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TAXATION OF PENSIONS

AUSTRALIA'S RETIREMENT INCOME POLICY: MEANS TESTING AND TAXATION OF PENSIONS

GEORGE KUDRNA¹

Introduction

Most OECD countries rely on pay-as-you-go social insurance systems designed to provide certain living standards in retirement that correlate with pre-retirement income (OECD 2015). These earnings-related systems with defined benefits are usually accompanied by a basic flat-rate pension paid to each retiree or a minimum pension to prevent retirement income from falling below some minimum level. Australia's retirement income policy differs from this OECD prototype, consisting of a non-contributory and means tested public pension,² and a mandated private retirement saving scheme, known as the Superannuation Guarantee. These two publically-stipulated pillars are supplemented by voluntary private retirement savings.

Australia's multi-pillar pension system is considered among the best in the world. Mercer's 2015 Global Pension Index (Mercer 2015), which compares 25 countries' retirement systems in terms of sustainability, integrity and adequacy, ranks Australia's system third, behind those of Denmark and the Netherlands. The means tested public pension and increasing self-provision in retirement make the system relatively robust in coping with demographic change – making this a model for reforming other countries' social security systems facing large fiscal burdens. Nevertheless, the generous pension means testing and large tax breaks for superannuation (Australia's term for private pensions) have come under increasing scrutiny and are the main focus of this article.

In this article, we begin by discussing key features of Australia's retirement income pillars. We then focus on means testing of the age pension and the taxation of superannuation – introducing the policy design and considering economic implications of these two features of Australia's retirement income policy. Finally, the article closes with some concluding remarks on the advantages and shortcomings of the system and suggests several lessons to be learned for other countries.



The pillars of Australia's retirement income policy

Australia's retirement income policy consists of three pillars. The first is a mandatory, publically-managed "safety net" pillar comprising the age pension. The second pillar is also mandatory, but is a privately-managed Superannuation Guarantee scheme based on defined contributions made by employers. The third pillar consists of voluntary and privately-managed voluntary superannuation and other long-term savings. The main aspects of these three pension pillars are featured in Table 1 and discussed below.

First pillar - The age pension.

Since its commencement in 1909, the age pension has been a means tested payment, with eligibility for the pension based on age and residency, but not, like in many other developed countries, on work history. At present, a claimant for the pension must be in Australia at the time of application and have been an Australian resident for at least ten years. The pension access age is currently 65 years, but it will gradually increase to 67 years between 2017 and 2023.

The age pension is an expenditure of the federal government and thus financed through general tax revenues. It is benchmarked to wages, with the maximum rate set at 27.7 percent of male total average weekly earnings (MTAWE) for single pensioners and 41.3 percent for couples. To ensure it stays aligned with average standards of living, the pension rates are adjusted twice a year to the greater of the movement of MTAWE, consumer price index (CPI) or pensioner and beneficiary living costs index (PBLCI). Although the age pension

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² Means testing refers to targeting public pensions to seniors with limited private means. Note that the Australian *age pension* is assessed against both pensioner's private income and assets.

Table 1

Features of Australia's three pension pillars			
	Age Pension	Superannuation Guarantee	Voluntary Superannuation
Commenced	1909	1992	1850s
Residency	Yes (at least 10 years)	No	No
Access age	65, increasing to 67 by 2023	55, increasing to 60 by 2025	55, increasing to 60 by 2025
Coverage	Means tested (against both income and asset; owner-occupied housing fully exempt)	Employees aged 18–75 with earnings in excess of \$A450/month	Voluntary; tax incentives for contributions, subject to contribution caps
Funding	General tax revenues	Fully funded; individual accounts	Fully funded; individual accounts
Contributions	Non-contributory	Minimum employer contributions at 9.5% of gross wages (increasing to 12% by 2025)	Voluntary employer and personal contributions; government co-contributions
Benefits	Maximum single (couple) rate at 27.7% (41.3%) of MTAWE; indexed to wages	Mostly based on defined contributions; choice of lump sum, annuity or phased withdrawal	Mostly based on defined contributions; choice of lump sum, annuity or phased withdrawal
Other benefits/features	Pensioner supplement, rent allowance, concession card	Vested and portable, choice of fund by employees	Vested and portable, choice of fund by employees

Source: Author's compilation based on Bateman, Chomik and Piggott (2012) and Chomik and Piggott (2014).

is a taxable income, the availability of the Seniors and Pensioners Tax Offset (SAPTO) for senior Australians ensures that those receiving the maximum (part) pension pay no (reduced) income tax. In addition to this explicit pension taxation, the means test acts as an implicit tax for some pensioners due to a withdrawal of the pension benefit. The means test applies to both private income and assets, but is quite generous and fully exempts owner-occupied housing. It effectively excludes the top 20 percent of the age-eligible population from receiving any pension, but sees almost 50 percent of the population receive the full amount. More details on the means testing of the age pension are provided in the next section.

Second pillar - The Superannuation Guarantee.

The age pension and voluntary occupational superannuation were the only two pension pillars in Australia until the late 1980s. Despite multiple attempts, Australia has never implemented a national social insurance system similar to those in Europe and the US. The lack of retirement income combined with severe economic problems in the 1980s led to the federal government establishing the Superannuation Guarantee – legislated in 1992.

The Superannuation Guarantee (SG) is a compulsory retirement income scheme that pre-specifies a minimum amount of contributions to be made by employers on behalf of their employees aged 18 to 75 with earnings of

at least \$A450 in a calendar month. Mandatory contributions must be paid at least quarterly at the current rate of 9.5 percent of gross wages into individual accounts managed by employee-nominated private superannuation funds. Employers who fail to pay the mandatory contributions are subject to the SG charge, consisting of owed contributions plus interest and administrative costs. In 2012, the government legislated further increases in the mandatory SG rate, gradually increasing it to 12 percent of gross wages by 2025.

Third pillar - Voluntary superannuation.

Voluntary superannuation and other long-term savings (including housing) form the third pillar.³ Voluntary superannuation contributions can be made from before-tax and/or after-tax income. The former are known as concessional or employer contributions and the latter are called non-concessional or personal contributions. All contributions (including mandatory employer contributions) are portable and cannot be accessed until the statutory eligibility age is reached.

Superannuation funds place the contributions in individual accounts (after deducting the concessional tax from employer contributions) and invest them on behalf of individuals. Individuals can choose from a range of

³ Note that as pointed out by Bateman, Chomik and Piggott (2012), housing is the most important non-superannuation asset for most Australians, with over 80 percent of retirees being owner-occupiers, mostly with no mortgage.

investment strategies, including equities and cash. Fund investment earnings (net of the earnings tax) are added to superannuation assets that may be withdrawn upon reaching the statutory superannuation access age, which is currently 55 years, increasing to age 60 in 2025. Superannuation benefits can be taken out in the form of a lump sum or an income stream (annuity or phased withdrawal).

Since the introduction of compulsory superannuation, both superannuation assets and coverage have grown rapidly. Australia now has the fourth largest pension market in the world, with total assets amounting to over AUD 2 trillion in June 2015 or 125 percent of Australia’s GDP (APRA 2015). The total superannuation coverage has more than doubled since the 1980s, increasing to 94 percent of all employees (covered by compulsory and voluntary superannuation) by 2007 (ABS 2009).

al disregard of AUD 6,500 for labour income to boost the labour supply of older Australians. Beyond the disregard, the maximum pension is reduced at the taper of 50 percent for every extra dollar of assessable income.

The asset test also distinguishes between homeowners and renters, with the asset disregard being higher for renters who have a greater need to store savings. Beyond the disregard, the maximum annual pension is currently reduced by AUD 39 for every additional AUD 1,000 of assessable assets. At present, the income test applies to most part age pensioners, because the asset test has a large disregard. However, because the asset test has a steeper taper, it affects those pensioners with higher financial wealth. Nevertheless, the means test is fairly generous –as shown in Figure 1– in addition to their home, a couple can hold over AUD 1.1 million in combined financial assets and still receive some pension.

Means testing of the age pension

Means test design.

Many OECD countries have a means tested pension scheme, but Australia’s age pension is unusual in that it applies both the income and asset tests. Each test includes the following parameters: (i) the maximum benefit (that differs for single and couple pensioners); (ii) the disregard (income and asset thresholds up to which the maximum benefit is paid); and (iii) the taper (rate at which the pension benefit is withdrawn). The pension benefit paid to an eligible individual or household is then determined by either the income or asset test that results in a lower pension amount.

The pension payments due to the income and asset tests for different household types are plotted in Figure 1. Under the income test, a single pensioner with annual private income of up to AUD 4,212 (the income disregard) receives the maximum annual pension of AUD 22,542. There is an addition-

Figure 1

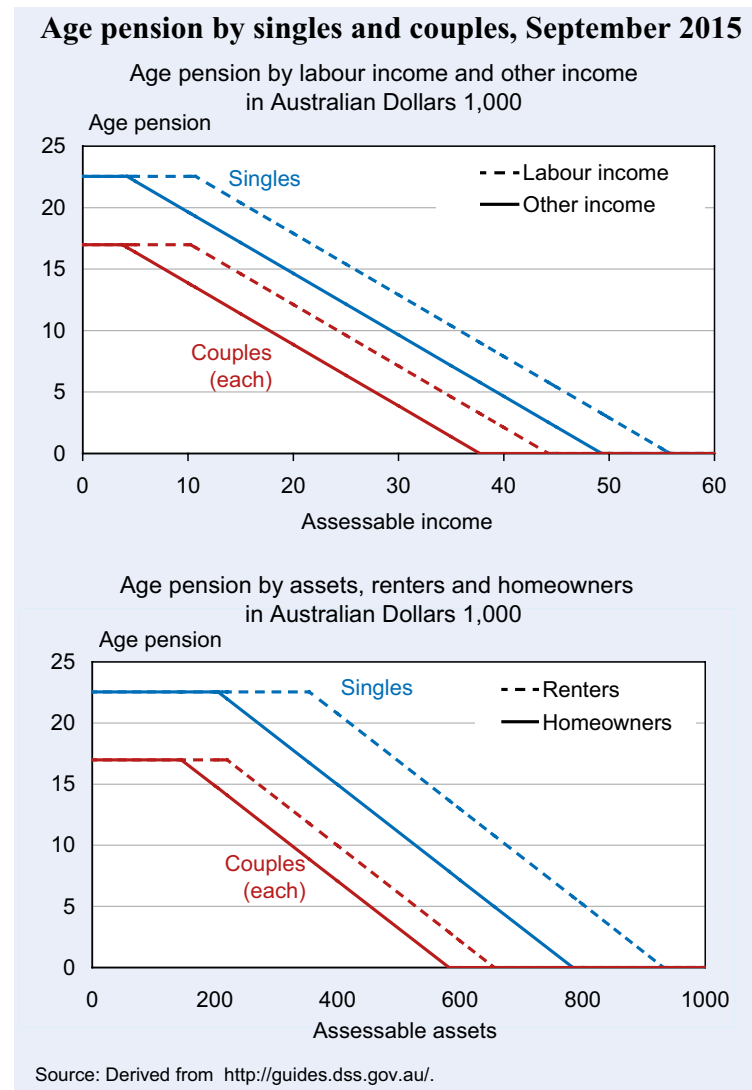
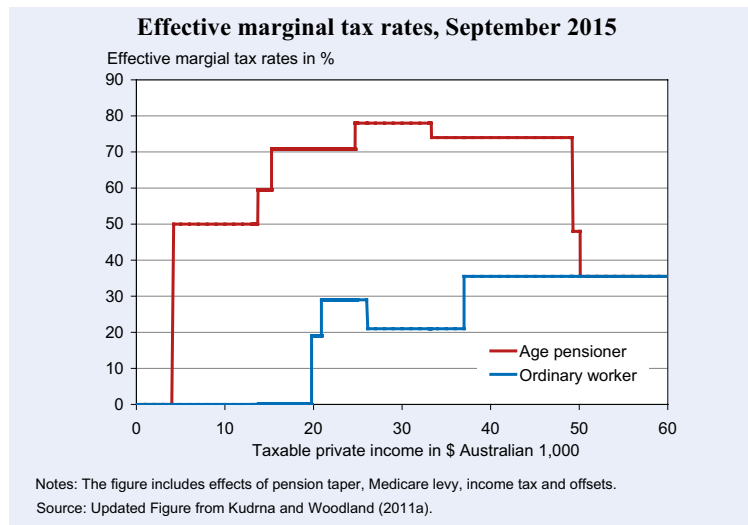


Figure 2



Economic effects.

The means testing of public pensions is often criticised for the high effective marginal tax rates (EMTRs) generated by a withdrawal of the pension benefit. As illustrated by Figure 2, EMTRs in 2015 for single senior Australians are substantially higher than for non-seniors over a wide range of lower incomes. More specifically, as soon as the private income exceeds the income disregard, the EMTR for a single senior Australian is 50 percent (given by the income taper). The EMTR climbs up to 78 percent for a narrow income range. As shown by Kudrna and Woodland (2011), the age pension means test represented a significant labour supply disincentive, but only for some older Australians affected by high EMTRs.

It is important to realise that in addition to high EMTRs for some seniors, means testing reduces public pensions, thus also providing incentives for life-cycle labour supply and savings. Furthermore, while a more aggressive taper generates higher EMTRs, it affects a smaller proportion of the eligible population than a shallower taper. Finally, the tax on workers to finance a means tested programme is much lower than in countries with a universal pension programme. These points highlight important trade-offs between EMTRs, the number of people affected by means testing, and other explicit taxes in the economy.

Kudrna (2015) investigates the impact of further tightening the taper and extending the labour income exemption. Motivated to examine extensions of the 2009 age

pension reform, Kudrna showed that further increases in the taper would have positive effects on aggregate labour supply and asset accumulations, as well as on long-term welfare. These effects are mainly due to the reduced income taxes needed to support a pension with tighter withdrawal rates.⁴ Relaxing the income test for labour income has a much smaller aggregate effect compared to increasing the taper, but importantly, the policy has largely positive effects on the labour supply at older ages.

To contain increasing pension expenditure and to more effectively target pension benefits to those in need, the Australian government has recently legislated to tighten the asset test by doubling the asset taper from 2017 onwards.

Taxation of superannuation

Superannuation tax treatment.

Tax concessions for private pensions are common among OECD countries. Most member countries employ an expenditure tax approach that exempts contributions and fund earnings from any taxation, but taxes benefits progressively as regular private income. By contrast, Australia taxes superannuation under a comprehensive income tax regime, which sees contributions and fund earnings taxed (at concessional rates), but benefits as generally tax-exempt. However, as shown in Table 2, the existing superannuation taxation is more complex than the simple description provided above.

The tax treatment of contributions differs by their type, amount and tax payer's income. Before-tax contributions that include mandatory and other employer contributions made from gross wages are tax deductible to employers (or self-employed) and are taxed at a concessional rate of 15 percent by superannuation funds. The concessional tax rate for high income earners is 30 percent, and low earners with AUD 37,000 p.a. or less effectively pay no tax on before-tax contributions. Both before-tax and after-tax contributions are subject

⁴ Similar results were obtained by Kumru and Piggott (2009) who examined tightening the taper of the means tested pension in the UK.

Table 2

Taxation of Australia's superannuation		
Contributions ^{a)}	Fund earnings ^{b)}	Benefits ^{c)}
<p><i>Before-tax contributions</i> (all employer and self-employed tax deductible contributions): taxed at 15% or 30% for those with annual income > \$A300,000; Excess contributions taxed at 49% applied above allowable annual limits of \$A30,000 for those aged <49 and \$A35,000 for those 49+.</p> <p><i>After-tax contributions</i> (personal, spouse and child contributions): no tax payable up to allowable limit of \$A180,000 p.a. or \$A540,000 in a three-year period. Excess contributions taxed 49%.</p> <p><i>Government co-contributions</i> (available for low/middle income earners with annual income < \$A50,454): No tax payable.</p>	<p><i>Interest income:</i> Taxed at 15%.</p> <p><i>Dividend income:</i> Taxed at 15% less imputation credits.</p> <p><i>Foreign source income:</i> Taxed at 15% less credits for foreign tax paid.</p> <p><i>Realised capital gains:</i> Taxed at 15% or 10% for assets held >12 months</p> <p><i>Retirement benefits:</i> Tax free earnings generated by underlying assets if minimum drawdown requirements satisfied.</p>	<p><i>Benefits taken by 55-59:</i> <i>Lump sums:</i> Taxed at 17% above tax free threshold of \$A195,000.</p> <p><i>Income streams:</i> Taxed at marginal income tax rate less 15% tax rebate available.</p> <p><i>Benefits taken from age 60</i> <i>Lump sums:</i> Tax free <i>Income streams:</i> Tax free</p>
Notes: ^{a)} Taxation differs by type of contribution, amount and income; ^{b)} Taxation differs by type of income and retirement phase; ^{c)} Taxation differs by age and benefit type.		
Source: Updated version of Bateman and Kingston (2007).		

to caps, with excess contributions being taxed at the top marginal income tax rate of currently 49 percent. The statutory tax rate on fund earnings is 15 percent, but the effective earnings tax rate of average fund is about 7.5 percent because of imputation credits and the capital gains tax discount. In the drawdown stage, earnings generated by the asset supporting an income stream are tax-free. Since 2007, superannuation benefits (both lump sum and income streams) withdrawn by those aged 60 and over are tax-exempt.

Sustainability and equity concerns.

Australia has one of the lowest public pension expenditure levels among developed economies, with the government spending on the age pension currently at 2.9 percent of GDP, rising to 3.6 percent of GDP by 2055 (Australian Treasury 2015a).⁵ However, the tax breaks for superannuation (private pensions) in Australia are larger than in any other OECD country (OECD 2015). According to the Australian Treasury (2015b), the size of superannuation tax concessions measured in terms of foregone revenue was AUD 29.7 billion or 1.9 percent of GDP in 2014-15 – growing at an annual rate of

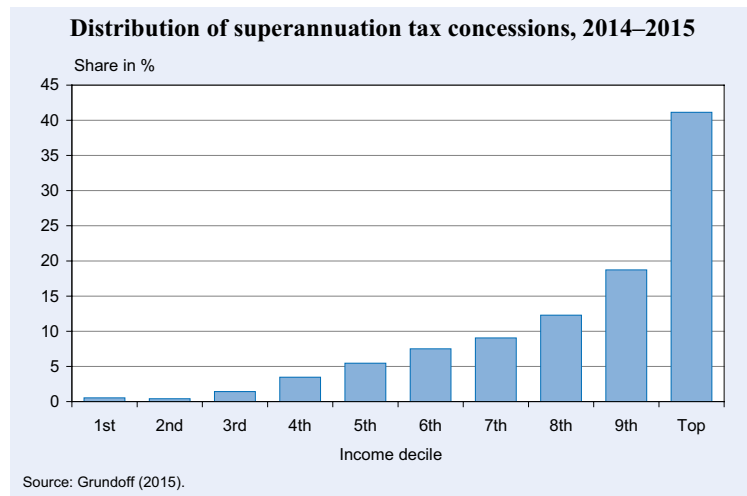
13.6 percent (which is three times faster than spending on the age pension). The treasury forecasts that superannuation tax breaks will grow to AUD 49.5 billion by 2017-19 – exceeding the age pension cost in 2018-19.

The distribution of superannuation tax concessions is an even more pressing issue. According to the Australia Institute (Grudnoff 2015), the wealthiest ten percent of households receive 41 percent of the tax concessions, while the bottom 50 percent of households only get 11 percent of the tax concessions (see Figure 3). Taking into account the age pension, the level of this combined support is more equally distributed (AIST Mercer 2015), but the largest recipients are the top one percent of households with a total government support of AUD 650,000 over their working life (more than double the amount received by a median earner).

Although superannuation balances have increased significantly over the last decade (due in part to tax concessions), with the average balance reaching AUD 76,424 in 2014 (Clare 2015), the superannuation system is still in a transition stage. Once it matures, mandatory contributions together with the age pension are expected to generate a replacement rate well over the OECD benchmark of 70 percent for the full carrier worker on average earnings. However, individuals with broken work pat-

⁵ This compares to an average public expenditure of 7.9 percent of GDP on old-age and survivors benefits across the OECD countries (OECD 2015).

Figure 3



terns, including women, will have much lower retirement incomes. As shown in Figure 4, in 2013–14 women aged 60–64 held, on average, AUD 138,154 in their superannuation compared to the average balance of AUD 292,510 held by men in the same age group. The superannuation gender gap has increased over the last decade partly due to an increasing gender wage gap, but also due to the superannuation taxation that provides large tax breaks for high earners who are, on average, men.

Proposals and reforms.

A recent review of the Australian tax system (Australia’s Future Tax System (AFTS) 2010) recommended a progressive taxation of contributions, a reduced tax on fund

earnings and a flat-rate contribution rebate. The proposal effectively represents a switch to a pre-paid expenditure tax approach, with the taxation of contributions linked to the progressive income tax schedule. Using a model-based analysis of the AFTS proposed reforms, Kudrna and Woodland (2015) showed significant improvements in vertical equity, as well as increased private savings and reduced government expenditure on the age pension.

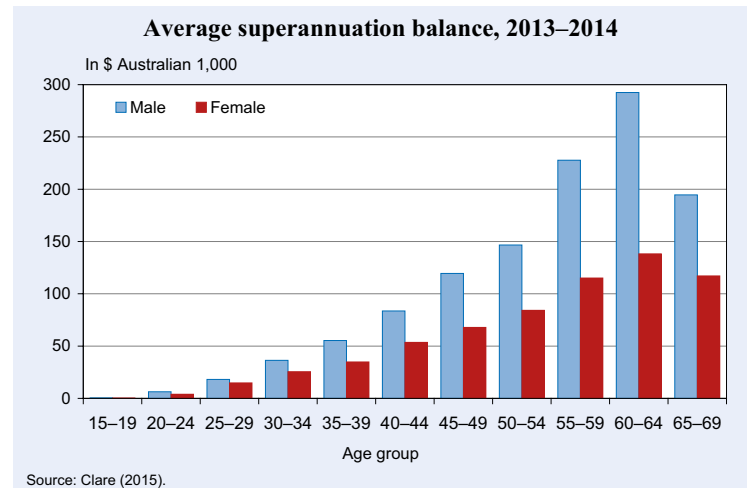
The changes proposed by AFTS (2010), however, were ignored by the government. Instead, in 2012, the government legislated

a reform that included gradual increases in mandatory contributions to 12 percent of gross wages and effectively a removal of the 15 percent concessional tax for low income earners. It is worth noting that the latter component of the reform is being phased out, and from 2017 onwards low income earners will pay the 15 percent tax on employer contributions, making the distribution of superannuation tax concessions even more uneven.

Conclusion

This article described and assessed Australia’s retirement income system, focusing on the means testing of the public age pension and the taxation of pre-funded superannuation. Most commentators have an overwhelmingly positive view of the Australian pension system because it is above all highly sustainable. In terms of sustainability, the system has one of the lowest pension costs in the OECD – largely due to the flat-rate age pension and the uncommon feature of means testing both income and assets. In addition, it rates relatively well on the accumulation side, as well as increasing self-provision in retirement – all of which limits future growth in public pension expenditure and has positive effects on household and national savings. In relation

Figure 4



to adequacy, the replacement rate is currently below the OECD average, but is expected to increase with the maturity of the superannuation system and eventually exceed the OECD benchmarks – another eventual positive of the system.

However, a key shortcoming of the Australian pension system is the existing taxation of superannuation, which is complex, inequitable and exposed to political risk. Superannuation tax concessions are expensive, mainly benefit high income earners and create unfairness in the system in relation to lower income earners and women. One suggestion to address this inequity, reduce complexity and limit political risk would be to adopt the AFTS (2010) proposal with superannuation contributions taxed in the hands of individuals under the progressive income tax schedule. Another issue, which is not addressed in this article, relates to the decumulation stage of superannuation. In the absence of compulsory annuitisation of superannuation savings and low demand for private annuities, together with high uptake for lump-sum payouts, the superannuation system fails to cover longevity and inflation risks.

So the lessons for any developed country looking to reform its pension system are that: (i) adopting means testing can significantly assist in keeping pension expenditure (and the taxes on workers required to fund a means tested pension) modest as the population ages; and (ii) the use of means testing should exempt earned income to encourage labour force participation among older workers; but (iii) the application of tax concessions for private pensions should be considered carefully to ensure that they are equitable across the range of incomes.

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TAXATION OF PRIVATE PENSIONS IN THE UK¹

CARL EMMERSON²

Introduction

Private pension saving is a key component of retirement saving in the UK. The most recent data available shows that four-tenths of private household wealth is held in private pensions. Among those aged 55 to 64 nearly 73 percent had accumulated some private pension rights, with the median holding among those with some pension rights being £149,300 (Office for National Statistics 2015).³ This is partly explained by the fact that holding savings in pensions is, on average, tax favoured relative to other saving vehicles. The fact that large amounts are placed in private pensions also makes it important that the tax treatment of such savings is well-designed.

