Retirement after Divorce: A Structural Model of Pension Sharing and Insurance*

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November 3, 2026

Abstract

Pension-sharing rules at divorce vary widely across countries, but little is known about how alternative rules affect behaviour and welfare. These policies may provide valuable insurance to the pension-poorer spouse, particularly when divorce occurs late in life. We study their effects in Denmark, where pension wealth is not divided between divorcing spouses. Empirically, we show that divorce is associated with delayed retirement, particularly among women. We then estimate a dynamic structural model of household bargaining, divorce, and retirement to study how households insure themselves against late-life divorce and evaluate two alternative pension-sharing policies. Cash compensation for pension wealth differentials mainly smooths consumption around divorce and has little effect on retirement. In-kind pension sharing, by contrast, leads divorced women to retire earlier and reduces their reliance on public pensions. Ex ante, married households value the insurance provided by pension sharing, but the form of compensation matters: Only in-kind compensation generates net positive willingness to pay. Both policies generate small positive fiscal externalities.

*We are grateful to our supervisors Abi Adams, Alison Andrew, Mathias Fjællegaard Jensen, Thomas H. Jørgensen and Hamish Low for their guidance and support throughout this project. We also thank Søren Leth-Petersen and Cormac O'Dea for valuable comments and suggestions. We further thank seminar participants at the University of Copenhagen and the University of Oxford, and conference participants at EAYE 2026, SEHO 2026, and IIPF 2026, for helpful feedback. All errors are our own.

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1 Introduction

Over the past two decades, the share of divorces occurring after age 50 has roughly doubled. Divorce therefore increasingly takes place at a stage of life when a large share of household resources is tied up in illiquid pension wealth, often unevenly distributed between spouses. At the same time, individuals have limited scope to rebuild assets or human capital before retirement, and their financial security for the remainder of life is largely determined by accumulated pension rights. Losing access to a spouse's resources at divorce can therefore have persistent consequences for living standards in old age, making the treatment of pension wealth an important determinant of how individuals are insured against late-life divorce.

While the legislation on how to divide non-pension wealth at divorce is relatively similar across OECD countries, the treatment of pension wealth varies considerably. Some countries, for example Germany, mandate equal division of all pensions, while others, for example Denmark and Sweden, treat pensions as individual property. The UK and the US lie between these extremes, allowing for offsetting of pension wealth imbalances through other channels, such as liquid wealth. These rules determine whether pensions accumulated during marriage continue to insure both spouses after divorce or remain tied to individual earnings histories. Where household insurance is incomplete, divorcees must instead adjust through the margins still available to them, including labour supply, private savings, and public transfers. Yet little is known about how these margins interact or how pension-division rules shape their relative importance.

In this paper, we ask how pension-division rules shape this insurance, and which margins substitute for it when household insurance is incomplete. We use comprehensive administrative data from Denmark to document the link between divorce and retirement behaviour. Denmark presents a suitable research case for several reasons: First, Danish divorce legislation stipulates that while non-pension wealth should be split equally at divorce, pension wealth is kept separate. Second, the Danish administrative registers contain individual-level data on pension wealth and contributions, earnings histories, as well as links to spouses. This allows us to analyse within-couple wealth inequality, both before and after divorce. Finally, Denmark is an example of a fairly gender-equal society with high labour force participation for both men and women. Nevertheless, there is still a substantial gender pension gap, and as such the treatment of pension wealth at divorce may have important consequences for divorcing individuals' retirement resources.

We begin by documenting how late-life divorce affects resources and the margins through which individuals adjust. Women enter divorce with substantially less pension wealth than men: at the average age of divorce, the within-couple pension gap is 20.2%. Because pension entitle-

ments remain with the individual title-holder, this imbalance determines the private retirement resources available to each spouse after divorce.

We then establish three stylized facts. First, divorce constitutes a large and persistent shock to household resources. Equivalized disposable income falls sharply at divorce and recovers only gradually as individuals adjust through labour supply and repartnering. The scope for recovering becomes increasingly limited with age. Individuals divorcing around age 55 remain on a rising equivalized disposable income trajectory well into the ages at which the continuously married have begun to retire, whereas those divorcing around age 65 experience little subsequent recovery.

Second, retirement is an important adjustment margin. Individuals divorcing around age 55 remain employed longer than the continuously married, despite having lower employment rates earlier in life. Those divorcing around age 65 follow employment profiles similar to the continuously married until divorce, after which their labour-force participation increases relative to that group.

Third, the welfare state provides an additional layer of insurance. Because pension wealth is not divided at divorce, divorced women enter retirement with lower private pension income. They nevertheless receive the highest public pension payments among the marital-history groups we consider, consistent with means-tested benefits partially offsetting differences in private retirement resources. Together, these facts suggest that when household insurance is incomplete, adjustments shift towards continued employment and public transfers.

The descriptive relationship between divorce and retirement is difficult to interpret for two reasons. First, divorce and retirement are jointly determined. Divorce can affect retirement decisions, but retirement incentives and pension institutions may also affect marital stability by changing each spouse's value of remaining married relative to divorcing. The observed association between divorce and retirement therefore does not identify a causal effect of divorce on retirement, but rather an association between two jointly determined outcomes. Second, even such a causal effect would not reveal the underlying mechanism. Divorce may delay retirement because it reduces access to household resources, but also because retirement is less valuable without a spouse with whom to share the leisure. Based on the data alone, we cannot say how much of the retirement response reflects incomplete insurance through pension division rather than other consequences of divorce.

We address these challenges by developing a dynamic structural life-cycle model in which married couples make joint decisions over savings and retirement. Couples bargain under limited commitment and divorce arises endogenously when participation constraints bind. During

working life, individuals earn stochastic labour income and allocate savings between pension and non-pension assets, which differ by liquidity, returns, and treatment at divorce. Individuals retire endogenously. In retirement, they consume out of savings and pension incomes, including benefits from a means-tested public pension system that reflects the Danish institutional environment.

In the model, gender-specific income profiles during working life generate systematic differences in earnings and pension accumulation within couples. Additionally, we explicitly model gender differences in longevity risk. Together, these features generate higher marginal values of wealth for women than for men, creating tension over the household saving rate within married couples and shaping retirement responses following divorce. By modelling retirement and divorce jointly in an environment with unequal earnings and multiple forms of wealth, the framework captures how pension institutions affect both the resources available after divorce and the value of remaining married. It allows us to compare pension-division regimes that are not observed in the data and to quantify how they change retirement behaviour, individual self-insurance, and reliance on public pensions.

We calibrate the model to the Danish economy and use it to evaluate two counterfactual pension-division regimes relative to the baseline, in which pension wealth remains individual at divorce. Under *in-kind division*, the couple's pension wealth is pooled and divided equally at divorce, but remains illiquid until retirement. This resembles the German system, where pension rights accumulated during marriage are divided between former spouses. Under *cash compensation*, pension entitlements remain with the title-holder, but differences in pension wealth are offset through transfers of liquid, non-pension assets. This resembles arrangements available in the UK and some US states.

Both policies transfer resources towards the spouse with lower pension wealth, but they differ in when those resources become available: While cash compensation increases resources available immediately after divorce, in-kind division only increases resources available in retirement. The two policies therefore insure different parts of the late-life divorce shock.

For both simulated reforms, the effects are concentrated among individuals who divorce before retirement with little spillover to the continuously married. Cash compensation is primarily used to smooth the immediate consumption drop upon divorce. Relative to the baseline, it dampens the fall in women's consumption by 3 percentage points (15%) and amplifies the fall in men's consumption by 3 percentage points (27%), reflecting transfers from the typically pension-richer spouse to the typically pension-poorer spouse. Because these transfers are liquid, they are largely used to smooth consumption around divorce and have only modest effects on

retirement timing.

In-kind division instead insures retirement resources. Divorced women retire 3.34 months earlier and earn 18.23% higher incomes from private pensions during retirement. For men, the effects are mirrored, with retirement being postponed 2.37 months and private incomes being 7.85% lower, relative to the baseline. Because the policy directly changes private pension wealth and subsequent pension income, it also interacts with the means testing of public pension benefits: Divorced women rely less on public pensions, while divorced men receive more. Taken together, the results show that the form in which insurance is provided matters. Cash compensation helps households absorb the immediate resource loss at divorce, whereas in-kind division leaves that short-run adjustment largely unchanged but reduces disparities in retirement resources. In doing so, it shifts part of the insurance against late-life divorce away from individual labour supply and the welfare state and back towards resources accumulated within the household.

We evaluate the welfare effects of both reforms using individual liquid-asset equivalents: each individual's willingness to pay for the reform, computed at the start of model time, before divorce is realized. This measures the reform's insurance value. Women, who are on the receiving end of transfers under pension sharing, have positive willingness to pay for both in-kind division and cash compensation, while men's willingness to pay is correspondingly negative. For in-kind division, however, women's gains outweigh men's losses, generating a positive net willingness to pay for the population. This leaves scope for a Pareto-improving reform when combined with a redistributive lump-sum transfer. Cash compensation instead generates a negative net willingness to pay. This asymmetry arises because women, who live longer on average, place a higher marginal value on pension wealth than men do, so transferring pension wealth from men to women is preferable to transferring an equivalent amount of liquid wealth. Both reforms also generate small positive fiscal externalities. Taken together, pension sharing can be welfare-improving, but only when resources are transferred in the form that matches how spouses value them.

This paper relates to three strands of literature. First, we contribute to the literature on households as providers of insurance and on the interaction between family structure and social insurance. Spouses insure one another through shared income and wealth and through behavioural responses to adverse shocks. This role is especially important at older ages, when households increasingly rely on accumulated assets and public transfers. Existing work shows that the loss of a spouse through death is a major financial risk in old age: Surviving spouses adjust labour supply, with particularly strong responses among women, and become more reliant

on means-tested benefits (Braun et al., 2017; Chang & Ko, 2023; Fadlon & Nielsen, 2021). We study the related loss of spousal insurance through divorce. Unlike widowhood, however, divorce and its financial consequences are directly shaped by policy, including the rules governing the division of pension wealth.

A related strand emphasizes the reverse link: Social-insurance institutions can themselves affect marriage and family decisions (Low et al., 2018; Persson, 2020). This two-way interaction motivates a framework in which marital status and economic behaviour are jointly endogenous. We contribute by showing how pension-division rules determine whether retirement resources accumulated within marriage continue to insure both spouses after divorce, and how incomplete household insurance shifts adjustment towards labour supply and means-tested public pensions.

Second, we relate to the literature on how divorce risk and divorce institutions shape behaviour within marriage and outcomes after separation. This literature studies legal arrangements intended to insure spouses, particularly women, against large consumption losses at divorce. Property division and maintenance payments can equalize post-divorce resources, but may also reduce precautionary labour supply within marriage by weakening the need to accumulate an independent buffer (Foerster, 2023; Kreyenfeld et al., 2023; Voena, 2015). Conversely, greater divorce risk can increase married women's labour supply as they seek to smooth consumption across married and divorced states (Fernández & Wong, 2014, 2017). These studies therefore show that divorce policy affects behaviour both after divorce and in anticipation of it. We focus on the same insurance–adjustment trade-off late in the life cycle, when labour supply and retirement are among the few remaining margins of response. In line with Olivetti and Rotz (2016), we find that adjustment is concentrated among those who actually divorce: Because expected late-life divorce risk is low, precautionary responses within marriage are limited, whereas divorcees work longer after losing access to household resources. Our contribution is to study how this adjustment depends on the treatment and liquidity of pension wealth. By distinguishing in-kind pension division from compensation through liquid assets, we show that not only the extent of legal redistribution, but also the form and timing in which insurance is provided, shape post-divorce consumption and retirement behaviour.

Finally, we contribute to the growing literature on the economic consequences of late-life divorce. Existing studies document persistent declines in economic resources following divorce, particularly for women, as well as increased employment at older ages and limited opportunities for repartnering (Brown & Lin, 2012; Brown & Wright, 2017; Brown et al., 2019; Lin & Brown, 2021; Olivetti & Rotz, 2016). We complement this evidence by developing a framework in which divorce and retirement are jointly endogenous and by explicitly modelling private pension wealth

and means-tested public retirement benefits. This allows us to compare alternative pension-division regimes and to distinguish how liquid compensation and in-kind pension sharing insure different parts of the late-life divorce shock.

In the following, we first provide an overview of institutional features and the data. Section 3 illustrates the life-cycle characteristics of divorcees. Section 4 presents the model, solution method and model fit. Lastly, Section 5 discusses the effects of counterfactual policies and Section 6 concludes.

2 Data and Institutions

2.1 Pension system

The Danish pension system consists of three pillars. First, all residents above the state pension age (SPA) are entitled to a state pension, funded through general taxation in a pay-as-you-go model.[1] The state pension consists of a base rate and a supplement. In 2020, the yearly base rate was 10,300 EUR (77,028 DKK) and it is means-tested against other sources of income at the individual level. The supplement is means-tested against other sources of income at the household level, such that it depends on marital status.[2] Appendix Figure A.1 illustrates the state pension scheme for different household types. The maximum transfer is approximately 45% of the average factory worker's salary (Amilon, 2015). Upon reaching the SPA, the decisions to claim state pension and to stop working are independent, although earnings-testing creates incentives to stop working for retirees who receive the supplement. Since 2004, the SPA has been 65 years for both men and women, regardless of labour market status.[3]

Second, most wage earners participate in occupational pensions, of which the majority are negotiated through collective bargaining agreements. These schemes are funded by regular contributions from employees, typically ranging between 6% and 17% of gross wages, which are partially matched by employers. Pension wealth is managed by occupation-specific pension funds. For workers who are covered by the collective agreement, participation in the pension scheme is mandatory and based on a principle of solidarity within the respective labour union. As such, the contribution is determined by the collective agreement with little margin of adjustment at

[1] Full eligibility requires 40 years of residence in Denmark, the Faroe Islands or Greenland since age 15.

[2] A 2023 pension reform removed the means testing of the base rate and the supplement against both own and spousal labour income, in an effort to incentivize working beyond the retirement age. However, since our analysis relies on data from before the reform, we consider only the pre-reform pension scheme. Cohabitants are treated like married couples.

[3] The 2004 reduction in SPA was passed in 1999 to reduce the length of eligibility for early retirement benefits. From 2019 the SPA gradually increases: As of 2025, the effective SPA is 67 years, and is set to further increase for later-born cohorts.

the individual level.[4] In addition, all wage earners pay into the legally mandated supplementary pension ATP (Arbejdsmarkedets Tillægspension), to which workers and employers contribute a fixed rate per hour worked.

