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Gender and Family: Conceptual Overview

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Abstract: This paper starts from the fact that women receive lower pensions than men on average, and considers policies to address that fact. Women typically have lower wages than men, a greater likelihood of part-time work and more career breaks, and thus generally a less complete contribution record. In addition, pension age may be lower for women and annuities may be priced using separate life tables for women. The paper looks at three strategic ameliorative policy directions: policies intended to increase the size and duration of women's earnings and hence improve their contribution records; policies to redirect resources within the pension system, including for survivors and after divorce; and ways of boosting women's pensions with resources from outside the pension system.

Key words: Gender, Pension Wealth, Annuity Pricing

JEL codes: J16, J32, H55

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Abbreviations and Acronyms

DB	Defined Benefit
DC	Defined Contribution
NDC	Nonfinancial Defined Contribution

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1. Introduction¹

Social policy aims to increase individual well-being along multiple dimensions:

- Income security, through earning opportunities, insurance, consumption smoothing, and poverty relief;
- The maintenance and improvement of physical and emotional health; and
- Education and training for labor market activity and personal development.

Family policy aims to promote the achievement of those objectives for all family members, and in a way that promotes gender equity.

This paper considers how pensions can contribute to these aims. Specifically, it considers how pension design can contribute to policies about gender and family.² To frame the issues it is helpful to go back to fundamentals, in particular labor market experience and pension design.

1.1. Labor market experience

In a contributory system, a person's pension entitlement is generally determined by:

- Total contributions by that individual each year, which depends on his/her hourly wage, w , and the number of hours in covered work, L ; and
- The individual's contribution density, i.e., the number of years of paid work, N .

Internationally, the empirical facts are that women fare less well than men on all these dimensions. On average, they have:

- Lower wages than men (w lower);
- A greater likelihood of part-time work (L lower).

¹ This paper draws on Barr and Diamond (2008, 2010) and Barr (2012, 2013).

² For a parallel study, see Chłoń-Domińczak (2017).

- Shorter careers, inter alia, because of more career breaks (*N* lower).³

1.2. Pension design

The effect of the gender pay gap (a snapshot at a point in time) is compounded by women's less-complete history of paid work, and may be further exacerbated by the way pensions are designed. For example:

- Minimum pension age for women may be lower than for men.
- Annuities may be priced using separate life tables for men and women.
- The fraction of a couple's pension that continues after the death of one spouse may not be enough to maintain the living standard of the other. Since women are more likely to survive their husbands than vice versa, the problem affects women disproportionately.
- Indexation of pensions in payment that fails to protect replacement rates affects women more strongly given their longer life expectancy on average.

Thus for reasons with roots both in labor markets and pension design, it is no accident that elderly poverty is greater among women than men.

The system of fully funded individual accounts in Chile illustrates the problems of design that, in different combinations, arise in different pension plans. The system presents women with a quadruple whammy:

- Lower pay on average;
- More gaps in employment; note that in a defined contribution (DC) plan, missing contribution years are particularly costly when younger (i.e., when women are having children);
- An earlier pension age;⁴

³ For a wide-ranging study of the gender wage gap, see Blau and Kahn (2017), and on Latin America, Amarante, Colacce, and Manzi (2017).

- The fact that it is legal for annuities to be priced using separate life tables for men and women.

The first two result in women having a smaller accumulation on average than men, the last two that for a given accumulation a woman receives a lower pension than a man.

1.3. Overview of income poverty

In every country shown in Table 1.1, women experience a higher rate of elderly poverty; and in every country except Poland, older pensioners (disproportionately women) are at higher risk of elderly poverty than pensioners aged 65–75.

⁴ Note that many of the countries in Central and Eastern Europe have already equalized pension age or are on a path to do so.

Table 1.1: Income poverty rates by age, sex, and household type, selected countries, 2014

(Percentage with incomes less than 50 percent of median household disposable income)

	Older people (aged over 65)					Whole population
	By age			By gender		
	All 65+	66-75	76+	Men	Women	
Australia	25.7	23.4	29.2	23.6	27.5	12.8
Canada	9.0	8.5	9.9	6.7	11.0	12.6
Chile	16.3	16.2	16.4	16.1	16.4	16.1
Denmark	3.2	2.1	4.9	2.3	4.0	5.5
Finland	5.2	2.9	8.5	3.2	6.8	6.3
France	3.6	2.8	4.5	2.7	4.2	8.2
Germany	9.5	8.4	10.3	6.8	11.5	9.5
Greece	8.2	7.1	9.5	6.9	9.3	14.8
Italy	9.3	8.9	9.7	6.7	11.2	13.7
Japan	19.0	17.0	21.3	15.1	22.1	16.1
Netherlands	3.7	2.5	5.5	3.4	3.9	7.9
New Zealand	10.6	7.7	15.2	6.6	14.0	10.9
Norway	4.3	2.2	7.3	1.9	6.3	8.1
Poland	7.6	8.3	6.7	4.6	9.3	10.4
Portugal	9.7	8.5	11.2	7.1	11.6	13.5
Slovak Republic	3.8	3.3	4.8	1.9	4.9	8.7
Spain	5.4	4.7	6.2	3.7	6.7	15.3
Sweden	10.0	6.6	15.2	6.4	13.1	9.0
Switzerland	19.4	16.3	23.8	16.6	21.8	9.9
United Kingdom	13.8	10.4	18.5	11.1	16.0	10.9
United States	20.9	17.6	25.7	17.2	23.9	16.8
OECD	12.5	10.7	13.9	8.7	13.6	11.5

Source: OECD 2017 (Table 6.3).

The question this paper addresses is: what policies help to reduce the number of (mainly) women experiencing income poverty in old age?⁵ After some framing discussion in section 2, the rest of the paper is organized around three strategic policy directions:

- Increasing the size and duration of earnings (section 3);
- Redirecting resources within the pension system, including for survivors and after divorce (section 4); and/or
- Adding resources from outside the pension system (section 5).

