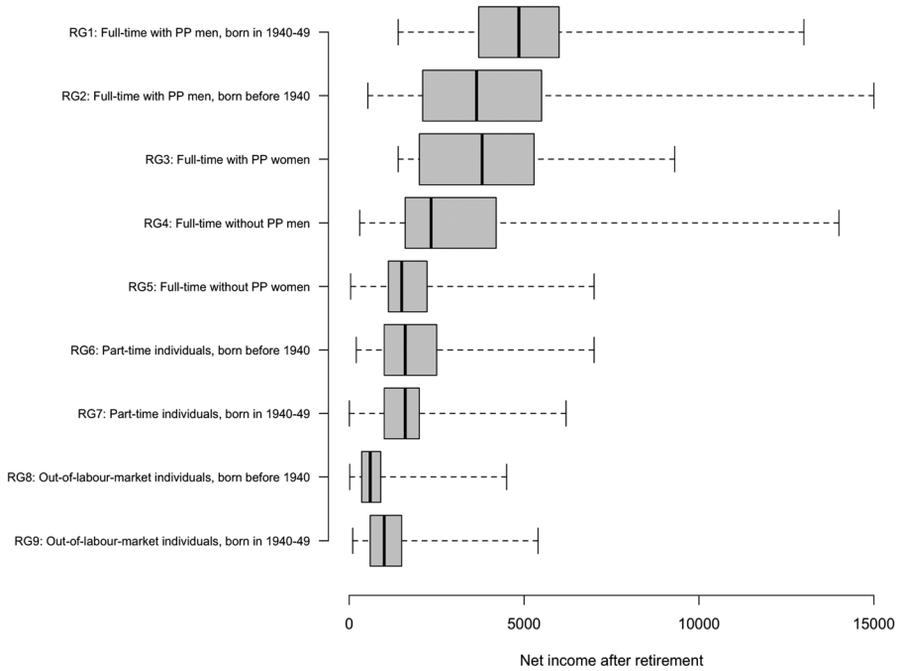
Notes:
RG = Regression tree group
Two-sample Kolmogorov–Smirnov tests:
$D_{RG1/RG2}=0.26^{**}$, $D_{RG1/RG3}=0.25$, $D_{RG1/RG4}=0.45^{***}$, $D_{RG1/RG5}=0.66^{***}$, $D_{RG1/RG6}=0.68^{***}$, $D_{RG1/RG7}=0.69^{***}$, $D_{RG1/RG8}=0.89^{***}$, $D_{RG1/RG9}=0.84^{***}$
$^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$

born in the 1940–49 period (RG1) have the highest median personal income, with low variation across the first and third quartiles. The median personal income after retirement is similar in the groups of full-time employed men with PP contributions born before 1940 (RG2) and full-time employed women with PP contributions (RG3). However, the variation of net personal income measured by interquartile values is higher in these groups than in the previous group of full-time employed men with PP contributions born in the 1940–49 period. Statistical tests show that there is a significant difference in net personal income between the groups of full-time employed men with PP contributions born in the 1940–49 period and those born before 1940. However, there is no significant difference in net personal income between the group of full-time employed men with PP contributions born in the 1940–49 period and the group of full-time employed women with PP contributions.

The median personal income of full-time employed men and women without PP contributions is lower than the median personal income in the respective groups of full-time employed men and women with PP contributions. Additionally, the dispersion of net personal income is higher in the group of men employed full-time without PP contributions than in the group of women developing similar career trajectories. The median personal income of part-time employed individuals does not depend on cohort and varies weakly across the groups. Median personal income is

Table 2: Results of log-linear model of income among regression tree groups

	Beta coefficients	St. error	Exp(beta)	Confidence interval
Intercept	7.5***	0.05	1808.042	[1525.38–1863.11]
RG1: Full-time with PP men, born in the 1940–49 period	0.9***	0.13	2.46	[1.92–3.22]
RG2: Full-time with PP men, born before 1940	0.7***	0.13	2.01	[1.62–2.66]
RG3: Full-time with PP women	0.7***	0.19	2.01	[1.42–2.97]
RG4: Full-time without PP men	0.3**	0.12	1.34	[1.07–1.72]
RG5: Full-time without PP women	−0.5**	0.16	0.61	[0.44–0.81]
RG6: Part-time individuals, born before 1940	−0.1	0.16	0.9	[0.67–1.23]
RG7: Part-time individuals, born in the 1940–49 period	−0.3	0.16	0.74	[0.56–1.03]
RG8: Out-of-labour-market individuals, born before 1940	−1.1***	0.12	0.33	[0.25–0.40]
RG9: Out-of-labour-market individuals, born in the 1940–49 period	−0.7***	0.14	0.50	[0.39–070]

Notes:

N = 481; RG = regression tree group, reference category in Table 2: sample mean (contrast sum).