Third, individuals may make additional contributions to private pension schemes, which are voluntary and flexible in design. These are largely used by self-employed who are not covered by labour market pensions, or for wage earners who may want to pay more into their pension plan than what follows from their collective agreement.

Both labour market and private pensions can take the form of capital pensions (lump-sum payouts), installment pensions (paid out over the duration of 10–20 years), or lifetime annuities. Claiming payouts of private or occupational pensions earlier than three years before the SPA is subject to a heavy tax penalty of 60%. Hence private and occupational pensions are de facto inaccessible until three years before SPA. Upon payout, pensions (private, occupational and state) are taxed according to regular income taxation.

2.2 Divorce legislation

Divorce is relatively cheap in Denmark, both in terms of monetary and non-monetary costs. No-fault, unilateral divorce has been possible in Denmark since 1923. Couples who agree to divorce can obtain divorce immediately without a period of reflection, whereas couples who disagree must undergo a six-month reflection period.[5] There is a small administrative fee of approximately 108 EUR (800 DKK) as of 2025.

Under the Danish marital property regime, assets are governed by a *deferred community of property*. In practice, spouses retain ownership of individually held assets during marriage, while full community of property applies upon divorce. At divorce, all positive net wealth is pooled and divided equally between the divorcing spouses. In Denmark, unlike in many other jurisdictions, this includes wealth accumulated before the start of the marriage.

An important exception is that of pension wealth. Danish law stipulates that "reasonable pension wealth" is considered separate property and does not enter the calculation of personal net wealth to be transferred in divorce. While divorce legislation does not provide a precise definition of what constitutes a "reasonable" pension, legal practice typically interprets this as pension savings corresponding to what is customary for individuals of similar age and occupation.

[4]Individuals can typically adjust their own contribution by only a few percentage points. Additionally, they can to some degree affect the investment risk profile, typically by choosing between a low-, medium- or high-risk portfolio. However, the specific portfolios are chosen and managed by the fund.

[5]Prior to 2014, all divorcing couples had to undergo the six-month separation period before divorce. In cases of infidelity, violence, child abduction, or in case the couple has previously been separated for two years, there is no mandatory separation period.

However, the same principles apply to both occupational and private pensions: As long as total pension wealth does not exceed what is considered reasonable, it remains outside of the marital estate. Importantly, it is not possible for individuals to strategically save into pension accounts in order to retain pension rights following a divorce, as such savings would *not* be considered reasonable.[6]

2.3 Data

In the following, we use administrative registers for the population (BEF), personal taxable income (IND) and pension contributions (INPI) that cover all Danish residents in our sample period. For Section 3, we restrict all data to the time period 1995 to 2020, such that the first divorces, defined as switching civil status from married to divorced or changing the ID of the spouse, are recorded in 1996. Pension wealth data is only available from 2014 and is taken from the PENSFORM register.

3 Descriptive evidence

In the following, we present descriptive evidence to illustrate how gender pension gaps emerge during marriage, how they evolve during a divorce event and whether and to what extent they are mitigated after divorce. This highlights that gender pension gaps are largely caused by family career breaks and this is not compensated by a transfer of pension wealth upon divorce. In response, women who experience divorce increase their lifetime labour supply but only through a delay of retirement. We consistently refer to divorced men or women as those who have ever experienced divorce. This combines individuals whose marital status is divorced with those who have remarried. As remarriage shapes how divorce in working life affects retirement outcomes, abstracting from this group would overstate the average effects of divorce. Furthermore, since divorce is an endogenous decision, we seek to make no causal statements in this section, but instead describe empirical patterns comparing divorcing individuals to those who marry but do not divorce, both in their similarities and differences prior to the divorce as well as after the divorce.

Fact 1: Divorce is a persistent negative shock to living standards. We begin by documenting how household resources evolve around divorce over the late life cycle. Our analysis

[6] In cases where individual retention of pension rights would put one spouse at an unreasonable disadvantage, for instance if the within-couple inequality in pension wealth is very large or due to family-related decisions such as time out of the labour force due to parental leave, there are compensatory mechanisms in place to ensure a fair division of wealth. However, these mechanisms are only very rarely used in practice. See Familieadvokaten.dk (n.d.)

uses individuals born between 1940 and 1969, observed in the administrative registers between 1990 and 2020, whom we observe to be married at age 40. Because the registers cover only a 30-year period, no single cohort is observed throughout the full age range of interest. We therefore combine overlapping segments of the life cycle across cohorts to construct synthetic life-cycle profiles.[7]

We classify individuals into five mutually exclusive groups according to their divorce experience:

$$div_i \in D = \{\text{never}, 45, 55, 65, \text{other}\}.$$

The category other contains individuals who divorce at ages other than 45, 55, or 65. These individuals remain in the estimation sample and contribute to identifying the baseline age profile, but we do not display their predicted profile in the figures.

For an outcome y_{it}, we estimate

$$\begin{aligned} y_{it} = \alpha &+ \sum_{a \in A \setminus \{a_0\}} \gamma_a \mathbb{1}[age_{it} = a] + \sum_{c \in C \setminus \{c_0\}} \theta_c \mathbb{1}[cohort_i = c] \\ &+ \sum_{d \in D^P} \delta_d \mathbb{1}[div_i = d] + \sum_{a \in A \setminus \{a_0\}} \sum_{d \in D^P} \beta_{a,d} \mathbb{1}[age_{it} = a] \times \mathbb{1}[div_i = d] + u_{it}, \end{aligned} \tag{1}$$

where

$$D^P = \{\text{never}, 45, 55, 65\},$$

so that other is the omitted divorce-experience category. The coefficients γ_a describe the baseline age profile among individuals in the residual divorce group, while δ_d and $\beta_{a,d}$ capture level and age-profile differences for the groups shown in the figures. Birth cohorts are grouped into ten-year intervals,

$$C = \{1940\text{s}, 1950\text{s}, 1960\text{s}\}.$$

We use the estimated model to predict the outcome at each age for individuals who never divorce and for those divorcing at ages 45, 55, and 65, fixing birth cohort at the 1950s.[8] Our measure of living standards is equivalized disposable income, as constructed by Statistics Denmark. It is calculated as total disposable household income divided by an equivalence scale that accounts for household size and composition.[9] Figures 1 and 2 show the resulting profiles for women and men, respectively.

[7]The marital-history registers contain the dates of changes in marital status. We can therefore condition on marriage at age 40 even for individuals who enter our income data at a later age.

[8]Predictions are constructed using Stata's `margins` command. The residual divorce category, one age category, and one cohort category are omitted in estimation.

[9]The first adult receives a weight of 1, each additional adult a weight of 0.5, and each child a weight of 0.3.

Figure 1: Women's equivalized disposable income by age and age at divorce

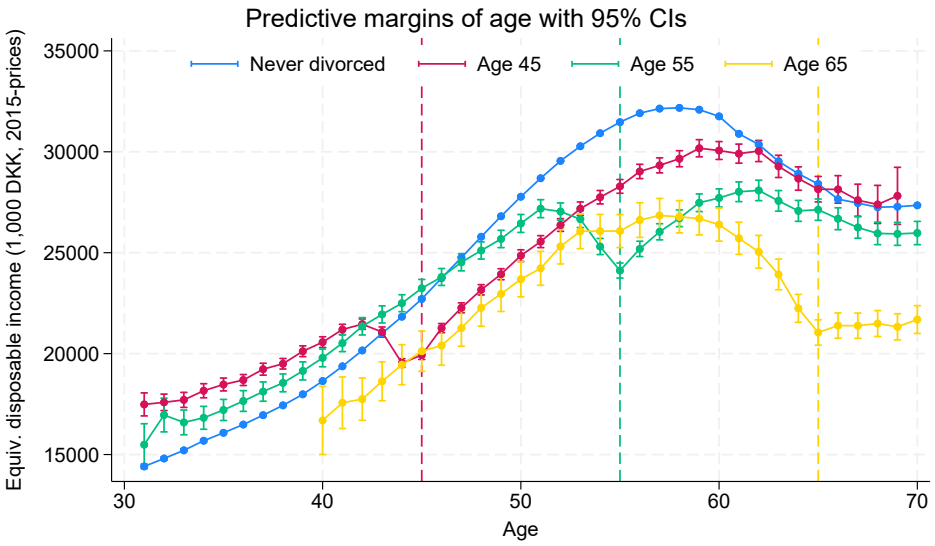
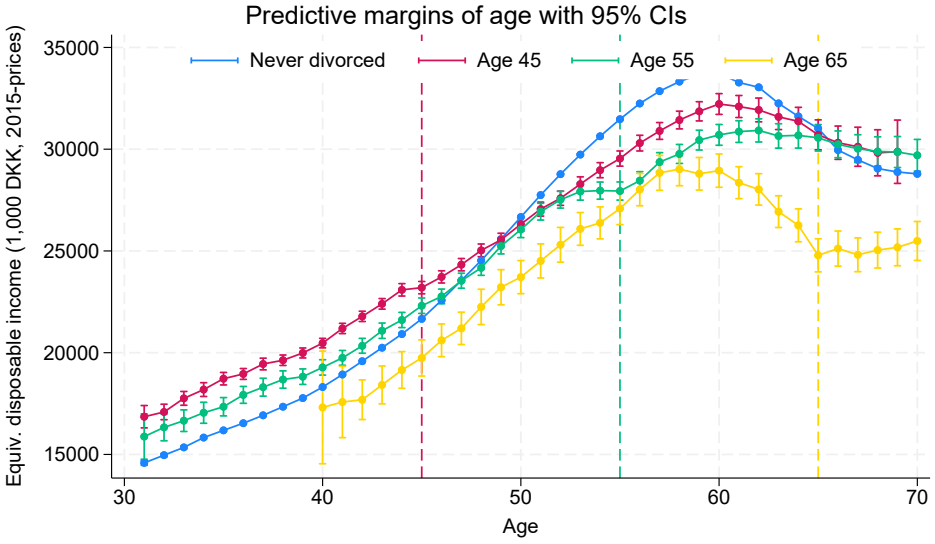


Figure 2: Men's equivalized disposable income by age and age at divorce



Among individuals who remain married, equivalized disposable income follows a smooth, hump-shaped profile. It initially rises as the earnings of both spouses increase, before flattening and eventually declining as one or both spouses withdraw from the labour market and enter retirement.

Divorce interrupts this trajectory. For women, equivalized disposable income falls sharply around the time of divorce. The decline begins slightly before the recorded divorce date, which likely reflects the fact that the registers record the legal divorce rather than the preceding separation. Income subsequently recovers, but only gradually, consistent with adjustment through higher own income and repartnering.

The decline is less pronounced for men. One reason is that men have higher average earnings and therefore lose a smaller share of the household's income when access to their spouse's resources ends. At younger ages, differences in children's residence may further widen the gender difference: Children are more likely to reside with their mother after divorce, increasing her equivalence-scale adjustment relative to that of the father.

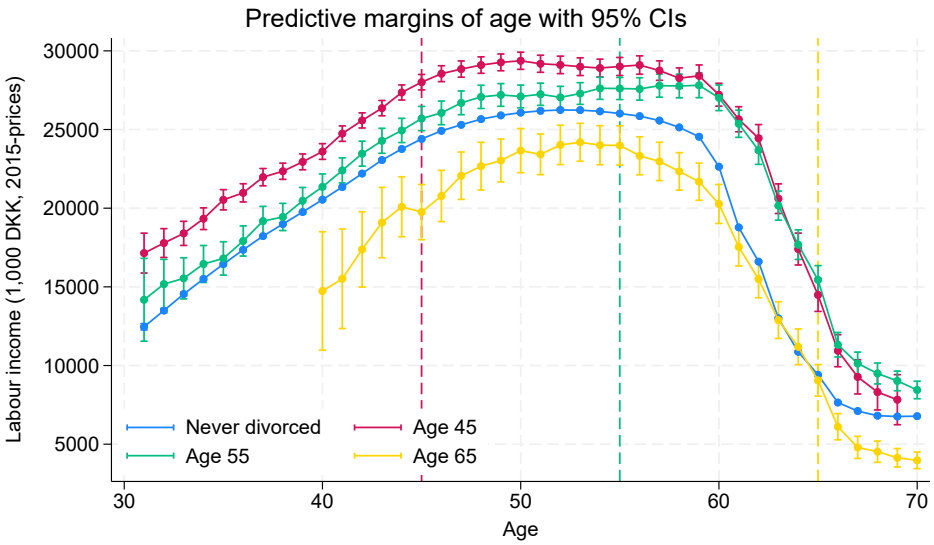
The profiles also indicate that recovery from divorce interacts with the transition into retirement. While equivalized income begins to flatten among continuously married individuals, those divorcing around age 55 remain on an upward trajectory, particularly women. This suggests that they are still rebuilding their resources at ages when the continuously married have begun to withdraw from the labour market.

Recovery is especially limited following very late divorce. Individuals divorcing around age 65 experience a clear decline in equivalized disposable income, but little subsequent rebound. At this stage of life, most human capital and assets have already been accumulated, and retirement substantially limits the remaining scope for adjustment through labour supply. Late-life divorce can therefore generate a persistent reduction in living standards precisely when individuals have the least capacity to rebuild their resources.

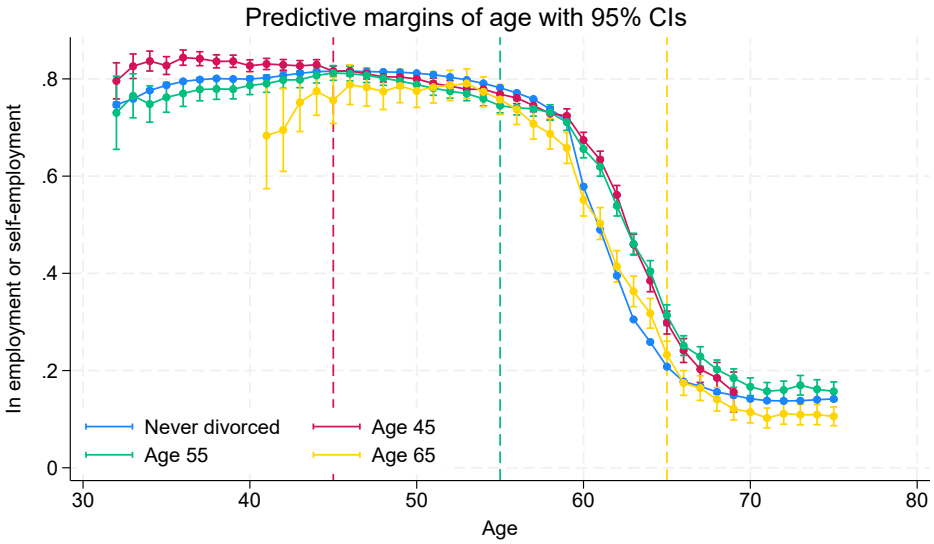
Fact 2: After divorce, women partially mitigate retirement underpreparedness by working more and longer.