Section 6 sets out some general conclusions.

2. Framing the issues

2.1. Policy issues

In thinking about pension design it is mistaken to base analysis entirely on a typical case. It is important to take account of diversity of living arrangements and of individual and family behavior.

2.1.1. Living arrangements are diverse and do not remain static

Some adults are single and live alone, others are single and share housing and other consumption, and others are married or in other recognized partnerships. Married couples differ in the extent to which they share resources. Some stay married until one of them dies, other marriages end in divorce after varying lengths of time, and many people remarry after a divorce or the death of a spouse.

⁵ The examples in this paper are frequently presented in terms of husband and wife, with the woman as the primary carer, but recognizing throughout that other types of partnerships flourish and that the man may be the primary carer. Examples also often assume that the woman has the lower earnings in a couple, again recognizing that this is far from always the case.

2.1.2. Tax and benefit rules can affect men and women differently

Taxes and benefits affect the behavior of family members. That conclusion is inescapable – it is not possible to have a policy that does not affect incentives. As examples:

- *Marriage*: Policy design can encourage or discourage marriage. Taxes may be higher or lower on two people if they remain single than if they marry. Similar issues arise with pensions, particularly for people considering marriage in middle age or later.
- *Consumption patterns*: Consumption can differ depending on whether benefits are paid to the husband or the wife. Evidence suggests that if child benefits are paid to the mother, a greater fraction will be spent on children (Goode, Callender, and Lister 1996). Other evidence (e.g., Case and Deaton 1998) suggests that the noncontributory old-age pension in South Africa provides family poverty relief via grandmothers.
- *Labor supply of men and women*: Gender-neutral taxes have different effects on average because men and women have different labor supply elasticities.
- *Labor supply of mothers of young children*: Policy design can encourage or discourage paid work, depending on the design of child care subsidies or income tax, the length of school hours, and the employment rules applicable to people with young children. Also relevant is the subsidized provision of pension credits for those caring for young children.

2.1.3. Resulting questions

These different impacts suggest a series of questions with both positive and normative aspects, the answers to many of which are outside the scope of this paper:

- How should consumption be shared within the family?

- Should the earnings of husband and wife be taxed on an individual or family basis?
- Are labor supply and caring decisions made on the individual or household level?
- Should taxes and benefits encourage mothers with young children to accept paid work or discourage them from doing so?
- If policy is intended to encourage mothers with caring responsibilities to take paid work, should policy subsidize a carer at the time of child rearing or in retirement?
- Should taxes and benefits be designed to encourage marriage? If other policy goals can be met only by rules that discourage marriage (for example, if some benefits are lost upon marriage), how much weight should be given to that disincentive when designing such policies?
- How should pensions be organized for survivors or upon divorce?

The reason for posing these questions is to make it clear that none has an unambiguous answer. The conclusion is that there is not—and cannot be—a single optimal policy that applies universally. Discussion instead considers policy options that make sense in different contexts, with no pretense at setting out definitive answers.

2.2. Analytical approach

The analysis in the paper has four centers of gravity.

2.2.1. Multiple objectives

Pension systems have multiple objectives that cannot all be fully achieved at the same time. In analytical terms, the task is to optimize across different objectives concerning marriage, labor supply during working years, and the distribution of consumption within the household and over time, including old-age economic security. The optimum will depend on the relative weights given to the various objectives; and since those weights reflect

differences in individual tastes and in social values (for example, between paid work and care activities), views about policy are likely to differ widely. Complicating matters is that it is often not clear whether a particular outcome, for example a woman forgoing paid work to care for young children, is the result of choice or constraint.

2.2.2. Holistic

As the previous paragraph suggests, it is necessary to evaluate a pension plan in the context of the pension system as a whole. To illustrate, an exclusive focus on consumption smoothing (e.g., a pure nonfinancial defined contribution [NDC] plan) suggests an arrangement in which benefits bear a fairly exact relationship to a worker's accumulated contributions; but such a system would fail to relieve old-age poverty for low-paid workers and would not offer insurance against adverse labor market outcomes, both problems with a substantial gender element.

Thus in what follows, some discussion is specific to the NDC design and some is relevant also to other designs and to other parts of the pension system.

2.2.3. Second best

Analysis should be couched in what economists call "second-best" terms; that is, assuming a world with imperfect information, incomplete markets, and distorting taxation. For example, the goal of minimizing (as opposed to optimizing) labor supply disincentives is mistaken because any pension system that includes poverty relief inescapably creates distortions. Thus minimizing distortions would imply little or no poverty relief—the cure would be worse than the disease. Pension systems can have substantial effects on behavior, including labor supply, saving, and the division of resources within a household. But these effects are not necessarily adverse; furthermore, even where they are adverse, the system will still raise welfare if the welfare gain from improved old-age security outweighs the costs of adverse incentives. In short, policy has to seek the best balance among poverty relief,

insurance, and containing distortions, which again will depend on the weights given to the different objectives.

2.2.4. Distribution matters

Many people (particularly non-economists) think that economics is only or mainly about efficiency. That view is deeply mistaken: economics has always been about equity as well as efficiency—indeed, one of the major thrusts of the optimal taxation literature (Diamond and Mirrlees 1971a, 1971b) was to integrate the two concerns.

3. Strengthening earnings records

Approaches to strengthening earnings records include general labor market policies to assist paid work (section 3.1); policies that support paid work alongside caring activities (section 3.2); and policies that facilitate longer working life (section 3.3). These approaches help to reduce the gender gap in pensions, whether DC, NDC, or defined benefit (DB).