This paper starts by briefly setting out the economic principles of what a neutral tax treatment of saving would look like. The following section describes current UK practice, and particularly highlights where it departs from a neutral system. The subsequent section considers some reform options, and the last section offers some conclusions.

Principles

There are, in general, three obvious points where pension saving could be subject to personal taxation: firstly, before income is paid into a pension; secondly, as any returns accrue; and thirdly, when the pension is drawn.⁴

¹ The author would like to thank Stuart Adam, Paul Johnson and Gemma Tetlow for their useful comments. Funding from the ESRC Centre for the Microeconomic Analysis of Public Policy at IFS (grant number RES-544-28-5001) is also gratefully acknowledged. This paper draws on Emmerson (2014). Responsibility for any errors is that of the author alone.

² Institute for Fiscal Studies.

³ Data from the 2012 to 2014 wave of the Wealth and Assets Survey (Office for National Statistics 2015).

⁴ Other taxes – such as corporation tax, inheritance tax, stamp duties on purchases of shares and property – might affect pension returns, but are beyond the scope of this paper.

One option, which has been advocated by (among others) Meade (1978) and Mirrlees (2011), is to give tax relief on contributions to pensions, to levy no personal tax on returns as they accrue, and for income from pensions to be subject to tax. This is known as an EET (Exempt, Exempt, Taxed) regime. This type of treatment neatly achieves two objectives:

Firstly, it ensures that, at the personal level, only excess returns to savings are subject to tax: if higher returns are generated, a greater amount of tax will be paid on the eventual pension income.

Secondly, it means that individuals who are subject to a higher rate of income tax during part of their working life, but subject to a lower rate of income tax in retirement, are able to smooth their income so that they need not end up paying more tax over their lifetime than an otherwise-equivalent individual who receives the same lifetime income in a less variable way.

An EET regime is not, however, flawless. Those who expect to face a lower marginal rate of income tax in retirement than they do at the moment will have their incentive to save distorted by the tax system: they will be incentivised to spend less today and to spend more in retirement than they otherwise would do.

The starting point for the tax treatment of savings should be not to cause any distortion between spending today instead of saving and spending in future. But if all savings were taxed in such a way, the tax system would provide no incentive to save in a private pension. Therefore if public policy wants individuals to choose to lock away their savings until they retire, then it could be appropriate to have a more generous tax treatment of private pension savings than the benchmark EET system. Any such bonus should be tailored to the problem it is trying to solve. There seem to be two main concerns discussed that such a bonus might seek to address. Firstly, there is a potential concern that individuals would otherwise actively choose to save too little from society's point of view because of the presence of means-tested benefits. If this were a problem, then it would make sense to target the incentive towards those who would otherwise be likely to end up on means-tested benefits in retirement.

A second potential concern is that individuals might be saving too little from their own point of view. If this were the case, then it would make sense to target any incentive towards potential undersavers. In both cases, the incentive should be designed in a way that encourages individuals to respond to it and it should potentially only be targeted towards those who are actually likely to respond.

Current UK practice

The UK's income tax and capital gains tax regime for pensions closely resembles the EET regime described above. Contributions are made free of income tax, investment returns accumulate free of income tax and capital gains tax, and the pension in payment is subject to income tax. There are three obvious ways in which UK practice deviates from a pure EET treatment: limits on the amounts that can be contributed to and held in private pensions, the presence of a tax-free lump sum and the treatment of pension savings by the system of National Insurance contributions (NICs).

Limits

There are two limits that apply to private pension contributions. Firstly, individual contributions (i.e. not including those formally made by an employer) in a single year are not allowed to exceed the greater of 100 percent of an individual's earnings in that year, or £3,600 if their earnings are below this level. Secondly, tax relief is given on private pension contributions (both individual and employer) up to an annual limit, known as the annual allowance. In 2016–17 for most individuals this is set at £40,000 (lower than the £255,000 annual limit that was in place in 2010–11). Rather oddly, the small number of individuals with an annual income (including pension contributions) in excess of £150,000 (and a taxable income above £110,000) have a lower annual limit of just £10,000 for those with an income in excess of £210,000 (those who have accessed their pension also have a reduced annual allowance). Individuals are allowed to make use of any unused allowance from the previous three years, as long as they were a member of a scheme in those years. This means that, for many, the annual allowance will eventually effectively become a £160,000 limit over a rolling four-year window.

There is also a cap on the total amount that can be accumulated in a private pension, known as the lifetime limit. In 2016–17 this is set at £1 million (down from £1.8

million in 2010–11). To get a feel for how big a £1 million pension pot is, it is worth noting that a single man aged 65 with a pension pot that size could, at current annuity rates, take a tax-free lump sum of £250,000 and receive an annual pension pegged to inflation (as measured by the RPI) of about £28,500 (or an annual pension fixed in cash terms of about £44,000).⁵ On their own, these caps on contributions mean that some retirement savings are less generously treated than the benchmark EET treatment.

Tax-free lump sum

A quarter of the accumulated pension balance can be withdrawn as a lump sum free of income tax. The result is that a quarter of contributions are effectively subject to a very generous EEE treatment for income tax purposes. This means that someone who accumulated £1 million in a private pension would be able to receive £250,000 that had escaped income tax altogether: it would be taxed neither when it was earned nor when it was withdrawn from the pension.

National Insurance contributions

The NICs regime for pensions is quite different from the income tax regime. With employee contributions there is no relief on contributions for NICs and no NICs are payable on pension income (TEE treatment). However, employer pension contributions are treated extremely generously: they are excluded from earnings for both employer and employee NICs – total NICs relief of 22.7 percent for those earning below the upper earnings limit (£827 per week from April 2016) – while the pension income they generate is not subject to NICs either (EEE treatment). Employer pension contributions are the only major form of employee remuneration that escapes NICs entirely and make up roughly three-quarters of all pension contributions.

Cost of UK pensions tax relief and who benefits

The figures produced by the UK government suggest that the net cost of pension relief provided by income tax and NICs in 2013–14 was £35.2 billion. However, this takes the total cost of upfront tax relief, adds the cost of not taxing returns, and nets off the amount of tax

⁵ For someone in a defined benefit pension arrangement, a £250,000 lump sum and an annual RPI-linked pension of £37,500 – almost one-third higher than the maximum defined contribution pension – is deemed to be equivalent to a pension pot of £1 million (since defined benefit pension schemes are deemed to have a pot size 20 times the annual pension).

paid on pension income. In other words, it is an attempt to estimate the cost relative to a TTE tax regime, which is one in which individuals are not able to benefit from tax-rate smoothing and where the system encourages individuals to spend rather than to save.⁶ A better estimate (i.e. relative to a benchmark EET regime) would be the cost of NICs relief – estimated at £14.0 billion – plus the cost of the tax-free lump sum, which might be around £2.5 billion a year.⁷ This suggests that the true cost of income tax and NICs relief could be less than half the official estimate.

In addition, official estimates offer no analysis of how pension tax relief is distributed relative to the EET benchmark, although the tax-free lump sum and the lack of NICs on employer contributions will probably mean that the lifetime rich will, on average, see their pension contributions more generously treated than lower-income individuals will.

Options for reform

The starting point for those looking to reform the tax treatment of pensions in the UK should be to look at the elements that depart from the benchmark EET system and consider whether those departures are well-designed.

Bearing this in mind, a coherent reform of the current system could move in the following direction:

First: Increase the contribution limits. This would extend the amount of savings that could receive the benchmark EET tax treatment. A sensible priority would be to increase the annual allowances (or to extend the four year period of roll-over) since, for a given amount of lifetime contributions, this disproportionately falls on those who happen to want to make lump-sum pension contributions over their working lives, which is difficult to justify. Furthermore, just as all individuals have the same lifetime limit, it would also be sensible for most to have the same annual limit – i.e. not to limit individual contributions to the greater of £3,600 or 100 percent of

earnings, and not to have a lower annual limit for those with an annual income over £150,000.⁸

Second: Cap the tax-free lump sum. The tax-free lump sum means that individuals can get EEE income tax treatment on up to one-quarter of their pension fund (which can be up to £250,000). While the tax-free lump sum may be relatively transparent and well-understood, it is far from clear why those with, for example, almost £1 million already accumulated in a pension pot, should receive a subsidy on additional pension saving: they will not be reliant on means-tested benefits in retirement and they are relatively unlikely to be undersaving. Limiting the size of the tax-free lump sum would be an obvious improvement.

Third: Levy NICs on employer contributions. This is an opaque subsidy that is difficult to justify. The lack of employer NICs on employer pension contributions is forecast to cost £10.0 billion in 2015–16. Even if this were ended, it would still leave employer contributions free of employee NICs (and charging these on employer contributions would be more complicated in defined benefit arrangements). Therefore it might be better to move towards providing NICs relief on all pension contributions (i.e. employee as well as employer) and levying NICs on all pension income. This would move the NIC system towards EET treatment and help harmonise the operation of NICs and income tax. Implementing this reform slowly over time would help reduce the extent to which it represented retrospective double taxation (that is, by levying NICs on pension income, despite having already levied NICs on employee contributions to that pension, undermining the legitimate expectations of those who have saved up to now).

The UK government is currently considering how to respond to a consultation on reform to the tax treatment of pension saving (HM Treasury 2015). A response is expected in the March 2016 budget. Unfortunately, none of the reforms suggested above appear to be likely outcomes: if a major reform is implemented, it seems likely to take one of two forms (Cumbo and Barret 2015):

First: Moving to a system whereby individuals all receive the same rate of up-front relief on their contributions (i.e. regardless of whether they are a basic, higher or additional rate income taxpayer). Such a reform

⁶ In addition, rather than deduct the income tax that is expected to be paid on the pensions of today's working age population, the calculation deducts the income tax raised on pensions currently in payment. The former is likely to be significantly greater not least due to growth in the number of pensioners.

⁷ The government previously estimated the total cost of the tax-free lump sum at around £2.5 billion (in 2009–10), but no longer produces an estimate.

⁸ A reduced limit for those who have already started to draw their pension might still be appropriate in order to limit the ability of individuals to recycle pension income back through a pension in order to qualify for more tax-relief.

would be misguided, as it considers the tax treatment of pension contributions in isolation from the tax treatment of the pension income they finance. It is hard to see how it can be unfair for higher-rate taxpayers to receive 40 percent relief when basic-rate taxpayers receive 20 percent relief, yet at the same time not be unfair for higher-rate taxpayers to pay 40 percent tax on their pension income when basic-rate taxpayers pay only 20 percent. It is, of course, true that many of those receiving relief at the higher rate will only pay basic-rate tax in retirement. However, such individuals are simply smoothing their taxable income between high-income and low-income periods, undoing the ‘unfairness’ that an annually-assessed progressive tax schedule creates by taking more tax from people whose incomes are volatile than from people whose incomes are stable.⁹

Second: Moving to a system where up-front relief is not given on any pension contributions, but pension income is completely untaxed when received (a TEE regime, equivalent to what the UK has for saving in Individual Savings Accounts and owner-occupied housing). While this regime (like a pure EET regime) would have the desirable feature of leaving the normal return to saving untaxed, it would have the undesirable feature of also leaving any returns in excess of this untaxed. Furthermore, it would not allow individuals to benefit from tax-rate smoothing.¹⁰

It is also possible that the current system will be retained. This option has explicitly been left open by the government and, while not the best possible option, it could be preferable to the two options set out above. However, one significant risk with retaining the current system is that it has not proved to be particularly durable, and the direction of recent reforms might suggest that the pension contribution limits could be further reduced in the future. Such a change would continue to be a move in the wrong direction.

⁹ Even if receiving higher-rate relief and then paying basic-rate tax is seen as unfair, that does not diminish the case for accompanying any restriction of tax relief on contributions with a restriction of the tax on pension income. The tax system should treat pension contributions and pension income in a symmetric way.

¹⁰ In addition, it would bring forward in time a substantial amount of income tax receipts (£27.0 billion extra would have been raised in 2013–14), but at least half of this would represent revenue being brought forward, rather than genuinely additional revenue (in the same year income tax levied on pension income raised £13.1 billion and growth in the pensioner population would be expected to increase this over time). This raises a concern that, with a tendency to focus on the short-term indicators of the health of the public finances, the Chancellor – or one of his successors – might inappropriately spend rather than bank this temporary windfall.

Conclusions

The UK’s income tax and capital gains tax regime for pensions is closest to an EET regime that has many attractions. Deviations from this regime include the presence of a tax-free lump sum and the fact that employer contributions escape NICs entirely. These come at a considerable cost in terms of foregone tax revenues.

There may be good reasons for using the tax system to encourage people to save a certain amount in a private pension. However, a reform package that included restrictions of the size of the tax-free lump sum, and placing at least some NICs on employer pension contributions, would be very welcome. It would reduce the subsidy to pension saving and ensure it was better targeted at encouraging individuals to save sufficiently, so they are not reliant on means-tested benefits in retirement and getting those who would otherwise undersave for retirement to save more. Raising the annual allowance – which penalises those who would otherwise like to make lump-sum pension contributions – and setting it at the same level for all individuals would also be a step in the right direction. Unfortunately, reforms of this kind do not appear to be on the agenda.

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TAXATION OF PENSIONS IN PORTUGAL: A SEMI-DUAL INCOME TAX SYSTEM

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Introduction

The Portuguese personal tax reform in 1989 established a comprehensive, progressive and unitary personal income tax system. Since then, the system has evolved gradually towards a semi-dual income tax system with certain categories of income exempt from taxation and/or subject to flat nominal withholding tax rates as a result of a number of tax reforms. The semi-dual income tax combines a highly progressive tax schedule for labour and pension income with low and flat nominal tax rates on some forms of capital (personal and corporate) income. The departure from a comprehensive, progressive and symmetric income tax system is justified by arguments of international tax competition, capital mobility, economic efficiency, the special role of savings, equity, neutrality and risk-sharing considerations, pension system sustainability and adequacy issues, the need to increase saving for retirement, administrative simplification, growing fiscal constraints, high unemployment levels, the need to attract foreign direct investment, the challenges of European integration and globalisation, off-shoring and disintermediation, or simply difficulties in assessing taxpayers real income.

Despite numerous parametric reforms undertaken in recent decades, the latest as part of the “Troika” bailout programme, the Portuguese pension system continues to be dominated by a mandatory PAYG earnings-related defined benefit public scheme, comprising two separate, but convergent schemes, with voluntary occupational and personal funded scheme still playing a minor role in funding retirement income. Recent studies show that the systems continue to be unsustainable and will

deliver inadequate income in retirement (Bravo, Afonso and Guerreiro 2013, 2014), unless a significant increase in the coverage and funding levels of private pension schemes takes place. The country was hit particularly hard by the economic and financial crisis and was compelled to cut pensions in payment and to reduce available incomes for older people through tax increases and temporary changes to the indexation of benefits. Tax relief for some retirement saving vehicles has either been capped by a given amount or simply eliminated. Some of the major occupational private pension schemes were incorporated into social security. This paper motivates and reviews the current semi-dual tax treatment of Portuguese pensions and other retirement income, highlights its particularities, and discusses whether it can contribute to the pension system’s long-term goals and challenges.

A brief overview of the Portuguese pension system

The Portuguese pension system combines a dominant mandatory PAYG earnings-related defined benefit public scheme, comprising of two separate, but convergent schemes, with incipient voluntary occupational and personal funded schemes, and covers only 3.7 percent of the country’s workforce. The funded pillars are privately managed and provide benefits based on individuals’ contributions and investment returns. Additionally, the public system includes non-contributory, means-tested pension benefits and top-up minimum contributory benefits, fully funded by general taxes. Contributory pensions are financed on a PAYG basis by social contributions, paid both by the employer and employee, complemented by a small fraction of the VAT tax. Contributions to private schemes are elective, separate from the regular social contribution and made mostly by employers. There is a Social Security Reserve Trust Fund (FEFSS), which currently manages around EUR 14,000 million in assets, which is financed through a fraction of social contributions. Public (private) pension schemes grant old age, early retirement, disability and survivors (DC/DB) pension benefits. In 2014, total pension expenditure accounted for 15.7 percent of GDP and almost 75 percent of all social security expenditure. Average annual old-age pension amounts to EUR 5,098

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(16,111) for those in the private (public) sector. The current benefit ratio is 70.8 percent (54.9 percent) for male (female) pensioners, but is projected to decline significantly as a result of recent pension reforms and pension indexation rules. Occupational pension schemes grant benefits in the form of lump sum (maximum 1/3) and annuity payments. Although the saving rate is quite low (6.9 percent of disposable income in 2014), private pension saving schemes exist (e.g., in the form of individual acquisition of open pension units) and were very popular in the past due to generous tax incentives. In recent years Portugal has implemented numerous (temporary and permanent) parametric pension reforms (e.g., nominal benefit cuts, introduction of a sustainability factor, increase in the retirement age, new indexation mechanism) aiming to reduce public pension expenditure with little margin to address income adequacy concerns in an already very aged society. Policy (including fiscal) initiatives were driven by the short-term need for fiscal consolidation, rather than by a long-term prospect for the design of pension systems.

Taxation of pensions in Portugal

In this section we provide a concise analysis of the current tax treatment of pensions and retirement benefits in Portugal and how it compares in international terms. Before that, we briefly discuss the main alternative approaches to taxing pension income.

Basics of pension taxation regimes

The taxation of pensions involves three cash flows that can be taxed and the timing of taxation. Pensions can be (totally or partially) taxed (T) or exempt (E) at the point when employees and employers contribute or save to the pension scheme or savings vehicle, when asset returns (interest, capital gains or the equivalent gains in a PAYG system or distributable profit) arise, or when pension income is withdrawn. Given the three possible cash flows and timing points at which it is possible to charge taxes, a wide range of tax regimes can be found internationally. In a *pure* Schanz-Haig-Simons (SHS) *comprehensive income tax system*, all (or most) net cash income is added up and subjected to a common (usually) progressive tax schedule.² Accordingly, savings consisting of taxed earnings and accrual returns on accumulated funds are also subject to an income tax. In return, the withdrawal of assets from such saving vehicles is fully

exempted from taxation. Such arrangements are known as TTE schemes. This method of taxation discriminates in favour of current consumption and acts as a disincentive to (particularly long-term) saving. In a *pure* Fisher-Kaldor-Meade (FKM) *expenditure tax regime*, only consumption is taxed. Accordingly, both funds contributed and investment income and capital gains accrued in the savings vehicle are exempted from taxation. In return, benefits are treated as taxable income upon withdrawals and, thus, taxation is deferred to the payout phase. This is known as an EET or *tax deferral regime*. Contrary to SHS tax systems, EET systems achieve fiscal neutrality between current and future consumption and create incentives to save for retirement.

As a compromise between progressive SHS and expenditure tax systems, several countries have adopted a *dual income tax* (DIT). The DIT is a particular form of schedular tax that applies a separate (generally lower) flat tax rate to all (personal and corporation) capital income and a progressive tax schedule to the sum of the taxpayer's income from other sources (e.g., labour and pension income). Tax credits and deductions are used to enhance horizontal and vertical equity. *Semi-dual income tax systems* levy different nominal tax rates on different types of capital income. A semi-dual income tax (SDIT) system is a particular form of schedular tax that levies different flat rates to some forms of capital (personal or corporate) income, while maintaining a progressive tax schedule on other sources of income. Finally, under a *flat tax system* a proportional (flat) tax rate is levied on all net income.

Taxation of public pensions

The general taxation regime of public pension schemes in Portugal may be classified as EET for employees and employers. Employer and employee contributions to public pension schemes are not taxed. Employer contributions are considered part of the payroll, and therefore deductible in computing the corporate income tax (CIT), whereas employee contributions are deductible for personal income tax purposes. Tax relief is unlimited and applied at the individual's/family marginal income tax rate. Public pensions are funded on a PAYG basis and partially financed by the general government budget (non-contributory benefits) and, hence, there are no returns on investments that could be subjected to, or exempted from, taxation. Notional capital (i.e., increases in pension entitlements through the revalorisation mechanism of contributions, indexed to productivity gains and inflation) are entirely tax-free.

² For a detailed analysis on the main approaches to taxing personal income see, e.g., OECD (2006).

Table 1

Overview of the taxation of public pensions in OECD countries

Tax regime	Country	Pension taxation regimes
E-E-T	BE, DK, EE, FI, GR, IT, LT, LU, AT, PO, SE, CH, SI, ES, CZ, CY, PT	Expenditure tax model, pension benefits treated as “deferred labour income“
t-E-T	FR, IR, CA, MT, NL, UK	Deferred comprehensive income tax model with double taxation relief
t-E-t	DE, US	Fragmented expenditure tax model
T-E-E	LI	Tax-free savings accounts, “prepaid expenditure tax model“
t-E-E	HU	Tax-free savings accounts, “reduced prepaid expenditure tax model”
E-E-E	SK	Full income tax exemption
T-T-E	None	Comprehensive income tax model

Source: Adapted from OECD (2011) and Wellisch et al. (2008).

On the tax treatment of pensioners, public pensions are considered as deferred labour income and treated as pension income and taxed at the individual’s marginal income tax rate. The first EUR 4,104 of pension income is tax exempt regardless of its source. However, an extraordinary solidarity contribution (CES), introduced in 2011 and expanded as part of the “Troika” bailout programme, is paid on pensions above a certain amount. It also applies to private pensions and annuities paid by occupational pension plans. According to the Portuguese Personal Income Tax (PIT) system, Portuguese residents are taxed through IRS on their worldwide income on a self assessment basis and non-residents are subject to Portuguese tax on their Portuguese-sourced income at the applicable rates. Tax deductible expenses (e.g., contributions to retirement saving vehicles) are capped by an income-related global tax deduction amount. Total taxable income is subject to highly progressive tax rates, but contains a substantial zero-bracket amount that resulted in only relatively high levels of labour income being subject to the higher progressive tax rates.³ As of 2015, there are five income bands with tax rates ranging from 14.5 to 48 percent (11.6 to 38.4 percent in the Azores islands). A 3.5 percent *additional surcharge* for PIT was introduced in September 2011 and is levied on annual taxable income exceeding EUR 7,070. For taxpayers in the top bracket, a 2.5 to 5 percent *Additional Solidarity Surcharge* is also levied. The progressivity of the tax system and the overall tax burden of households, particularly retirees, have significantly increased in recent years as a result of the 2013 PIT tax reforms that reduced the number of tax brackets, increased marginal tax rates and created surcharges.

³ Families with annual income below EUR 8,480 are PIT exempted. In 2015, about 2.5 million pensioners (circa 83 percent of total) will be exempt from PIT.

Since 2015, labour and pension income have been treated equally, with the same PIT rates and deductions. By international comparison, the income threshold for the top bracket is one of the highest in OECD countries (together with Sweden and Denmark). Recent tax reforms have promoted a systematic differential treatment of investment income from income derived from other sources by using a common flat tax. To create a unified system that respects differences in the international mobility of income, tax rates applicable to income earned by residents and non-residents were made equal, with the exception of the regime for non-habitual tax residents detailed below. The semi-dualisation of the system aims to promote simplicity and stability. The general taxation regime of public pension schemes in Portugal is the most common type of scheme in OECD countries (Table 1).⁴ Many OECD and EU countries apply a variant of the EET regime to public pensions, with contributions and returns on (real or notional) investment totally or partially taxed.

Taxation of occupational and personal private pensions

The general taxation regime of voluntary occupational and personal private pension schemes in Portugal may be classified as TET for employee or individual contributions and EET for employer contributions. The tax treatment for direct insurance schemes is the same as for pension funds. Employer contributions are fully deductible in computing the CIT if the plan provides individualised acquired right’s benefits. If the pension plan benefits are “mere expectations” and a number of conditions

⁴ See also Yoo and de Serres (2005) and OECD (2015).

Table 2

General tax treatment of private pension plans in OECD and non-OECD countries

Tax regime	OECD countries	Non-OECD countries
EET	Canada, Chile, Estonia, Finland, Germany, Greece, Iceland, Ireland, Japan, Netherlands, Norway, Poland, Slovenia, Spain, Switzerland, United Kingdom, United States	Croatia, Latvia, Romania
TEE	Czech Republic, Hungary, Mexico	Lithuania
ETE		Cyprus
TET	Austria, Belgium, France, Israel, Korea, Luxembourg, Portugal	Malta
ETT	Denmark, Italy, Sweden	
TTE	Australia, New Zealand, Turkey	
EEE	Slovak Republic	Bulgaria

Source: Adapted from OECD (2015).

are fulfilled⁵, employer contributions are deductible in computing the CIT up to 15 percent of the annual total costs with wages and salaries.⁶ If the contributions exceed the above limit, the exceeding part is not deductible for CIT purposes unless the amounts are included in the employee's taxable income. Social contributions are not levied on employer pension contributions. A flat CIT rate of 21 percent is levied on the global taxable income realised by companies resident for tax purposes in Portugal (also applicable to Portuguese PEs of foreign entities).⁷ A reduced CIT rate of 17 percent applies to small and medium-sized companies on the first EUR 15,000 of taxable income.