At the average age at divorce, which was 45 in 2015, divorced women's pension wealth is 21.1% lower than that of her former spouse. To mitigate this gap, we observe that divorced women increase their lifetime labour supply. As shown in Figure 3b, there is surprisingly little immediate adjustment at the extensive margin of labour supply for women who divorce young, for example at age 45. However, these early-divorcing women already had higher rates of labour force participation and earnings than their never- or later-divorcing counterparts (Figure 3b). In contrast, later-divorcing women increase their labour force participation and earnings relative

Figure 3: Women's labour supply by age and divorce time



(a) Women's labour income by age and time of divorce

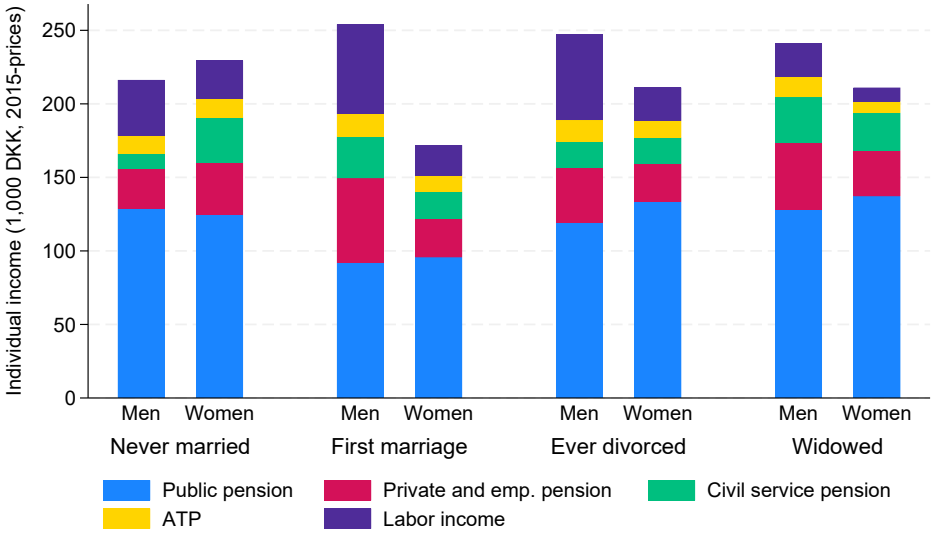


(b) Share of women active in the labour market by age and time of divorce

to women who do not divorce in the years after divorce. All women who have experienced divorce, no matter whether this occurred early or late, delay retirement. They retire on average 2 months later and are 2pp more likely to still be active by age 70 than continuously married women. Since we do not have a good measure of work hours, it is difficult to translate this into years worked full time. However, the large earnings differences between women who ever divorced and women who have not divorced in Figure 3a suggest that this difference is not due to marginal employment.

Fact 3: Despite delayed retirement, divorced women receive more government transfers in retirement.

Figure 4: Pension income composition by gender and marital status



Despite the considerable increase in lifetime labour supply by delaying retirement, the pension wealth of households of divorced women is lower than that of other households. As a consequence, these women receive larger state pension payments. On average, state pension income of ever-divorced women is 30.6% larger than that of continuously married women.

Despite the higher state pension income, and therefore higher individual income compared to women in their first marriage, divorced women have the lowest equivalized household income. At age 70, their equivalized household income is 10.9% lower than that of never married women, 10.8% lower than that of widowed women and 26% lower than that of women in their first marriage.

4 Model Description

In this section we present a dynamic model of pension saving, retirement and divorce. The central mechanisms of the model are: 1) households make cooperative decisions subject to limited commitment, which causes endogenous divorce and shifts in bargaining power , 2) households can save into a jointly held non-pension asset, but each individual makes defined contribution payments to individually held pension plans, and 3) after reaching the age of eligibility agents can choose to retire, i.e. to stop working and convert their pension wealth into an annuity.

A couple consists of a woman, $j = w$, and a man, $j = m$. Individuals live for up to T discrete periods, but face an exogenous, gender-specific probability of dying between each period. The

future is discounted exponentially at rate β.

At the start of the model life-cycle, married individuals work and receive a wage income at a disutility cost. Wages are determined by the underlying earnings capacity – or human capital – $K_{j,t}$, which is subject to gender-specific persistent risk. Each individual makes defined contributions to individually held pension plans, $P_{j,t}$, out of their labour income. Meanwhile, they can also save into a liquid, non-pension asset, A_t which is held jointly with the spouse.

After reaching the age of retirement eligibility, T_{retire}, the individuals get the option to convert their pension wealth into an annuity and stop working. Retirement is absorbing at the individual level and spouses do not have to retire at the same time.

While married, couples receive a stream of utility from their "match quality" with their spouse, ψ_t. Match quality evolves stochastically as a persistent AR(1) process. Throughout the life-cycle, couples make decisions subject to individual, forward-looking participation constraints with limited commitment. When one partner has a higher value of being single than remaining in the marriage under the last period's bargaining weight, the bargaining weight is updated to make both partners weakly prefer to stay in the marriage. When this is not possible, they divorce. This causes outside options, which depend on the treatment of assets and in particular pension wealth in divorce, to affect decisions of married couples as well as the number of divorces.

In total, the state space for the couple consists of their match quality, their individual levels of human capital, their individual pension plans and their joint non-pension wealth, $\mathcal{S}_t = \{\psi_t, K_{w,t}, K_{m,t}, P_{w,t-1}, P_{m,t-1}, A_t\}$ as well as the bargaining power parameter μ_t. After divorce, each individual's state space consists of their individual human capital, pension wealth and non-pension wealth, $\mathcal{S}_{j,t} = \{K_{k,t}, P_{j,t-1}, A_{j,t-1}\}$.

Figure 5 illustrates the decision timeline for a couple. Upon entering a period, agents first observe any shocks to survival as well as to all other state variables. If eligible, the surviving couple then decides whether or not one or both of the spouses should retire. A widowed spouse makes the retirement decision like a single individual. Next, for couples, the individual participation constraints are evaluated, and the couple may divorce. Finally, income is earned – capital, labour and pension income where relevant – and households choose how much to consume.

In the following, we describe the individual model components in more detail.

Preferences and economies of scale An individual of gender j gets utility of private consumption, $c_{j,t}$, and disutility of labour $l_{j,t}$. The utility of consumption is scaled with an equivalence scale, e_n, where $n = M, S$ determines the household type (married vs. single), to account for economies of scale in households with multiple persons. Utility is additively separable in

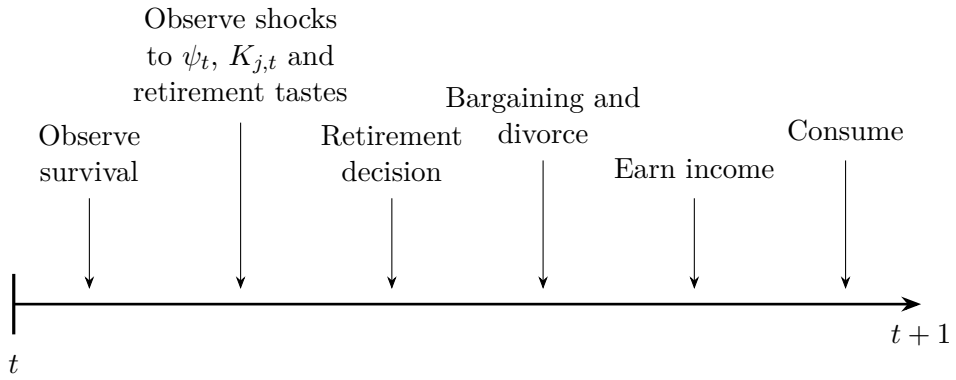


Figure 5: Couple decision timeline

consumption and labour supply:

$$u_j(c_{j,t}, l_{j,t}, n) = \frac{\tilde{c}_{j,t}^{1-\rho_j}}{1-\rho_j} - \delta_j^l \frac{l_{j,t}^{1+\zeta_j}}{1-\zeta_j}, \quad \tilde{c}_{j,t} = c_{j,t}/e_n$$

While working, labour supply is normalized to $l_{j,t} = 1$. In retirement, there is no labour supply, and utility collapses:

$$u_j^R(c_{j,t}, n) = \frac{\tilde{c}_{j,t}^{1-\rho_j}}{1-\rho_j}, \quad \tilde{c}_{j,t} = c_{j,t}/e_n$$

Labour income While working, an individual's labour income is determined by the following process:

$$\log I_{j,t} = \sum_q \phi_{q,g,t} \ \mathbb{1}[K_{j,t} = q] \tag{2}$$

The underlying earnings capacity – or human capital – $K_{j,t}$ is a discrete process. We let $K_{j,t}$ take five distinct values such that $\phi_{q,g,t}$ indicates the average labour income within income quintile q for gender g at age t. $K_{j,t}$ transitions according to a discrete Markov-process:

$$K_{j,t+1} = \begin{cases} 1 & \text{with prob. } \pi_{g,t}^{K_{j,t},1} \\ 2 & \text{with prob. } \pi_{g,t}^{K_{j,t},2} \\ etc. & \end{cases} \tag{3}$$

where we estimate the transition process directly in the data as the empirical transition probabilities between income quintiles by gender and age.

$K_{j,t}$ serves the function of introducing a stochastic component to labour income and is thus a source of persistent income risk. This incentivizes savings into the non-pension asset to self-

insure against negative income shocks.

Note that both the level of income, $\phi_{0,j}$, and between-period transitions $\pi_{q,t}^{K_{j,t}}$ are gender specific. This allows us to mimic empirical gender differences in wage levels and life-cycle profiles. Moreover, the pass-through of labour supply on human capital, α_j, also depends on gender.

In total, men's and women's income profiles differ both in terms of level, life-cycle profile, and risk. This becomes particularly important when considering the probability of divorce. In the single state, where there is no possibility of consuming out of spouse's income or risk-sharing with a spouse, liquid savings become the relevant self-insurance mechanism. This translates into different savings preferences, even in the married state.

Savings: pension and non-pension In each period in the working stage, pension wealth earns a gross interest of $R_{pension}$. Additionally, individuals contribute a fixed share γ_j of their labour income to their pension plan. Pension wealth is held at the individual level, and as such we index it by gender j.

$$P_{j,t} = R_{pension} P_{t-1} + \gamma_t I_{t-1}$$

Since pension contributions are exogenously tied to income which is gender-specific, this specification will automatically generate a gendered pension gap. This in turn provides another tension between spouses' savings preferences: The spouse with the lower pension wealth will have higher incentives to save into non-pension assets in order to ensure financial security in retirement.

We rely on the assumption of pension savings being exogenous, conditional on labour income. The majority of Danes' pension wealth is held in mandatory, occupational pensions, where the pension contribution rate is determined by collective bargaining. While there may be some room for individual adjustment, this margin is usually very small (a few percentage points). Therefore, we consider the approximation of exogenous contributions to be reasonable. We allow the pension contribution rate γ_j to differ by gender to account for the fact that men and women tend to sort into different occupations with potentially different pension agreements.

Apart from their own individual pension accounts, individuals can save into a jointly held liquid non-pension asset, A_t. In each period, the non-pension asset earns gross interest R, and savings consist of all income not paid into pension accounts or consumed. We impose a liquidity

constraint, restricting households to always have non-negative assets.

$$A_t = RA_{t-1} + \sum_{j \in \{w,m\}} \left((1-\gamma_j)I_{j,t} - c_{j,t}\right),$$
$$A_t \geq 0$$

We consider A_t a composite asset, encompassing all non-pension wealth, including semi-liquid assets and housing.

Pension income Upon retiring, agents convert their accumulated pension wealth to an annuity, pp_j, which provides income for the remainder of their lives. The annuity rate is q, such that:

$$pp_j = qP_{j,t}$$

Note that the annuity rate q does *not* depend on gender, despite the fact that there are gender differences in survival risk and consequently life expectancy. This is in line with Danish legislation which prohibits differentiating annuity prices based on e.g. gender.

After reaching the age of state pension eligibility, $T_{state_pension}$, agents can claim state pension. In line with the Danish setup, state pension has two components: First, a universal base rate which depends on cohabitation status, and second, a supplement which is means-tested against household income.[10]

Division of wealth at divorce In the baseline model, we mimic the Danish legal setup and let pension wealth remain with its stipulated owner, while all other assets are split equally. Letting $A^S_{j,t}$ denote the assets held by individual of gender j in event of divorce, we define the asset division function $f^A_j(A_t)$:

$$A^S_{j,t} = f^A_j(A_t) = \frac{1}{2}A_t$$

Similarly, we define the pension division function, $f^P_j(P_{j,t}, P_{-j,t})$, which in the baseline is:

$$P^S_{j,t} = f^P_j(P_{j,t}, P_{-j,t}) = P_{j,t}$$

By varying these functions, we model different asset division regimes.

[10] In 2023, means testing against both own and spouse's labour income was removed. However, during the period of estimation labour income was included in means testing, so we include it in the model state pension as well.

Survival risk and inheritances In each period, there is an exogenous probability of dying. We denote the probability of surviving until period $t+1$, conditional on being alive at time t, for individual of gender j, $s_{j,t+1}$. The survival probability is thus specific to age and gender.

When a married individual dies, the bereaved spouse inherits the full non-pension asset as well as a fixed share of the late spouse's pension:

$$A_{j,t}^{widow} = A_t$$

$$P_{j,t}^{widow} = P_{j,t} + bP_{-j,t}$$

This is the case both in the working stage (where inherited pension takes the form of a wealth transfer), and in the retirement stage (where inherited pension is an income stream).

The different survival risks introduce yet another tension in savings preferences between spouses. The spouse with the longer life expectancy – empirically, the wife – expects a longer retirement and hence a higher savings requirement. This effect is amplified even further by the fact that women on average hold less pension wealth. In other words: Women need to finance a longer retirement but have lower income and hence are incentivized to save more in non-pension assets.

The problem of the working single At time t, the economic environment of the single agent of gender j is characterized by their human capital, pension wealth and non-pension wealth, $\mathcal{S}_t^j = \{K_{j,t}, P_{j,t-1}, A_{j,t-1}\}$. Conditional on being in the working stage, a single individual of gender j chooses their own consumption, subject to state transitions. As such, the single's problem takes the form of a standard consumption-savings problem. We denote by the superscript S the value of being single:

$$V_{j,t}^S = \max_{c_j} u_j(c_j, l_j) + s_{j,t+1}\beta\mathbb{E}_t\left[V_{t+1}^S(\mathcal{S}_t + 1)\right]$$

We abstract from repartnering and assume the single state to be absorbing.