3.1. Labor market policies to assist paid work

Four types of labor market policies assist paid work:

- *Equal pay for equal work.* Though hugely important, this aspect of economic and social policy lies outside the scope of a paper on pension design. The policy direction is firmly noted but not discussed further.
- *Active labor market policies.* These can help (usually) mothers return to the labor force after a period of unpaid work.
- *Labor market legislation.* Labor codes can be more or less helpful in providing flexibility, notably in supporting part-time work.
- *Tax policy to encourage paid work by second earners.* The design of personal income tax affects labor supply by different family members. A family base taxes the income of a second earner at the family's marginal tax rate. With individual taxation, the marginal tax rate a person faces is independent of

marital status; thus the mother of young children faces lower tax rates than with family taxation and hence, at least via the substitution effect, is more likely to take paid work.

3.2. Policies to facilitate paid work alongside caring activities

Three sets of policy facilitate paid work alongside caring activities:

- *Sharing care-related tasks.* One way to assist paid work is to share tasks more equally within a household (OECD 2017b). This aspect relates more to social change than to specific policies. In addition, a range of policies, notably those connected with child care, facilitate paid work in younger years.
- *The quantity and quality of child care.* Prenursery children need care throughout the day, and school children need care outside school hours. Women are more likely to take paid work if child care is readily available (i.e., the facility has space for the child) and is available locally. Different elements in the solution include:
 - Enough child care facilities with good geographical coverage;
 - Closer alignment of the length of the school day with the work day, for example breakfast clubs and after-school clubs; and
 - Facilities that combine child care with office space (Financial Times 2017).
- *The cost of child care.* Child care has to be affordable as well as available. Thus the extent to which child care is subsidized, either through transfers to the parent or through tax-financed facilities, is directly relevant.

3.3. Facilitating longer working life

Three further policies address longer working life.

3.3.1. Setting minimum pension age

Though less frequent today, it remains the case that in some countries, the minimum pension age for women is lower than for men (OECD 2017a, Table 2.4). A lower mandatory retirement age unambiguously disadvantages women, in terms of both earnings opportunities and pension benefits, if the latter would be higher with longer work. A lower actual retirement age for women than men, either because retirement is mandatory or as a consequence of social attitudes, will reduce benefits for women in many pension arrangements. Also relevant is whether other rules, such as eligibility for disability benefits and the opportunity to contribute to tax-favored retirement accounts, are based on the minimum pension age. In such respects also, a lower retirement age can place some women at a disadvantage.

A good design will have three features: minimum pension age will be the same for men and women; retirement at that age is not mandatory; and minimum pension age will be related to life expectancy. Box 3.1 discusses the importance of the last feature in terms of arrangements in Sweden.

Box 3.1: Sweden: Faulty adjustment to increasing life expectancy

Adjusting pensions to rising life expectancy requires reducing benefits at each age of withdrawal from the labor force. In principle this can be done by focusing on one or both of:

- The *level* of the pension, by reducing monthly benefits at the minimum pension age;
- The *age* at which pension is first paid, by gradually increasing the minimum pension age, with no compensating increase (or a less-than-actuarial increase) in pension.

Minimum pension age in the NDC pension in Sweden is 61 years. The benefit a person receives at that age is based on (i) the size of his/her accumulation, and (ii) the remaining life expectancy of his/her birth cohort. Thus monthly benefits go down as life expectancy rises. A rational response would be to work longer. However, lessons from behavioral economics call into question uncritical adherence to the assumption of rationality (Thaler and Benartzi 2004). Considerable evidence shows that many people retire as soon as they are allowed to do so, whether or not that is in their own long-run best interests or those of their dependents.

These arguments suggest that a pension system should adjust to rising life expectancy in two ways, by:

- Adjusting the level of the pension for longer life expectancy assists the financial sustainability of the pension system.
- Increasing the minimum pension age broadly in line with life expectancy assists adequacy of benefits in cases where behavior deviates from simple economic rationality.

The gender-relevance of the last point is that a later start to pension, by increasing the benefit, is important to preserve living standards not only at the time of retirement, but into older ages reached disproportionately by women. Adjusting minimum pension age to reflect rising life expectancy is possible (and desirable) in any pension design.

3.3.2. Adjusting pension benefits for earlier or later retirement

Whether a person retires at minimum pension age or delays taking benefits will depend partly on how a person's pension is affected by a delayed start. It is desirable if someone with an incomplete contribution record has the option to fill some of the gaps by delaying

the start of benefits. Central to this element are the incentives to later retirement built into the pension design.

Incentives to continue work past the minimum pension age can vary between men and women depending on the structure of the benefit formula and differences in the earnings histories of men and women. If, for example, a large jump in benefits occurs when crossing a threshold number of contribution years, and if more women than men are just below the threshold when reaching minimum pension age, the incentive to work longer will be stronger for women than for men.

Good design suggests two elements to address the relation between pension benefits and the age at which pension is first received:

- The pension should be larger for a worker who is older when benefits begin, so as to preserve incentives to work until a suitable age for stopping work.
- Benefits should either start at a given age without requiring an end to work or should increase significantly for a delayed start.

Both elements are inherent in a DC design, whether NDC or funded DC. They can (and should) be incorporated into other designs.

3.3.3. Flexible retirement

The argument for later retirement as part of the response to rising life expectancy is well understood. There is less understanding of the gains from more flexible retirement. Even if there were no concerns about sustainability, such choice is good policy for two sets of reasons:

- Individuals vary widely in their preferences. Though many people retire as soon as they are allowed, others do not, because of the extra earnings, because postponing retirement raises their pension, and/or because they continue to enjoy working in their current job or another one.

- Individuals face different constraints. In the present context a particular gain is the possibility of improving incomplete contribution records.

Thus pension design should seek to accommodate differences across individuals by offering choice over how a person moves from full-time work to full retirement (Box 3.2 illustrates how this is done well in the system in Sweden); and labor market policy should facilitate institutions that allow people to move from full-time work toward full retirement along a time path of their choosing.