As far as employee contributions are concerned, if the plan provides individualised acquired right's benefits, 20 percent of overall employee contributions to private pension plans (both occupational and personal) made prior retirement are tax deductible, up to a limit that varies according to the individual's age. In addition, the above mentioned income-related global tax deduction amount applies. If the pension plan delivers benefits that are considered mere expectations, there are no tax deductions and a tax deferral regime applies. As far as the tax treatment of returns on investments and accumulation of funds is concerned, the general rule is that income generated by private pension assets is tax exempt. Dividends, rental, interest and other capital income are VAT exempt. Pension funds are also partially exempt from property, municipal and stamp duty. When

it comes to the tax treatment of accumulation of funds, there is no ceiling on the lifetime value of private pension funds. No tax applies on the accumulation of funds.

The tax treatment of private pension income depends on whether or not contributions were exempt and on the type of payout options chosen (annuities, lump sum). Taking benefits as programmed withdrawals is not allowed in Portugal. If the plan provides individualised benefits and the payout option is in the form of annuities, pension income is taxed at the individual's PIT rates. A maximum deduction of EUR 4,104 applies to total pension income. However, if the compulsory contributions to social protection schemes and to legal health subsystems exceed that limit, the deduction will be equal to the total amount of contributions. If contributions were exempt and pensioners choose to take accumulated capital as a lump sum, from 31 December, 2014, there is no tax exemption. Capital gains and other returns on the investment component are taxed at an autonomous rate of four or eight percent, depending on whether the contributions that originated such income were made before or after the 1st of January 2006, respectively. If contributions were taxed and the payout option is in the form of annuities, the contributions component of the accumulated pot is exempt, and only the capital gain and other returns on the investment component is taxed at the marginal PIT rates. If the contributions were taxed and pensioners choose to take accumulated capital as a lump sum, the contributions component is exempt, whereas capital gain and other returns on the investment part is taxed at an autonomous rate of four percent or eight percent, depending on whether the contributions that originated such income were made before or after the 1st of January 2006, respectively. With the exception of CES, social contributions are not levied on pension in-

⁵ At least 2/3 of the benefits must be annuitised and the provisions of the general social security scheme are accompanied with regard to retirement age, the pension plan assets are not managed by the sponsor, the pension plan covers exclusively benefits in case of retirement, health (post-work), disability or survivorship.

⁶ The limit is 25 percent if employees are not covered by social security.

⁷ A lower CIT rate of 18.4 percent applies to companies that are tax resident in the Autonomous Region of Azores, including PEs of foreign entities registered therein.

Table 3

Evolution of Extraordinary Solidarity Contribution (CES) in Portugal

Year	Monthly pension	CES
2011	> € 5,000	10%
2012	[12-18] IAS	25% of the benefit payment between 12xIAS (€ 5,030.64) and 18xIAS (€ 7,545.96)
	>18 IAS	50% of the benefit payment above 18xIAS (€ 7,545.96)
2013-2014	€ [1,350-1,800]	3.5% of the monthly pension between € 1,350 and € 1,800
	€ [1,800-3,750]	3.5% of € 1,800 + 16% of the amount exceeding € 1,800 but below € 3,750
	€ [3,750-12 IAS]	10% of the monthly pension between € 3,750 and € 5,030.64
	[12 - 18] IAS	25% of the benefit payment between € 5,030.64 and € 7,545.96
	>18 IAS	50% of the benefit payment above 18xIAS (€ 7,545.96)
2015	[11 - 17] IAS	15% of the monthly pension between € 4,611.42 and € 7,126.74
	> 17 IAS	40% of the benefit payment above 17xIAS (€ 7,126.74)

Source: Author's preparation based on national legislation. Note: IAS = € 419.22.

From the application of CES contribution in 2015 shall not result in a monthly pension of less than € 4,611.42.

come.⁸ Comparing the taxation of private pension plans in Portugal with that of their international counterparts, we can observe that while Portugal applies a TET regime for employee or individual contributions and EET for employer contributions, many OECD and EU countries apply a variant of the EET regime (Table 2).

Taxation of investment income and capital gains

Portuguese residents are subject to PIT on all their investment income. For certain types of Portuguese or foreign-sourced investment income, residents may choose between being taxed at reduced withholding tax rates; or adding the income to the overall income and be taxed according to the general PIT rules. Interest from bank deposits in Portugal, interest on Portuguese bonds, dividends paid by Portuguese companies and dividends and interest paid by foreign entities may be excluded from overall income and taxed at a flat withholding tax rate of 28 percent. Contrary to the so-called “pure” version of the dual income tax, the tax rate on capital income is not aligned with the CIT rate. Non-residents are subject to PIT on their Portuguese-sourced investment income through withholding at the same withholding flat rates.⁹ Capital gains arising from the difference between an asset's sale value and the corresponding acquisition cost are, in the case of shares, fully taxed at a 28 percent

special rate.¹⁰ Capital gains relating to immovable property acquired after 1 January 1989 are assessed to tax at progressive rates on 50 percent of their value. As to land for construction, it is subject to tax irrespective of the date of acquisition. Capital gains on the sale of unlisted equity of micro and SME companies are only taxable at a share of 50 percent. Portuguese residents are subject to PIT on the capital gains relating to Portuguese and/or foreign assets. Non-residents are only subject to PIT on their Portuguese-sourced capital gains relating to immovable property. Property Rental Income is subject to tax at 28 percent, or added to other categories of income after deducting all maintenance and repair expenses and Municipal Property Tax (IMI). There are no wealth, inheritance and gift taxes in Portugal. There are no property taxes in Portugal, other than IMI.

Taxation of investment funds income

Investment funds benefit from a favourable tax treatment in Portugal based on the principle that the holder of the units will have the same tax treatment than if it had invested directly in the assets held by the fund. From 1 July 2015 onwards, Collective Investment Vehicles (CIV) established and operating according to Portuguese law are taxed on profits, being however exempt, among others, investment income, rental income and capital gains, unless that income derives from “off-shore” entities. Tax losses generated by CIV now follow the regime foreseen in the CIT code. The taxable income is subject to the general CIT rate. Municipal and state surtax are not applicable. With proper adjustments,

⁸ The interest income subject to taxation can be reduced if over 35 percent of the contributions are paid in the first half of the contract, and the benefits are received over five years after the beginning of the contract (five to eight years: 80 percent of the interest is taxed; more than eight years: 40 percent of the interest is taxed). Otherwise, an autonomous normal 21.5 percent rate is levied on interest income subject to taxation.

⁹ Investment income paid by non-resident entities without a permanent establishment in Portugal, domiciled in jurisdictions with more favourable tax regimes, is liable to an autonomous tax rate of 35 percent.

¹⁰ Realised capital gains are included in taxable profits for corporate tax purposes, but gains on the disposal of shares may be exempt from tax under Portugal's “participation exemption regime”.

Table 4

Social security contributions on pension income	
Country	Social security contributions on pension income
Portugal	Special solidarity contribution between 15% and 40% of monthly benefits.
France	General scheme for employees (RGAVTS) and Complementary schemes for employees (ARRCO) and management staff (AGIRC): Generalized social contribution (CSG) of 6.6%, 3.8% or exemption (according to taxation); contribution for the repayment of the social debt (CRDS) of 0.5%; additional solidarity contribution for independent living (CASA) of 0.3%; Complementary schemes for employees (ARRCO) and management staff (AGIRC): Contribution of 1.0%.
Belgium	Solidarity contribution in the field of pensions varying from 0.5% to 2% according to the family charge and the gross amount of all statutory and non-statutory pensions. Minimum amount for pension is € 2,569.12 (couple) or € 2,222.18 (single) per month.
Italy	Contributo di solidarietà for pension benefits above 5 minimum wages (Fornero reform); Current rules establish contribution rates between 6% and 18% for pensions above 14 minimum wages; Contributo di perequazione, 2011 (5%-15% for annual benefits above € 90,000).
Norway	Pension income is subject to social security contributions at a comparatively lower rate.

Source: OECD (2015) and MISSOC Comparative Tables Database with author's additions (MISSOC 2016).

autonomous taxation is also applicable. Stamp tax rates range between 0.0025 and 0.0125 percent. The taxation “at exit” rule is applicable to the taxation of income obtained by individual holders of participation units/shareholdings in the CIV. For individual investors resident in Portugal for tax purposes, income distributed by the CIV and gains on the redemption are subject to a definitive flat withdrawal holding tax (WHT) rate of 28 percent, unless investors opt to be taxed on their overall income. Net capital gains are taxed at a WHT rate of 28 percent. For corporations, income distributed by the CIV is subject to WHT at a flat rate of 25 percent. Capital gains are not subject to WHT, as they are included in annual taxable profit. With some exceptions, foreign investment funds are only taxed on income obtained in Portugal at a WHT tax at a rate of 25 percent.

Social security contributions levied on pension income

In Portugal, health care systems are not included in social security. As such, like in most OECD countries social security contributions are levied only on gross labour income, and used to finance pension, unemployment, sickness, death, family and maternity benefits. Before 2011, pension income was exempt from social contributions. However, in 2011, the Portuguese government was under pressure to consolidate the budget and was forced to adopt reforms with significant short-term effects, one of which was the introduction for the first time of an extraordinary (social) solidarity contribution (CES), levied on public and private pensions above a certain amount. Politically advocated and justified as

being a temporary measure to broaden the social contributions tax base, part of a policy to spread the burden equally between different cohorts of citizens and generations (both active and retired), the argument found no general acceptance. The measure soon became one of the main issues in the national political debate, focusing on the question of whether there were legal boundaries to how much pension reforms could impact on the ‘acquired rights’ of pensioners, on whether CES took into account the principle of progressivity and proportionality in the PIT tax code, and on the extent to which CES could, being a social surcharge on PIT rates, constitute a second tax on the same pension income. The Portuguese Constitutional Court has been requested to rule on the matter several times in the last four years, and has decided in favour of government at times, and the Court found the measures unconstitutional and overruled them at others, and ordered to fully or partially reimburse the pensioners affected. In reality, CES was simply an alternative way to nominally reduce pension benefits, similar to the reductions that would be obtained through direct cuts, temporary freezes and/or permanent reduction of the indexation of benefits. Despite serious Constitutional Court remarks, the contribution was reformulated many times during this period to increase the taxable base and/or the number of tax brackets (Table 3).

For some groups of pensioners, CES actually imposed a ceiling on pension benefits. The majority of European Union countries do not charge any social security contributions on public and private pension benefits, and those who do it mostly refer to health, sickness or long-term care insurance coverage (OECD 2015). Current relevant

exceptions are Portugal, France, Belgium, Norway; a former exception was Italy (Table 4).

In Portugal lump sum payments from occupational pension plans are exempt from CES. This means annuitisation is fiscally discriminated compared to other payout options. Personal private pension funds and saving schemes are also exempt from CES, which means that equal treatment regarding the retirement saving vehicle has not been assured.

A place in the sun and a tax-free pension: PIT regime for non-regular residents

In 2009 Portugal implemented a PIT system for the non-regular resident with the purpose of attracting to Portugal non-resident professionals qualified for activities with high added value, intellectual or industrial propriety or knowhow, as well as beneficiaries of pension schemes granted abroad, offering a more beneficial tax burden. The non-regular resident tax regime is available for citizens deemed resident on Portuguese territory for tax purposes in the year to be taxed as a non-regular resident, that have not been deemed resident on Portuguese territory during the prior five years. Once granted, the regime applies for ten years (non-extendable) provided that, in each year, the individual meets the criteria to qualify as a tax resident. For pensioners, the main advantage of this regime is that it offers tax exemption on pension income provided that (i) income is taxed in the country of its source based on the double tax treaty rules, or (ii) cannot be considered as Portuguese source income under the Portuguese domestic rules. Given the widely implemented system of deferred income taxation of pension benefits in most OECD countries, this special regime offers Portugal a significant competitive advantage in the cross-border taxation of pension income, but raises problems of international tax equity and neutrality, particularly when retired emigrants were exempted from income tax on their old-age pension saving in their home country.

Is there a rationale for a semi-dual income tax in pension taxation?

Pension taxation should contribute to create an adequate, affordable, sustainable, equitable and efficient pension system, comprising mechanisms for individuals and households to smooth consumption over time, to insure against risks and to protect against the risk of poverty in old age. The taxation of pensions directly af-

fects consumption, saving, work and leisure decisions, affects asset allocation decisions and public finances. It therefore has direct implications for capital accumulation, productivity, economic growth, capital markets and welfare. When deciding on a specific tax system, consistency with recent pension reform trends that seek to raise the regular retirement age, provide incentives to work longer and to abstain from early retirement, promote privately-funded pension regimes, which complement or partly replace public pensions or increase adequacy for retirees at the bottom of the income scale, should be considered. Apart from the implications for income distribution and public revenue, additional considerations like tax neutrality, tax equity, risk sharing between governments and households, distributive consequences (income and wealth), opportunistic behaviour, the need to simplify the tax system, to increase transparency or to reduce administration costs should also be taken into account.

The DIT was introduced in the Nordic countries in the early 1990s as a compromise between SHS tax and expenditure tax, the two opposite poles recognised by conventional tax theory for a personal tax based on the ability to pay principle. Since then, Portugal and other EU countries have gradually moved towards an SDIT tax. The question that naturally emerges is then: to what extent is SDIT a system that, compared to TTE or EET, is better suited to address the personal and policy goals of a pension scheme and of the economy? Is there a theoretical or practical rationale for an SDIT in the taxation of occupational and private pensions and other retirement income? What are the arguments for and against DIT and SDIT in the context of pension taxation?¹¹ Is there is a rationale for taxing capital income at (a) lower marginal rate(s) than other income? Why should we combine a flat tax on capital income with a progressive rate schedule for labour and pension income? In making this discussion, besides the normal pension scheme goals, we will assume there are four main competing considerations an open economy faces in designing a pension taxation regime. At the domestic level, the main goals are *tax progressivity*, *tax comprehensiveness*, and *tax symmetry*. At the international level, the main goal is *competitiveness*, but issues like the *portability of pension entitlements* and *discriminating tax treatment* in the Single Market can run counter to all the four freedoms laid down in the EC Treaty. In a closed economy, an SHS tax can theoretically satisfy the three domestic objectives. When international competitiveness is add-

¹¹ For a detailed discussion on the merits and drawbacks of DIT see Sørensen (1994, 2005) and Boadway (2004).

ed to the equation, countries may not be able to fulfil all goals, particularly as cross-border mobility of capital varies both between types of capital and economic regions, and will have to sacrifice or compromise some of them. As the recent Portuguese experience shows, economic, political and social factors will ultimately determine which objective(s) to sacrifice.

Sacrificing comprehensiveness: The central role of savings taxation

Countries that adopted DIT and SDIT systems abandoned comprehensiveness, i.e., the joint treatment of capital and non-capital incomes, in an attempt to maintain “symmetry” while at the same time responding to strong tax competitive pressures. SHS tax discriminates in favour of current consumption, it is not neutral with regard to present and future consumption and acts as a disincentive to (particularly long-term) saving. Savings, particularly contributions to pension schemes, are not a normal commodity, and for most individuals they are a way to finance deferred consumption. The taxation of savings has a central role in the tax treatment of pensions. Pension taxation can affect both the total amount of savings in the economy and how those savings are allocated across different assets. This can directly affect the amount and efficiency with which capital is invested. Under an SHS tax, saving out of current income is double-taxed. This means that when stated in life-cycle perspective, horizontal equity is violated under an SHS tax. Applying a lower capital income tax rate in SDIT is seen as a way to mitigate the bias against future consumption and to alleviate the impact of taxing nominal (not real) rates of return. TEE systems shift the tax burden to working-aged agents and away from retirees.

There are additional arguments that help to justify a more favourable fiscal treatment of capital income and retirement saving in Portugal. Among them we highlight the desire to increase the number of people that save (and the amount saved) to finance their retirement, boosting national savings, increasing the importance of retirement saving vehicles and contractual savings institutions in financial markets, bounded rationality and bounded willpower problems (because of low financial literacy levels), the desire to reduce the currently high number and significance of those that are likely to fall into the safety net when in retirement, increasing the supply of long term funds to capital markets and promote investment and economic growth. Saving for retirement is particularly low in Portugal and will need to increase significantly in the future to address sustaina-

bility and adequacy problems in PAYG systems and to reduce pension expenditure.

Sacrificing symmetry: International capital mobility and other constraints

The international capital mobility constraint.

Portugal is a small, significantly open economy with perfect international mobility of capital that critically depends on foreign savings to counterbalance its significant public and private indebtedness levels. Recent banking failures and financial markets distress have also contributed to undermine the attractiveness of investing in Portugal. In recent years global tax competition concerns in Portugal have prompted legislative proposals to reduce CIT rates significantly below tax rates under the PIT tax system. This option sacrifices symmetry objectives. The option pursued in Portugal to differentiate tax rates on capital income has been largely determined by the elasticity of the tax base. Tax rates on the most sensitive types of capital income (e.g., dividends) are taxed under lower flat rates, while others are taxed under higher flat WHT rates or, optionally, kept within the ambit of progressive income taxation. Portugal’s adoption of an SDIT tax, the separation of the several flat capital income tax rates from the labour and pension income tax schedule allowed policy-makers to levy comparatively lower capital tax rates, to reduce the risk of capital flight and to increase the attractiveness of FDI.

The problem of defining the capital income component.

Some forms of capital income are simple to define in principle (e.g., interest income, dividends) and Portugal decided to tax them (by default) at a flat rate under a final withholding regime. This is expected to improve efficiency by increasing the symmetry of tax treatment of capital income and to simplify administration. Flat tax rates have increased significantly (40 percent) in recent years. This is against both the goal of encouraging people to save more and the objective of allowing individuals to take personal responsibility for adequate income in retirement. The adoption of final WHT regimes has expanded the tax base and is likely to enhance the progressivity of the tax system. Given this, the question of whether and how to tax net capital gains on corporate shares or real estate property at the individual level was discussed for many years in Portugal and suffered many changes. In the past, the option was simply to exempt capital gains from taxation, because of competitiveness considerations and the need to develop capital markets.

Then, for some years the option was to tax net capital gains only for shares held for less than a specific period of time (one year). This approach is assumed to create incentives to long-term (retirement) capital market investment, support privatisation processes and to prevent taxpayers from engaging in schemes to avoid tax on labour income by selling their shares to reduce or evade tax liability. The current practice is to tax net capital gains at the individual level by a flat rate of 28 percent. Taxing capital gains based on the realisation principle may lead to asset retention and lock-in effects, which hampers the optimal allocation of resources.

The fiscal revenue and unemployment constraints.

Portugal has significant deficit, public debt, social expenditure and unemployment levels and its marginal PIT rates are already among the highest among OECD countries. It will thus be very difficult to compensate lower marginal tax rates on retirement capital income by increasing labour income taxes further. Contrary to the pure form of the DIT, the PIT rate on capital income is not aligned with both the CIT rate and the marginal tax rate on labour income in the first bracket. The fiscal revenue constraint is likely to prevent further significant reductions in capital income tax rates.

Arbitrage opportunities and the erosion of social contributions' taxable base

The move from an SHS tax to an SDIT tax in Portugal offered significant tax planning (or tax evasion) opportunities by converting labour income from self-employment or from wages of owner-employees of closely-held corporations into income from capital. For medium- and high-income classes, there is a large difference in the marginal tax rates on capital and labour income, providing great incentives for income shifting from labour income to capital income. Since 2013, the combined reduction in the number of PIT tax brackets, the increase in PIT marginal rates and surcharges and the ongoing reduction in CIT rates to values now closer to the lowest marginal tax rate on labour and pension income have created a strong incentive to characterise income from labour as income from capital. Given that under the Portuguese (and many other countries') tax system labour income is subject to social security taxes, the move towards SDIT has substantially increased the effective marginal tax rates for labour income, but left tax rates for income from capital unchanged. As a result, the number of those registered self-employed has declined substantially in recent years and the number of

new SMEs grew exponentially. For pension schemes, the immediate consequence has been a decline in the taxable base for social contributions and corresponding contribution revenue, challenging its already problematic short- and long-term sustainability.

Equity, neutrality and risk-sharing considerations

Tax equity has always been a critical point in tax policy design in Portugal. The question of how tax equity is perceived in the SDIT tax model is a key point in the debate and, as such, it should be approached from various angles. First, there is not a consensus on what constitutes a socially acceptable indicator of a citizen's ability to pay, the basic principle of the income tax legislation in Portugal, and what the after-tax income distribution patterns should be. Assuming that annual comprehensive income is a socially acceptable indicator of a citizen's ability to pay, an SHS tax ensures horizontal equity and, for a given consensus about the redistributive features of the system, properly graduated tax scales also guarantee vertical equity. However, when stated in life-cycle perspective, horizontal equity is violated under an SHS tax. Neutrality over the timing of consumption should only be a reasonable starting point for tax design of pensions and retirement income. The taxation of savings affects individuals' decisions on how much to save, when to save, how to allocate savings across different assets and how much risk to take when allocating their savings between assets. The appropriate treatment of retirement savings and pension income should not neglect the impact of a given taxation regime on portfolio composition and risk taking. Moving now to the payout phase, there are important welfare effects that can justify sharing longevity risk between annuitants and annuity providers and the adoption of a tax deferral regime.

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THE TAXATION OF INTERNATIONALLY PORTABLE PENSIONS: AN INTRODUCTION TO FISCAL ISSUES AND POLICY OPTIONS

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Introduction

The development in old-age pensions in OECD countries exhibits several characteristic features. First, old-age income³ consists of a mix of public, occupational, and private retirement incomes whose components have become more diversified and variable. Second, countries encourage occupational and private retirement savings through tax preferences or direct subsidies to compensate for reduced public generosity. Third, the taxation of mandatory and voluntary pension savings deviates from the principles of comprehensive income taxation within and between countries. Finally, individuals spend more of their working life or retirement period abroad, facilitated by the improved portability of benefits between OECD countries, but also within key migration corridors.

As a result, individuals increasingly receive retirement income from national and cross-border entitlements and their tax treatment differs within and across countries. This has two main economic consequences: (i) taxation provokes efficiency losses due to planned tax arbitrage or unplanned exposure to tax distortions as individuals

are either motivated to move between countries (or prevented from doing so) or to restructure their retirement income portfolio with little effect on overall retirement savings; and (ii) taxation infringes on equity principles: At the individual level, the application of different tax rules for retirement benefits and savings instruments by different countries violates horizontal equity and is a source of interpersonal fiscal unfairness. At the country level, different, inconsistent, and uncoordinated taxation rules for retirement income create fiscal unfairness between countries and motivate tax competition.

Table 1 highlights for Germany scope and dynamics of pensions paid to and received from abroad. The number of pensioners living abroad on a German pension reached 1.7 million in 2013 (or 6.85 percent of all German pensions). Non-German pensioners living in Germany may also receive a pension for pre-migration insurance periods (as do 1.1 million pensioners, or 4.21 percent of all pensioners with a German pension). This gives a total of 2.8 million potential recipients (or 11.1 percent) of a cross-border pension. Yet these numbers reflect the labor mobility of the past and do not include the higher pan-European labor mobility since the 1990s. Estimates for the European Union of the future share of pensions paid abroad to the current workforce arrive at some 15 to 25 percent (Holzmann 2015).

The traditional instruments to address inequity issues in taxation are: (i) an appropriate income tax reform at the national level; and (ii) the renegotiation of double taxation treaties at the international level. We strongly doubt that uni- and bilateral approaches are promising strategies, even if countries decided to apply deferred income taxation to pension income. While at a national level the call for joint policy analyses of pensions and taxation has been made (most recently by Mirrlees 2010), transnational pensions and their taxation lack both operational understanding and a conceptual framework; this is *terra incognita*.

Against this background our paper offers an overview of the state of taxing the main forms of old-age pensions in and between OECD countries. We subsequently explain why the taxation of retirement savings has become so complex in OECD countries. Lastly, we argue for inter-

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³ A pension benefit paid as a lifetime annuity from retirement until death is the main, but not the only form of retirement income. It is dominant, but not omnipresent in mandated schemes; was dominant in occupational schemes at the time of defined benefit (DB) schemes that were gradually replaced by DC schemes, often with no obligation to buy a lifetime annuity at a certain age; and hardly exists for voluntary savings. The remainder of this paper uses “pensions” and “retirement savings” interchangeably unless a differentiation is warranted.