The problem of the working couple The economic environment of the working couple is characterized by their match quality, each spouse's human capital, each spouse's pension wealth, and their joint non-pension wealth, $\mathcal{S}_t = \{\psi_t, K_{w,t}, K_{m,t}, P_{w,t-1}, P_{m,t-1}, A_{t-1}\}$, as well as the bargaining power determining their decision process, μ_{t-1}. In each period, the couple chooses their consumption, $c_{w,t}$ and $c_{m,t}$, whether each of the spouses retires, and whether to

divorce. While consumption is continuous, the remaining choices are discrete. Conditional on discrete choices, optimal consumption is found by maximizing a weighted sum of the spouses' individual values. Here, we denote by μ the weight put on the woman's value and $1-\mu$ the weight put on the man's, with $0 \leq \mu \leq 1$.

Conditional on both spouses working, $l_{j,t} > 0$, while also remaining married with bargaining power μ, the couple chooses optimal consumption by solving the following problem:

$$\begin{aligned}\tilde{c}_{w,t}, \tilde{c}_{m,t} = \max_{c_{w,t}, c_{m,t}} & \mu \left(u_w(\tilde{c}_{w,t}, l_{w,t}) + \beta \mathbf{EV}_{w,t+1}(\mathcal{S}_{t+1}, \mu) \right) \\ & + (1-\mu) \left(u_m(\tilde{c}_{m,t}, l_{m,t}) + \beta \mathbf{EV}_{m,t+1}(\mathcal{S}_{t+1}, \mu) \right) \\ & s.t. \text{ borrowing and participation constraints}\end{aligned}$$

The expected continuation value, $\mathbf{EV_{j,t+1}}(\mathcal{S}_{t+1}, \mu)$ denotes the individuals' expectations over shocks to the future state, i.e.: survival of either spouse, match quality, human capital and retirement taste.

The value for spouse j of being in the working state, *conditional on remaining married with bargaining power* μ is then:

$$V_{j,t}^{M \to M}(\mathcal{S}_t, \mu) = u_j(\tilde{c}_{j,t}, l_{j,t}) + \beta \mathbf{EV}_{j,t+1}(\mathcal{S}_{t+1}, \mu) \tag{4}$$

The superscript $M \to M$ denotes values conditional on staying in the married state until the next period, which implicitly assumes survival of both spouses.

While married, each spouse has the outside option of divorce. The value of divorce, superscript $M \to S$ to indicate a transition from marriage to singlehood, is given by:

$$V_{j,t}^{M \to S}(\mathcal{S}_t) = V_{j,t}^{S}(\mathcal{S}_{j,t}) - \chi \tag{5}$$

$$s.t. \tag{6}$$

$$A_{j,t-1} = f_j^A(A_{t-1}) \tag{7}$$

$$P_{j,t-1} = f_j^P(P_{j,t-1}, P_{-j,t-1}) \tag{8}$$

Here, non-pension and pension wealth in the single state are divided according to the wealth division functions. Moreover, we incorporate a fixed utility cost of divorce, $\chi > 0$.

The couple bargains with limited commitment and as such faces individual forward-looking participation constraints:

$$V_{j,t}^{M \to M}(\mathcal{S}_t, \mu) \geq V_{j,t}^{M \to S}(\mathcal{S}_{j,t}) \tag{9}$$

When the participation constraint holds for both spouses, the couple's decision follows (4) directly. However, when one spouse's participation constraint binds, bargaining power μ is shifted. For example, if the wife's outside option value exceeds her value of staying in the marriage and she can credibly threaten to divorce her husband, μ is increased and her decision power within the marriage increases with it. The shift in μ is exactly so large that the wife becomes indifferent between marriage and divorce and (9) no longer binds. Likewise, if the husband's constraint binds, μ is decreased until he is indifferent. If no value of μ exists such that (9) holds for both spouses, the couple divorces.

The value for an individual of gender j of entering period t as married depends on the realization of the bargaining and divorce decisions:

$$V_{j,t}^{M}(\mathcal{S}_t, \mu_{t-1}) = D_t^* V_{j,t}^{M \to S}(\mathcal{S}_{j,t}) + (1 - D_t^*) V_{j,t}^{M \to M}(\mathcal{S}_t, \mu_t)$$

where $D_t^* \in \{0, 1\}$ denotes the divorce outcome and μ_t is determined from the bargaining process.

The couple's retirement decision Upon reaching the age of retirement eligibility, the couple can choose to annuitize their pension wealth and retire. A couple consisting of two working spouses faces four options: 1) both continue to work (denoted WW), 2) the wife retires while the husband continues to work (denoted RW), 3) the wife continues to work while the husband retires (denoted WR), and 4) both retire (denoted RR).

The total value of each discrete state is the sum of the previously defined value functions and a stochastic taste shock. Moreover, we include a constant, additive utility term θ when both spouses are either working or retired, to better match the correlation between spouses' retirement timing we observe empirically. It can be interpreted as the extra value the couple receives from spending their leisure time together. As such, the value of a working couple is (we suppress dependency on the state $\mathcal{S}_t$ and μ for convenience):

$$\begin{aligned} V_t^{startWW} = \max \{ & V_t^{WW} + \varepsilon^{WW}, \\ & V_t^{RW} + \varepsilon^{RW}, \\ & V_t^{WR} + \epsilon^{WR}, \\ & V_t^{RR} + \theta + \epsilon^{RR} \} \end{aligned} \tag{10}$$

We assume that the taste shocks ε^{XX} follow i.i.d. EV1 distributions, and hence we model the discrete choice to retire as a multinomial logit model.

We assume that the retirement choice is made *after* observing all shocks to survival, human

capital and match quality, but *before* the couple potentially bargains and/or divorces.

We assume retirement to be absorbing, and hence once an individual has retired, they cannot return to work. As a result, a couple in which one individual has already retired faces only two discrete options: whether the working spouse should keep working or retire. We model this analogously to the four-option case, with i.i.d. EV1 taste shocks and logit choice probabilities.

4.1 Solving the model

The model is solved using backwards induction over (discretized) grids of all state variables. We use extensions of the canonical endogenous grid method (Carroll, 2006), which relies on inverting the intertemporal first-order equation (Euler-equation) to obtain the optimal consumption choice. We account for the discrete retirement and divorce choices as well as the continuous consumption choice using the methodology of Iskhakov et al. (2017). Additionally, we use interpolated inversion (Hallengreen et al., 2024) to account for non-analytically invertible marginal utility at the couple level.

We discretize the match quality process using the Rouwenhorst method for highly persistent processes (Fella et al., 2019; Foerster et al., 2024), and human capital is assumed to be inherently discrete. We solve the model over discrete grids of the discrete state variables, ψ_t, $K_{w,t}$, $K_{m,t}$ and discretized grids of the continuous state variables, μ_{t-1}, $P_{w,t-1}$, $P_{m,t-1}$ and A_{t-1}, and use linear interpolation to approximate the solution objects between the grid points of the discretized variables. We approximate the marginal expected value of assets, which is necessary for the EGM, numerically, using centred finite differences over the asset grid.

We first solve the model for retired singles, then for fully retired couples, using the values of retired singles as input to determine the outside option for the retired spouses. Next, we solve for working singles and subsequently for couples consisting of both a retired and a working spouse – here, we need both the values of retired singles and working singles to determine the outside option values, as well as the value of retirement to determine optimal retirement choice. Finally, we solve for working couples, using the values of working singles as the outside option value, and the values of semi-retired couples and fully retired couples, respectively, to determine optimal retirement choice.

4.2 Estimation

To estimate the model, we define a target sample from the Danish administrative registers, whose behaviour we target the model to match. We estimate the model in a three-step procedure: First, we set a small number of parameters to match values found in existing literature. Next,

we externally estimate a number of parameter values directly from the Danish administrative registers without making use of the structural model. These are primarily parameters related to initial states and the wage process. Finally, we internally estimate the remaining parameters using the simulated method of moments (SMM) (McFadden, 1989), by minimizing the distance between empirical moments related to retirement and divorce behaviour and their simulated model counterparts. In the following section, we flesh out the sample construction and three estimation steps.

4.2.1 Estimation sample

We construct the analysis sample using administrative data available from 1986 to 2019. Women enter the sample at age 40 and men at age 43, conditional on being married at that age. Since men must be observed at age 43, the eligible male birth cohorts are 1943–1976. Similarly, since women must be observed at age 40, the eligible female birth cohorts are 1946–1979. The three-year age difference reflects the average age gap between spouses. Importantly, the women and men in the sample are not necessarily married to one another; rather, the sample consists of individual women and men who satisfy the relevant marital-status condition at the specified age.

We exclude self-employed individuals[11] and their spouses from the analysis. This restriction is motivated by several considerations. First, savings motives among the self-employed may differ from those of wage earners, as business wealth and precautionary savings are likely to play a larger role. Second, self-employed individuals are not covered by employer-provided occupational pension schemes in the same way as employees. Third, their pension and wealth accumulation may be more strongly shaped by private arrangements, including prenuptial agreements or business ownership structures. These features make the self-employed less comparable to the population targeted by the model and the empirical analysis.

We then restrict the analysis years to 2014–2019. This restriction serves two purposes. First, the administrative data contain information on pension wealth by account only from 2014 onward. Consequently, levels and changes in pension wealth, as well as within-couple gaps in pension wealth, can only be observed consistently from 2014. Second, the period 2014–2019 provides a relatively stable policy environment with respect to both divorce and retirement legislation. By focusing on this window, we avoid confounding variation from major institutional changes, such as the 2014 divorce reform that shortened the mandatory separation period, the 2013 reform of capital pension taxation, and the gradual increase in the state pension claiming

[11] Defined as having been self-employed for at least three years.

age beginning in 2019.

The final dataset is therefore a set of short panels, consisting of men from birth cohorts 1943–1976 and women from birth cohorts 1946–1979 who were married at age 43 and age 40, respectively. We use only observations from the 2014–2019 window when constructing the empirical moments.

This sampling strategy implicitly relies on a stability assumption: Moments observed for different cohorts within the 2014–2019 window are interpreted as informative about the relevant life-cycle profiles, rather than as reflecting cohort-specific differences.

4.2.2 Pre-set parameters and structure of model

We pre-set a number of parameters based on values from the literature. These parameters are summarized in Table 1. We set the CRRA parameter $\rho = 2$ and a discount rate of $\beta = 0.98^3$ based on the estimates of Attanasio and Weber (1995). For the consumption equivalence scale, we use the values used by Statistics Denmark to compute household equivalized income.

Table 1: Pre-set parameters from other sources

Parameter	Symbol	Source	Value
CRRA, women	ρ_w	Attanasio and Weber (1995)	2
CRRA, men	ρ_m	Attanasio and Weber (1995)	2
Annual discount factor	β	Attanasio and Weber (1995)	0.941
Equivalence scale, couple	e^M	DST	0.75
Equivalence scale, single	e^S	DST	1.0
Gross return on liquid assets	R	—	1.06

Furthermore, a number of parameters regarding the institutional context are set externally. This mainly involves parameters governing state pension payouts, and ownership and inheritance of wealth. We summarize these values in Appendix Table A.1.

4.2.3 Externally estimated parameters

Pension wealth and income The pension contribution rate is calculated as the average share of the total remuneration of employees younger than 60 that is made up by contributions to occupational pensions. When computing the annuitization rate as the ratio of private pension income to pension wealth in annuity pensions in early retirement, there is large heterogeneity. The mean is affected by large payouts, as for example allowed in the case of severe illness, and the median is affected by a large number of individuals who do not withdraw their pension wealth at that age. We therefore use the clear mode of 5% (Appendix Figure A.3).

Survival We parameterize the probability of surviving from one model period to the next based on observed survival patterns of birth cohorts 1920, 1925, 1950. Combining these three cohorts, we observe survival patterns from age 40 to age 92.

Note that survival probabilities are estimated from a different sample than the main estimation sample in order to facilitate estimation of survival probabilities at ages higher than 77 (the upper cap of the estimation sample). However, the age-conditional survival probability changes very little between cohorts, so it is likely to also be representative of the individuals of the estimation sample.

Income levels and transitions To compute wage income, we focus on full-time workers in the estimation sample. For each age and gender, we divide the sample into five income-quintile bins and compute average wage income within each bin. By letting the income quintile proxy for human capital, K_j, this gives us full-time wage income conditional on K_j, age, and gender.[12]

To correct for selection into retirement, we estimate a regression model of wage income as a polynomial in age separately for each income quintile, using only observations up to age 59, since retirement is generally unavailable before then. We then predict full-time income at each age and use the predicted values as inputs to the model. The current version uses a linear fit. While this rules out curvature in full-time wages over the life cycle, the linear fit has substantially better boundary properties than the quadratic and cubic specifications.[13] This is particularly important because the model requires predictions well beyond age 60. The empirical income profiles and corresponding linear fits are shown in Appendix Figure A.4.

Since curvature in labour income largely reflects diminishing returns to human capital, and since these effects are likely to be strongest early in the career, which we do not explicitly model in this paper, the linearity assumption is likely acceptable. Indeed, the income profiles are relatively flat between ages 40 and 60 for both men and women, as shown in Appendix Figure A.4.

In the model, we scale wage income by the observed full-time degree by age and gender in order to more accurately reflect wage income conditional on non-retirement. Appendix Figure A.5 displays labour income by age, gender, and human capital type, K_{it}.

We initialize human capital types, K_{it}, using the joint distribution of women's and their husbands' age- and gender-conditional income quintiles. This captures assortative matching at the initial age by allowing spouses' human capital types to be correlated. For example, 34.5%

[12]This measure is likely to be upward biased due to selection into full-time employment.

[13]In this particular case (not reported here), the quadratic fit does not preserve the ranking of income quintiles, while the cubic fit predicts substantial increases in full-time wages beyond age 80.

of women in the top quintile are married to men in the top quintile, compared with 10.9% of women in the bottom quintile. Appendix Figure A.6 shows the full matrix defining the joint distribution of K_{w0} and K_{m0}.

We similarly compute transition matrices between model human capital types based on age- and gender-specific probabilities of transitioning between income quintiles. Income quintile is moderately persistent over time. For instance, at age 50, a woman in the fourth quintile remains in the fourth income quintile in the next period with probability 65%, rises to the fifth quintile with probability 13%, and falls to the third quintile with probability 16%. In general, the probabilities of moving more than two quintiles in either direction are negligible. Appendix Figure A.7 shows the full transition matrices for women at age 50 and men at age 53, corresponding to model period 4.