Box 3.2: Sweden: The good news: Partial pensions

Sweden is an outlier internationally – and an example for other countries to follow – in allowing workers initially to draw only part of their pension. As in most countries, on reaching minimum pension age, workers can choose to draw all of their pension or none of it. In Sweden, workers also have the option to draw 25 percent, 50 percent, or 75 percent of their pension.⁶ The deferred element continues to grow; and if individuals carry on working, they will pay additional contributions, further increasing their eventual pension.

This arrangement is possible with DC, NDC, and DB pensions, and should become a standard feature. The particular advantage for women is the options it offers to improve on any earlier gaps in contributions and/or years of low pay.⁷

4. Redirecting resources within the pension system

The previous section discussed ways of improving the earnings records – and hence contribution records – of people with caring responsibilities. In a strictly individual design a

⁶ Norway offers a similar set of options.

⁷ The effects of flexible retirement are not simple. Börsch-Supan et al. (2017) find that flexible retirement increased the labor force participation of older workers but decreased total hours worked.

person accumulates pension saving that he/she draws down in retirement. Any other design requires an element of pooling with the pension wealth of others (addressed in this section) or finance from outside the pension system (section 5).

The term “redirecting” is used because it covers the pure cases of risk sharing (e.g., actuarially priced individual annuities) and of redistribution (e.g., counting years spent on caring activities as contribution years in a DB plan), and intermediate cases. The examples are presented in terms of redirecting resources within the pension system, though in some instances they could, as an alternative, be financed from outside the pension system.

The following categories, though not mutually exclusive, help to clarify the discussion. Different designs provide:

- Pooling among individuals to cover the longevity risk (section 4.1)
- Pooling within the family (section 4.2)
- Pooling among pensioners (section 4.3)
- Pooling among workers and pensioners (section 4.4).

4.1. Pooling among individuals: Improving annuities

A simple annuity pays a pension benefit for life: it can cover an individual or a couple, and it can be indexed (or not) in different ways. Key aspects concern actions on the demand and supply sides of the market.

4.1.1. What requirement to annuitize?

Annuitization insures the individual against longevity risk. A strong case exists against simple voluntarism. Reliance on drawdown forgoes the welfare gains of insurance, both for the individual and for other family members. Behavioral economics gives insights into why a voluntary system leads to people not annuitizing, or not annuitizing enough.

The resulting potential ill effects are twofold: pensioners may spend too much too soon; or they may spend too little, either for fear of running out of money or to avoid “spending the

children’s inheritance.” Such tendencies do not imply that mandatory full annuitization is optimal. Uncertainty about future expenditures and bequest motives both imply that not all wealth should be annuitized (Davidoff, Brown, and Diamond 2005). Some countries have a requirement to annuitize, but also an option for workers to take part of their accumulation as a lump sum when first drawing pension.⁸

4.1.2. The supply of annuities

Insurance can cope with risk (where the probability is known) but not with uncertainty (where it is not). In principle, annuities are priced on the basis of the expected remaining lifetime of the annuitant, which is treated as a risk. That model may have been appropriate when the gap between typical retirement age and life expectancy was small (e.g., five years). Today, however, many people retire in their early 60s and may live for another 30 years. Thus retirements are typically much longer than in the past; as a result, the “funnel of doubt” about remaining life expectancy at the time a person retires is large. It can therefore be argued that life expectancy is not a simple risk but has a significant element of uncertainty.

Various ways exist to address the supply-side problem, including variable annuities (in which the annuity adjusts from year to year reflecting changes in life expectancy of the cohort of annuitants, and perhaps also financial market outcomes). That approach shares risks among annuitants. Other approaches share risk more widely, of which two stand out. Governments, unlike private insurers, can raise income from sources other than insurance premiums; in addition, governments can change contractual arrangements (e.g., raising state pension age) in ways that have democratic legitimacy – forms of adjustment that are not available to private insurers. Thus one way to address uncertainty is for the government to be the annuity provider. This is the approach in Sweden.

⁸ In the United Kingdom, workers used to be required to convert at least 75 percent of their accumulation into an annuity, so could take up to 25 percent as a (tax-free) lump sum. The rules were recently relaxed.

A private sector solution would be through longevity bonds. Suppose that official figures underestimate increases in life expectancy, leading to losses by annuity providers who therefore either leave the market or price future annuities conservatively. One way to address the problem is for government to sell longevity bonds. In this arrangement, in (say) 2020, an insurance company would sell an annuity to an individual aged (say) 70 priced on official estimates of the remaining life expectancy of a 70-year-old person in 2020. If the cohort of annuitants lives longer than the 2020 projection the taxpayer finances the resulting extra cost. Thus the insurance company takes on the risk, the taxpayer the uncertainty. This is a sensible division of labor. The role of government is to fill the missing market.⁹

4.1.3. What role for deferred annuities?

Persons without an annuity must draw down their pension savings, with the risk of spending too much too soon or too little too late. One approach is a rule-of-thumb for drawdown. In the United States, for example, there are tax penalties for drawing down too little and too much.¹⁰

In principle, a useful approach is to combine drawdown with a deferred annuity – i.e., an annuity bought at (say) age 65 that pays an annual benefit for life from age 85. That arrangement could be voluntary, or there could be a nudge or mandate. In practice, the market for deferred annuities is thin. But such an instrument would be useful both to allow drawdown over a known period (i.e., from retirement until the start date of the deferred annuity) and to protect against old-age poverty. Where such an annuity is joint-life (discussed next), it also protects elderly survivors, disproportionately widows.

⁹ For fuller discussion, see Thomsen and Verner Andersen (2007) and Blake, Boardman, and Cairns (2010).