Table 1

Recipients of statutory German pensions			
Number of pensioners in millions (% of total pensioners)	2013	2010	2005
Total non-German pensioners	2.562 (100%)	2.367 (100%)	2.032 (100%)
- living in Germany	1.059 (41.3%)	0.944 (39.9%)	0.774 (38.1%)
- living outside Germany	1.503 (58.7%)	1.423 (60.1%)	1.258 (61.9%)
Total German pensioners	22.602 (100%)	22.646 (100%)	22.452 (100%)
- living outside Germany	0.222 (0.98%)	0.206 (0.91%)	0.170 (0.76%)
Total pensioners	25.164 (100%)	25.013 (100%)	22.484 (100%)
- living outside Germany	1.725 (6.85%)	1.629 (6.51%)	1.427 (5.83%)
- non-German pensioners living in Germany	1.059 (4.21%)	0.944 (3.77%)	0.774 (3.44)
- potential recipients of cross-border pensions	2.784 (11.1%)	2.573 (10.3%)	2.201 (9.8%)

Source: Genser and Holzmann (2016), based on Eurostat Online Database (June 2015).

national coordination of pension taxation and suggest replacing the current dominant, but not omnipresent scheme of deferred pension taxation with front-loaded taxation that can be combined with three tax payment options.

The state of pension taxation within and between OECD countries

Income taxation in most OECD countries is codified according to the Schanz/Haig/Simons principle of comprehensive income (CI) taxation, which regards any annual increase in personal wealth as taxable income. This is also true for pension claims which increase individuals' ability to pay and should therefore be taxed under a CI tax. To compare national pension tax practices we distinguish between the usual three phases where taxation can be applied: Contributions, returns and disbursement. Technically CI taxation of pensions can be characterized by a T-T-E income tax, where T is the individual income tax rate and E indicates that an income flow is tax exempt. We use t to indicate that a reduced tax rate $t < T$ is applied.

Table 2 reveals that no country in our sample applies T-T-E taxation to statutory pensions, as all of them provide tax relief either by deferring income taxation or by subjecting pension income to lower rates. The taxation of occupational pensions is similar and exhibits an even greater scope of complexity, although no country fully exempts occupational pensions from income tax. Private pensions are granted particular tax preferences that differ between specific pension savings vehicles.

Surprisingly, none of the OECD countries in our sample offers expenditure taxation for private pension savings.

The complexity of the tax treatment of pensions increases when pensions accrue across borders. The avoidance of international double taxation of cross-border pensions is codified in bilateral double taxation treaties. Although these treaties usually follow the recommendations of the OECD model convention treaty, there is room for variance in income tax assignments for different forms of foreign income. Table 3 reveals the tax assignment of cross-border pension flows in treaties signed by Germany and Switzerland. There is a marked dominance of the residence principle, but statutory pensions are frequently assigned to the source country exclusively. Shared tax assignments allowing for limited source country tax credited in the residence country are rare.

A closer look at the bilateral network of double taxation treaties reveals three fundamental complexities of cross-border pension taxation. First, both countries tax cross-border pension benefits differently for different forms of retirement income. Second, both countries tax inbound cross-border pension benefits differently depending on the source country. Third, outbound pension benefits paid by Germany or Switzerland are taxed differently depending on the residence country of the pensioner.

Table 2

Income taxation of pensions in OECD countries				
Tax regime	Statutory pension	Occupational pension	Private pension	Characterization of tax regime
T-T-E		US	SE	Comprehensive income tax
t-T-t		IT, SE	IT	CIT with partially deferred savings taxation
T-E-T		CA, MT	FR, MT	CIT with deferred return taxation
E-T-T		DK, DE, PT, US	DK, SE	CIT with deferred savings taxation
t-E-T	FR, IR, CA, MT, NL, UK	BE, EE, FI, FR, IR, LT, AT, SI, UK, CY	BE, EE, FI, FR, IR, CA, LT, LU, CH, SI, UK, CY	Deferred CIT with double taxation relief
T-E-t		FR	DE, FI, FR, MT, ES	CIT with deferred preferential savings taxation
E-E-T	BE, DK, EE, FI, GR, IT, LT, LU, AT, PL, PT, SE, CH, SI, ES, CZ, CY	DE, GR, CA, LU, NL, AT, CH, SI	none	Fisher/Kaldor expenditure tax, deferred income taxation
T-E-E	LI	PL	PO, US	Prepaid expenditure tax
t-E-t	DE, US	DE, LI, AT, PT, SK, ES, CZ, HU, US	DE, LT, LI, LU, NL, AT, PT, CH, SK, ES, CZ, HU, US	Partially deferred prepaid expenditure tax
t-E-E	HU	GR, LI, LU, AT, HU, CY	GR, LT, LI, AT, CH, HU, CY	Reduced prepaid expenditure tax
E-E-E	SK	none	none	Full income tax exemption

Source: The authors, based on Genser and Holzmann (2016), IBFD (2015), and Wellisch et al. (2008).

Explaining diversity, complexity, and the inconsistency of taxing global pensions

Our analysis identified three driving factors for the disarray of the status quo.

The diversity of the taxation of national pensions

A first reason is the legalistic view that pension benefits from unfunded pensions are regarded as deferred labor income and taxed on a cash-flow basis, viz. E-E-T. Pension benefits from funded pensions are regarded as withdrawals from accumulated pension wealth and taxed as capital income upon accrual, viz. T-T-E. There is, however, no distinct dividing line between the two forms of pensions, particularly with respect to occupational pensions and their funded or unfunded nature.

A second argument for the diversity in taxation is the incomplete move from CI taxation towards consumption-type income taxation. The CI tax approach has been the global guideline for the rational design of progressive income tax schedules for over 100 years and received political support for its concordance with the ability to pay principle. As far as the taxation of retirement income is concerned, however, CI taxation has a number of pitfalls that have contributed to its partial

demise in income tax codes. The proposals for expenditure taxation (Fisher 1930; Kaldor 1955), the results on the non-optimality of same-rate taxation of labor and capital income, and the operational feasibility of a cash-flow design approach that avoids taxation of the normal returns to capital (Bradford 1986) also contributed to the weakening. Nevertheless, no industrialized country has ever tried to replace CI tax with an expenditure tax regime. However, pension taxation is one remarkable exemption and expenditure tax is seemingly the widely-accepted benchmark for tax lawyers and pension economists.

A third argument for the diversity in pension taxation is the varying scope and composition of tax preferences for pension savings within countries. While there is an economic justification for subsidizing voluntary pension savings as a merit want, political motives for tax preferences are manifold and are triggered by electoral campaigns, by lobbying of financial industries or by piecemeal policy steps to cope with financial pressure on unsustainable public pension systems.

The lack of fiscal fairness across countries

The OECD model tax convention as a blueprint for bilateral double taxation treaties does not feature a general

consistent rule how portable pensions should be taxed. Article 18 only addresses pension benefits and assigns the right to tax them to the residence country. An escape clause allows the source country (Article 19/2) to tax benefits from public pensions, which are paid by public authorities or public funds. But the model tax convention does not address pension taxation in the contribution and accumulation phases. Fiscal unfairness felt by treaty partners has triggered attempts to unilaterally override treaty rules and to recoup tax losses from pension tax preferences of migrants, but such measures were ruled discriminatory and thus illegal by the European Court of Justice as they hamper labor mobility.

The coordination dilemma of bilateral double taxation treaties

Model tax conventions by the OECD and the UN have led to tax coordination with bilateral treaties, but the international network offers ample room for tax arbitrage and treaty shopping. Yet bilateral treaty negotiations are unlikely to serve the multi-national coordination requirement and two aspects do not help: A conceptual framework is lacking for how best to integrate pension savings consistently into the OECD model convention to mitigate the conflict between individual equity and inter-country fiscal fairness. Even if such a framework existed, the renegotiations of roughly 100 bilateral double taxation treaties for each OECD member country would be a daunting task in view of the historical evidence on the duration of treaty renegotiations and the room for bargaining between any pair of countries.

The separation of social and fiscal responsibility at a national and an international level

In most countries social policy and tax policy are assigned to different ministries, while an economic approach calls for a concerted policy design to meet the distributional objectives efficiently and to ensure fiscal sustainability. But political evidence at a national level suggests little conceptual and administrative coordination and overall government guidance. The situation is even worse at the EU Commission, where pension issues are split across a number of Directorates General (DG) and separated from income taxation issues handled by the DG Taxation and Customs Union. And no international organization (like the ILO, IMF, World Bank or OECD) has used its mandate to explore, analyze, and guide pension design and pension taxation coherently at a national and an international level.

New policy options

To address the complexities and inconsistencies of global pension taxation, the identified drivers of the prior sections offer guidance for innovative policy options. First, there is no hope that a revision of double taxation treaties alone will provide the break-through: There is no conceptual framework to guide such revisions and bilateral negotiations alone will not be able to curb the treaties' patchwork. Second, the international trend toward an expenditure-type treatment of retirement income offers a level playing field for statutory, occu-

Table 3

Tax assignment of cross-border pensions in German and Swiss double taxation treaties

Tax assignment in German treaties	Statutory pensions	Occupational pensions	Private pensions
Residence country exclusively	CA, CH, CZ, EE, ES, FI, GR, HU, IR, IT, LU, PT, SE, SI, UK, US	AT, BE, CH, CZ, EE, ES, FI, FR, GR, HU, IR, IT, LU, MT, NL, PL, SE, SI, UK, US	AT, BE, CH, CZ, DK, EE, ES, FI, FR, GR, HU, IR, IT, LU, MT, NL, PL, PT, SE, SI, UK, US
Source country exclusively	AT, BE, DK, FR, IT (citizens), MT, NL, PL, SE	FR (mandatory)	
Tax credit in residence country		CA, DK	CA, DK (rents)
Tax assignment in Swiss treaties			
Residence country exclusively	CA, CH, CZ, EE, ES, FI, GR, HU, IR, IT, LU, PT, SE, SI, UK, US	AT, BE, CH, CZ, EE, ES, FI, FR, GR, HU, IR, IT, LU, MT, NL, PL, SE, SI, UK, US	AT, BE, CH, CZ, DK, EE, ES, FI, FR, GR, HU, IR, IT, LU, MT, NL, PL, PT, SE, SI, UK, US
Source country exclusively	AT, BE, DK, FR, IT (citizens), MT, NL, PL, SE	FR (mandatory)	
Tax credit in residence country		CA, DK	CA, DK (rents)

Source: The authors, based on Genser and Holzmann (2016), Wellisch et al. (2008), and tax treaties.

pational and private pensions and promises reduced distortions. However, the back-loaded E-E-T approach is in conflict with international mobile labor, the resulting unequal revenue allocation, and also creates administrative and compliance problems that grow with an aging population. Third and luckily, our proposed front-loaded pension tax shares several welcome properties of an expenditure tax, decouples tax liability creation and tax payment, and offers additional flexibility while reducing compliance and control costs. Front-loaded taxation produces transparent records of tax-liability for each retirement saver at each point of time and makes it possible to settle tax-balance problems without painful renegotiations of double taxation treaties.

Intertemporal neutral front-loaded pension taxation

A front-loaded T-t-E scheme of pension taxation shares the intertemporal neutrality property of a back-loaded Fisher/Kaldor-type expenditure tax E-E-T. T-t-E income taxation exempts pension benefits withdrawn from accumulated pension wealth, but taxes income spent on pension savings when contributions are made and returns on pension wealth when they accrue and exceed normal capital returns. Both tax systems are also equivalent under a set of simplifying assumptions and their present values of the tax burdens are lower than those under comprehensive income taxation with the same tax schedule.

Compared to deferred income taxation, a front-loaded system by definition avoids pension tax revenue losses when individuals migrate (as workers or retirees). If source and residence countries implement front-loaded regimes, double taxation of cross-country pensions is avoided because any migrant's tax balance is known upon emigration and can therefore be settled accordingly.

A front-loaded tax scheme normally implies that tax liabilities must be cleared immediately upon income tax assessment. While the present value of taxes, and thus net income across the life-cycle, is the same as under a back-loaded scheme, the earlier tax payment may be seen as unduly reducing the net income of pension savers and thus an unacceptable loss of purchasing power. For this reason, we complement the T-t-E front-loaded pension tax with options for a decoupling of tax liability and tax payment, i.e. we propose variants where the tax payments of the T-t-E income tax liability can be shifted to future in an actuarially fair manner.

Three tax payment options

Under the **front-loaded tax payment** option all tax liabilities are settled when they occur (Genser 2015). The front-loaded loss of individual net income can be compensated for by reducing the mandatory or voluntary contributions to pension systems by the marginal tax rate. Consequently investments in pension wealth are reduced by the personal tax factor (1-T). The same is true for accrued non-normal pension wealth returns. Pension funds are obliged to pay income tax on that return to the tax authority and pension wealth growth is reduced by the tax factor. Pension benefits are pre-taxed and no further income tax is due when disbursed after retirement. Since all income tax liabilities on pension wealth are settled at any time, no revenue loss arises in the emigration country.

Under the **deferred tax payment** option all tax liabilities are accumulated and turned into a tax annuity on retirement that must be paid to the tax administration in line with the disbursement of the monthly pension benefits (Holzmann 2015). If a pension saver leaves the country and no arrangements exist with the new residence country to continue postponing the payment until retirement, then the accumulated tax liability becomes due as a form of exit tax.

The approach combines a formal front-loading of taxation (T-t-E) with a material back-loading (E-E-T), as the tax is only due when benefits are disbursed. This deferral might increase political support for such a tax reform, as it reduces time inconsistency, i.e. the temptation to charge pension benefits again when benefits are paid out. Keeping track of deferred tax liabilities, taxes already paid, and the net amount of pension wealth across an individual's lifecycle imposes an additional cost on tax administration, but provides a valuable data base for long-term pension and tax planning.

Under the **distributed tax payment** option tax payments are spread evenly across the whole pension cycle by charging the same tax rate t^* on contributions, pension wealth returns, and pension benefit pay-outs. Applying t^* to these bases creates the present value of tax payments, which exactly covers the present value of the front-loaded pension tax liability, but the rate is only half the rate of the other payment regimes. The lower tax rate might increase political support and facilitate revenue sharing between source and residence countries if individuals migrate. However, administrative costs will be similar to pension benefit related tax collection.

Conclusions

The taxation of internationally portable pensions and other retirement savings is characterized by astonishing diversity, complexity, and inconsistency. This disarray reflects a conceptual void in terms of how to tax global pensions, national autonomy in the taxation of retirement income, but also flexibility in bilateral rules for avoiding double taxation via different forms of old-age pensions.

A successful reform approach needs a conceptual framework for global pension taxation, supported by a major group of OECD members; the willingness to agree on a multilateral approach (e.g., at the EU level); and the readiness to take up economic recommendations for a coordinated tax and pension policy at both the national level and that of international organizations.

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AGING AND THE INHERITED WEALTH OF NATIONS¹

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Introduction



An important premise of modern capitalism is the idea that anyone, regardless of their parents' wealth, can become rich with the right entrepreneurial skills. A recent surge in self-made billionaires is often considered to be the proof of this premise. Kaplan and Rauh (2013), for instance, report that the share of Americans included in the Forbes 400 list – which provides a list of the wealthiest people ranked by net worth – that grew up in wealthy families fell from 60 percent to 32 percent between 1982 and 2011.

Notwithstanding this observation, however, Thomas Piketty (2014) and his co-authors have argued that the role of inherited wealth is on the rise in advanced economies. Piketty and Zucman (2014a,b) show that although the inherited share of total wealth decreased steadily from the beginning of the 20th century until the 1970s in Europe (Figure 1 for France, UK and Germany), it began to increase again after that, a trend that has continued until the present day. Accordingly, the earlier reduction was driven by wars in the first half of the century, which impoverished the population across the board.

Those who died between 1950 and 1960 were reported to be the least wealthy in the 20th century. The increase in the inherited share of total wealth, on the other hand, stems from increasing *inter vivos* gifts. Although it is

not clear why such gifts started increasing, Piketty and Zucman (2014a) suggest that longer lives may have induced parents to transfer a portion of inheritance sooner to help their offspring. We can infer from this argument that the total bequeathed wealth (inheritance and *inter vivos* gifts) has also increased as a response to longer lives, which is the main motivation for our discussion here.

Demographic aging, indeed, provides a natural suspect for the increasing share of inherited wealth. Decreasing mortality and fertility rates, both of which lead to an increase in average age in a society, have led to dramatic changes in the demographic structure of societies, especially in high income countries, in recent decades. Figure 2 shows the survival curves from 1950 to 2010. Accordingly, a 60 year-old person could expect to live about 17 more years in 1950. S/he can expect to live about 23 more years nowadays. Accompanying the decrease in mortality, and perhaps more importantly, the fertility rate fell from about three children per woman to 1.8 children per woman in the same period. As a result, the share of older people (aged 60 years or over) in society (old age dependency ratio) increased from about 12 percent to nearly 22 percent within six decades. Obviously, this demographic transformation should lead to some adjustments in the wealth and income structure of the economy.

In this paper, we study how demographic aging could explain the evolution of inherited wealth over time.⁴ In particular, we are interested in shedding light on the effects of a decrease in fertility and of an increase in longevity on three commonly used indicators pertaining to the relationship between inheritance and wealth:

1. Inherited share of total wealth (ISW),
2. The ratio of inheritance to real wages (RIW), and
3. Inherited wealth inequality (IWI).

In contrast to the implication made by Piketty and Zucman (2014), we find that aging in either form, a decrease in fertility or an increase in longevity, is not likely to explain the U-shaped pattern in the inherited share

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⁴ See also Weil (1996).

Figure 1

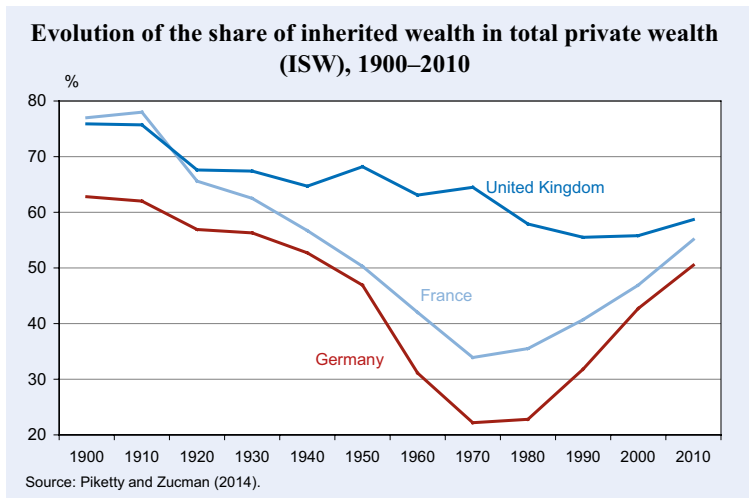
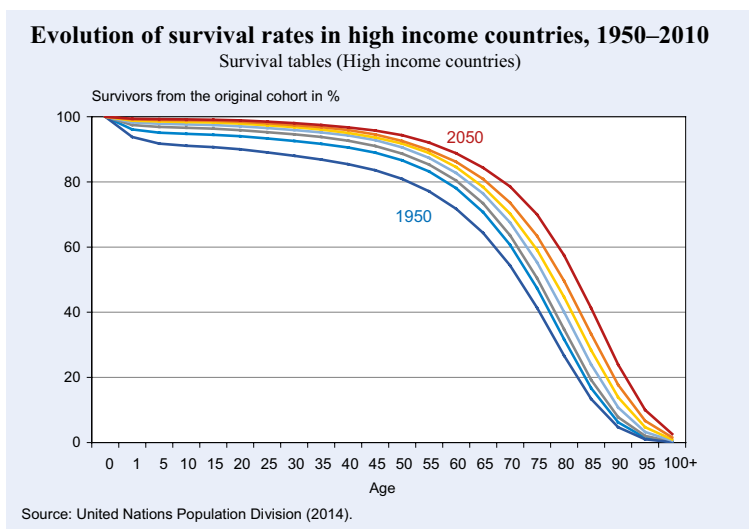


Figure 2



of total wealth in advanced economies. Both types of aging lead to a decrease in ISW. This is primarily because intentional bequests fall following a decrease in fertility, and although accidental bequests become larger with decreasing mortality, they also become less frequent, which dominates the effect on size.

Our results also suggest an alternative mechanism that could generate such a U-shaped pattern of the ISW after the Second World War: the rise and fall of retirement annuities. In many high-income countries, public and private defined benefit systems took up after the Second World War and the benefits provided by these systems increased steadily for several decades. Our simulations show that, other things being equal, an increase in such

annuitization could lead to a decrease in the ISW. Interestingly, however, the annuitization trend was reversed towards the end of the century, following a shift from defined benefit to defined contribution pensions.⁵ Thus, the rebound of the ISW could be driven by such a progressive abandonment of annuitized retirement savings.

This paper continues with a discussion on how aging affects bequeathing at individual level in the next section. In the subsequent section we consider the effects of aging on the economy-wide indicators of inherited wealth with and without annuitization. The last section provides some concluding remarks.

Aging and bequeathing

In order to understand how demographic aging may change bequeathing, we need to understand why bequests occur in the first place. However, untangling the motives behind any transfer in wealth from a parent, dead or alive, to a child is a daunting task. The first distinction we should be aware of is whether the transfers are intentional or not.

For instance, we may not know whether a bequest is left accidentally, because of the incompleteness of annuity markets, or intentionally, that is based on some type of altruism. Similarly, in the case of inter vivos gifts, it may be unclear whether the transfers are “true gifts” induced by altruism, or whether they involve some sort of exchange, i.e. the beneficiary provides some services like providing care to the donor. Thus, we shall inquire about each case separately. In a companion paper (Onder and Pestieau 2016a) we study the impact of a decline in fertility and of an increase in longevity on the level of wealth transfers more formally. In this short paper, we

⁵ On this point, see Munnell, Aubry and Crawford (2014).

will limit ourselves to presenting just a selection of the results that arise from such an analysis.⁶

Intentional bequests

There are three major motives that can be classified as intentional, which are explained as follows.

Pure dynastic altruism (altruistic bequest):

This represents a case where parents care about the likely lifetime utility of their children and hence about the welfare of future generations. Accordingly, wealthier parents make larger bequests, and holding parents' wealth constant, children with higher labor earnings will receive smaller bequests. There is also a tendency for parents to leave different amounts to different children in order to offset income inequality among them. With pure altruism, we are in the framework of Ramsey's optimal saving model that ends up with the modified golden rule in steady state. As a result, capital accumulation and inheritance depend on both the social rate of discount and the population growth rate. Whereas a decline in fertility could foster wealth transfers, changes in longevity do not play a major role.

Joy of giving (paternalistic bequest):

In this case, parents are motivated not by altruism, but by a direct utility that they receive from the act of giving. This phenomenon is also known as "warm glow" giving and can be explained by some internal feeling of virtue arising from sacrifice in helping one's children, or by the desire to control their life. *Ceteris paribus*, these bequests are subject to income and price effects, but do not have any compensatory effect, namely they are not intended to smooth consumption across generations. With this motive we expect the number of children to play a key role if the joy of giving arises from the per-child bequest, rather than the overall bequest.

Exchange-related motives (strategic bequests):

In their canonical form, exchange related models consider children choosing a level of "attention" to provide to their parents and parents remunerating them with

the prospect of bequest. The exchange can involve all sorts of non-pecuniary services and they can be part of a strategic game between parents and children. Strategic or exchange bequests depend on the wealth and the needs of the donor; they are not compensatory between parents and children and they do not need to be equal across children. The effect of aging on the size of the transfer depends on the specification of the model. In general, we expect that a longer life calls for more filial attention and, in return, more bequests. The impact of fertility is less clear. For example, in the strategic bequest example going from two to one child makes a big difference, as the parents lose part of their bargaining power and have thus to increase the level of their gifts to get a certain level of attention.

Please note that these motives can explain both bequests at the end of life and *inter vivos* gifts, with the exception of strategic bequests, which only concern wealth transfers made at the very end of life. The motives cited to date concern voluntary transfers. In the following, we briefly introduce unintentional or accidental bequests.

Accidental bequests

The other type of bequest considered here is the unplanned or accidental bequest, which results from a traditional life-cycle model. Accordingly, people save during their working lives in order to finance consumption when retired. Bequests occur solely because the life span of some individuals happen to be shorter than they anticipated *ex-ante*, hence the "accidents". A necessary condition for such bequests to occur is that wealth should be held in bequeathable form that is transferable to the beneficiary like money or certain forms of assets. Thus, imperfections in annuity markets are implied.

With accidental bequests, we expect the effects of aging to be the opposite of those with pure altruism. The fertility rate should not play a direct role, but as the survival probability increases, we should observe larger (but also less frequent) accidental bequests.