Pension and non-pension wealth In the model, non-pension wealth accumulates endogenously, while pension wealth accumulates exogenously as long as individuals are working. We use the estimation sample to set initial values for both wealth components.

We define initial pension wealth as wealth held in occupational pension accounts at the end of the year in which women are age 40 and men are age 43. For each gender, we compute average pension wealth within each income quintile and assign individuals in the model an initial pension wealth level based on their initial human capital type, K_{i0}.

For initial non-pension wealth, we compute average net wealth within each income quintile by gender at the initial ages. The wealth measure includes real assets, financial assets such as bank deposits, stocks, and bonds, and wealth held in private pension accounts, net of secured and unsecured debt. We cap this measure at zero to ensure consistency with the model's credit constraint. We then assign each individual an initial non-pension wealth level based on their initial human capital type, K_{i0}, and set household-level non-pension wealth equal to the sum of the wife's and husband's initial non-pension wealth.

Appendix Table A.2 displays initial values of pension and non-pension wealth by initial income type.

4.2.4 Internally estimated parameters

We estimate the remaining parameters using the simulated method of moments. Let

$$\psi = (\delta_{lw}, \delta_{lm}, \zeta_w, \zeta_m, \sigma_\eta, \theta, \sigma_\epsilon)$$

denote the vector of estimated parameters. These include the utility parameters related to

labour supply, δ_{lw}, δ_{lm}, ζ_w, and ζ_m, the standard deviation of the match quality shock, σ_η, the utility bonus from joint retirement with a spouse, θ, and the standard deviation of the retirement taste shock, σ_ϵ.

We define a set of simulated model moments as a function of model parameters $m(\psi)$. The SMM estimate $\hat{\psi}$ is then the value that minimizes the weighted distance between $m(\psi)$ and its empirical counterpart $\hat{m}$, that is:

$$\hat{\psi} = \arg\min_{\psi} \Big((m(\psi) - \hat{m})' \hat{W} (m(\psi) - \hat{m}) \Big)$$

We let $m(\psi)$ include the share of men and women, respectively, retired by age, the share of women ever-divorced by age, the share of couples who retire in the same time period, and the elasticity of labour income at age 65 with respect to pension wealth at age 44. The last moment we get from Maibom et al. (2026), while we compute the rest directly from the estimation sample.

We solve the minimization problem numerically, using the Nelder-Mead algorithm. For a given candidate value of ψ, we solve the model, simulate 50,000 couples, compute a vector of moments $m(\psi)$ and subsequently the weighted distance to the empirical moments. Table 2 displays the parameter estimates.

Table 2: Calibrated parameters

Parameter	**Symbol**	**Value**
Disutility of labour weight, women	δ_{lw}	0.227
Disutility of labour weight, men	δ_{lm}	0.157
Disutility of labour curvature, women	ζ_w	1.9
Disutility of labour curvature, men	ζ_m	2.89
Love shock variance	σ_η	0.0267
Joint retirement state bonus	θ	0.116
Retirement taste shock variance	σ_ϵ	0.082

4.2.5 Fit

As shown in Table 3 the model matches the divorce profile closely. The share of women who have ever experienced divorce is within one percentage point of the data at ages 41, 50 and 59. It also fits men's retirement profile well, overpredicting the share retired at 65 by 6 percentage points and matching it at 62 and 68. For women, the model fits the share retired by ages 65 and 68 reasonably well but overpredicts early retirement: 48 percent are retired at 62, compared with 34 percent in the data. At the same time, it underpredicts joint retirement (42 versus 50

Table 3: Model fit: Data vs. Simulation

Moment	Data	Sim	Diff	Weighted sq. diff
Retirement (women)				
Share retired at 62	0.34	0.48	0.15	2.136
Share retired at 65	0.71	0.70	-0.01	0.008
Share retired at 68	0.85	0.80	-0.05	0.212
Retirement (men)				
Share retired at 62	0.20	0.22	0.02	0.054
Share retired at 65	0.50	0.56	0.06	0.368
Share retired at 68	0.76	0.76	0.00	0.000
Divorce				
Share ever divorced at 41	0.01	0.02	0.01	0.145
Share ever divorced at 50	0.06	0.06	-0.01	0.085
Share ever divorced at 59	0.09	0.10	0.01	0.184
Other moments				
Pension elasticity retirement	-0.30	-0.17	0.13	1.634
Share retire together	0.50	0.42	-0.08	0.722
Objective value				5.548

percent).

Both discrepancies are consistent with our assumption of a uniform three-year age gap between spouses. In the data, the median gap is about two years, so for many couples coordinated retirement requires a smaller deviation from each spouse's preferred retirement age than in the model. In the model, wives can retire together with their husbands only by retiring at 62, when the husband reaches the state pension age. Some couples coordinate this way, which inflates women's early retirement. Others do not coordinate at all, which lowers joint retirement.

Finally, the model underpredicts the pension-wealth elasticity of retirement (0.17 versus 0.30). Retirement in the model therefore responds less to changes in pension wealth than in the data, so the retirement effects of the counterfactual reforms in Section 5 are likely conservative.

5 Counterfactual Simulation

With the model in hand, we simulate savings, retirement, and divorce behaviour under alternative pension division regimes. We consider two counterfactual policies.

The first counterfactual policy, which we label *In-kind pension division*, pools pension rights across spouses and splits them equally in the event of divorce.[14] Under this regime, pension wealth is divided between spouses, but it retains its original form: It remains illiquid before retirement and is paid out as an income stream after retirement. This is similar to the policy

[14]That is, $f_j^P(P_{j,t}, P_{-j,t}) = \frac{1}{2}(P_{j,t} + P_{-j,t})$ and $f_j^A(P_{j,t}, P_{-j,t}, A_t) = \frac{1}{2}A_t$ in the terminology of Section 4.

environment of Germany.

The second counterfactual policy, which we label *Cash compensation*, captures a setting in which pension wealth is too illiquid, administratively complex, or costly to divide directly. This may be the case if pension rights are tied to different pension funds, cannot easily be transferred across accounts, or can only be liquidated at substantial cost. Instead, differences in pension wealth at divorce are offset through transfers of other assets. Specifically, under Cash compensation, non-pension wealth is divided so as to equalize total wealth across spouses, while each spouse retains full rights to their own pension account.[15][16] This counterfactual emulates the policy environment of the US and UK.

Both policies mechanically redistribute resources at the time of divorce. They also affect ex ante savings incentives for couples who face a positive probability of future divorce.

The two policies differ in the timing and form of insurance they provide. Under in-kind pension division, insurance operates primarily through the retirement margin. By equalizing pension resources at divorce, the policy guarantees both spouses more similar streams of income in retirement, conditional on the pension wealth accumulated before divorce. However, the value of this insurance is realized only at retirement, since pension wealth remains illiquid before then. At the same time, by weakening the motive to accumulate individual retirement wealth as self-insurance against divorce, the policy may free up resources for consumption smoothing around divorce.

In-kind pension division also has a direct spillover to public pension payments. Since equalizing pension wealth changes annuity income in retirement and public pensions are means-tested against annuity income, the redistribution mechanically reduces public pension payments to the recipients of pension-wealth transfers. At the same time, the in-kind regime reduces the pension wealth of primary earners at divorce, such that public pension payments to this group can increase.

Under cash compensation, insurance is instead realized at the time of divorce. Rather than equalizing pension wealth itself, the policy provides the pension-poorer spouse with liquid resources that can be used immediately to smooth consumption, saved for retirement, or used to support earlier retirement. Since pension accounts and annuity income are not directly changed, cash compensation has no direct mechanical effect on public pension payments. Any spillovers to public pensions arise only indirectly, through changes in retirement behaviour or pension saving induced by the policy.

[15]We continue to impose the model's credit constraint, so that the pension-wealthier spouse cannot transfer more non-pension wealth than what would leave them with zero non-pension wealth.

[16]In the terminology of Section 4, $f_j^P(P_{j,t}, P_{-j,t}) = P_{j,t}$ and $f_j^A(P_{j,t}, P_{-j,t}, A_{j,t}) = \frac{1}{2}(A_t + P_{-j,t} - P_{j,t})$.

For each regime, we simulate 50,000 women and men, all initialized as married at age 41 for women and age 44 for men.

5.1 Pre-retirement: Mechanical redistribution of pension wealth dominates

Before individuals reach the age of retirement eligibility, behavioural responses to the policy are limited to divorce and savings decisions. In the simulations, we find little to no response along either margin following the introduction of either policy. As a result, the main effect of the policy for individuals below the age of pension eligibility is the mechanical redistribution of wealth between divorcing spouses. Table 5 reports the effects of in-kind pension division and cash compensation on the level and concentration of pension wealth across demographic groups, measured at age 59, before retirement becomes an available choice. As shown in Table 4, in the majority of both divorcing and non-divorcing couples, the pension wealth of the husband is larger than that of the wife and the mean difference at divorce is 642,000 DKK or just under 100,000 USD.

In-kind pension division directly redistributes pension wealth from the pension-richer spouse, typically the husband, to the pension-poorer spouse, typically the wife. As a result, average private pension wealth increases substantially for divorced women, by 329,990 DKK, or 16.27 percent relative to the baseline. For divorced men, in-kind division reduces average pension wealth by 309,090 DKK, or 11.59 percent.[17] The effects on working-life pension wealth among never-divorced individuals are negligible, reflecting the very limited divorce response to the policy. Aggregating across all marital histories, in-kind division increases pension wealth among 59-year-old women by 1.5 percent and reduces pension wealth among 59-year-old men by 1.16 percent, such that it reduces the pre-retirement gender pension gap from 16.37% to 14.12%.

Panel B of Table 5 shows how these redistributive effects translate into changes in the concentration of pension wealth, measured by the share held by the top 20 percent of the distribution. Among divorced individuals, in-kind division reduces pension concentration for both men and women. This reflects the fact that the policy redistributes pension claims from the pension-richer to the pension-poorer spouse within divorcing couples, regardless of gender. Changes in concentration for the full population are more muted and depend on where divorced individuals are located in the overall gender-specific pension wealth distribution. Hence, while

[17] Mechanically, the increase in women's pension wealth should be equal to the decrease in men's pension wealth. There are two reasons why this equality does not hold exactly in the reported age-59 cross-section. First, men are three years older than their wives in the model, so some women observed as divorced by age 59 were married to men who had not yet experienced divorce by their own age 59. Second, because the model includes survival risk, in some former couples only one spouse survives until the measurement age. When we limit the analysis to former couples in which both spouses divorced before age 59 and both survive until age 59, the equivalence holds. In relative terms, the effect is always larger for women, who hold lower baseline pension wealth.

Table 4: Simulated gap in pension wealth at time of divorce (1,000 DKK)

Variable	Mean	P10	P50	P90	Share > 0 (%)
Divorcing couples	642.35	-75.99	608.89	1444.57	86.62
Married couples	605.81	-133.46	560.19	1445.14	84.70

Notes: The table displays basic descriptives on the gap in pension wealth between divorcing spouses, measured as the man's pension wealth minus the woman's.

in-kind division clearly compresses pension wealth within the divorced population, its effect on aggregate concentration combines this within-divorce redistribution with the baseline position of divorced individuals in the overall distribution.

By contrast, cash compensation for pension differentials has essentially no effect on pension wealth, either in levels or in concentration. This follows directly from the design of the policy: Pension accounts are not transferred between spouses, and any effect on pension wealth can therefore arise only through behavioural or compositional responses. Since marital transitions and savings behaviour are largely unchanged in the simulations, the distribution of pension wealth remains almost identical to the baseline.

Table 5: Effects of pension division rules on pension wealth and wealth concentration at age 59

Panel A: Mean pension wealth (1,000 DKK)			
	Baseline	**In-kind division**	**Cash compensation**
	Level	*Δ (Δ %)*	*Δ (Δ %)*
Married women	2094.89	-0.08 (-0.00%)	-0.05 (-0.00%)
Married men	2581.61	0.00 (0.00%)	0.00 (0.00%)
Divorced women	2027.68	329.99 (16.27%)	0.40 (0.02%)
Divorced men	2667.19	-309.09 (-11.59%)	0.00 (0.00%)
Widowed women	2747.30	0.00 (0.00%)	0.00 (0.00%)
Widowed men	3055.76	0.00 (0.00%)	0.00 (0.00%)
All women	2184.27	32.84 (1.50%)	0.01 (0.00%)
All men	2611.82	-30.27 (-1.16%)	0.00 (0.00%)
Panel B: Top 20% pension wealth share			
	Baseline	**In-kind division**	**Cash compensation**
	Level	*Δ (Δ %)*	*Δ (Δ %)*
Married women	27.03	-0.01 (-0.03%)	-0.00 (-0.01%)
Married men	26.86	0.00 (0.00%)	0.00 (0.00%)
Divorced women	25.87	-1.34 (-5.20%)	0.03 (0.11%)
Divorced men	27.81	-0.41 (-1.46%)	0.00 (0.00%)
Widowed women	24.79	0.00 (0.00%)	0.00 (0.00%)
Widowed men	26.25	0.00 (0.00%)	0.00 (0.00%)
All women	27.23	0.33 (1.20%)	-0.00 (-0.00%)
All men	27.41	-0.45 (-1.63%)	0.00 (0.00%)

5.2 Income, retirement, and behavioural responses

Under the baseline, women who divorce before age 60 on average retire 3 years and 3 months later than women who never divorce. This gap is reduced under both counterfactual scenarios. Under in-kind division, the gap falls by 3.34 months on average, and this is due to an increase in early retirement but even more so due to a reduction in the share of women working at or beyond the state pension age. The effect of pension wealth splitting on retirement under cash compensation is less pronounced, since some of the transfer can be consumed to smooth consumption in working life. Cash compensation reduces the average age at retirement by only one month. Divorced men similarly increase their average age at retirement, by the same magnitude as women reduce theirs under cash compensation and by a bit less than the change in women's retirement age under in-kind division. This is due to differences in earnings potential and life expectancy. Since women expect to live longer, they derive more value from the change in pension wealth.

There is almost no effect of changing the pension-division rules on never-divorced spouses behaviour. Due to the small effect on the divorce rate, the policy does not have a large effect on intra-household behaviour.