R2 = 0.308; adjusted R2 = 0.29; F value=26.261, $p < 2.2e-16$***, AIC = 77.27448; BIC = 1486.052; *$p < .05$; **$p < .01$; ***$p < .001$
For this regression, we used a parameterisation to make the sum of the regression coefficients zero (Chambers and Hastie 1992). These contrasts make it possible to have regression coefficients for all groups without a reference category. A significant positive or negative coefficient indicates a personal income statistically higher or lower than that of the sample mean, respectively. A nonsignificant coefficient implies that the corresponding income is not different from the sample mean.

lowest in the groups of individuals with out–of–labour–market situations and features a low variation across these groups. Statistical tests show a significant difference in net personal income between each of these groups and the group of full–time employed men with PP contributions born in the 1940–49 period.[7]

The variation in net personal income after retirement among the regression tree groups presented in Figure 3 motivates us to compare personal income while controlling for its skewed distribution by using the logarithm of personal income after retirement as the dependent variable in a multivariate analysis (Table 2).

Table 2 shows that personal income after retirement depends on the intensity of previous participation in the labour market (ordered from full–time employment to out–of–labour–market trajectories). The highest personal income after retirement in the first two groups relates to four causal factors: one processual (full–time occupational trajectory), two positional (sex and birth cohort), and one structural (contribution to PP). This means that the opportunity of individuals to build large financial reserves results from the interaction of processual and structural factors with two positional factors. For the sake of clarity, the term average income indicates the income corresponding to the exponential of the intercept coefficient, which amounts to CHF 1,808. The income in the first group (RG1) is 2.46 times higher than the average income, which amounts to CHF 4,447 per month. The income in the second group (RG2) is 2.01 times higher than the average income and amounts to CHF 3,634 per month. The personal income after retirement in the third group of full–time employed women with PP contributions (RG3) shows the influence of three factors and confirms that the structural factor (access to a PP) compensates for or even dominates the positional factor (being a woman) under an otherwise equal processual factor (full–time occupational trajectory) in the comparison to the group of full–time employed men without PP contributions. For the second group of men, their income is 2.02 times higher than the average income, and it amounts to CHF 3,634 per month. The personal income after retirement in the groups of full–time employed men and women without PP contributions reflects the influence of processual and positional factors (sex) and shows that the full–time occupational trajectory does not compensate for the influence of sex. The income in the group of full–time employed men without PP contributions (RG4) is 1.34 times higher than the average income, and it amounts to CHF 2,422 per month. However, the income in the group of full–time employed women without PP contributions (RG5) is 0.61 times lower than the average income and amounts to CHF 1,102 per month. The income after retirement of part–time employed and out–of–labour–market individuals results entirely from processual and positional (birth cohort) factors. We consider the effect of gender to be implicit for part–time employees, as most among them are women. For part–time employed individuals, birth cohort does not seem to play an important role in predicting income after retirement, which does not differ from the average income, while for out–of–labour–market individuals, being born before 1940 is an aggravating factor for the constitution of financial reserves. The income of part–time employed individuals is 0.9–0.74 times lower than the average income and amounts to a range of CHF 1,337–1,627 per month. The income in the groups of out–of–labour market individuals is 0.5–0.33 times lower than the average income and amounts to a range of CHF 597–904 per month. This income is much lower than the at–risk–of–poverty threshold fixed in 2009 to CHF 2,342 for a single person in Switzerland (Méry, 2009).[8]

Overall, the results show that full-time occupational trajectories associated with a contribution to a PP make it possible to have a comparatively high income after retirement. However, positional factors, namely, being a woman and being born before 1940, substantially decrease the constitution of financial reserves. Although the contributions to the PP (structural factor) weaken the effect of such positional factors on the constitution of financial reserves, such effects remain present. Interestingly, individual disadvantages in processual factors (part-time employment and unemployment) to a lesser degree interact with positional factors, particularly with sex.

Conclusion

This study combines the core program of SA (Blanchard et al, 2014) and regression tree classification to investigate the combined influence of positional, processual and structural factors on the constitution of financial reserves after retirement. One of the strengths of this research is that it estimates the level of financial reserves available in old age by considering the interaction between initial social characteristics (positional factors), occupational trajectories (processual factors), and institutional arrangements regarding the pension system (structural factors). Previous studies have focused on the association between positional factors and financial reserves in old age, and only a few have considered occupational trajectories as processual factors for income after retirement (Fasang, 2012; Madero-Cabib and Fasang, 2016; Cheng, 2021). In this research, we attempted to go a step further by considering a typology of trajectories that reflects the joint influence of processual, positional and structural factors following de Coninck and Godard's (1990) propositions about the assessment of causality in life course research.