Aging and inherited wealth

We now focus on economy-wide implications of demographic aging and associated changes in individual bequests. In addition to affecting bequests, demographic aging also changes individual savings, capital per worker, and wage and interest incomes. Thus, we should

⁶ Please note that we assume exogenous demographics in our analysis. It is clear that if both longevity and fertility were made endogenous, some of the results would have to change depending on the factors determining fertility and mortality. For more detailed analyses, see Zhang, Zhang and Lee (2001) and Leroux, Pestieau and Ponthiere (2011). But such considerations go beyond the scope of this paper.

take these effects into consideration. This requires us to specify the bequest mechanism explicitly. We draw our results from Onder and Pestieau (2016b), where we use a simple Diamond-style overlapping generation model to investigate the effects of aging on bequeathing. In that model, individuals are assumed to live two periods, consuming in both, and providing some labor in the first one. They retire in the second period, the length of which is not known ex-ante. There is a certain probability of surviving the first period. Population is increasing at a predetermined rate.

As it is not feasible, or meaningful, to include all motives in the same model at once, we focus on two types of bequests: accidental bequests and joy-of-giving related bequests. Individuals can derive some utility from transferring resources to their offspring. Thus, they save in the first period to finance their consumption in old age and to leave a bequest. As annuity markets are incomplete in case of premature death, their children will inherit both the intended bequests, but also the forgone second period consumption of their parents. We assume quasi-linear utility for the first period consumption so as to keep wealth distribution within a given reasonable range. We also introduce a given scheme of annuities, which may come from either social security or from defined benefit pensions.

In the following, we discuss the comparative statics exercises from this model to assess the effects of decreasing fertility rates and mortality (which is equivalent to an increase in longevity) on i) the inherited share of wealth (ISW), ii) inheritance to real wage ratio (RIW), and iii) inherited wealth inequality (IWI). As it turns out, the presence and the extent of annuity schemes like defined benefit pensions plays a major role in determining how these indicators behave in aging societies.

Absence of annuity schemes

When annuity schemes do not exist all savings are bequeathable. Our stylized specification leads to the following analytical results in such a case.

Result 1. The inherited share of total wealth decreases when mortality or fertility decreases.

This is the most important and rather robust result of our analysis. A decrease in fertility or an increase in longevity has a depressive effect on the relative importance of inheritance in wealth accumulation. Thus, this finding

does not support Piketty and Zucman's argument in this case.

Result 2. Intentional bequest to wage ratio decreases and accidental bequest to wage ratio increases with a decrease in fertility. However, they are both unaffected by changes in the mortality rate.

Result 3. Inequality of inherited wealth increases when fertility decreases. The effect of mortality is non-linear. Starting from high mortality (short longevity), a small decrease in mortality increases the inequality of wealth. The effect is, however, the opposite if the starting mortality level is low.

Please note that the third result is determined by how we specify uncertainty in the case of mortality and how we measure inequality. For the former, we assume a predetermined probability of having a full life span. For the latter, we use a variance-based indicator (coefficient of variation) to measure the dispersion. In this case, it is known that the highest variance is reached when the probability of survival is equal to 0.5.

Next, we introduce the case of annuities.

Presence of annuity schemes

Introducing annuities complicates the analysis, and we are no longer able to produce analytical results. Thus, we adhere to using numerical simulations with a wide range of parameter/variable values. The results are as follows:

Result 4. Demographic aging decreases the inherited share of wealth (ISW).

Figure 3 shows the effects of decreasing mortality and fertility on the ISW. As the color shifts from dark blue to light yellow in the graphs, the ISW increases. Both decreasing mortality and decreasing fertility reduces the ISW, however, for different reasons. Changes in fertility mainly affect the ISW through intentional bequests. The higher these bequests vis-à-vis voluntary savings, the higher the ISW. When fertility decreases, the number of children who benefit from bequests decreases. This naturally reduces the total intentional bequest each parent desires to leave. The decrease in fertility also reduces the voluntary savings because fewer children would benefit from them if they are bequeathed accidentally. However, this effect is relatively small, as accidental

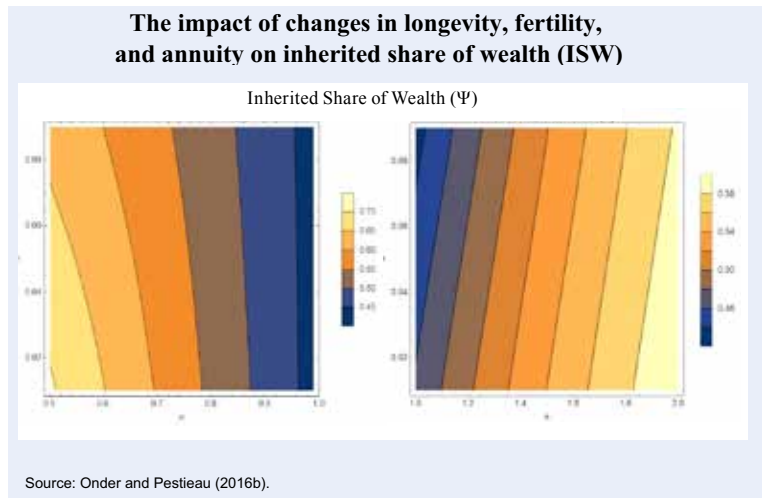
mortality is not a sure thing. As a result, with decreasing fertility, intentional bequests decrease faster than voluntary savings, reducing the intentional bequest to voluntary savings ratio, and eventually the ISW.

The effect of mortality on ISW is manifested through both intentional and accidental bequests. Other things being equal, the higher the intentional bequests vis-à-vis the voluntary savings, the higher the ISW. Similarly, the higher the mortality rate, the higher the ISW. A reduction in mortality makes accidental bequests less likely, but more sizable. To see evidence of this, please note that a decrease in mortality pushes up voluntary savings in order to finance consumption in a longer (expected) life. Thus, those who die early leave larger bequests. However, this happens less frequently after the reduction in mortality. In the end, the frequency effect dominates the size effect, and total accidental bequests decrease. Intentional bequests also decrease vis-à-vis voluntary savings in this case. However, this effect is relatively small compared to the direct effect of mortality. As a result, bequests grow less than proportionately in comparison to voluntary savings, and the ISW decreases.

Result 5. The inherited share of total wealth (ISW) decreases with a rise in annuities.

As clearly shown by Figure 3, an increasing annuitization of wealth at retirement leads to a decrease in the inherited share of wealth. This follows from the observation that annuities and voluntary savings are close substitutes in financing the second period consumption. An increase in annuities leads to a reduction in voluntary savings (but its effects on intentional bequests are ambiguous). This affects both aggregate wealth and inherited wealth through accidental bequests. Overall, the effect on accidental bequests dominates and

Figure 3



Source: Onder and Pestieau (2016b).

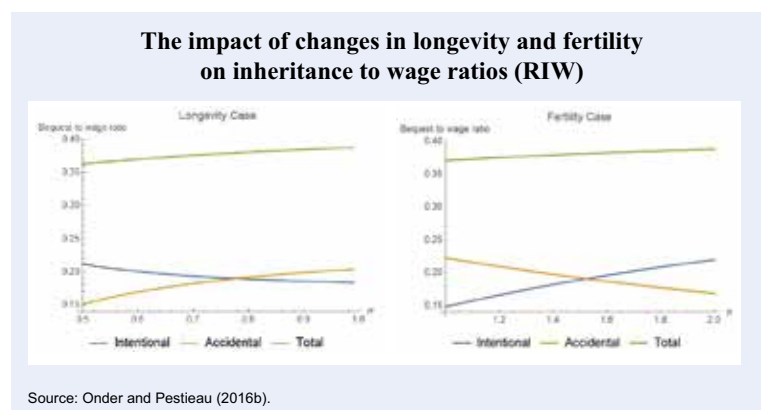
Notes: Horizontal axis shows the mortality rate (π) in the left panel and fertility rate (n) in the right panel. In both cases the vertical axes show the annuity values (a). The contour curves show the iso-ISW values, and a move from dark blue to light yellow denotes an increase in the ISW.

the ISW decreases with a rise in annuities. Such a trend was indeed prominent in the post-war era in most advanced countries, where pensions coverage with defined benefits increased rapidly. Thus, this result suggests that an increase and a subsequent decrease in annuitization could help to explain the U-shaped pattern of inherited share of total wealth observed over the last half-century.

Result 6. Aging leads to an increase in the size of accidental bequests and a decrease in intentional bequests vis-à-vis real wages.

This result concerns the size of accidental and/or intentional bequests received by a single child in comparison

Figure 4

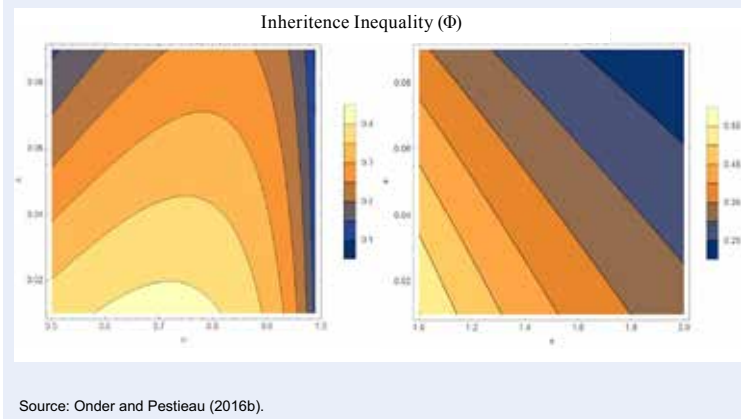


Source: Onder and Pestieau (2016b).

Notes: Horizontal axis shows the mortality rate (π) in the left panel and fertility rate (n) in the right panel. In both cases the vertical axes show the RIW.

Figure 5

The impact of changes in longevity, fertility, and annuity on inherited wealth inequality (IWI)



Notes: Horizontal axis shows the mortality rate (π) in the left panel and fertility rate (n) in the right panel. In both cases the vertical axes show the annuity values (a). The contour curves show the iso-IWI values, and a move from dark blue to light yellow denotes an increase in the IWI.

son to his/her real wage. Figure 4 shows our simulation results.

As accidental bequests are the savings that were intended for the parent's old age consumption, but are split among the children after the parent's early death, a decrease in the number of children has a direct positive effect on how much each child receives. In addition, it has indirect effects. For instance, it affects the parent's decision to save for future consumption. Taking into consideration the utility s /he receives from leaving accidental bequest, which is a function of the inheritance received by each child and the total number of children, the parent adjusts his/her voluntary savings down when s /he has fewer children. Another indirect effect, which follows on from the former, is the decrease in wages and interest rates that are brought about by the decrease in savings. Overall, the direct effect and wage adjustment together dominate indirect adjustments, and the accidental bequest to wage ratio increases when the fertility rate goes down.

Lower fertility also has a direct negative effect on intentional bequests. As in the case of accidental bequests, the utility received by a parent from leaving an intentional bequest is a function of the inheritance received by each child and the total number of children. Thus, the parent adjusts his/her total intentional bequests downwardly when s /he has fewer children, and this adjustment is larger than that which occurs in voluntary savings. Overall, when combined with higher wages, the intentional bequest to wage ratio decreases.

The effects of mortality changes on bequests work in similar ways, but have additional channels. A decrease in mortality leads to an increase in voluntary savings because consumption needs in old age become more likely and annuity benefits become lower. It also increases the wages with savings, but this is a second order effect. Overall, since savings are higher, early deaths generate larger bequests compared to wages.

Finally, a decrease in mortality affects intentional bequests less than accidental ones. This follows on from the fact that voluntary savings increase because both survival probabilities become higher and annuity receipts become smaller. By comparison, intentional bequests respond only to the former. Overall, both kinds of savings lead to an increase in wages; however, since the change in intentional bequest is small, the intentional bequest to wage ratio decreases with lower mortality.

Result 7. A decrease in fertility increases inheritance inequality (IWI). The effect of mortality, however, is not monotonic: starting from high levels, a reduction in mortality initially increases the IWI; however, the IWI eventually starts decreasing when mortality becomes low enough.

Intuitively, a decrease in fertility reduces both accidental bequests (through voluntary savings) and intentional bequests. However, the impact on the latter is larger. Therefore, although the average inheritance size decreases, the dispersion between the two types of inheritances (a large inheritance that comprises of both accidental and intentional bequests and a small inheritance with only intentional bequests) increases because the smaller one decreases faster.

The effect of a change in mortality on inequality of inheritance depends on the size of mortality rates. With lower mortality, accidental inheritance becomes less frequent, but it increases as voluntary savings rise. Thus, both the mean and variance of total bequests could increase or decrease depending on the exact values.

Table 1

Summary of results: the effects of aging on indicators of inherited wealth				
	Declining fertility		Increasing longevity	
	With annuities	Without annuities	With annuities	Without annuities
Inherited share of wealth (ISW)	-	-	-	-
Intentional inheritance to real wage ratio (RIW-intentional)	-	-	-	No effect
Accidental inheritance to real wage ratio (RIW-accidental)	+	+	+	No effect
Inherited wealth inequality (IWI)	+	+	+/-	+/-

Source: The authors.

Table 1 summarizes our findings, where a positive sign denotes an increase in each indicator and a negative sign denotes a decrease.

Conclusion

The purpose of this paper was to study the role, if any, that aging may have played in the upward trend seen in inherited wealth in recent decades. We also wanted to check whether the annuitization provided by defined benefits pension systems could also explain this phenomenon. Our conclusion is that aging, that is lower fertility and higher longevity, is not likely to explain the current bequeathing behavior, whereas annuitization could. Finally, a caveat is in order. In this exercise we have focused on two types of bequests, those relying on the absence of perfect annuity markets and those arising from some joy of giving. Implications of demographic aging may be different for bequests with other motives such as pure altruism and exchange.

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RISK OF POVERTY AMONG OLDER PEOPLE IN EU COUNTRIES

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Introduction

The financial crisis has affected the age profile of poverty in European Union (EU) countries considerably. The poverty rate increased among children, youths and working-age adults, but it decreased among the elderly. Before the crisis, the elderly was one of the groups with the highest incidence of poverty risk in many countries. Although the poverty risk among the elderly was already falling prior to the 2007/08 crisis, their fall was accelerated during the crisis, partly as a result of the buffer they experienced from their stable pension income benefits. For instance, as an effect of the crisis, youths became the most vulnerable group (OECD 2015, pp. 111).

The data source for the results presented in this paper is exclusively the survey on income and living conditions (abbreviated as EU-SILC). The EU-SILC was launched in 2003 and expanded in 2005 to cover all (then) 25 member states.

The EU-SILC provides annual data on income distribution, poverty, social exclusion and other living condition variables. The surveyed population includes all private households.

The results presented in this paper cover the data collected between 2005 and 2014 (since each year collects income data for the previous fiscal year, this data cover the income period from 2004 to 2013).

There were several reasons for this shift in poverty risk between age groups. The major reasons include growing unemployment, falling labour income and relatively intact pension incomes. The older people had the safety net of pension incomes, and those older workers who were still working had the safety of long-term contracts and labour market protection.

In this paper, we analyse the issue of the financial situation of older people in relation to macroeconomic indicators by reviewing poverty trends over the last ten years (between 2005 and 2014). The broad objectives of our research are:

- What is the poverty risk of the older population in the 28 EU countries compared to that of other age groups?
- How did changes in macroeconomic indicators (such as unemployment and GDP change) influence changes in poverty rates?
- Is the gender gap in poverty rates still dominant?
- What is the relationship between monetary poverty and material deprivation?

We work with the widely-used concept of relative poverty, which counts poor individuals as those living in households where equivalised disposable income is below the threshold of 60% of the national equivalised median income. The relative poverty measure has important limitations, notably that thresholds are country-specific and that the poverty of a certain group might be the result of the changing income position of another group (further discussion on methodology is covered in Zaidi 2010).

Key findings

The analysis presented in this paper highlights that the stability of pension income benefits provided a buffer for the elderly against the adverse impact of the financial crisis that started during 2007/2008.

In 2014 over 16 million older people (age 65+) were at risk of poverty in the 28 member states of the European Union. This is a slightly lower number than in 2008, despite the fact that the population aged 65 and over grew during that time by approximately 6.5 million (partly due to the inclusion of Croatia as the 28th new member State). The head-count measure shows that close to 18% are categorised as poor. This indicator has been stable since the beginning of the 21st century, which is not surprising given the relative nature of the at-risk-of poverty indicator. The full list of indicators and size of population per country is presented in Table 1.



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A significant variation is observed across countries, especially for those with high and very high rates of the indicator. For the purpose of capturing these differences, countries can be grouped into three categories:

Lower-than-average at-risk-of-poverty (below 15%): There are eight countries in this category: Luxembourg (6%), the Netherlands (7%), France (10%), Denmark (10%), Czech Republic (11%), Spain (13%), Ireland (13%) and Slovak Republic (13%).

Close-to-average at-risk-of-poverty (between 16% and 21%): Ten countries fall into this category: Austria (16%), Sweden (17%), Finland (17%), Belgium (17%), Germany (17%), Hungary (18%), Poland (18%), United Kingdom (19%), Slovenia (20%), Italy (20%) and Portugal (21%).

Higher-than-average at-risk-of-poverty (23% and higher): Here we have nine countries: Greece (23%), Malta (23%), Cyprus (27%), Croatia (30%), Lithuania (32%), Romania (34%), Estonia (35%), Latvia (39%) and Bulgaria with a very high rate of 48%.

The same grouping was used to analyse the poverty of older people in 2008 (covering income from 2007), i.e. before the effects of the crisis were visible. The crisis had a different effect on different countries, and this is reflected in at-risk-of-poverty rates.

- Five countries, which were ascribed to the lowest group in 2008, are still in the lowest group: Luxembourg, the Netherlands, France, the Czech Republic and Denmark.
- Three countries moved from “lower-than-average” to the category “close-to-average” (Sweden, Germany and Hungary), with only a slight increase in the poverty rate, hence their movement was rather connected with the decreased EU-average.

Table 1

Proportion and number of older people (65+) at risk of poverty in the EU countries, using 60% of the median as the poverty threshold, 2014

Countries	At-risk-of-poverty rate (65+, in %) 2014	At-risk-of-poverty rate (65+, in %) 2008	Poor population (65+, in 1000s), 2014
Bulgaria	47.8	65.5	677
Latvia	39.3	58.8	148
Estonia	35.0	40.9	83
Romania	34.0	49.2	1 106
Lithuania	31.9	39.9	173
Croatia	29.7	-	219
Cyprus	27.2	49.3	29
Malta	23.3	26.0	17
Greece	23.0	28.1	505
Portugal	21.1	27.7	438
Italy	20.2	24.4	2 618
Slovenia	20.1	24.4	64
United Kingdom	19.3	28.5	2 167
Poland	18.2	26.9	1 020
Hungary	18.1	17.5	282
Germany	17.4	15.5	2 828
Belgium	17.3	22.9	322
Finland	17.0	23.9	176
Sweden	16.5	15.5	314
Austria	15.7	21.2	236
Slovak Republic	13.4	21.9	102
Ireland	13.0	22.5	76
Spain	12.9	26.2	1 050
Czech Republic	10.7	12.5	191
Denmark	10.4	18.6	108
France	10.1	14.1	1 128
Netherlands	6.9	9.7	191
Luxembourg	6.4	5.4	5
European Union (28 countries)	17.8	-	16 271
European Union (27 countries)	17.7	23.3	16 052
European Union (15 countries)	16.3	20.9	12 161

Source: EU-SILC 2014 (income data refers to 2013).

- The next three countries achieved the shift to “lower-than-average” from “close-to-average”: the Slovak Republic, Ireland and Spain; it is worth underlining that the rate for Spain was cut by half during that time.
- Only one country – the United Kingdom – managed to decrease the poverty rate from “higher-than-average” to “close-to-average”.

Most of the countries kept the same relative position as in 2008, despite changes in the poverty rate. This is especially true for countries in the “higher-than-average” group. In all of these countries, we observe a de-

crease in at-risk-of-poverty rates, but they still have the highest rates in Europe.

To summarise, between 2008 and 2014 the situation of older people improved in most EU countries, with significant efforts made in Spain and Ireland. The situation only deteriorated in three countries (Sweden, Hungary and Germany), with a slight increase in the poverty rate (whereas the average rate for 27 member states, excluding Croatia, decreased by 5.6 percentage points).

In 2014, the situation of the older population was better than that of the working age population (18–64 years old) in most EU countries (see Figure 1). The at-risk-of-poverty rate for the working population was only lower than that for the older population in six countries, i.e. in Bulgaria, Latvia, Estonia, Lithuania, Croatia and Malta, although the difference between the rates for those two groups is small. The situation of older people is much better vis-a-vis that of the working age population in countries with a low at-risk-of-poverty rate: Luxembourg, the Netherlands, France, Denmark, Spain and Ireland. However, we also observe a huge gap between the two age groups in Hungary, Italy and Greece (with the EU’s highest rate of at-risk-of-poverty for people aged 18–64 years old). By contrast, in 2008 the situation of older people was only better than that of the working age population in four countries, namely: Hungary, Luxembourg, France and Poland.

Poverty risk and macroeconomic indicators

The point of interest is therefore the change in the economic situation of the older and working age population, and how this is connected with the economic crisis. Hence, we analyse the relationship between at-risk-of-poverty and main economic indicators: the percentage

Figure 1

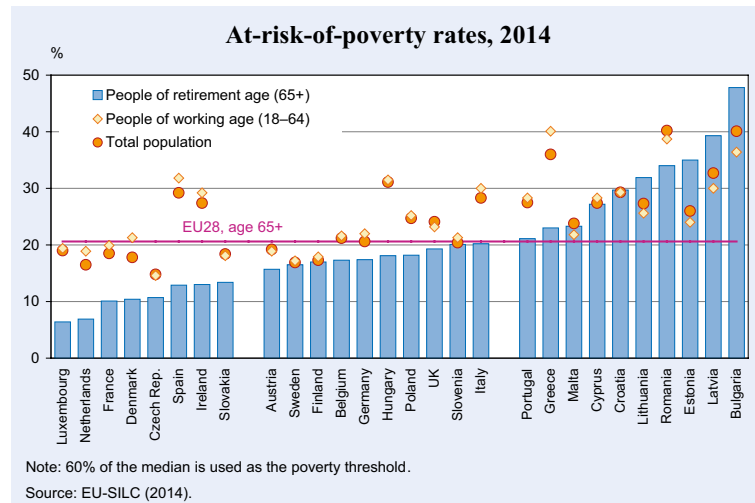
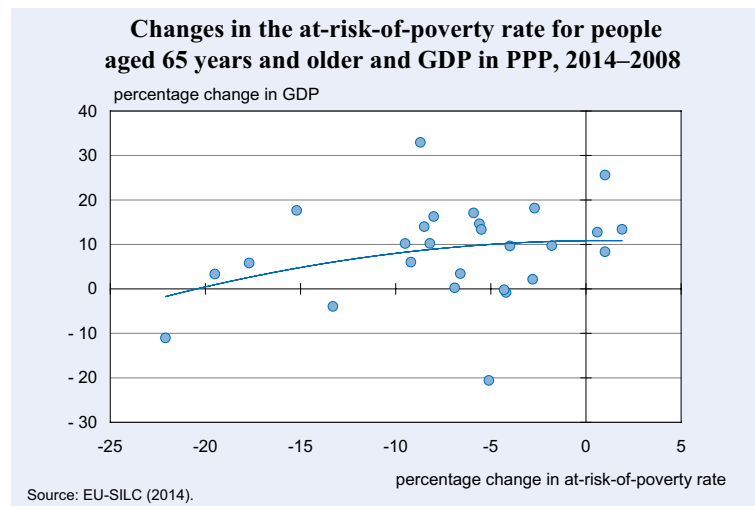


Figure 2



change of a country’s GDP, and changes in its unemployment rate, as well as equivalised income.

The Pearson correlation coefficients between the changes in the at-risk-of-poverty rate for the older population and economic indicators was rather weak or moderate: 0.28 for GDP (in Purchasing Power Parity (PPP)) change, -0.35 for median equivalised income (in PPP) change and -0.41 for unemployment rate change. It can therefore be said that the macroeconomic effects of the crisis had a moderate influence on the financial situation of older people.