Table 7 shows that in-kind division increases total retirement income for women. Mechanically, the transfer of pension wealth increases their income from private pensions by 13%. As described above, there is some crowding out of labour income due to retiring earlier (3.4%). There is furthermore a small crowding out of public pensions of 0.9%, since public pensions are means-tested against all other income. Thus, enforcing the division of pension wealth in kind mitigates the effect of divorce on late-life living standards of divorced women. And it moves the insurance from being at the individual (self-insurance through retirement timing and saving) and the Government (providing a means-tested public pension system) to the initial married couple (through sharing of pension resources at divorce). This is flipped for men, although it is worth pointing out that divorced men suffer from the same loss of economies of scale in consumption, such that even with a moderately higher income, they are not necessarily better off after divorce. Note also that both men's and women's labour supply responses in turn affect the amount of crowding-out in the other two income types. For example, men's private pension income falls by less than the mechanical effect, since they work and therefore contribute longer. And the mechanical effects on public-pension payments are also reduced by this, since not just the occupational income but also the labour income enter the means-testing. Cash compensation has little to no effect on public or private pension income, but wage income is reduced by 1% for divorced women and increased by 1% for divorced men. Because the state pension is tested

against income but not wealth, there is no direct effect of any transfer in non-pension wealth on public pension payments. Therefore, cash compensation has smaller fiscal implications, whilst also shifting the source of insurance against the late-life cost of divorce from the individual to the couple.

Table 6: Labour supply and retirement responses to divorce scenarios

	Baseline Level	In-kind division Δ from baseline	Cash compensation Δ from baseline
Panel A: Divorced before age 59			
Women			
Share working at age 62	76.87	-1.78	-0.80
Share working at age 65	58.64	-2.61	-0.88
Share working at age 68	44.91	-2.62	-0.71
Retirement age	67.91	-3.34 months	-1.08 months
Men			
Share working at age 62	80.31	1.26	0.78
Share working at age 65	63.76	1.59	0.73
Share working at age 68	48.58	1.72	0.53
Retirement age	67.68	2.37 months	1.08 months
Panel B: Never divorced			
Women			
Share working at age 62	48.53	-0.02	-0.02
Share working at age 65	26.75	-0.01	-0.05
Share working at age 68	16.61	0.01	-0.03
Retirement age	64.67	-0.00 months	-0.02 months
Men			
Share working at age 62	77.85	-0.00	-0.00
Share working at age 65	41.16	-0.00	-0.04
Share working at age 68	20.68	-0.00	-0.05
Retirement age	65.88	-0.01 months	-0.03 months

Notes: The table reports labour supply and retirement outcomes by divorce status and sex. Share working is measured in percent. Average retirement age is measured in years. Changes in the share working are measured in percentage points relative to the baseline model within panel and sex. Changes in retirement age are measured in months relative to the baseline model within panel and sex. Panel A includes individuals divorced before age 59. Panel B includes individuals who never divorce.

5.3 Consumption smoothing

Whilst the primary intention of a pension-division policy is to change retirement outcomes, any such policy can also affect consumption-smoothing around the actual divorce event. Figure 6 shows the changes in equivalized consumption around divorce for men and women. Since men on average earn more than women, the equivalized consumption drop is much larger for women under all counterfactuals. It is, however, even in the baseline negative for both partners due to the loss of economies of scale in consumption. On average, women's consumption drops by 19.2% and men's consumption by 11%. As in-kind transfers of pension wealth are illiquid at the

Table 7: Counterfactual effects on income composition for divorced seniors

	Baseline	**In-kind division**	**Cash compensation**
	1,000 DKK	*Δ 1,000 DKK (Δ %)*	*Δ 1,000 DKK (Δ %)*
Women			
Public pension (age 62+)	95.28	-0.90 (-0.94%)	0.06 (0.06%)
Private pension income (age 62+)	72.30	13.18 (18.23%)	0.41 (0.57%)
Labour income (age 62+)	87.94	-3.38 (-3.85%)	-1.01 (-1.15%)
Men			
Public pension (age 62+)	80.05	1.02 (1.27%)	-0.10 (-0.13%)
Private pension income (age 62+)	91.17	-7.16 (-7.85%)	-0.38 (-0.42%)
Labour income (age 62+)	153.09	2.53 (1.65%)	1.12 (0.73%)

Figure 6: Impact on equivalence-scale adjusted consumption at divorce

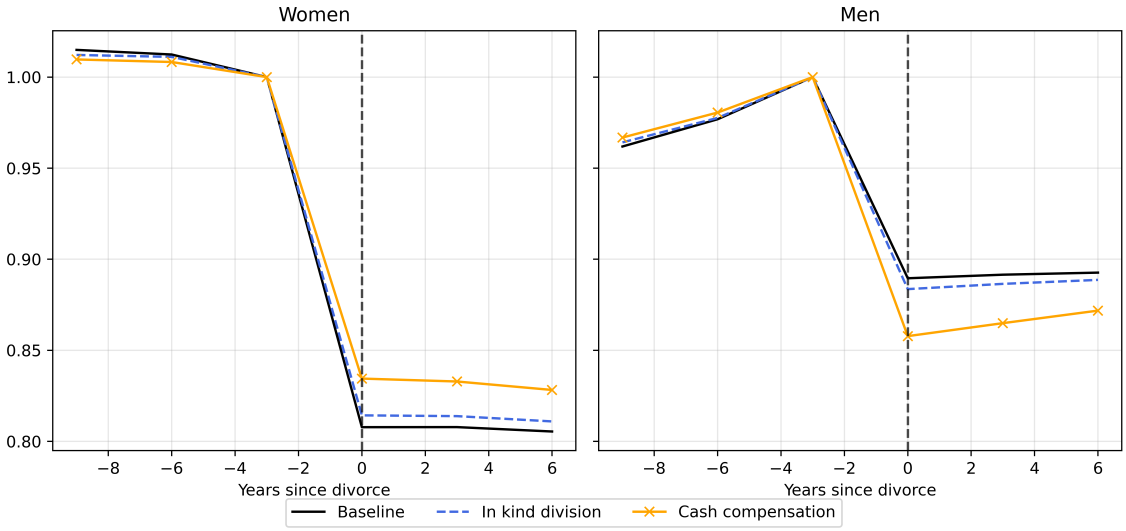


Table 8: Impact on equivalence-scale adjusted consumption at divorce

	Baseline	In-kind division	Cash compensation
All divorces			
Women	19.22%	18.57%	16.55%
Men	11.04%	11.64%	14.22%
Divorced before age 59			
Women	19.72%	19.41%	17.16%
Men	10.45%	10.76%	13.46%
Divorced at age 59 or later			
Women	16.09%	13.84%	12.80%
Men	13.02%	14.71%	16.97%

Notes: The table reports the percentage decline in equivalence-scale adjusted private consumption at divorce, relative to the pre-divorce level. The impact is computed as $1 - C_0/C_{-1}$, where event time 0 denotes the year of divorce. Early divorces are defined as divorces occurring before age 59.

time of divorce, the change in consumption is only affected in so far as savings in non-pension wealth react to the reduced (women) or heightened (men) need to save for retirement. In turn, the transfer of liquid wealth under cash compensation has a much larger effect on the immediate cost of divorce. Table 8 further disaggregates these patterns by age at divorce. Even in late divorces, when the pension wealth is already paid out as an annuity, women experience a smaller consumption drop under cash compensation, since they prefer to smooth out the consumption drop in the immediate aftermath of the divorce when given the option. And under each regime, the drop in women's consumption at divorce is smaller in retirement than in working life, since either the annuity is already available, or the cash can be run down over a shorter amount of remaining years. Both in the baseline and the counterfactuals, men's consumption drop is larger and women's smaller under a late compared to an earlier divorce. But under either pension-splitting policy, men actually experience a larger drop in consumption than women when the divorce happens in late life. The reason men are less affected than women by an early divorce is that, on average, they are the primary earners. But after age 59, most of the lifetime earnings potential has already been converted into savings, in the forms of pension wealth and other assets. Unlike future potential earnings, these are divided at divorce. Under the baseline, men keep the higher pension wealth and are therefore less affected than women. But under the counterfactuals, wealth is fully divided. Under cash compensation, men lose liquid wealth and keep annuity income at divorce. But due to their lower life expectancy, they would run down liquid wealth more quickly than allowed to do with pension wealth under annuitization rules and more quickly than women, such that their consumption is more affected. Under in-kind division, the consumption drop is almost the same by gender. Compared to cash compensation, men are able to keep their preferred asset type and run down liquid wealth faster, softening the drop in consumption. In this case, all types of assets are distributed equally at divorce, and therefore men's consumption drop is slightly larger.

The counterfactual simulations show that the economic effects of pension division depend crucially on the form in which pension wealth is shared. In-kind pension division substantially equalizes retirement resources among divorced spouses and changes retirement behaviour, but because the transferred wealth remains illiquid, it provides limited protection against consumption losses at early-life divorce. Cash compensation, by contrast, has little effect on pension wealth or public pension payments, but provides stronger consumption insurance at the time of divorce by reallocating liquid assets. The two policies therefore insure different margins: In-kind division primarily reduces inequality in retirement income, while cash compensation primarily smooths the immediate consumption shock of divorce.

5.4 Welfare and government budget

The previous subsections show that both policies mechanically redistribute pension and non-pension wealth between spouses and induce behavioural adjustments in savings, retirement, and consumption. Redistribution alone does not imply that a policy is desirable, however: Whether a reform raises welfare depends on how much the losing spouse gives up relative to how much the gaining spouse values what they receive. We therefore evaluate both counterfactual regimes using an individual-level, money-metric measure of welfare.

For each individual j, we compute the transfer of liquid wealth Λ_j that, if paid under the baseline regime of individual pension ownership, would leave individual j exactly as well off in expectation as they are under the counterfactual policy. Letting $\tilde{\mathcal{S}}_t$ denote all state variables other than liquid assets and bargaining power, Λ_j solves

$$\mathbb{E}_{t-1}\left[V_{j,t}^{M,\text{Baseline}}(\tilde{\mathcal{S}}_t, \mu_{t-1}, A_{t-1} + \Lambda_j)\right] = \mathbb{E}_{t-1}\left[V_{j,t}^{M,\text{Policy}}(\tilde{\mathcal{S}}_t, \mu_{t-1}, A_{t-1})\right], \tag{11}$$

where $V_{j,t}^{M}$ denotes spouse j's value of remaining married. We report the individual *liquid-asset equivalent*, $A_{j,t}^{eq} = \kappa_j \Lambda_j$, where κ_j is spouse j's share of household liquid assets, so that $A_{j,t}^{eq}$ is expressed on the same footing as an individual holding of non-pension wealth.

The asset equivalent is each individual's willingness to pay for the policy: $A_{j,t}^{eq} > 0$ means individual j would give up liquid wealth under the baseline regime to obtain the policy instead, while $A_{j,t}^{eq} < 0$ means they would need to be compensated to accept it. Two features of the measure matter for its interpretation. First, it is computed *ex ante*, at model entry (ages 40 and 42 for women and men), before any divorce has occurred. It therefore reflects the value of the policy as insurance against a divorce that may or may not materialize, integrating over each individual's entire distribution of future divorce risk, timing, and outcomes, rather than the gain or loss conditional on actually divorcing. Second, the equivalent is computed separately for each spouse rather than for the couple as a whole, which is the relevant object for asking whether a reform makes each member of the household individually better or worse off, rather than only better off on average.

Figure 7 reports the population-average liquid-asset equivalent by gender and policy, expressed as a percentage of the average wage across genders. Under in-kind division, women's average equivalent is positive, at around 5.8 percent of the average wage, while men's is negative, at around -3.6 percent. Because women's gains exceed men's losses, the population average is positive, at roughly 1.1 percent of the average wage. Under cash compensation, women's average equivalent is again positive but smaller, at around 2.9 percent, while men's is substantially more

negative, at around −11 percent, so that the population average is negative, at roughly −3.9 percent.

This reversal in the sign of the net welfare effect is the central result of the exercise. Mandating that pension wealth be shared in kind is, on average, welfare-improving, and combined with a lump-sum transfer from winners to losers, has the potential to generate a Pareto improvement. Compensating the pension-poorer spouse in cash is instead, on average, welfare-reducing, even though it is more effective at smoothing consumption around divorce, as shown in the previous subsection. The reason is not how much is redistributed, but what is redistributed. In-kind division transfers pension wealth, typically from husbands to wives; because women live longer, they place a higher value on an additional unit of pension wealth, which is paid out as an income stream over what is, in expectation, a longer remaining lifetime, so the gains to wives exceed the losses to husbands. Cash compensation instead transfers liquid wealth, and men place a relatively high value on the liquid wealth they give up. As a result, the losses to husbands from giving up liquid wealth exceed the gains to wives from receiving it. The same underlying asymmetry in how spouses value pension versus liquid wealth, rooted in the gender gap in longevity built into the model, pushes the two policies' welfare rankings in opposite directions.

Table 9 disaggregates asset equivalents by relative pension position, reporting the pension-poor and pension-rich spouse's asset equivalent under each policy at the top and bottom bins of the wife's share of couple pension wealth at model entry. It shows that it is relative pension position within the couple, not gender per se, that determines whether an individual gains or loses: The pension-poor spouse's equivalent is positive whether that spouse is the wife (17.95 percent of the average wage under in-kind division, 26.45 percent under cash) or the husband (9.21 and 11.86 percent, respectively), and the pension-rich spouse's is negative whether that spouse is the husband (−13.53 and −27.49 percent) or the wife (−9.36 and −25.64 percent). Population averages are dominated by the fact that wives typically hold the smaller share of couple pension wealth, so the gender pattern in Figure 7 is, in effect, an average over households in which women are disproportionately represented among the pension-poorer spouse.

Beyond the sign, both the gains to winners and the losses to losers are larger under cash compensation than under in-kind division, including per DKK of wealth transferred: Liquid wealth is immediately available to smooth consumption around divorce, so both sides of the transfer value it more highly than the equivalent amount of illiquid pension wealth. It is precisely because the losses to the paying spouse grow by more than the gains to the receiving spouse that cash compensation's population-average net willingness to pay turns negative in Figure 7, even though it delivers larger gains to winners than in-kind division does.

Finally, we ask whether these welfare gains come at the expense of the public budget. They do not. Appendix Table A.3 decomposes the change in expected government revenue and expenditure over each individual's remaining life cycle. The government's budget responds to pension-division reform through two types of channel: tax revenue, collected on labour income, early-retirement (*efterløn*) benefits, and private pension income; and public expenditure, on *efterløn* and means-tested state pension benefits, which fall as private income rises.