¹⁰ Individuals are required to withdraw the Required Minimum Distribution (RMD) from age 70½. Failure to do so incurs a tax penalty of 50 percent of the shortfall, i.e., if the RMD is US\$50,000 someone who withdraws only US\$30,000 faces a tax penalty of US\$10,000. See <https://www.irs.gov/retirement-plans/retirement-plans-faqs-regarding-required-minimum-distributions#8>

4.2. Pooling within the family

As noted earlier, personal income tax poses the question of whether to think of the individual or the family as the economic unit for policy design. The same is true for pension systems. Should a person in a rich family with low earnings or low pension benefits be eligible for the same redistribution as someone with similar earnings or benefits in a poor family, or on their own? Many people would say no, but a complicating factor is that family structures have become more fluid: more than in the past, family at the time when pension starts may be different from family at the time when its members worked and made pension contributions. And divorce settlements may or may not have taken into account future pension benefits.

Organizing pensions on an individual rather than a family basis, with women having pensions only in their own right, is argued by some to be a better fit for societies with such fluidity. On the other hand, as with income tax, family structure affects available resources and the demands on those resources.

Pooling within the family has at least three aspects: sharing pension pots during working life; survivors' pensions; and accommodating divorce.

4.2.1. Sharing pension pots year by year during working life

Consider a couple where the husband has a record of continuous high-earning employment, and the wife one of low earnings and a low contribution density. Thus the husband has a large pension and the wife a small one. Where a couple (i) stays married throughout working life and retirement, (ii) does not differ greatly in age, and (iii) shares income amicably, this arrangement might be a useful rule of thumb. However, a case can be made for giving couples some flexibility over the division of pension capital. The issue is particularly relevant where a couple divorces during working life.

A minimal approach is to allow pension entitlements to be shared on a voluntary basis. A more radical option (Barr 2001, 150) is to require that half of a husband's contribution goes into his wife's accumulation and vice versa. The argument for doing so is that caring for children (or elderly dependents) has costs, and those costs have to fall somewhere. Pooling pension pots means that the costs of child rearing in terms of forgone pensions is shared between parents. These accounts belong to the individual and would be carried through a divorce. Against these advantages, however, is the problem that arises when the ages of husband and wife are significantly different and they have had very different earnings, and the higher earner is older. In such a case, dividing pension assets undercuts their ability to finance the couple's retirement if they remain married. This is clearest in the case of a one-earner couple. When the worker reaches retirement age, only half of the benefit is available until the younger spouse has reached retirement age.

4.2.2. Survivors' pensions

The specific question is whether pension design should allow, encourage, or mandate joint-life annuitization. The main argument for joint-life annuitization of at least of a part of a worker's pension is to prevent poverty for the surviving spouse, most often the wife. The root of such poverty is twofold:

- Economies of scale arise in household formation. A single survivor of a couple typically needs about 65–70 percent of the couple's income to maintain a broadly constant standard of living. If spouses are the same age and have identical earnings histories and identical pension benefits, the death of one may lower the living standard of the other. This is part of the reason why poverty is more frequent among widows than among married elderly women.¹¹

¹¹ Although the paper discusses surviving spouses, a well-designed system also has benefits for young survivors, notably young children.

- In addition, as discussed, women on average have lower earnings and/or a lower contribution density than men.

While social policy can help to address the second reason, the first is inherent.

For both reasons, survivors' pensions are important for preserving the living standards of the elderly. Several ways of organizing such benefits are available. A worker's accumulation could be used to buy a joint-life annuity with a suitable fraction (50 percent is common) for the survivor, based on the actuarial conversion of a single-life annuity into the relevant joint-life annuity. In a two-earner couple this could be done by both partners.

Mandatory joint-life annuitization can create winners and losers because:

- Life expectancy at a given age is generally lower among lower earners than higher earners (OECD 2017c); thus standard annuity pricing – whether single- or joint-life – redistributes from poorer to richer people.
- In some systems, survivors' benefits do not adjust for the age difference between spouses, redistributing from couples of similar age to ones with a large difference.

If joint-life annuitization is voluntary, the potential issue is adverse selection: couples who think that, even having adjusted for the age difference between spouses, one will live considerably longer than the other are more likely to purchase such annuities.

A DB system could offer a similar set of options, based on the actuarial conversion of a single-life annuity into the relevant joint-life annuity. Alternatively, survivors' benefits could be provided out of the revenues of the pension system as a whole.

Different designs give different degrees of "nudge." Joint-life annuitization could be voluntary, or could be the default, or could be a stronger default by requiring both partners to agree in writing that the default should be replaced by a single-life annuity for the worker. Alternatively, joint-life annuitization could be mandatory. Sweden is an outlier

internationally in ruling out joint-life annuitization in the NDC pension, an arrangement assessed in Box 4.1.

The main conclusion is that there are powerful arguments against organizing pension benefits – whether NDC or other designs – on a strictly individual basis.

Box 4.1: Survivors' pensions in Sweden

Unusually, the NDC pension in Sweden:

Does not allow transfers of notional capital between spouses and registered partners, either during a marriage or upon divorce; and

Has no option for joint-life annuities. When (as is more usually the case) the husband dies, his NDC pension dies with him.¹²

The argument in Sweden for this design is that either arrangement would violate gender equity if it discouraged married women's labor supply – the more generous the survivors' benefits, the more powerful the disincentive. The issue is important because the gender pay gap persists, and gender equality is elusive even in Sweden (OECD 2018).

However, several counterarguments are that:

In efficiency terms, the design places heavy emphasis on first-best rationality, i.e., that the prospect of a low pension in the future will increase a woman's labor supply in the present.

It implies that the costs of parenting should fall on women in old age to the extent that a woman earns less than her husband. Many would dispute this value judgement, both directly, and particularly if the reason she earns less is forgone career opportunities because

¹² The fully funded premium pension in Sweden allows joint-life annuities, but with no requirement or nudge.

of caring activities.