The effects of the crisis had a more prevailing influence on the working age population. The Pearson correlation coefficient between changes in the at-risk-of-poverty rate

Figure 3

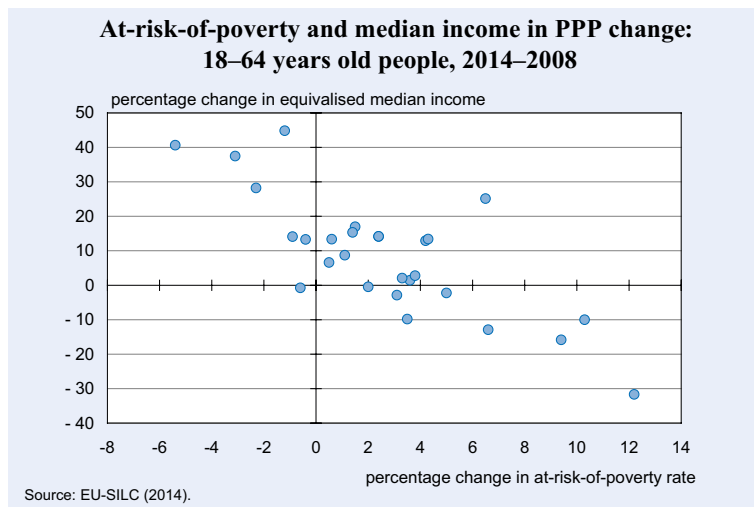


Figure 4

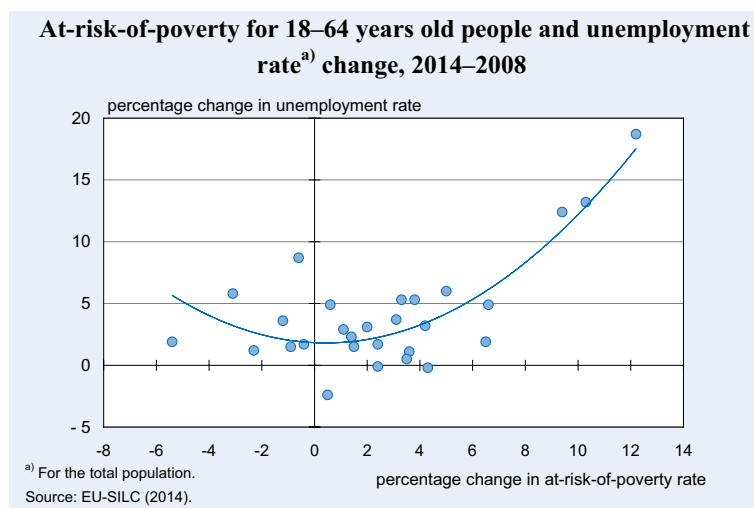
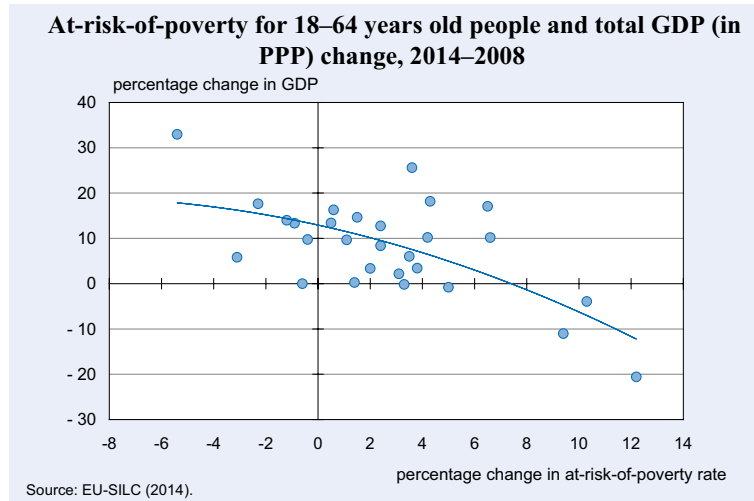


Figure 5



and the unemployment rate was -0.62, total GDP (in PPP) 0.68, and median equivalised income (in PPP) -0.78 (see Figure 2).

The relationship between changes in poverty and median income is straightforward (see Figure 3). In those countries where the median income decreased between 2008 and 2014, the at-risk-of-poverty rate increased. This is particularly visible for countries such as Greece (-32% decrease of median income), Cyprus, Spain and Ireland. In those countries where median income increased (the Slovak Republic 45%, Poland 41%, Bulgaria 38% and Romania 28%), the poverty rate decreased. There are also some outliers, as Estonia, Malta or Denmark, where both the poverty rate and median income increased.

The relationship between the at-risk-of-poverty and the unemployment rate is positive, i.e. the higher the unemployment growth, the higher the change in the at-risk-of-poverty rate (see Figure 4). We observe the highest growth in the unemployment rate (between 2008 and 2014) in Greece, Spain and Cyprus. The risk of poverty for the working age population also increased significantly in those countries. In the countries where the poverty risk decreased, the unemployment rate increased slightly. We also observe cases where the poverty risk for the working age population decreased, despite the increase in the unemployment rate, especially in Bulgaria, Romania, Poland and the Slovak Republic.

The correlation between GDP growth and poverty risk is nega-

tive: generally, the higher the GDP growth, the lower the risk of poverty (see Figure 5). Total GDP between 2008 and 2014 has only dropped in five countries (and only by a fraction in Slovenia and Italy) and the risk of poverty has increased in those countries. It is especially visible for Greece and Cyprus. In most of the countries with the highest GDP growth (Poland, Romania, the Slovak Republic and Austria), the risk of poverty was lower than in 2008. However, we also observe an increase in the at-risk-of-poverty rate in countries with GDP growth above the EU-average: Belgium, Denmark, Estonia, Lithuania, Ireland, Luxembourg, Hungary, Malta and Sweden. There is also the special case of Bulgaria, where the poverty rate has decreased, despite very weak GDP growth (below EU-average).

In short, we may say that the macroeconomic effects of the crisis affect the financial situation of the working age population, but have limited influence on the older population. Therefore, in 2014 people aged 65 and over can be considered as relatively less vulnerable than their working age counterparts.

Patterns of poverty across subgroups of older people

The financial situation of older women differs considerably from that of older men. This is the result of the structural assumption embedded in pension systems and the labour market. Women were expected to leave paid employment after marrying or – at least – for the period of childcare. Therefore, women’s situation was affected by their lower pension contributions and eventually resulted in lower income in old age. Not surpris-

ingly, the risk of poverty for older women is greater than the risk for men, although the gender gap in poverty has been quite stable since the beginning of the 21st century.

In 2014 the risk-of-poverty for female population was 20%, for older males it was 15%. In every EU country the rate for women is higher than the corresponding rate for men. However, there are countries where this difference is rather small (e.g. Luxembourg, Belgium and Denmark), whereas there are others with a huge gender bias (e.g. Estonia, Latvia and Lithuania).

The first group mainly features countries with a low at-risk-of-poverty rate, such as Luxembourg, Belgium, Denmark, Malta, the Netherlands, Spain and France, where the gap is below three percentage points. We generally observe the highest gap among countries with high poverty risk, such as Estonia, Latvia, Lithuania, Romania and Bulgaria. However, there are also countries with a low or average poverty rate and a huge gap between the rates for men and women, such as Sweden, Finland and Slovenia. A significant gender gap in those three countries was also observed in 2008.

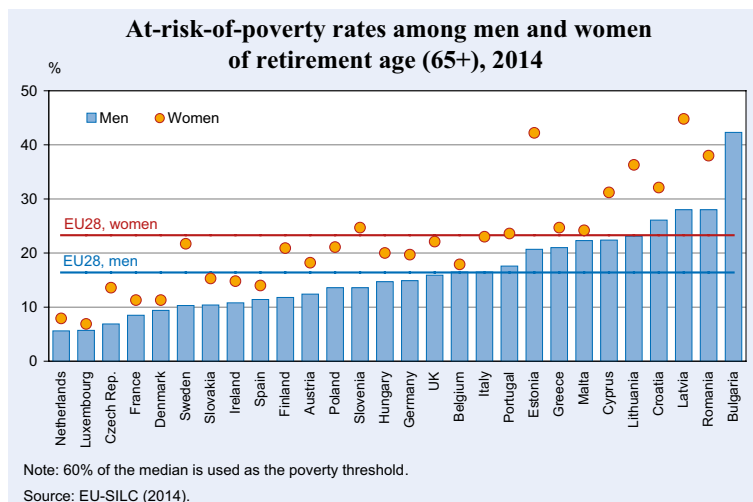
The poverty risk and the gender gap for the older population are even greater than for people aged 65 and over. The EU-average rate for men aged 75 years and over is 15%, while the corresponding rate for women is 22% (see Figure 6).

In all countries we observe a higher poverty risk for women aged 75 years and over. In some countries the gender gap amounts to almost 20 percentage points (e.g. Estonia: 24% for men and 44% for women). In six coun-

tries, the poverty risk for older women is close to or above 40%, and in two countries (Latvia and Bulgaria) it is close to 50%, implying that every second elderly women is in danger of living in poverty. Generally, the countries can be categorised as having a low or a high gender gap in the same way as the rate for the population aged 65+. Therefore we can say that the gap in the poverty risk between the sexes increases upon retirement age, and is even greater after that age.

The poverty risk gender gap in older cohorts is far greater than

Figure 6



that in the working age population. For the core working age population (25–54 years old) this difference is close to one percentage point (for 65 and over: five percentage points). In all countries gender gaps for the working age population are smaller than those for the older population. In 12 out of 28 member states, the poverty risk is actually higher for men. Interestingly, a higher poverty risk for men aged 25–54 is observed in countries with the highest risk for women aged 65 and over (mainly Eastern Europe), and in Scandinavian countries (Sweden, Denmark and Finland).

Trends in poverty risks for the elderly over the last ten years

Changes in the poverty risk of elderly persons over time add important details to the body of knowledge on poverty for the elderly. The Eurostat statistical database now enables us to analyse trends for a ten year period, between 2005 and 2014. During that time, the poverty risk for the total population (average for 27 EU member states) decreased slightly (from 25.8 to 24.4, reaching its lowest value of 23.3 in 2009).

The extent of the change was dramatic for older people (65 years and over). This population experienced a significant improvement in the financial situation as the indicator for at-risk-of-poverty decreased by almost eight percentage points, from 25.5 to 17.7. The latter figure is the lowest rate in the ten-year period but the decreasing trend is constant, which means that the situation of older people is improving year by year.

The decrease in the poverty rate was especially meaningful for new member states (12 East European countries), where it dropped from 42% to 24%. This resulted from the rapid economic development of those countries, although the decrease in the population of 18–64 year-olds in new member states (from

Figure 7

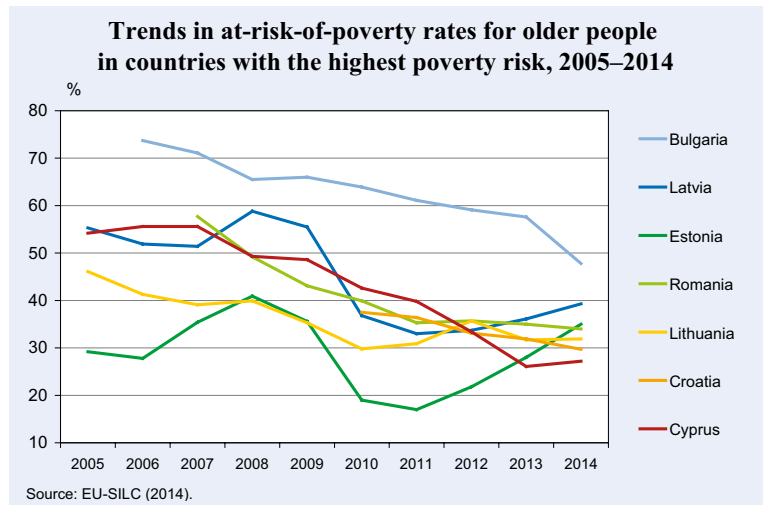
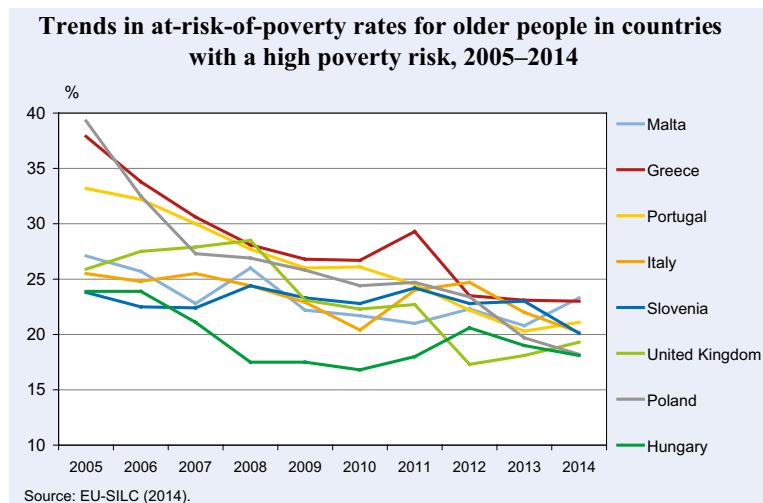


Figure 8



40 to 28) was slower, which proves that the development in new member states was not accompanied by a reduction in social protection for the elderly.

The detailed results for all EU countries are presented in Figures 7–10. In this analysis we applied country groupings based on at-risk-of-poverty rates in 2014. This enabled us to examine trends over the last ten years and observe how different countries achieved their current positions.

The first panel reports the results of those countries that exhibited high at-risk-of-poverty rates (see Figure 7). In this group, we have three countries with the highest drop in the poverty risk: Cyprus (-27 percentage points (p.p.)), Bulgaria (-26 p.p.), and Romania (-24 p.p.). The

Figure 9

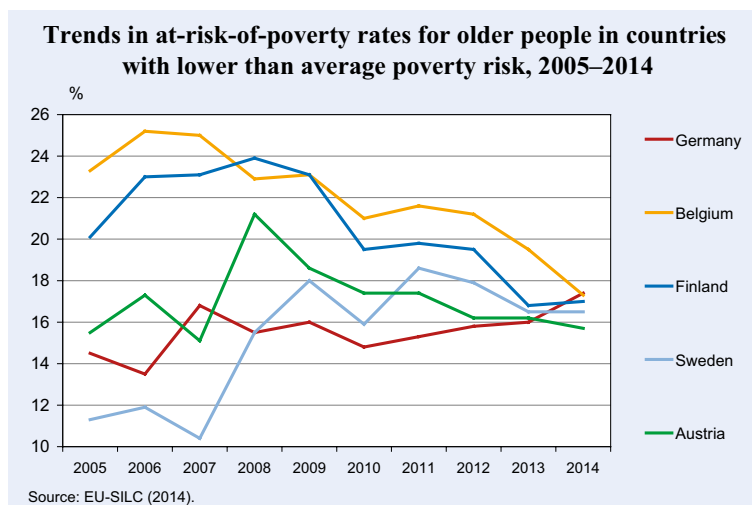
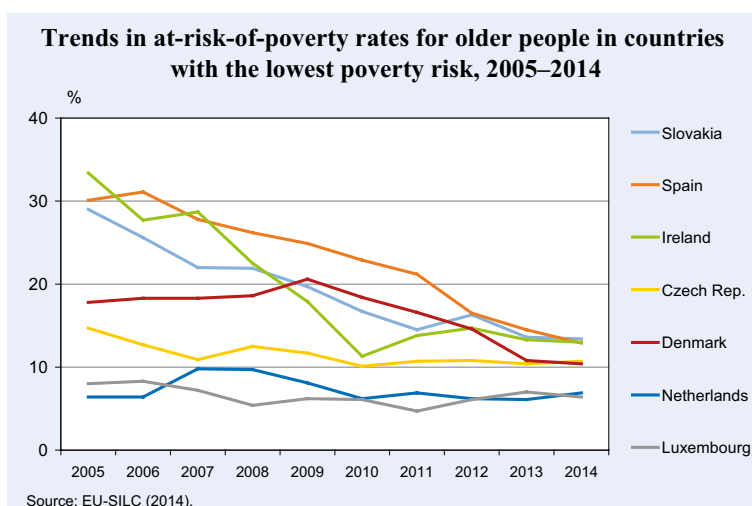


Figure 10



next three countries also experienced a significant decrease (however, for Croatia data are available for the period from 2010 to 2014). The only exception is Estonia, where the poverty risk increased from 29% to 35%.

In this group of countries, we can observe the striking effects of economic and social policy during that period (Figure 7). Although the starting point for countries such as Estonia and Latvia was quite different, after ten years they reach the same level. It is also worth noting here that despite huge efforts, the risk of poverty in countries like Bulgaria, Romania or Latvia is still much higher than the EU-average.

In the second group we classify countries with a risk of poverty above the EU-average (18%) and below

25% (see Figure 8). This cluster is highly diversified in terms of geographical location and in the level of the indicator at the starting point (the lowest and the highest value for 2005 were 24% and 39%). However, the common feature is the decrease in the poverty risk over time (Figure 8).

The scope of the decrease, however, varied for different countries. In Poland the poverty risk decreased by an impressive 21 percentage points. A significant fall was also observed in Greece and Portugal. Other countries experienced only a slight decrease, especially in Malta and Slovenia, where the poverty risk dropped by just four percentage points.

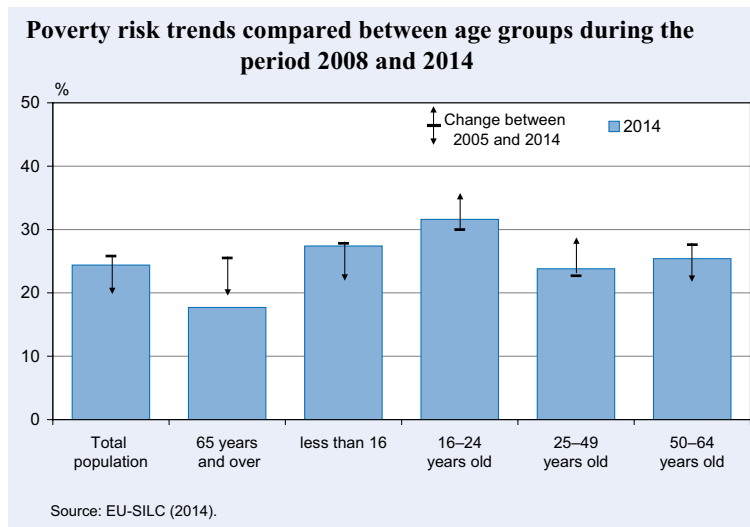
In the third cluster, we grouped countries with a poverty risk slightly below the EU-average (see Figure 9). These countries, although almost on the same level in 2014, had different starting points. Hence, some of them experienced an increase and some saw a decrease in the at-risk-of-poverty rate.

Two countries with lower values in 2014 than in 2005 are Belgium and Finland. In both cases the value of the indicator was quite stable between 2005 and 2012 and a significant drop was only observed for the years 2013 and 2014.

An unlikely situation was seen in Germany and Sweden. Both countries are among the few countries where the poverty risk for older people increased between 2005 and 2014: by five p.p. in Sweden and by three p.p. in Germany. Sweden saw a sharp increase in 2008 and the indicator maintained its higher value up to 2014. In Germany, a spike was observed in 2007. In both cases the increase took place before the effects of the financial crisis could be noted.

The exceptional case in this cluster is Austria, which also experienced a sharp increase in the poverty rate in

Figure 11

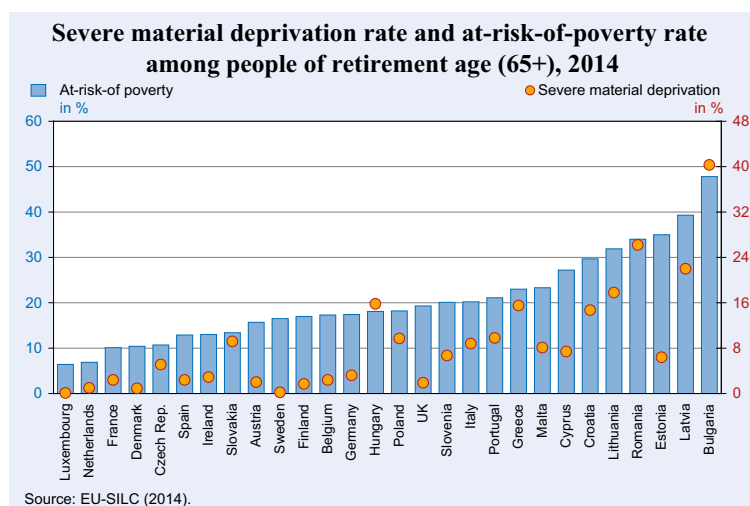


2008, but managed to decrease this rate, which eventually returned to its 2005 level by 2014.

This group of countries therefore features developed, old member states with a rather low poverty risk, but with different policy approaches towards the poverty among the elderly over time.

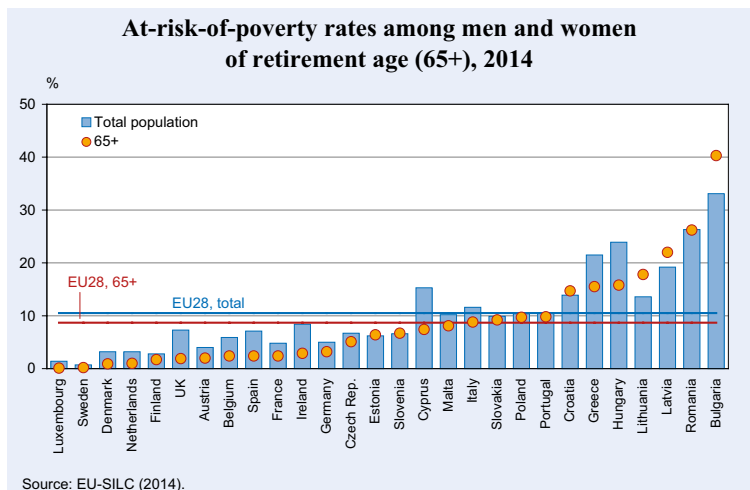
The last group includes countries with the lowest rate of poverty risk (all below 15%) (see Figure 10). This is a very diverse group taking into account the starting point (year 2005) and the trend developed over time.

Figure 12



Ireland, Spain and the Slovak Republic had higher than average at-risk-of-poverty rates in 2005. Since then, they have experienced a sharp and continuous decline in their indicator levels. The financial crisis and its effects on GDP and unemployment did not influence the declining trend in poverty risk in those countries, even if their macroeconomic indicators were diverse (e.g. -4% GDP growth in Spain, +14% GDP growth in the Slovak Republic).

Figure 13



The second set of countries in this cluster are those that moderately decreased their poverty risk, but had a starting point that was already little below EU-average. They include: France (-8 p.p. between 2005 and 2014), Denmark (-7 p.p.) and the Czech Republic (-4 p.p.). France and the Czech Republic experienced a gradual decline in the poverty risk, whereas Denmark saw a slight increase until 2009, followed by a sharp decline (especially in the years 2012–2013).

The last two countries in this cluster are Luxembourg

and the Netherlands – both of which boast the lowest poverty risk for older people for the whole period of 2005–2014 (although with fluctuations). Respective rates for those countries never exceeded 10%, which suggests a stable and efficient policy against poverty among the elderly.

In the last ten years we have witnessed an unprecedented decline in the poverty risk for the elderly, which is now significantly lower than in 2005. Economic changes over the last ten years have a different impact on different age categories (see Figure 11).

The at-risk-of-poverty rate for the total population also decreased in the last ten years, but only by 1.3 p.p. The poverty risk for children was stable during that period. The population close-to-retirement age (50–64 years old) saw a 2.2 percentage point improvement.

The core working age population, by contrast, appeared to be most vulnerable during the years 2005–2014. The poverty risk for persons 16–24 years old increased by 1.6 p.p. and for 25–49 years old it rose by 1.1 p.p.. This, however, is not the whole story for these groups. Both of them experienced a decline in poverty risk between 2005 and 2009, before risk started to grow again. The rate between 2009 and 2014 therefore increased for the population of 16–24 year-olds by 3.7 p.p. and for 25–49 year-olds by 3.0 p.p..

It is worth mentioning that the trend in poverty risk was similar for all age groups: with a decline between 2005 and 2009 and an increase after 2009, but the working age population still did not return to the levels seen in 2005.

Analysis of other facets of poverty

As a supplementary measure for a financial poverty indicator, the EU-SILC database uses the indicator of “material deprivation”. This indicator measures the percentage of the population that cannot afford at least three of the following items:

- to pay their rent, mortgage or utility bills;
- to keep their home adequately warm;
- to face unexpected expenses;
- to eat meat or proteins regularly;
- to go on holiday;
- a television set;
- a washing machine;

- a car;
- a telephone

For the purpose of our analysis, we employed the indicator of severe material deprivation rate, defined as the enforced inability to pay for at least four of the above-mentioned items (see Figures 12 and 13).

The ranking of countries according to severe material deprivation is similar to the ranking for the at-risk-of-poverty rate. Bulgaria, Romania and Latvia have the highest rate of severe material deprivation, while Luxembourg, the Netherlands and Denmark have the lowest level for both material deprivation and poverty risk. There are significant differences, however, in the case of a few countries. In Estonia a high percentage of older people is at risk of poverty, whereas only few experience severe material deprivation. This also holds true for Cyprus and Malta. On the other hand, we have countries such as Hungary and (to a lesser extent) the Slovak Republic, where the poverty risk is rather moderate or low, but material deprivation is high.

Conclusions

One of the outcomes of the development in the last ten years was a significant improvement in the (relative) financial situation of older people, which is confirmed by the drop in the at-risk-of-poverty rate for this group.

In 2014 this was the age group with the lowest poverty risk. This confirms that the social policies aimed at supporting older vulnerable groups have proven successful. However, not necessarily as a result of these policies, the group with the highest risk of poverty is currently young adults (16–24 years old).