For most of these channels, women's and men's responses move in opposite directions and largely cancel out in the aggregate. Under in-kind division, women retire slightly earlier and men slightly later, so the resulting changes in labour-income and *efterløn* tax revenue are of opposite sign for the two groups; similarly, equalizing pension wealth lowers women's public pension payments and raises men's, since both remain means-tested against a total pool of household income that the policy leaves roughly unchanged. This offset is close, but not exact, in part because the spouse who continues working or retains higher pension income is typically also the higher earner, so a given behavioural change translates into a larger change in tax revenue for that spouse than the mirrored change does for the other.[18] The one channel with no offsetting force at all is pension taxation on wealth held after retirement: In-kind division shifts pension wealth toward women, who live longer and consequently pay tax on that wealth over more years than a man with the equivalent pension wealth would, so aggregate pension tax revenue rises unambiguously, if modestly. The net effect across all channels is a small positive fiscal externality for both reforms: 3,810 DKK (about 510 EUR) per person over the remaining life cycle for in-kind division, and 3,370 DKK (about 450 EUR) for cash compensation. Pension-division reform can therefore improve household-level welfare without imposing a fiscal cost; if anything, it very slightly improves the government's budget position.

Taken together, a positive population-average willingness to pay for in-kind division is, in principle, sufficient for a Pareto improvement: A planner could use a lump-sum transfer from net winners to net losers to make every individual at least as well off as under the baseline.[19]

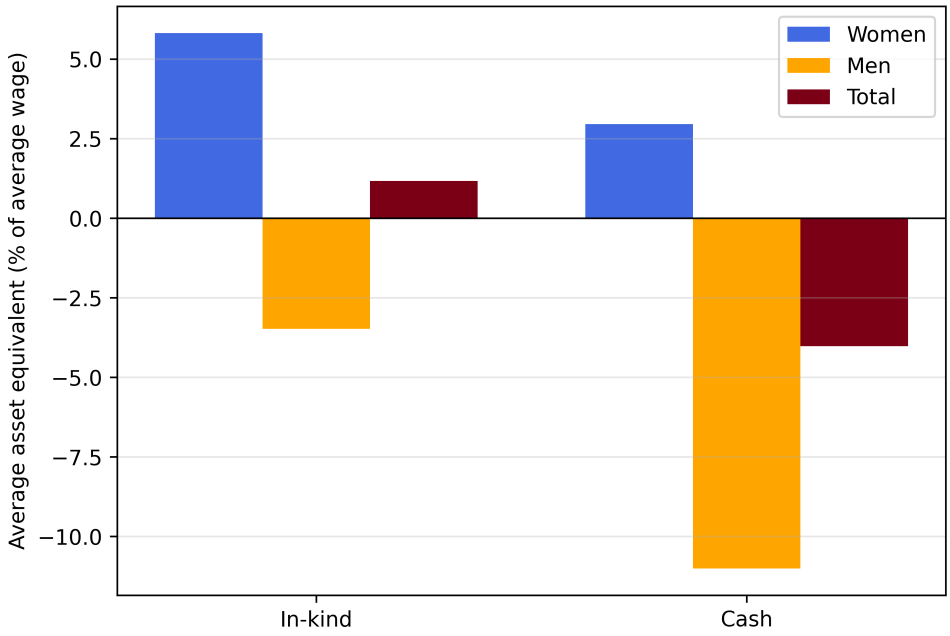
6 Conclusion

This paper has shown that in order to understand the effects of legislation regarding the division of assets in divorce, it is important to account for labour supply responses. Based on Danish

[18] We currently calibrate the model with a flat income tax. We would expect a progressive tax schedule to strengthen this asymmetry, since the transfers we study run from the typically higher-earning to the typically lower-earning spouse.

[19] This is a claim about the population as a whole, however, and does not by itself establish that each married couple could privately reach the same outcome, which would additionally require the wife's and husband's asset equivalents to sum to a non-negative amount *within that couple*, not merely on average across couples.

Figure 7: Average liquid-asset equivalent by gender and policy



Notes: The figure shows the average liquid asset equivalent, i.e. willingness to pay for the two simulated policies by gender and in total. The measure is reported at the beginning of model time, i.e. age 40 for women and age 42 for men, in percent of the average wage across genders.

Table 9: Liquid-asset equivalents for the pension-poor and pension-rich spouse

	In-kind division		Cash compensation	
	A^{eq} (% avg. wage)	$A^{eq,\text{scaled}}$ (%)	A^{eq} (% avg. wage)	$A^{eq,\text{scaled}}$ (%)
Pension-poor spouse				
Wife (wife's share $< 20\%$)	17.95	5.18	26.45	7.35
Husband (wife's share $> 80\%$)	9.21	3.76	11.86	4.53
Pension-rich spouse				
Husband (wife's share $< 20\%$)	−13.53	−4.15	−27.49	−8.07
Wife (wife's share $> 80\%$)	−9.36	−3.93	−25.64	−10.99

Notes: The table reports average liquid-asset equivalents for spouses in the top and bottom bins of the wife's share of couple pension wealth at model entry. A^{eq} is in percent of the average wage. $A^{eq,\text{scaled}}$ additionally scales the equivalent by the couple's joint pension wealth, so it can be read as willingness to pay (or required compensation), in cents, per DKK of pension wealth potentially transferred. In both bins, the spouse holding the minority share of pension wealth has a positive asset equivalent under both policies, and the majority-share spouse's is negative, regardless of which spouse holds which position.

administrative data, we find an association between being ever-divorced and delaying retirement for women but less so for men. We hypothesize that this is at least in part due to pension wealth not being split between divorcing spouses and divorcing women thus not being compensated for the sizeable gender gap in pension wealth, which can be at least in part traced to family decisions.

We build a dynamic, structural life-cycle model with endogenous divorce and retirement and use it to interpret these results. We find that for our preliminary calibration, the model reproduces the result of delayed retirement for divorced women, when pension wealth is not divided at divorce.

We then use the model to evaluate the effects of introducing in-kind pension splitting at divorce. When pension wealth is treated like joint instead of separate property, there is almost no adjustment in selection into divorce or overall divorce rates, such that the law change translates into the distribution of pension wealth. We find a reduction in inequality within and across genders. This causes divorced women to retire earlier and divorced men to retire later. Women's labour supply changes more than men's due to their higher valuation of pension wealth based on differences in survival risk. The effects of this policy change on married couples' retirement timing are small at the individual level, but contribute significantly to aggregate effects.

References

Amilon, A. (2015). The effects of a Danish legal reform on divorce probabilities and pension savings. *Review of Economics of the Household*, *13*(1), 193–218. https://doi.org/10.1007/s11150-012-9168-3

Attanasio, O. P., & Weber, G. (1995). Is Consumption Growth Consistent with Intertemporal Optimization? Evidence from the Consumer Expenditure Survey [Publisher: University of Chicago Press]. *Journal of Political Economy*, *103*(6), 1121–1157. Retrieved July 8, 2025, from https://www.jstor.org/stable/2138706

Braun, R. A., Kopecky, K. A., & Koreshkova, T. (2017). Old, Sick, Alone, and Poor: A Welfare Analysis of Old-Age Social Insurance Programmes [Publisher: Review of Economic Studies Ltd]. *The Review of Economic Studies*, *84*(2), 580–612. Retrieved January 23, 2025, from https://ideas.repec.org//a/oup/restud/v84y2017i2p580-612..html

Brown, S. L., & Lin, I.-F. (2012). The Gray Divorce Revolution: Rising Divorce Among Middle-Aged and Older Adults, 1990–2010. *The Journals of Gerontology: Series B*, *67*(6), 731–741. https://doi.org/10.1093/geronb/gbs089

Brown, S. L., Lin, I.-F., Hammersmith, A. M., & Wright, M. R. (2019). Repartnering Following Gray Divorce: The Roles of Resources and Constraints for Women and Men. *Demography*, *56*(2), 503–523. https://doi.org/10.1007/s13524-018-0752-x

Brown, S. L., & Wright, M. R. (2017). Marriage, Cohabitation, and Divorce in Later Life. *Innovation in Aging*, *1*(2), igx015. https://doi.org/10.1093/geroni/igx015

Carroll, C. D. (2006). The method of endogenous gridpoints for solving dynamic stochastic optimization problems. *Economics Letters*, *91*(3), 312–320. https://doi.org/10.1016/j.econlet.2005.09.013

Chang, M., & Ko, A. (2023). Marital Transitions, Housing, and Long-Term Care in Old Age.

Fadlon, I., & Nielsen, T. H. (2021). Family Labor Supply Responses to Severe Health Shocks: Evidence from Danish Administrative Records. *American Economic Journal: Applied Economics*, *13*(3), 1–30. https://doi.org/10.1257/app.20170604

Familieadvokaten.dk. (n.d.). 574 Skal pensionsordninger deles? Retrieved December 18, 2025, from https://familieadvokaten.dk/emner/574.html

Fella, G., Gallipoli, G., & Pan, J. (2019). Markov-chain approximations for life-cycle models. *Review of Economic Dynamics*, *34*, 183–201. https://doi.org/10.1016/j.red.2019.03.013

Fernández, R., & Wong, J. C. (2014). Divorce Risk, Wages and Working Wives: A Quantitative Life-Cycle Analysis of Female Labour Force Participation. *The Economic Journal*, *124*(576), 319–358. https://doi.org/10.1111/ecoj.12136

Fernández, R., & Wong, J. C. (2017). Free to Leave? A Welfare Analysis of Divorce Regimes. *American Economic Journal: Macroeconomics*, *9*(3), 72–115. https://doi.org/10.1257/mac.20150293

Foerster, H. (2023). *Untying the Knot: How Child Support and Alimony Affect Couples' Decisions and Welfare* (Boston College Working Papers in Economics No. 1043). Boston College Department of Economics.

Foerster, H., Obermeier, T., & Schulz, B. (2024). Job Displacement, Remarriage, and Marital Sorting. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.4979572

Hallengreen, A., Jørgensen, T. H., & Olesen, A. M. (2024). Fast Solution of Dynamic Intra-Household Bargaining Models.

Iskhakov, F., Jørgensen, T. H., Rust, J., & Schjerning, B. (2017). The endogenous grid method for discrete-continuous dynamic choice models with (or without) taste shocks. *Quantitative Economics*, *8*(2), 317–365. https://doi.org/10.3982/QE643

Kreyenfeld, M., Schmauk, S., & Mika, T. (2023). The gender pension gap in Germany: Is divorce a gender-equaliser? *Ageing and Society*, *43*(11), 2700–2720. https://doi.org/10.1017/S0144686X21001513

Lin, I.-F., & Brown, S. L. (2021). The Economic Consequences of Gray Divorce for Women and Men. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*, *76*(10), 2073–2085. https://doi.org/10.1093/geronb/gbaa157

Low, H., Meghir, C., Pistaferri, L., & Voena, A. (2018). Marriage, Labor Supply and the Dynamics of the Social Safety Net [Issue: 24356 Series: Working Paper Series Type: Working Paper _eprint: 24356]. https://doi.org/10.3386/w24356

Maibom, J., Andersen, T. M., & Borgbjerg, A. K. (2026). Pension Wealth and the Timing of Retirement. Retrieved May 4, 2026, from https://papers.ssrn.com/abstract=6053369

McFadden, D. (1989). A Method of Simulated Moments for Estimation of Discrete Response Models Without Numerical Integration [Publisher: [Wiley, Econometric Society]]. *Econometrica*, *57*(5), 995–1026. https://doi.org/10.2307/1913621

Olivetti, C., & Rotz, D. E. (2016). Changes in Marriage and Divorce as Drivers of Employment and Retirement of Older Women [Publisher: National Bureau of Economic Research, Inc]. *NBER Working Papers*, (22738).

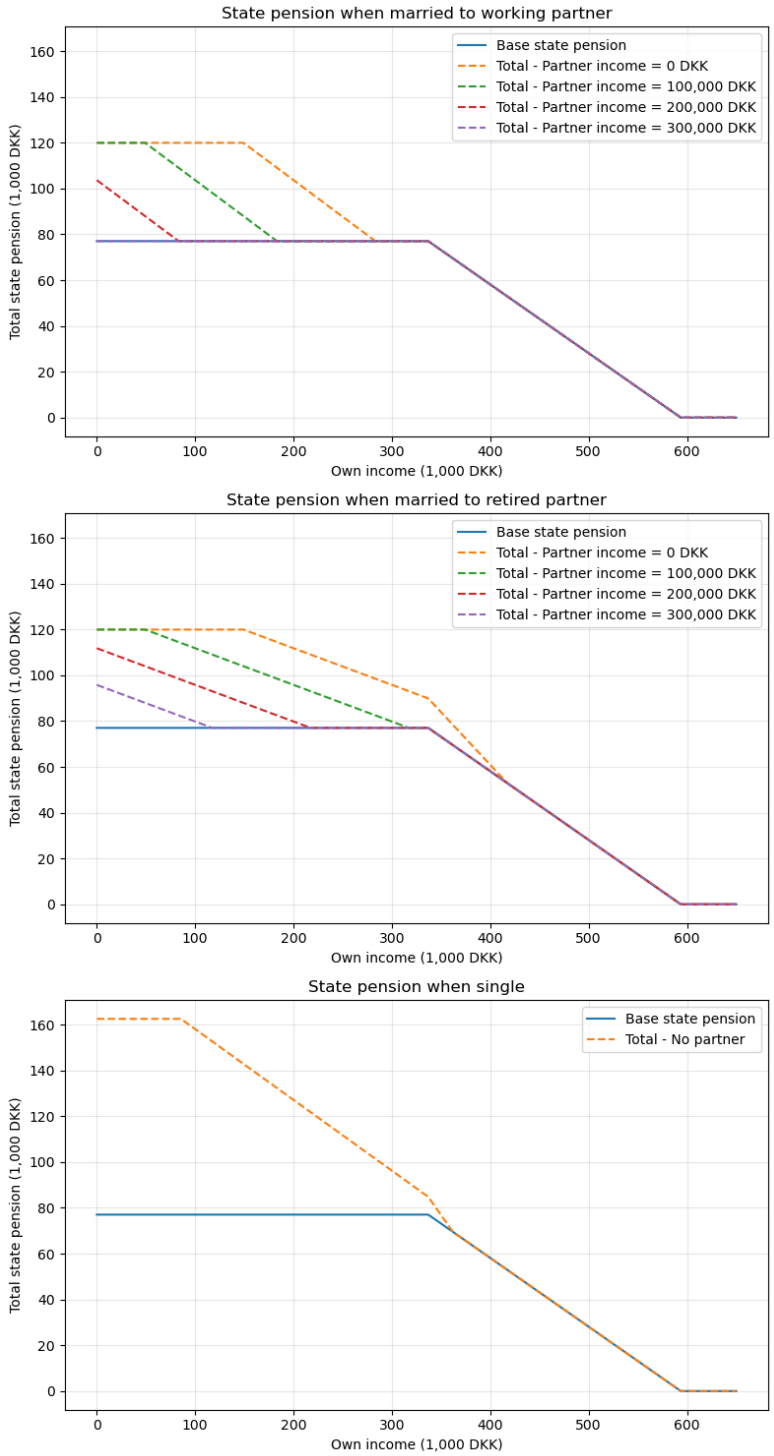
Persson, P. (2020). Social Insurance and the Marriage Market [Publisher: The University of Chicago Press]. *Journal of Political Economy*, *128*(1), 252–300. https://doi.org/10.1086/704073