It ignores the reality, noted above, that a couple is not in all respects the same thing as two single individuals.

It takes insufficient account of changes in family structure, in particular that divorce is more common than in the past.

The Swedish design is not an inherent part of the NDC design; joint-life annuities are possible in NDC plans, as in funded DC plans and DB plans.

4.2.3. Divorce

Divorce is common and, if there is no adjustment, divorce after many years of marriage can result in very low benefits for a person with a limited earnings history. Poverty rates for elderly divorced women who do not remarry are high in the United States.¹³

Thus there are rules, often involving the courts, about the division of accumulated assets (sometimes including human capital) of a couple upon divorce, with particular focus on accumulations during the marriage.

Different strategies are used to provide benefits after a divorce, implemented through decisions at the time of retirement or at the time of divorce. One strategy is to provide benefits when a divorced person reaches retirement age. This can be done as a transfer of benefits between spouses. For example, when a worker starts to draw a pension, benefits are adjusted to provide some benefits not only to a current spouse, but also to previous spouses, using a formula relating to the lengths and timing of the marriages. Future availability of such benefits could be factored into a divorce agreement. Alternatively,

¹³ In 2014, the poverty rate in the United States was 4.9 percent for married women over 65. The comparable figures for widows and divorced women were 16.3 percent and 18.4 percent, respectively – see <https://www.ssa.gov/retirementpolicy/fact-sheets/marital-status-poverty.html>.

benefits for a divorced spouse could be financed from the resources of the pension system generally, without reducing the benefit of the worker entitled to the pension, as in the United States.

A second strategic approach is to transfer pension wealth between spouses at the time of a divorce, based on their earnings records during the marriage. With a funded DC plan the actual assets are divided; in an NDC plan it is the notional capital. Such transfers are also possible in a DB plan. For example, in Canada, when a marriage or common-law partnership ends, the entitlements to the Canada Pension Plan built up by the couple during the time they lived together may be divided equally between them as part of a divorce settlement.

A third approach, discussed earlier, is to divide earnings records on an annual basis during the marriage, for example with individual accounts, where each year the earnings of husband and wife are divided between them.

4.3. Pooling among pensioners

Resources can be pooled more widely than only within families. Two main approaches are discussed.

4.3.1. Gender-specific or joint mortality tables

Governments can provide annuities based on a single mortality table for men and women in a given birth cohort, or require that private providers do so. As a result, a man and a woman with the same accumulation and retiring at the same age receive the same monthly pension. However, with a single mortality table, men on average receive less in present value terms per dollar of accumulation than women because of their lower average life expectancy.

Alternatively, governments may allow pension providers to base annuities on gender-specific mortality tables. Given different life expectancies, a man and woman with the same accumulation and retiring at the same age would receive different monthly pensions, the man receiving a larger one. This practice is outlawed in employer-organized systems in the

United States and the European Union, and many countries require joint mortality tables not only for the mandatory system but also for voluntary pensions.

Joint mortality tables, however, are not the end of the story. Since higher earners tend to live longer than lower earners of the same gender, uniform pricing tends to benefit them; additionally, market pricing will reflect administrative costs, so that people with higher benefits may get better pricing. Since men on average have higher earnings, such outcomes have a gender effect even in a system that mandates joint mortality tables.

4.3.2. Indexing pensions in payment

Once a pension is awarded it can be increased each year in line with prices, wages, or a combination, raising another set of issues (Barr and Diamond 2008, section 5.3.4).

For a given initial pension, the more rapidly benefits grow, the more expensive the system; the less rapidly they grow, the further pensioners fall behind average living standards over time. Thus price indexation places greater emphasis on containing costs and preserving purchasing power, and wage indexation greater emphasis on the relative adequacy of benefits. Pension design needs to strike a balance between these two aspects.

At a given long-run cost, a tradeoff arises between the initial level of pensions and the subsequent rate of growth of benefits: the more rapidly benefits grow, the lower it is necessary to set the initial benefit. This is the way that initial benefits are determined in a system with annuities in funded DC systems and in the calculation of initial benefits in the NDC system in Sweden.

Since workers differ in life expectancy, different combinations of initial benefit levels and growth rates of benefit with the same aggregate long-run cost will affect different workers differently:

- A worker with a shorter expected life will prefer higher initial benefits with slower subsequent growth.

- Within each gender, people with higher earnings tend to live longer; thus the choice of growth rate of benefits has important ex ante distributional effects.
- On average women live longer than men, thus there is also a gender issue.

To illustrate, at a given long-run cost, price indexation generates a higher initial pension, benefitting people with shorter lives, but exposing elderly pensioners (typically widows) to being left further and further behind. With wage indexation, the reverse occurs.

4.4. Pooling among workers and pensioners

Pooling among workers and pensioners can take place in four ways.

4.4.1. Less stringent contribution requirements

A DB plan can cover gaps in the contributions of some workers from the contributions of other workers. Some countries give no benefit unless a person has contributed for at least a minimum number of years, while others provide benefits after any contribution. Since women on average contribute for fewer years than men, the latter approach tends to provide at least some pension for more women. For the same reason, a smaller number of years of contributions necessary to qualify for a full benefit tends to help second earners.

Pension credits are a particular example of this approach. In a DB plan, years spent in caring activities could be included as contribution years, with caring-related gaps financed from the contributions of other workers. As discussed shortly, in a DC plan, tax-financed contributions could be paid on behalf of the carer. In an NDC plan, such contributions could be notional (i.e., financed from within the NDC plan) or real (i.e., involving outside finance) (Chłoń-Domińczak, Franco, and Palmer 2012).

Three other forms of pooling, though with no specific gender aspects, benefit women by assisting the adequacy and sustainability of the pension system.