In line with our first hypothesis, which states that the impact of positional factors on the constitution of financial reserves is carried out by processual factors such as career development, the results show that the constitution of financial reserves is a sequenced process that is strongly related to the individual occupational trajectories (their duration, rate of employment, wage) together with its contribution to a PP. However, positional factors, especially sex and birth cohort, impact the development of occupational trajectories. As such, they largely contribute to shaping the profiles of labour market participation for men and women over the life course (see, for example, Levy et al, 2013) in recent and older birth cohorts. In particular, sex shapes the constitution of financial reserves through full-time occupational trajectories, whereas the birth cohort accounted for reserve differences among the full-time employed, as well as among the part-time employed and the unemployed individuals. For example, men born between 1940 and 1949 are more economically advantaged and have lower variation in their retirement income than men born before 1940. This difference is accounted for in part by changing institutional conditions throughout the 20th century. Nevertheless, some other positional factors, such as the level of education, professional status at age 30, marital status at age 30 and nationality of origin, influence the constitution of financial reserves to a lesser extent. Hence, this result supports the first hypothesis made in this research by stressing that positional factors may not play the primary role in the constitution of financial reserves over the life course and that their influence is likely to be mediated by processual factors.

Structural factors, such as occupational benefit provision with contributions to a PP, promote the constitution of large financial reserves. Furthermore, since 1985,

enrolment in a PP has equalised the effect on retirement income for a large majority of employees in Switzerland (Bonoli, 2006b; Leimgruber, 2008; Sager, 2011). The positive effect of occupational benefit provision is more important for the pension income of individuals who have developed full-time occupational trajectories. Only to a much lesser extent has this institutional change positively influenced the financial resources of part-time employed and unemployed individuals. Our results indeed show that the pension income of part-time employed individuals is 1.4–1.8 times lower than the at-risk–of-poverty threshold. The pension income of out-of-the-labour market individuals is 2.6–4.0 times lower than the at-risk–of-poverty threshold. Our results only partly support the second hypothesis that states that the availability of PPs, as a structural factor, strongly interacts with the effect of positional factors on the constitution of financial reserves. The personal incomes of full-time employed women with PP contributions remain lower than the pension incomes of men with identical occupational trajectories. Hence, access to occupational benefit provisions only marginally compensates for inequalities related to positional factors such as sex and birth cohort. Indeed, retirement plans consistently compensate not only for social inequalities linked with care and family involvement but also for inequalities stemming from structural exclusion from the labour market, non-normative life course events and/or ethno-racial discrimination (Madero-Cabib, 2015; Madero-Cabib and Fasang, 2016). Recently, this irregularity was recognised by introducing parental credits for the years during which women were occupationally inactive due to their care of children under the age of 16 (OASI, 2023).

Overall, our results confirm that the constitution of financial reserves occurs by the simultaneous effect of a series of factors anchored at different societal levels (individual characteristics, occupational careers and institutional context of the pension system). These findings shed light on the interaction of multilevel systems of advantages and disadvantages, such as latent social characteristics and pathways of occupational careers, for retirement benefits (Dannefer, 2021). Positional factors shape processual factors and highlight the presence of a segregated institutional context that frames the pension system in Switzerland. Note that the results of our study are limited to the dimensions of the occupational career before retirement. Future analyses should include other life course dimensions, such as education and family, characterised by specific events and transitions, as well as their onset ordering and timing (Abbott, 2016; Madero-Cabib and Fasang, 2016; Hofäcker et al, 2016; Spini et al, 2017). From this perspective, the transitions from education to employment and to parenthood, as well as the spatial mobility of individuals, are relevant factors associated with the constitution of financial reserves over time in a variety of national contexts that need to be considered by future research (Blossfeld et al, 2015; Cheng, 2016; Van Winkle, 2018; Muller et al, 2020).

Notes

[1] Assurance vieillesse et survivants (AVS); https://www.avs–ai.ch.

[2] La loi fédérale sur la prévoyance professionnelle vieillesse, survivants et invalidité (LPP).

[3] https://www.guidesocial.ch/recherche/fiche/generatepdfAll/122.

[4] Art. 122 al. 1 CCS.

[5] Some 18% of sample of the third wave of the SHARELIFE (2009) survey are individuals who belong to the birth cohort born before 1929, while these individuals made up 8%

of seventh wave of the SHARE (2017) survey sample. In contrast, 60% of individuals included in the sample of the seventh wave of the SHARE (2017) survey belong to the birth cohort born in the 1940–49 period compared to the third wave of the SHARELIFE (2009) survey, in which 49% of the individuals are from this birth cohort.

[6] http://traminer.unige.ch/preview-diss.shtml.

[7] The limit our comparison tests to the ones of each group versus the group of full-time employed men with PP contributions born in the 1940–49 period, which corresponds to the group of the male breadwinners who had a full-time professional career and beneficiated of the better pension scheme (see Widmer and Ritschard, 2009).

[8] According to the EU standard, the at-risk-of-poverty threshold corresponds to 60% of the median income in the country.

Conflict of interest

The authors declare that there are no conflicts of interest.

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