Voena, A. (2015). Yours, Mine, and Ours: Do Divorce Laws Affect the Intertemporal Behavior of Married Couples? *American Economic Review*, *105*(8), 2295–2332. https://doi.org/10.1257/aer.20120234

A Additional Figures

A.1 State pension scheme

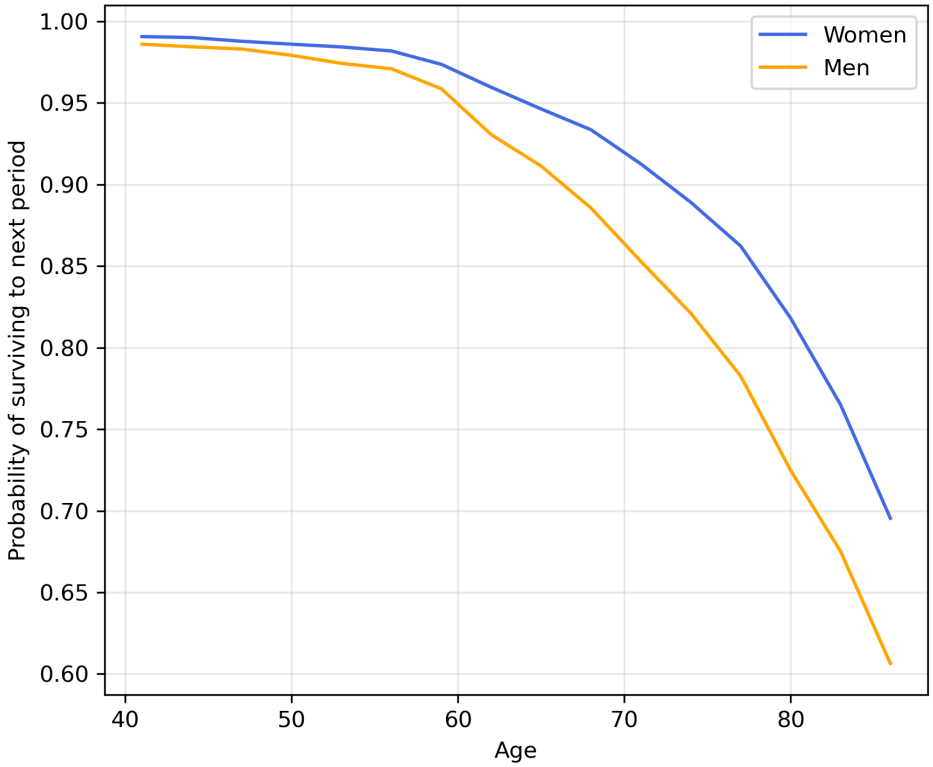
Figure A.1: Danish state pension, base rate and supplement (2020)



Notes: The figure illustrates the dependency of the state pension transfer on marital status, own income and – if applicable – partner's labour force status and income, as of 2020.

A.2 Model parameters

Figure A.2: Model survival probabilities



Notes: The figure displays the probability of surviving until model period $t+1$, conditional on reaching period t. As one model period corresponds to three calendar years, this is equivalent to the probability of surviving to age $a+3$ conditional on reaching age a. We estimate these probabilities based on the population register BEF.

A.3 Counterfactual simulations

Table A.1: Institutional parameters

Parameter	**Source**	**Value**
Early retirement age	Legislation	62
State pension eligibility age	Legislation	65
State pension base rate	Legislation	4.62
State pension base cap	Legislation	20.2
State pension taper rate	Legislation	0.3
State pension supplement (single)	Legislation	5.13
State pension supplement cap (single)	Legislation	4.46
State pension taper rate (single)	Legislation	0.309
State pension supplement (couple, RR)	Legislation	2.57
State pension supplement cap (couple, RR)	Legislation	8.41
State pension taper rate (couple, RR)	Legislation	0.16
State pension supplement (couple, W/R)	Legislation	2.57
State pension supplement cap (couple, W/R)	Legislation	0.16
State pension taper rate (couple, W/R)	Legislation	8.41
Women's share of wealth at divorce	Legislation	0.5
Share of pension inherited	—	0.3
Share of liquid assets inherited	—	1

Notes: The values are based on the design of the Danish old age pension scheme as of 2019. All monetary values are expressed in units of 50,000 DKK per three-year period.

Table A.2: Initial wealth by income quintile and gender

	Women		Men	
K_{i0}	Non-pension wealth	Pension wealth	Non-pension wealth	Pension wealth
1	0	397	21	617
2	0	543	64	815
3	23	636	175	935
4	55	773	300	1,068
5	331	929	625	1,436

Notes: Values are measured in 1,000 DKK.

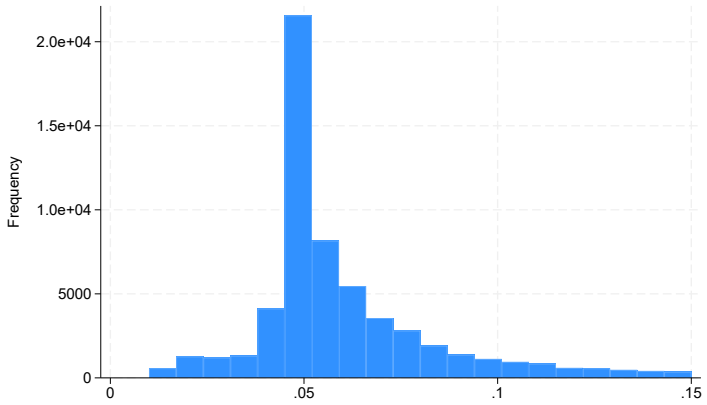
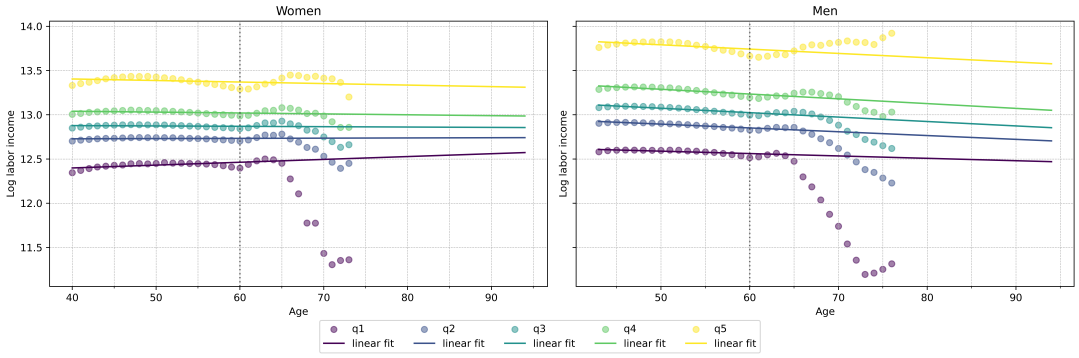


Figure A.3: Histogram of observed annuitization rates (if positive and below 15%)

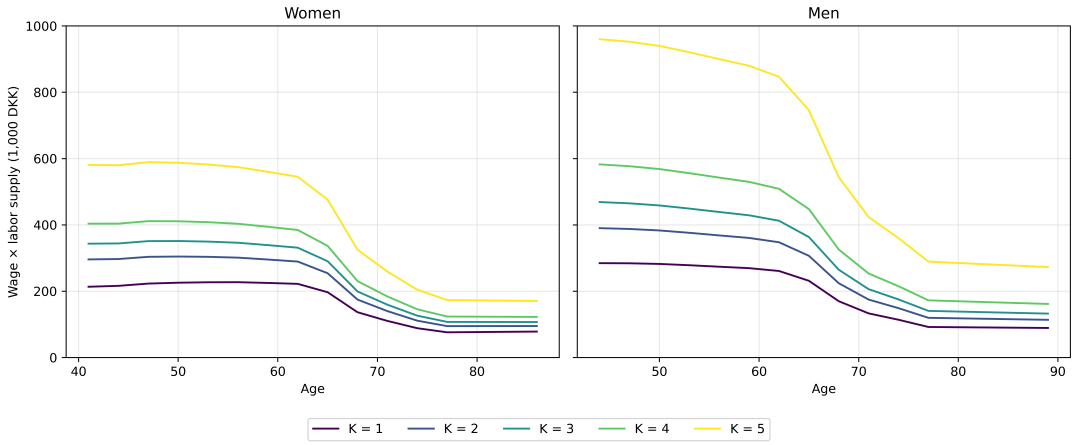
Notes: The figure shows distribution of the estimated ratio of occupational pension payments to occupational pension wealth in early retirement (ages 66–68). It does not show the large share of zeros and the long right tail of high payout rates. Since the former are driven by the choice to delay withdrawal of the occupational pension and the latter by health-based or other accelerated payouts, we take the mode to be indicative of the regular annuitization rate that retirement decisions are also based on.

Figure A.4: Full-time income over the life cycle: Data and linear fit



Notes: The figure shows income for full-time workers by age, gender, and income quintile. The linear fits are estimated using data from ages 40 to 59 and then projected beyond age 59 to account for selection into retirement.

Figure A.5: Model income when employed



Notes: The figure shows model labour income by age, gender, and human capital type, K_{it}, conditional on working. Income is computed as the product of full-time wages, based on the linear fit displayed in Figure A.4, and age- and gender-specific full-time degrees.

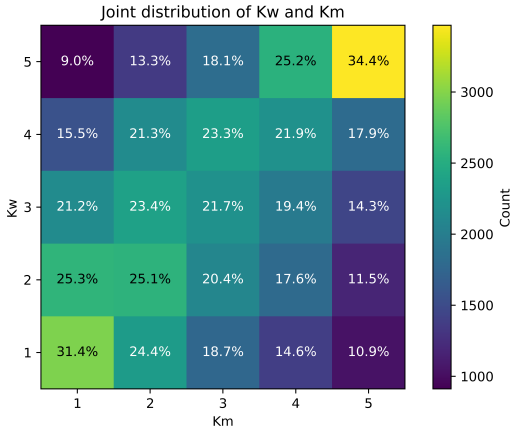
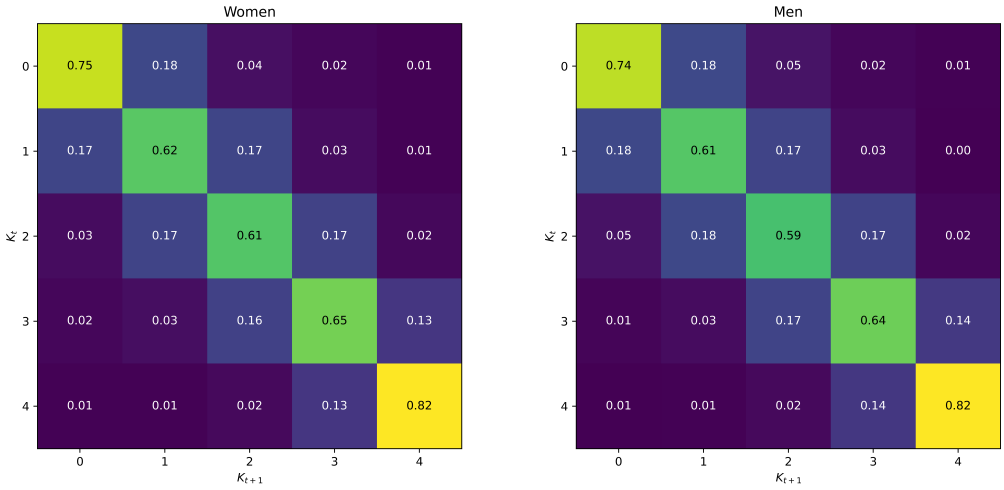


Figure A.6: Initial distribution of K_{w0} and K_{m0}

Notes: The figure shows the initial distribution of K_{w0} and K_{m0} and their correlation. Numbers indicate row percentages. The values are based on full-time income quintiles.

Figure A.7: Income transition matrix at age 50 for women and age 53 for men



Notes: The figure displays an example of transition probabilities between human capital types, K_{it} and $K_{i,t+1}$. The transition probabilities are calibrated based on transitions between full-time income quintiles.

Table A.3: Decomposition of fiscal effects by policy, income source, and gender (1,000 DKK per person)

Model	Flow	Gender	Wage income	Private pension	Early retirement	State pension	Total
In-kind	Revenue	Women	-2.36	11.43	0.04	-1.52	7.59
		Men	8.88	-10.67	-0.68	1.86	-0.62
		Total	**3.26**	**0.38**	**-0.32**	**0.17**	**3.49**
	Expenditure	Women			0.09	-3.24	-3.15
		Men			-1.45	3.95	2.50
		Total			**-0.68**	**0.35**	**-0.33**
	Net	Women	-2.36	11.43	-0.05	1.72	10.74
		Men	8.88	-10.67	0.77	-2.09	-3.12
		Total	**3.26**	**0.38**	**0.36**	**-0.19**	**3.81**
Cash	Revenue	Women	-1.80	-0.06	0.21	0.48	-1.17
		Men	8.81	-1.00	-0.68	-0.72	6.41
		Total	**3.51**	**-0.53**	**-0.23**	**-0.12**	**2.62**
	Expenditure	Women			0.45	1.02	1.47
		Men			-1.44	-1.54	-2.98
		Total			**-0.50**	**-0.26**	**-0.76**
	Net	Women	-1.80	-0.06	-0.24	-0.54	-2.64
		Men	8.81	-1.00	0.76	0.82	9.39
		Total	**3.51**	**-0.53**	**0.26**	**0.14**	**3.37**

Notes: The table displays the decomposition of fiscal effects of the two simulated reforms: In-kind pension division, where pension wealth is divided equally between divorcing spouses, and cash compensation, where pension wealth remains with the title holder, but differentials are compensated through other assets. The table displays the reform effects on government revenues in the form of taxation of wage income, private pension income, early retirement benefits and state pension benefits, as well as expenditures in the form of payouts of early retirement and state pension benefits. Effects are shown by gender and in total, and the unit is 1,000 DKK per capita over the model life cycle (i.e. from age 40 and onwards for women and age 42 and onwards for men).