4.4.2. Minimum pension age

Earlier discussion pointed to several conclusions: that minimum pension age should be the same for men and women, and that retirement at that age should not be mandatory. A third issue is how minimum pension age adjusts to rising life expectancy.

In a DC or an NDC plan, pension benefits decline automatically as life expectancy rises. In such a plan the purpose of raising minimum pension age is to protect the adequacy of benefits rather than the economic sustainability of the plan. In a DB plan with a given pension age, rising life expectancy leads to increasing costs and hence problems of sustainability. Raising minimum pension age with no compensating increase in monthly pension benefits is a way of pooling the longevity risk between workers and pensioners, given the tradeoff between higher contributions and a higher minimum pension age.

4.4.3. Pooling across workers and pensioners: Collective DC pensions

The Netherlands has funded industry pension plans. The system is evolving but in broad terms offers workers a career-average benefit, but (i) contingent on fund performance, and (ii) with a cap on the employer contribution rate. The combination of a career-average design with solvency-contingent indexing of liabilities results in a plan that is a hybrid of DB and DC.

A collective arrangement of this sort has advantages. Collective risk pooling offers wider risk sharing than an individual plan. As an example:

“[I]f a cohort lives longer than expected, the resulting lower funding rate harms the indexation of the deferred annuities offered to younger cohorts. Moreover, by linking pension benefits to the wages of workers, pension funds allow retirees to share in the wage risks of workers” (Bovenberg and Gradus 2014, 6).

4.4.4. Pooling across workers and pensioners: Accrual in an NDC plan

Suppose that the stock market crashes. The annuity that a worker invested in the stock market will buy will fall correspondingly (if the value of an accumulation falls from 100 to 75, so will the resulting annuity). An NDC plan can spread that risk more widely because accrual works differently.

In an NDC plan a person's pension wealth is crystallized year by year. Thus, as Box 4.2 explains, an economic crisis late in a person's career has a smaller effect than with fully funded individual accounts.

Box 4.2: Accrual in an NDC plan shares risk

In contrast with a fully funded DC system, a person's pension wealth in an NDC plan is crystallized year by year. More specifically, in my first year in the labor force, my contribution, $C_1 = tY_1$, where t is the contribution rate and Y_1 my earnings in year 1. C_1 then earns a notional return, r_1 ; and $C_1(1+r_1)$ earns a notional return r_2 in year 2, etc. In a good year, r will be higher and vice versa. Thus in year 1, I earn a "slice" of my pension. Ditto in year 2, etc., so that when I retire, my pension is the sum of those "slices," not unlike a career-average DB plan. If a major crisis strikes in year n , the effect is mainly via the accrual rate on the flow of new contributions and the indexation of benefits in payment rather than on the value of the stock of notional assets.

Thus the NDC design gives pensioners more protection than fully funded individual accounts by sharing risk more widely. Adjustment to protect previously accumulated "slices" does not fall entirely on pensioners (as in a pure DC plan) but is shared between pensioners and workers. Thus the calculation of the "slice" each year is on a DC basis, but its preservation is more like a DB system.

5. Adding resources from outside the pension system

Old-age security is affected by institutions outside the pension system in many ways. This section outlines four: supporting contribution records during working life; subsidizing pensions in payment; noncontributory pensions; and the role of insurance, particularly to cover age-related risks.

5.1. Supporting contribution records during working life

In a DC plan, the contributions of someone not in paid work because of caring activities can be paid year by year on (more usually) her behalf by taxpayers. The pension contributions of low earners could similarly be supplemented (the DC plan in Mexico incorporates a taxpayer subsidy that declines as earnings rise and is fully tapered away for high earners (OECD 2015, 306)). An NDC plan has analogous options.

5.2. Subsidizing pensions in payment

Pensions in payment can also be subsidized by the taxpayer, for example paying a full benefit on the basis of a combination of contributions and pension credits. That arrangement is possible with DC plans (e.g., cover for maternity in Chile), in NDC arrangements (e.g., a minimum pension guarantee), and in DB plans.

5.3. Noncontributory benefits

A noncontributory pension is awarded on the basis of a test of age and residence, but without a contributions test. The benefit can be awarded on the basis only of age and residence, as in the Netherlands and New Zealand, or could be subject also to an income or assets test.

Since women on average have lower contribution densities and often smaller contributions, a noncontributory pension has a particular benefit for them. A reinforcing design would provide a higher basic pension for a single person than for a member of a couple, helping to preserve the replacement rate of the surviving partner.

The existence or otherwise of benefits financed from outside the pension system has a fundamental bearing on gender equity. To illustrate with an extreme example, if there was a Europe-wide noncontributory pension of €1 million per year for each elderly person irrespective of marital status, this paper would be much less salient.

5.4. Good insurance

The more comprehensive a country's insurance to cover the costs of medical care and long-term care, the less the need for precautionary saving, hence the greater the fraction of pension wealth that can be converted into an annuity. The general point is that greater support from noncontributory sources and better insurance against risks faced disproportionately by older people are a powerful separate source of gender equity in old age, illustrating the point made early in the paper of the importance of thinking about pension systems holistically.

6. Conclusion

6.1. Balancing multiple objectives

This section returns to some of the questions listed earlier.

6.1.1. Who should bear the costs of child-rearing, and when?

Should society assist with the costs of child rearing and, if so, should it do so at the time of caring or in retirement? Different ways of recognizing care activities have different distributional and incentive effects. One approach is to credit a person's pension record with a fixed amount for each year that he/she provides care, as in the NDC plans in Sweden and Poland. Sweden also credits a caregiver's individual funded account. Thus her pension is larger because of additional deposits into her account, paid out of general revenue.

In some countries pensions are based on career-average earnings, typically incorporating people's highest earning years. In this case a uniform level of credit per year of child care raises the pension of someone with a short career or sufficiently low earnings, while offering less (or no) help to someone with a long career and high earnings.