The shift between age groups is visible in almost every EU member state. In 2008, the situation of older people was better than that of the working age population in just four countries. In 2014, the at-risk-of-poverty rate for the working population was lower than for the elderly in just six countries.

Changes in the macroeconomic indicators as a depiction of the crisis had the most serious impact on the financial situation of the working age population, but the same economic downturn had a limited impact on the older population’s financial status. We observed a weak correlation between changes in the at-risk-of-poverty rate, and GDP growth, and changes in unemployment and

median income in the case of the population aged 65 and over. The effects of the crisis are visible only for the working age population.

Despite significant progress in the economic emancipation of women, we still observe a gender gap in poverty rates. The risk of poverty for older women is greater than the same risk observed for older men. What is more striking is that this gender gap in poverty has been quite stable since the beginning of the 21st century, with the rate for women remaining higher than that for men in every EU country. The gender gap for poverty risk in the oldest age cohorts (age 75+) is greater than that observed for the age group of 65+ as a whole, although it still remains lower than that observed for the working age population.

Over the last ten years, the indicator for at-risk-of-poverty for the elderly has decreased by almost eight percentage points, from 25.5 to 17.7 percent. The decrease in the poverty rate was especially strong in the new member states, and particularly in Cyprus, Bulgaria, Romania and Poland. Poverty rates increased in just three countries (Sweden, Estonia and Germany). The biggest efforts in the reduction of poverty rates made over the last ten years were seen in Cyprus, Bulgaria, Romania, Poland and Ireland, mainly due to strengthening of minimum income guarantees in these countries.

There is a strong positive relationship between the monetary poverty risk and material deprivation. Some special cases, which require further analysis, were Estonia (with a high poverty risk, but low material deprivation) and Hungary (an average poverty risk, but high material deprivation).

The analysis presented in this paper highlights that the stability of pension income benefits provided a buffer for the elderly against the adverse impact of the financial crisis that started during 2007/2008. By contrast, the working age population was disproportionately affected by the crisis. This paper does not examine the mechanisms behind this change in any detail, or how the subsequent changes during the austerity period affected the financial situation of the elderly. In many countries like Greece, Spain and Portugal, many public services were cut during the post-crisis austerity period, which affected the older population worse than the working age population. Of particular relevance to older people were the cuts observed in the health and social care services, which were important, but not the focus of this paper.

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POLITICAL PARTIES AND ECONOMIC OUTCOMES. A REVIEW

LOUIS-PHILIPPE BELAND¹

Abstract

This paper presents a review of the impact of the political parties of US governors on key economic outcomes. It presents the impact of Democratic versus Republican governors on pollution, spending, policies, and labor market outcomes, using a regression discontinuity design (RDD). It shows a lower level of pollution under Democratic governors and an increase in the share of spending on education and health. It also shows that blacks, immigrants, and other minorities have better labor-market outcomes relative to white natives under Democratic governors.

Introduction

Governors are in charge of the executive branch of their state. Governors propose and administer the budget, recommend legislation, sign laws, establish policies, and appoint department heads. Governors have considerable control over policies as they can veto bills coming from the state legislature. In some states, the governor has partial or absolute power to commute or pardon criminal sentences and has additional roles, such as commander-in-chief of the National Guard. In addition, governors may exercise line item veto power on bills that involve taxing or spending, giving them the right to reject part of a bill passed by the legislature – this tool is available in all but seven states. In sum, they have a high degree of autonomy in the governance of their state.

This paper presents a review of the impact of the political parties of governors on key economic outcomes. It presents the impact of Democratic versus Republican governors on labor market outcomes, pollution, spending,

and policies. It uses a regression discontinuity design (RDD) to determine the causal impact of political parties on outcomes of interest. The results show that party affiliation matters for economic outcomes. It shows a lower level of pollution under Democratic governors and an increase in the share of spending on education and health. It also shows that blacks, immigrants, and other minorities have better labor-market outcomes than white natives under Democratic governors.

The first section presents a review of the literature related to this topic, the next section discusses the RDD methodology, and the following section presents the data, descriptive statistics, and graphical evidence. The subsequent section is devoted to results, while the last section offers some conclusions.

Literature

There is a growing body of literature on the impact of political parties (Democratic versus Republican) on economic outcomes at the US state level. Besley and Case (1995) find that Democratic governors had an impact on income taxes, workers' compensation benefits, and spending from 1950 – 1986. In a follow-up paper, they show that the unified effect of a Democratic governor and Democrats controlling both the upper and lower houses of the legislature (united government) has a positive and significant impact on total spending, family assistance, workers' compensation, and taxes (Besley and Case 2003). Leigh (2008) investigates the gubernatorial partisan impact on numerous policy settings, economic, and social outcomes during the period 1941 – 2001. He finds a slightly higher minimum wage, lower post-tax inequality, and a lower unemployment rate under Democratic governors. Beland (2015) and Beland and Unel (2015a), using RDD, find that minorities such as blacks and immigrants have better labor-market outcomes under Democratic than under Republican governors. Beland and Boucher (2015) find that pollution is lower under Democratic governors, while Beland and Oloomi (2015) find that the share of spending in educa-



¹ Louisiana State University.

tion and health sectors are higher under Democratic governors.² This paper presents a review of this evidence.

RD methodology

To evaluate the causal impact of political parties of governors (Democrats versus Republicans) on economic and policy outcomes, we use a regression discontinuity design (RDD), following Lee (2001, 2008). The RDD allows for the removal of endogeneity concerns arising from factors such as voter characteristics, quality of candidates, resources available for campaigns, and other unmeasured characteristics of states and candidates that could bias estimates. Similar methodology is employed in several papers. We estimate the following parametric RDD approach as our main specification:

$$Y_{st} = \beta_0 + \beta_1 Dem_{st} + f(MV_{st}) + X_{st} + \phi_s + \psi_t + \varepsilon_{st} \quad (1)$$

Y_{st} represents the outcome of interest in state s and year t . β_1 shows the effect of a Democratic governor on the share of state spending in the above sectors. Dem_{st} takes value of one if the winner of the election at state s and year t is a Democrat and zero if the winner is a Republican. MV_{st} represents the margin of victory of the elected governor at the most recent election. Margin of victory is the difference between the vote shares of the winner and the second-place candidate. Values are positive when a Democrat wins the election and negative when a Republican wins. The cutoff point for the RDD is zero. We estimate the party affiliation impact of the governor on economic outcomes controlling for the margin of victory, using a second order polynomial: $f(MV_{st})$.³ ϕ_s and ψ_t are state and year fixed effects. Standard errors are clustered at the state level to account for potential serial correlation within a state over time. X_{st} represents time-varying controls regarding states' demographic and political characteristics.

For labor market outcomes, we have individual-level data and estimate the following equation:

$$Y_{ist} = \beta_0 + \beta_1 Dem_{st} + \beta_{DC} Dem_{st} * C_{ist} + \beta_C C_{ist} + f(MV_{st}) + X_{st} + Z_{ist} + \phi_s + \psi_t + \varepsilon_{ist} \quad (2)$$

$C_{ist} = [Black_{ist} \ Other_{ist} \ Imig_{ist}]$ is a vector of variables that characterizes each individual's race or immigration status. *Black* equals one if the individual is black, and *Other* equals one if the individual is neither white nor black. *Imig* equals one if the individual is an immigrant. Z_{ist} represents individual characteristics such as marital status, gender, education, and age.

Data, descriptive statistics and graphical evidence

Data

Election data come from two main sources. Prior to 1990, data come from ICPSR 7757 (1995) files called *Candidate and Constituency Statistics of Elections in the United States*. Post-1990 data come from the Atlas of US Presidential Elections (2015). Variables taken from these sources are the political party of the winner (Democrat versus Republican) and the margin of victory.

Data on state spending come from State Government Finances data from the US Census Bureau. This data presents a comprehensive annual summary of state government expenditure. As outcome variables we use the share of state government spending on education, health/hospitals, public safety, social welfare, and agglomerate all others. Data are available from 1960 – 2012.

Data on pollution are from the US EPA AirData from 1980 – 2013. Yearly average concentrations in a given state for five major pollutants are considered: CO, Ozone, NO2, Particulates, and SO2. These five pollutants are targeted by the EPA for their negative impact on health and on the environment. Ozone and Particulates are particularly damaging for health and can lead to respiratory problems, especially for people with asthma. NO2 contributes to the formation of Ozone and Particulates. SO2 contributes to the formation of Particulates. Concentration levels represent averages across the states' monitoring stations.

Labor market data come from the March Current Population Survey (CPS) by Flood et al. (2015). Outcome variables are earnings, being employed, total hours worked, and weeks worked. CPS provides a large sample size of workers and

² Other studies at the US gubernatorial level study the impact of political parties on unionized workers (Beland and Unel 2015b) or on entrepreneurship (Beland, Eren and Unel 2015). There are other studies investigating the partisan impact at other levels of government in the US and in other countries. By example, Ferreira and Gyourko (2009) find no significant party affiliation impact of the mayor on the size of city government, spending, and the crime rate. Lee, Moretti and Butler (2004), using an RD design, find that party affiliation has a large impact on a legislator's voting behavior. Pettersson-Lidbom (2008) finds a positive party effect of left-wing government on spending and tax using Swedish local government data.

³ Results are similar if a 1st or 3rd degree polynomial or local-linear RDD are used. RDD has strong internal validity for closed elections. However, the validity of the RDD estimates for non-contested election is not clear (see Lee and Lemieux 2014).

Table 1

Descriptive statistics			
Panel A			
Years in Office	1960–2013	1980–2013	1993–2013
All governors included	2,343	1,666	1,027
Democratic governor	1,269	849	466
Republican governor	1,074	817	561
Percentage Democratic governor	54%	51%	45%
Panel B			
	Margin of victory	Margin of victory	Margin of victory
1980–2013 Elections	5%	10%	15%
All governors	359	708	931
Democratic governor	169	347	453
Republican governor	190	361	478
Note: Margin of victory is the difference between the percentage of vote cast for the winner and the candidate who finished second. Small values of margin of victory are representative of close elections. This table shows the balance of the number of Democratic and Republican governors at different values of margin of victory and by years.			
Source: ICPSR 7757 (1995), Atlas of US Presidential Elections (2011).			

has many individual characteristics such as age, education, race, and marital status. We use data from 1994–2014, which represents the income years 1993–2013. Years are dictated by the availability of the immigrant variable.⁴

Data on policies are from the University of Kentucky Center for Poverty Research (UKCPR) (2015) and Leigh (2008) data. Four key policies are studied in this paper: state minimum wage, state earned income tax credits (EITCs) rate, workers’ compensation benefits and top corporate tax rate. State minimum wage measures the minimum wage in the state, as several states opt to have a higher minimum wage than the federal one. The State EITC is a refundable tax credit primarily for individuals and couples with children; the aim of the policy is to increase employment. Workers’ compensation benefit is a state-mandated insurance program that provides compensation to employees who suffer job-related injuries and illnesses. The top corporate tax is the maximum corporate tax rate for business in the state. Data are from 1980 – 2013.

⁴ Results are similar for blacks and others if years 1977 – 2013 are used.

Descriptive statistics

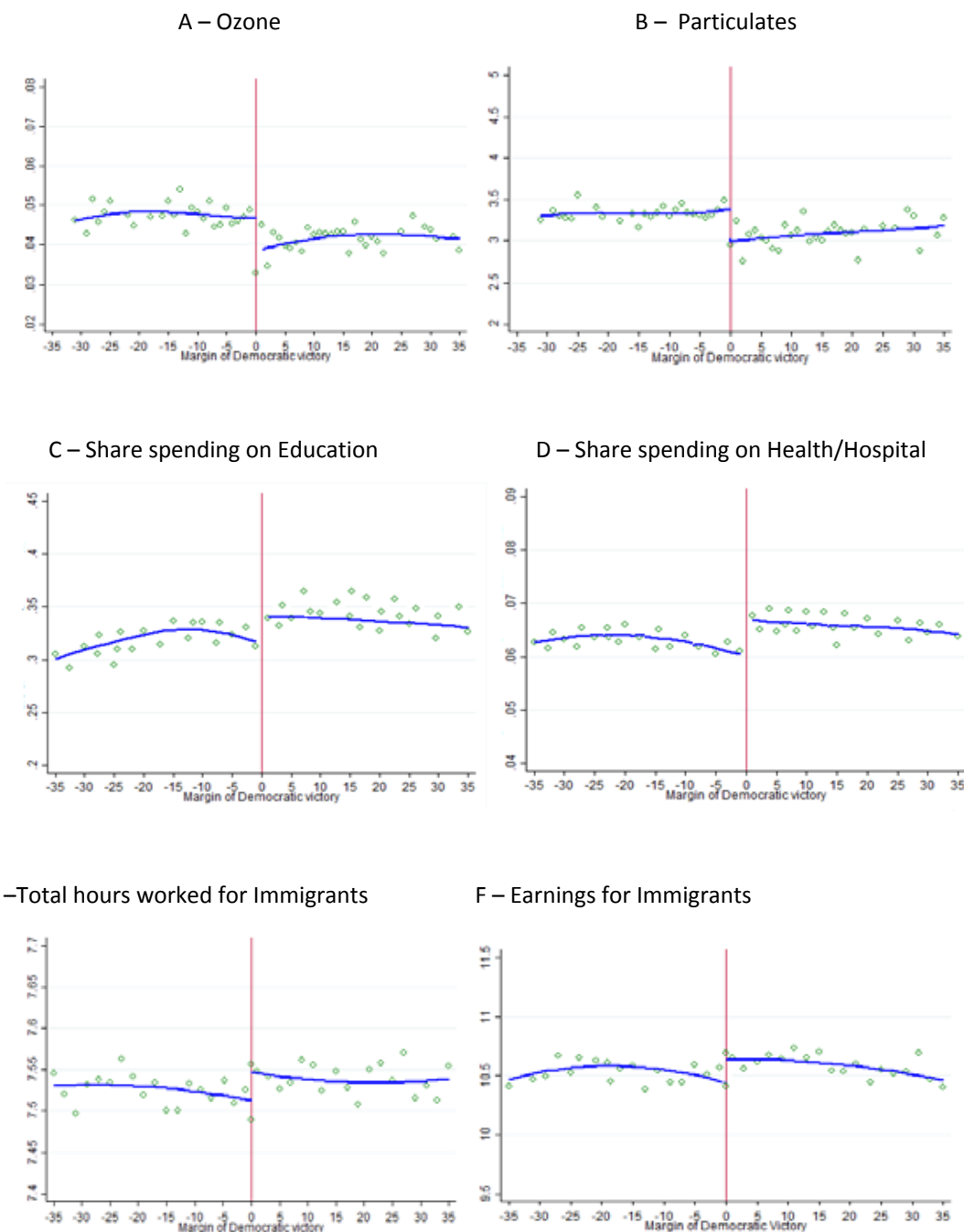
Panel A of Table 1 shows the number of years governed by either a Republican or Democratic governor, and the number of elections where either a Democratic or Republican governor was elected. From 1980 – 2013, there are 1,666 years in office, which includes 849 years (51 percent) governed by Democrats. Panel B of Table 1 shows the number of elected governors by margin of victory (five percent, ten percent and fifteen percent). It provides evidence that the number of Democratic and Republican governors is similar for close elections. There are 708 years in office at the margin of victory of ten percent, 347 (49 percent) of which are governed by Democrats.

Graphical evidence

Figure 1 presents the regression discontinuity graphs for the following outcomes: hours worked and earnings for immigrants, spending on education and health, and air quality level for Ozone and Particulates. The discontinuities in the graphs are at zero percent of the margin of victory. Values are positive when a Democratic governor is in power and negative for a Republican. Each dot in these graphs represents the average of the

Figure 1

Regression discontinuity graphs



Source: The authors.

outcome variable at state s and year t , grouped by margin of victory intervals. The solid line shows the fitted values. Figure 1 shows a higher share of state government expenditure on education and health/hospitals when Democratic governors are in office. It also shows an increase in total hours and earnings for immigrants and a decrease in pollution (represented by Ozone and Particulates) under Democratic governors.⁵

⁵ For brevity, we include only a sample of RDD graphs. Graphs for all outcomes are available upon request.

Results

Pollution

Table 2 presents RDD estimates for outcome variables: concentrations of CO, Ozone, NO₂, Particulates, and SO₂. Table 2 reports only the coefficient of interest: β_1 , which captures the causal impact of the Democratic governor. Table 2 shows that under a Democratic governor, the realized level of pollution is lower for Ozone

Table 2

Impact of party affiliation on pollution					
Variable	CO (1)	NO2 (2)	Ozone (3)	Particulates (4)	SO2 (5)
Democrat	-0.0394	-0.1254**	-0.0025***	-0.0715**	-0.1020
	(0.0249)	(0.0621)	(0.0007)	(0.0283)	(0.0632)

Notes: All regressions include state fixed effects and time effects. State average concentrations for each year: CO2 (ppm), NO2 (ppb), Ozone (ppm), Particulates (ug/m3), SO2 (ppb). Numbers in parentheses are standard errors based on clustering data at state level; ***, **, and * represent statistical significance at the 1%, 5%, and 10% level, respectively.

Source: Airdata (EPA). Data are from 1980 – 2013.

Table 3

Impact of party affiliation on spending						
Variable	Education (1)	Health/Hospitals (2)	Public Safety (3)	Social Welfare (4)	Other (5)	Total Spending (6)
Democrat	0.0235**	0.0488**	0.0384*	-0.0177	-0.0233**	-0.0014
	(0.0093)	(0.0241)	(0.0193)	(0.0225)	(0.0096)	(0.0038)

Notes: All regressions include state fixed effects, time effects. Outcome variables are the share of spending on education, health and hospitals, public safety, social welfare and other sectors. Numbers in parentheses are standard errors based on clustering data at state level; ***, **, and * represent statistical significance at the 1%, 5%, and 10% level, respectively.

Source: US Census Bureau. Data are from 1960 – 2013.

(-0.3 percent), NO2 (-12.5 percent) and Particulates (-7.2 percent). The coefficients for CO and SO2 are negative, but not significant. This is an important finding because of the well-documented link between air pollution and health (Greenstone 2004; Chay and Greenstone 2005; Dominici et al. 2014). The impact of partisan allegiance of governors (Democrats vs Republicans) on air quality can arise from several channels: more stringent air quality standards, better monitoring or stronger enforcement programs.⁶

Spending

Table 3 presents the impact of party affiliation of governors (Democrats versus Republicans) on spending allocations. We consider the following sectors: education, health/hospitals, public safety, social welfare and agglomerate the other sectors.⁷ Table 3 also presents the impact of party affiliation on total spending. Table 3 reports the coefficient for β_j : the causal impact of the Democratic governor on the outcome of interest.

Table 3 shows that under Democratic governors, the share of spending on education (+2.4 percent), health and hospitals (+4.9 percent) and public safety (+3.8 percent) is higher; while the share of spending on the other sectors (-2.3 percent) is lower. The results suggest that some money is shifted from the other sectors to the education, health/hospitals, and public safety sectors under Democratic governors. This is a key issue, as the literature documents the benefits of higher funding for education and health (Barro 1991; Cellini, Ferreira and Rothstein 2010; Martin et al. 2012; Gupta, Verhoefen and Tiongson 2002).

Table 3 also presents results for total expenditure in the state as an outcome. It investigates whether total government expenditure also depends on party affiliation. Column 6 of Table 3 shows that party affiliation has no impact on total expenditure, only on the allocation of funds. Table 3 shows that Democrats allocate a higher share of the state budget towards sectors that are key to their electorate.⁸

Policies

Table 4 studies the impact of the party affiliation of governors on four key policies: state minimum wage,

⁶ The impact of Democratic governors on the realized level of pollution happens mostly below EPA standards (i.e. EPA standard recommendation for air quality are respected for both Republican and Democratic administrations). For an in-depth analysis, see Beland and Boucher (2015).

⁷ Other sectors group the following: highway, natural resources, parks and recreation, interest on general debt, and governmental administration. They are grouped under *other sectors* for brevity.

⁸ For an in-depth analysis, see Beland and Oloomi (2015).

Table 4

Impact of party affiliation on policies				
Variable	State minimum wage (1)	State EITC (2)	Worker compensation (3)	Corporate tax (4)
Democrat	0.0654* (0.0387)	0.0820 (0.5582)	0.1094 (0.0859)	0.0510 (0.1757)

Notes: All regressions include state fixed effects and time effects. Numbers in parentheses are standard errors based on clustering data at state level; ***, **, and * represent statistical significance at the 1%, 5%, and 10% level, respectively.
Source: UKCPR (2015) and Leigh (2008). Data are from 1980 – 2013.

Table 5

Impact of party affiliation on labor markets				
Variable	Employed (1)	Total weeks (2)	Total hours (3)	Annual income (4)
Democrat	0.0017 (0.0020)	0.0011 (0.0021)	0.0039 (0.0043)	0.0047 (0.0063)
Imig × Democrat	0.0145*** (0.0035)	0.0152*** (0.0048)	0.0138* (0.0081)	0.0367*** (0.0120)
Black × Democrat	0.0184*** (0.0033)	0.0252*** (0.0055)	0.0229** (0.0089)	0.0270** (0.0132)
Other × Democrat	0.0114** (0.0049)	0.0175** (0.0065)	0.0212** (0.0090)	0.0128 (0.0138)
Imig	0.0055 (0.0035)	0.0032 (0.0022)	0.0042 (0.0054)	-0.1947*** (0.0181)
Black	-0.0405*** (0.0022)	-0.0232*** (0.0040)	-0.0092* (0.0054)	-0.0412*** (0.0148)
Other	-0.0077* (0.0039)	-0.0141** (0.0056)	-0.0187*** (0.0056)	-0.0724*** (0.0239)

Notes: All regressions include state fixed effects, time effects, and other control variables specified in equation (2). All dependent variables but “Employed” are in logs. Numbers in parentheses are standard errors based on clustering data at state level; ***, **, and * represent statistical significance at the 1%, 5%, and 10% level, respectively.
Source: CPS March samples from IPUMS for the survey years 1994 – 2014.

state-earned income tax credits (EITCs) rate, workers’ compensation benefits and top corporate tax rate. Table 4 shows that under Democratic governors, the minimum wage is slightly higher than under Republican governors. Table 4 shows that there is no significant difference between Democrats and Republicans for the other three policies.

Labor markets

Table 5 presents the impact of the party affiliation of governors (Democratic versus Republican) on labor market outcomes. The following labor market outcomes are considered: being employed, total weeks worked, total

hours, and annual income. All outcomes, except being employed, had a logarithm transformation and are conditional on working. The analysis is separated by type of workers: white, black, immigrant, and other minorities. Table 5 shows the labor impact of political parties on black, other minority, and immigrants relative to white natives. The interaction terms *Imig×Dem*, *Black×Dem*, *Other×Dem* measure the effect of Democratic governors on immigrants, blacks, and other minorities, respectively, relative to white natives. The variable Democrat will measure the impact of the Democratic governor in power on white natives.

Table 5, column (1) shows the RDD estimates for the outcome being employed. It shows that immigrants

(+1.5 percent), blacks (+1.8 percent) and other minorities (+1.1 percent) are more likely to be employed under Democratic governors relative to white natives. It also shows that the political party in power has no significant impact on the likelihood of a white native being employed.

Columns (2) and (3) are devoted to total weeks worked and total hours worked respectively. Columns (2) and (3) show that under Democratic governors, immigrants (+1.5 percent and +1.4 percent), blacks (+2.5 percent and +2.3 percent), and other minorities (+1.8 percent and +2.1 percent) work more weeks and more total hours relative to white natives. Democratic governors have no significant impact on white native total weeks and total hours worked. Column (4) presents the RDD estimates for annual income. It shows that immigrants (+3.7 percent) and blacks (+2.7 percent) have significantly higher annual income under Democratic governors relative to white natives. There is no significant impact on white natives.⁹

These results are important given the labor market gap between immigrants, blacks, and others relative to white natives. Table 5 also shows the mean impact of being black, immigrant, and other minorities relative to whites on labor market outcomes. Table 5 shows that this gap is considerably smaller under Democratic governors. This is particularly meaningful given that immigrants, blacks and others tend to vote for Democratic Party candidates; and this leads to better labor market outcomes for those groups under Democratic governors.¹⁰

Conclusion

In this paper, we present a review of the causal impact of Democratic governors on several outcomes, using a regression discontinuity design. This review suggests that Democratic governors and Republican governors differ on several accounts. It shows that under Democratic governors, the level of pollution is lower and there is higher spending on health and education. This paper

also presents evidence that the labor market outcomes of blacks, other minorities, and immigrants are better under Democratic governors relative to white natives.

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⁹ For an in-depth analysis, see Beland (2015) and Beland and Unel (2015).