In other countries, years spent in caregiving may be dropped from the calculation, thus reducing the number of years used in calculating career-average earnings. With an earnings-related pension, this approach implicitly credits a higher-earning woman with a larger amount than a lower-earning woman.¹⁴

These different approaches also have different implications for finance: with a fully funded or NDC plan, the cost of a pension credit has to be met at the time that the credit is earned; in a DB plan, the cost can be left until the pension is paid.

A broader question is whether pension credits for caregiving are good policy. The credit is a blunt instrument that does not distinguish between cases where labor supply is affected by the credit and where it is not. A parent in a well-off household may have no paid work, and hence be eligible for a credit, but also employ a full-time nanny. That is, a pension credit does not distinguish between those who look after the children themselves and those who do not.

The underlying question is whether support for child rearing should be backloaded by supporting the carer's future pension or frontloaded with support at the time of caring. The latter type of support can include child benefit and/or subsidies for child care. The choice of

¹⁴ To see this, suppose a pension is normally based on a person's 40 highest earnings years. For someone who has 30 years of earnings and spent 10 years caring for children, the average will be based on those 30 years of highest earnings, with the next-highest 10 years of earnings dropping out of the calculation. Thus those 10 years are credited with the average of the highest-earning 30 years rather than zero. This is worth more to a woman with higher earnings in those 30 years than to one with lower earnings. For women with more than 30 years of positive earnings, the gain depends on earnings in the highest-earning 30 years relative to earnings in lower years.

balance between support at different stages in the lifecycle is to a considerable extent a matter of social values and politics, and hence a matter for each country to decide.

6.1.2. To what extent should paid work be encouraged?

Decisions about old-age security need to be considered alongside policy preferences about the balance between paid work and caring for children. The fact that some designs encourage paid work does not mean that paid work should necessarily be maximized. A central policy question is the balance between encouraging paid work on the one hand, and encouraging caring in the home on the other. The issue is controversial because answers depend both on social values and on hard-to-measure empirical magnitudes, such as the benefits of parenting and whether a stay-at-home carer does so out of choice or constraint.

Incentives to take paid work are stronger where subsidies for child care are conditioned on the caregiver being in paid work, and where taxation of secondary earners¹⁵ is lower. Incentives to take paid work are weaker where caregiving is recognized through a pension credit. In contrast, a child benefit paid independent of work (as is typical) has an income effect on labor supply but no substitution effect.¹⁶

The relative sizes of these elements determine the balance of incentives between paid work and caregiving. For example:

- The incentive to stay at home to care for children can be strengthened by making child benefits or pension credits, or both, available only to people with no (or little) earnings.
- To strengthen the incentive to take paid work, a subsidy for child care could be conditioned on working at least a minimum number of hours. Such a

¹⁵ The secondary earner is the spouse with the lower earnings.

¹⁶ By increasing parental income, the child benefit reduces the incentive to take paid work; however, the benefit has no effect on the net return to additional work, and thus creates no disincentive via the substitution effect.

subsidy encourages (i) the use of paid child care by those who earn income, and therefore (ii) the willingness to accept work.

- It is possible to separate the incentive to work from the incentive to use paid child care by changing the balance between (i) the child care subsidy, and (ii) lower taxes or higher pension credits for those working. Design can make part-time work more or less attractive relative to full-time work.

6.1.3. What should be the relative treatment of different types of families?

The balance between different instruments has distributional effects that are diverse and complex. A greater emphasis on pension credits or child benefits assists families with children relative to those without. A greater emphasis on lower taxation of secondary earnings benefits couples with children relative to single parents. Unless the lower taxation of secondary earnings is available only to those with small children, it does not match a pension credit. And a pension credit does not perfectly match a child care subsidy, since use of child care is not universal among those who work.

Potential distributional effects also arise between better- and worse-off families. For example, if pension credits go primarily to members of high-earning families (perhaps because they are the most likely to be able to afford to have someone not in paid work), the situation is very different from one where the credit goes primarily to low-income single parents, who would otherwise have very small pensions. Thus the case for a pension credit needs to be evaluated with a focus on who receives it and on the extent to which that fits policy makers' distributional objectives.

6.2. Central conclusions

This paper put forward three sets of arguments about gender and family issues in pension design:

- No unambiguously best design exists, but some designs are unambiguously bad.

- Policy should not focus only on the design of the pension system but should recognize the impact on eventual pension benefits of other policies, for example the taxation of earnings, subsidies for child care, all-day schools, and regulations about flexibility of work for parents of young children.
- The argument is not that women ought to work or ought to care for children; rather it is that tax and pension systems (and other policies) inevitably create incentives that affect decisions about paid work, care activities, and leisure and therefore should be chosen to reflect social values and individual preferences and constraints, all of which will differ within and across countries.

More concretely, pension design needs to be sensitive to the differing impacts on men and women. To that end it should:

- Consider what recognition is appropriate, and in what form, of years spent in socially valued activities such as caring for children, disabled people, and elderly dependents, balancing such recognition with incentives to participate in paid work.
- Set common rules for pension eligibility and determination.
- Require the use of joint life tables if the system includes mandatory annuitization.
- Ensure that satisfactory pension arrangements are in place for surviving spouses and after a divorce.

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ABSTRACT

This paper starts from the fact that women receive lower pensions than men on average, and considers policies to address that fact. Women typically have lower wages than men, a greater likelihood of part-time work and more career breaks, and thus generally a less complete contribution record. In addition, pension age may be lower for women and annuities may be priced using separate life tables for women. The paper looks at three strategic ameliorative policy directions: policies intended to increase the size and duration of women's earnings and hence improve their contribution records; policies to redirect resources within the pension system, including for survivors and after divorce; and ways of boosting women's pensions with resources from outside the pension system.

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