¹⁰ We implemented several robustness checks. The results are similar if a 1st or 3rd degree polynomial or local-linear RDD are used. The results are similar if only united governments were considered (when both governors and legislatures are from the same party). Other key tests were performed: McCrary test (2008) and Placebo RDD, using outcome one year before the election. These two results give confidence in the applicability of RDD. Results omitted for brevity are available upon request. One potential threat to the RDD validity arises if workers change state, according to which political party wins the election. We find no evidence of such a tendency for close elections.

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A BASIC UNEMPLOYMENT INSURANCE SCHEME FOR THE EURO AREA¹

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Introduction

The Eurozone debt crisis has led to an intensive debate over reforms of the fiscal institutions, which would lead to greater economic stability and better incentives. It is a widely discussed particularity of the European Monetary Union (EMU) that monetary policy is centralized, while fiscal policy is carried out at a national level (Bordo, Jonung and Markiewicz 2013).⁶ Critics of the current setup argue, among other things, that national automatic stabilizers provided insufficient cushioning of economic shocks during the crisis. According to this view a key issue was that some EMU member states lost access to private capital markets or were not far off losing it, so that their ability to let national stabilizers play their part was limited. From this perspective, common fiscal stabilization mechanisms would help to make EMU more resilient to asymmetric macroeconomic shocks (Bertola 2013, IMF 2013). The main concerns in this debate relate to the issues of permanent transfer flows within the currency union and moral hazard. In particular, national governments might neglect structural reforms or fiscal consolidation.

What are the options for the design of a fiscal risk sharing mechanism in the euro area? In the so-called Four Presidents' Report published in 2012, the former President of the European Council, Herman van Rompuy, made the following suggestion: "An EMU

fiscal capacity with a limited asymmetric shock absorption function could take the form of an insurance-type system between euro area countries. [...] The specific design of such a function could follow two broad approaches. The first would be a macroeconomic approach, where contributions and disbursements would be based on fluctuations in cyclical revenue and expenditure items [...]. The second could be based on a microeconomic approach, and be more directly linked to a specific public function sensitive to the economic cycle, such as unemployment insurance." (Van Rompuy 2012). The European Commission, and more recently Jean-Claude Juncker in the Five Presidents' report, built upon this initiative with their own blueprints for the EMU (European Commission 2012, Juncker et al. 2015).

In recent years, various studies have been published that analyze and discuss different aspects of a European fiscal union and different reform proposals along the lines of the Four Presidents' report. For the 'macroeconomic approach', existing proposals include a cyclical shock absorber based on output gaps (Enderlein, Guttenberg and Spiess 2013) and a stabilization fund for the euro area (Furceri and Zdzienicka 2015). For the 'microeconomic approach', the debate has focused on the idea of a common EMU-wide unemployment insurance system (henceforth EMU-UI) as proposed among others by Deinzer (2004), Dullien (2014) and Andor (2014).

Our paper (Dolls et al. 2015b) is the first to provide a comprehensive and systematic analysis of a wide range of design options for an EMU-UI system based on household micro data.⁷ Our counterfactual experiment covers the period since the launch of the euro in 1999 until 2013. The analysis includes 18 member states (EA 18) and simulates a sample of repeated cross-sections for each member state combining micro data from the EU Statistics on Income and Living Conditions (EU-SILC) and the EU Labor Force Survey (EU-LFS). We focus on the redistributive and stabilizing effects of a basic EMU-UI scheme that partly replaces national



¹ This article is a short version of Dolls et al. (2015b).

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⁶ In the following we equivalently use "EA", "EMU" and "Eurozone" to refer to the 18 member states of the European Currency Union that had introduced the euro by 2014.

⁷ Bargain et al. (2013) simulate different variants of a fiscal union with a joint tax-benefit system. In the present paper, we focus on one element: an EMU-UI system. See Fuest and Peichl (2012) for a discussion of different elements of a fiscal union, as well as Dolls et al. (2015a) for a new blueprint for a fiscal union combining fiscal insurance (through EMU-UI) with an orderly procedure to restructure the debt of an insolvent euro member.

UI systems. The basic EMU-UI system is designed such that it has a broad coverage of the short-term unemployed, while the long-term unemployed are not eligible. Unemployment benefits from the EMU-UI scheme can be topped up by national UI systems. We quantify the coverage and stabilization gaps. These are defined as the differences in coverage and stabilization between i) the benchmark scenario of national UI alone and ii) a reform scenario where EMU-UI and national UI coexist as explained further below. Coverage and stabilization gaps are calculated at the aggregate household level, as well as for different socio-demographic groups within each country. Automatic fiscal stabilization effects are broken down into household income and government budget stabilization. In addition, we explore the effects of experience rating and compare the basic EMU-UI scheme to a variant with 'contingent', i.e., trigger-based benefit payments that provide income insurance only if the labor market situation deteriorates significantly in a given member state. Moreover, we run several sensitivity checks regarding the coverage and generosity levels of the scheme. We also discuss various concerns and the potential adverse effects of an EMU-UI system, and particularly the view that such a system would give rise to moral hazard and that it might even lead to a 'transfer union', a result that would conflict with the political promises made by at least some national governments to their electorates when the euro was introduced. Importantly, the aim of our paper is not to serve as a policy proposal. It should rather be seen as a conceptual experiment, providing general insights into the economic implications of various design options for a basic EMU-UI. In the following we discuss the general design options for an EMU-UI scheme, discuss their advantages and disadvantages, and present results for a basic variant.⁸

Possible characteristics of an EMU-UI system

A common unemployment insurance system for the euro area could be designed in various ways. Three key options have been discussed in the literature on this subject and in the policy debate to date. A first option would be a common EMU-UI system that provides a basic level of insurance by partly replacing national unemployment insurance systems. Benefits from the euro area system could be topped up by additional payments from national unemployment insurance systems. Hence, there would be room for diversity across member states

⁸ In Dolls et al. (2015b), we present further variants and additional results.

so that existing differences with regard to replacement rates and benefit duration could be preserved. The EMU-UI system would be financed by social insurance contributions with a contribution rate that could be uniform across Eurozone member states, or country-specific and time-variant to restrict cross-country transfers. An important feature of such a scheme is that it would provide income insurance for the unemployed (under certain eligibility conditions) irrespective of the size of the unemployment shock in a given member state. As an alternative, a common scheme could provide income stabilization only in the event of large (unemployment) shocks. Such contingent unemployment benefits would be triggered if the level and/or change in overall unemployment were to reach a pre-determined threshold in a given period. National unemployment insurance systems would still be in place in normal times. As a third option, the euro area unemployment insurance scheme could complement national systems by providing additional transfers, which would either top up national benefits or kick in if national benefits were to expire. The payout rules of this scheme could also be trigger-based. Such a system would be comparable to the US unemployment insurance system where regular state benefits can be complemented by two types of benefits extension programs that are at least partly provided by the federal government, the Extended Benefit program (EB) and emergency benefits (Nicholson, Needels and Hock 2014).⁹

Concerns over introducing an EMU-UI system

In principle a fiscal insurance mechanism should not lead to redistribution ex ante. A major concern with an EMU-UI system is that it might do exactly that: it may result in permanent transfers between euro area member states, an outcome that would meet strong resistance in those countries that would be the net contributors. How do the three variants for an EMU-UI system differ with regard to the risk of permanent redistribution? A basic EMU-UI scheme would not be designed to generate permanent redistribution because such a scheme is based on changes in employment status, rather than on unemployment levels. Differences in unemployment rates alone do not (necessarily) lead to permanent redistribution because benefits would be targeted at cyclical (short-term) unemployment and would expire after

⁹ Please note that in the US regular state benefits are paid for a period which usually lasts no longer than six months. The large extensions of unemployment insurance provided by the US federal government in the 2009–12 period increased the benefit duration to 99 weeks in many US states. Unemployment benefits in the EMU are usually granted for much longer periods of time than regular state benefits in the US.

a certain time span. It may nevertheless happen that (net) transfers are unevenly distributed across member states if flows into unemployment diverge permanently or if there are permanent differences in the level of short-term unemployment. This risk could be reduced by claw-back mechanisms based on experience rating; or if transfers were to be trigger-based as under the contingent benefit scheme. Clearly, redistributive effects of the former (latter) scheme would depend on the exact claw-back mechanism (choice of the trigger). The risk of permanent transfers would be high with an EMU-UI scheme that provides extended benefits after national unemployment benefits expire, because such a scheme would be likely to cover not only cyclical, but also structural unemployment. Moreover, it could incentivize governments to cut national unemployment insurance benefits as the EMU-UI system would step in.

A further concern related to moral hazard is that a common EMU-UI system could undermine incentives for national governments to address structural weaknesses in the labor market. One argument against this claim is that national governments would still bear the cost of long-term unemployment under a basic, contingent or non-contingent EMU-UI system. This argument is much weaker, however, with an extended benefit program, which would also be likely to cover structural unemployment. Moreover, incentives to pursue active labor market policies such as short-time work could be adversely affected by an EMU-UI system given that the cost of short-term unemployment would be borne by the common pool.

Additional concerns relate to other moral hazard issues including administrative manipulation and adverse incentive effects at the individual level with regard to job search and labor supply. National administrations would have incentives to use their discretion to increase the number of benefit recipients. Incentives to manipulate would depend on the characteristics of the system, e.g. the required employment period or a waiting period for EMU-UI benefits. The longer both periods are, the more costly would administrative manipulation be, but longer periods would also reduce desired insurance effects. Distortions at the individual level depend on the overall benefit level (EMU plus national benefits) and duration relative to the status quo. The effect of a common EMU-UI system on labor migration in response to labor market shocks is ambiguous. The portability of unemployment benefit claims might increase the willingness of individuals to migrate and to search for a job in a member state with better labor market conditions.

But the benefits could also reduce incentives for active job search if the EMU-UI is more generous than national unemployment insurance systems.

Data and methodology

There are different possible methodological approaches for analyzing the economic effects of an EMU-UI system. While previous research has mainly used aggregate macro level data, we rely on representative household micro data for the EA18 using EUROMOD, a static tax-benefit calculator for the European Union countries. EUROMOD is mainly based on cross-sectional micro data from the EU Statistics on Income and Living Conditions (EU-SILC) released by Eurostat, which we combine with micro data from the EU Labor Force Survey (EU-LFS).¹⁰ The key advantage of our approach in the present context is that we exploit both detailed income distribution information contained in EUROMOD, as well as information on changing labor market patterns over time from the LFS. We are thus able to account for heterogeneity in various characteristics of the populations in different countries, which macro data approaches cannot capture.

In our simulation experiment, we introduce an unemployment insurance scheme for the EA18 member states and ask what would have happened if such a scheme had been introduced at the launch of the euro in 1999. As there are neither panel data nor repeated cross-sectional data available containing both income distributions and labor market conditions for all EA member states over this period, we construct a series of reweighted cross-sections for the period of analysis, which exactly replicates changes in labor market conditions (unemployment rate, share of short- and long-term unemployed, size and composition of the labor force) and average earnings over time. Our baseline input data is from EU-SILC 2008, the most recent data available with the version of EUROMOD used, including the EA18 member states. For each country, these data are first reweighted to reflect labor market conditions as observed in 1999, and then subsequently reweighted for each year of the analysis.

From the LFS, we impute changes in (un)employment rates, size of the labor force, shares of short- and long-

¹⁰ Sutherland and Figari (2013) provide more detailed information on EUROMOD, the underlying input data and validation. The EU-LFS, conducted by the national statistical institutes across Europe and processed by Eurostat, is a representative household survey covering the years from 1983 onwards. It is the most important source for labor market statistics in the EU.

term unemployment, and coverage rates of national UI systems for 18 gender-age-education strata (male/female, three age groups, three education levels) on an annual basis. We simulate (un)employment changes over time for each of the 18 socio-demographic subgroups so that our series of reweighted cross-sections precisely matches these dimensions both at the subgroup and aggregate level. Earnings growth is imputed from the AMECO-database in order to account for changes in the tax base of the EMU-UI and national UI systems. These imputations ensure that our reweighted micro data are consistent with aggregate statistics in each year of our simulation period. The analysis at the subgroup level allows us to examine individual heterogeneity within each member state, showing which groups in the population would benefit/lose from the introduction of an EMU-UI system. In addition, we construct a national UI calculator that incorporates all important policy rules of national UI systems over the period 2000–13 and simulate national unemployment benefits in addition to EMU-UI benefits in the case of dual insurance and in the benchmark scenario.

Our analysis is based on the following simplifying assumptions. Firstly, we do not take into account general equilibrium effects of an EMU-UI system, i.e., our analysis remains in a partial equilibrium context. This implies that we abstract both from the potential moral hazard of national governments and administrations, which could have adverse labor market effects, as well as from the potential growth-enhancing effects of an EMU-UI scheme. Accounting for these macroeconomic feedback effects would require linking our micro data to a macro-econometric simulation model. Secondly, we do not simulate individual behavioral responses, e.g. potential migration responses, changes in hours worked or different patterns of entries and exits to the labor force, which could follow the introduction of an EMU-UI. In the light of these assumptions, our results should be interpreted as 'first-round' effects of an EMU-UI system. A further assumption relates to the interaction between EMU-UI and national UI systems, given that a basic EMU-UI system analyzed in this paper would partly replace national UI systems. We assume that national UI systems would top up the EMU-UI scheme if national UI systems are

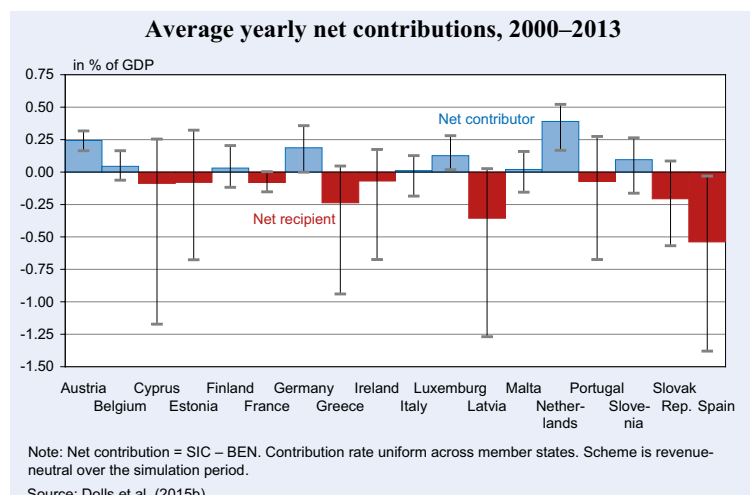
more generous in their coverage or replacement rate, so that no unemployed person would be worse off after the introduction of an EMU-UI system. Finally, we run our simulations as if the EA18 had existed from 1999 onwards, as it would complicate the interpretation of our results if we included new member states only after their adoption of the euro.

Results and discussion

Our main results are as follows. We find that a basic EMU-UI scheme with a replacement rate of 50 percent, a maximum duration of benefit receipt of 12 months and a broad coverage of all new unemployed with previous employment income could be implemented with a relatively small annual budget. Over the period 2000–13, average benefits would have amounted to roughly 47 billion euro per year, financed by a uniform contribution rate across member states of 1.56 percent on employment income. The scheme is not designed to give rise to permanent redistribution across countries because only short-term (rather than structural) unemployment is insured. Nevertheless our simulations reveal that a small number of member states would have been net contributors or net recipients in each year of our simulation period. Figure 1 shows that Austria, Germany and the Netherlands would have been the largest net contributors with average yearly net contributions of 0.19–0.39 percent of GDP. Latvia and Spain are the largest net recipients (average yearly net benefits of 0.36 and 0.54 percent of GDP).

We show that a basic EMU-UI scheme can provide insurance by stabilizing household incomes and govern-

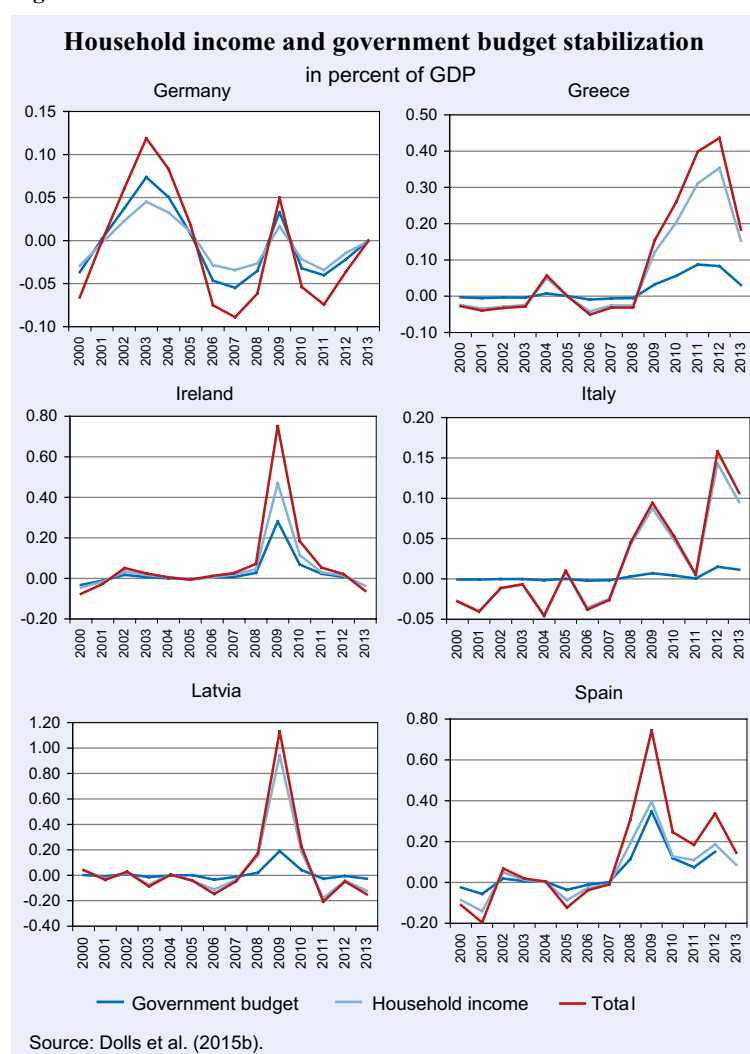
Figure 1



ment budgets. Household incomes are stabilized if unemployment benefits under dual insurance (the combination of national UI and EMU-UI) are more generous or if coverage rates are higher than in the status quo. Government budgets are stabilized in the event of unemployment shocks due to the fact that national UI benefits increase less in case of dual insurance relative to the benchmark. We compare automatic stabilization effects under dual insurance and the status quo. Figure 2 shows the stabilization effects of the simulated EMU-UI scheme for a selection of member states. Stabilization effects are measured as the change in net benefits following entries into or exits from unemployment relative to GDP in a given year. Figure 2 reveals that the largest stabilization gains would have been achieved in the recent crisis period with cushioning effects of up to 1.1 percent of GDP in Latvia. Germany belongs to those countries that would have been stabilized mainly in the early 2000s and very little afterwards due to improving labor market conditions in the following years.

Turning next to within-country heterogeneity, we find the largest coverage and stabilization gains for the young and, perhaps surprisingly, also for the high-skilled unemployed. The reason for the former is that the young often do not meet the eligibility conditions of national UI, while they are covered by the simulated EMU-UI. The result for the high-skilled is due to a higher proportion of short-term relative to long-term unemployed (who are not eligible to EMU-UI) among them. Finally, we consider a contingent version of the basic scheme, which is activated if the unemployment rate in a given member state is one percentage point higher than in one of the previous three years. Under this system no member state would have been in a permanent net contributing/receiving position. With 22 billion EUR per year, the overall budget and thus the amount of cross-country redistribution would have been less than half as large as under the non-contingent scheme in the baseline.

Figure 2



One should note that the simulations assume revenue-neutrality over the entire time span considered (2000–2013), but not in each period. This raises the issue of whether the EMU-UI would be allowed to issue debt. In our calculations the EMU-UI would have produced a surplus in its early phase, so that reserves would have been available to finance higher benefits in the crisis. But there is, of course, a concern that political pressures would build up to let the EMU-UI accumulate more and more debt until it needs to be ‘bailed out’ by the member states. Clearly, while a balanced budget in each period would limit the ability of the system to act as a fiscal stabilizer, an effective debt limitation would be needed. One possible approach would be to start by deliberately accumulating reserves, which would provide a buffer in the next recession.

We should emphasize that our analysis has a number of limitations, which should be taken into account in the

interpretation of the results. Most importantly, it is not the objective of our paper to establish whether or not the introduction of an EMU-UI scheme is desirable in terms of overall welfare. Our analysis is descriptive and simply focuses on the financial flows implied by a basic unemployment insurance scheme and the ability of these flows to act as an automatic stabilizer. In addition, we take economic behavior as given. If EMU-UI had the desired stabilizing effects, the financial flows in the system would differ from those calculated here; the redistributive effects would probably be smaller. However, if the moral hazard effects dominated, the financial flows from contributors to recipients could also be larger. Adding behavioral effects to the analysis would be a promising area for future research.

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LOCAL RESPONSES TO A NATIONAL PRODUCTIVITY-ENHANCING REFORM

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JON MARIUS VAAG IVERSEN²

Introduction

Economists and political scientists agree that public sector reform implementation faces a basic challenge: the gainers from status quo are often politically “strong”, and the losers are politically “weak” (see for instance Fernandez and Rodrik 1991; Moe 2003). That is, a reform that has made it through the political process will not have the intended effects if the reform elements supported by powerful groups and institutions are more likely to be implemented. Looking to research literature on this topic for empirical evidence on reform implementation does not yield much information. This article seeks to fill in that gap to some extent by reporting results from analyses of the implementation of a national educational accountability reform introduced to the federal governing system of Norway.

The reform, unanimously decided in parliament in the period 2003–2006, has two major components. There is a federal part: about 430 municipalities, who are responsible for running their own elementary and lower secondary schools subject to national laws and regulations (almost 98 percent of the elementary and lower secondary schools are public schools), were encouraged to substitute local accountability systems for their long-existing, input-oriented governing systems. And there is also a national part: tests in mathematics, and reading in Norwegian and in English administered at the national level were introduced – firstly in 2004, followed by their withdrawal in 2005 and their reintroduction in 2007. The tests met with resistance; primarily from the

teachers’ union, and the government decided that school average test results should not be made public. However, newspapers have used their freedom of information to publish the results on a regular basis, changing the informational environment everywhere and independent of the municipalities’ responses to the reform.

By design, the intention of the reform – improvements in student performance – can be achieved by mobilizing two different types of disciplinary devices; the institutions of direct democratic control and better informed parent-demanders in the market. The teachers’ union has not been able to hinder the disclosure of national test results. The discussion below begins by investigating the implementation of the federal part of the reform. The question is whether the gainers from the status quo were able to hinder the reform of local governing systems. Thereafter we seek to evaluate reform effects and likely mechanisms. Did student performance and the productivity of the education sector improve? If improvements occurred; which were the important mechanisms at work?

Reform of local governing systems³

A survey of the chief municipality executives is used to gather information on the reform’s implementation status around three years after it was passed by parliament. The accountability reform features the decentralization of decisions on hiring teachers, resource allocation, teaching organization and several other issues, in addition to arrangements to hold school leaders accountable for student performance from the municipal level to schools. We capture the degree of the reform’s implementation with a decentralization index – measuring the degree of decisions decentralized from the local council to the schools, and an accountability index – measuring the degree to which the school principals are held accountable for student performance. A reform implementation index (standardized with mean zero and standard deviation one) is generated by adding the two indices. The distribution of reform implementation across the municipalities is portrayed in Figure 1.

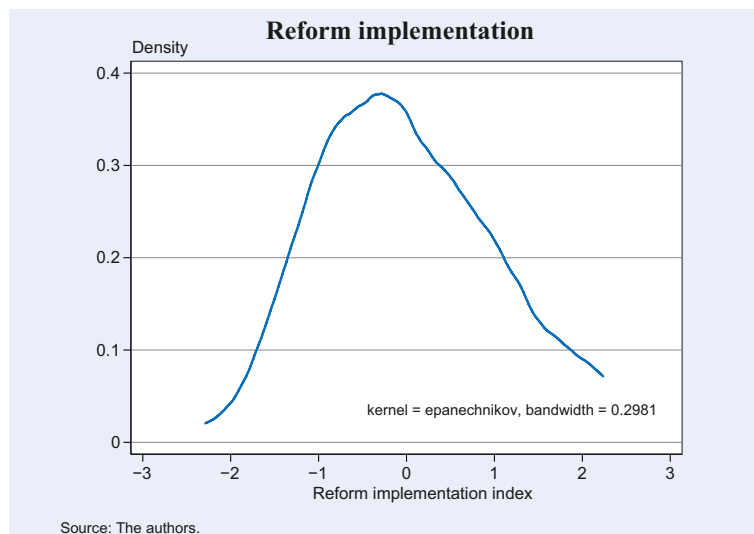


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³ This section is based on Bonesrønning (2013).

Figure 1



Reform implementation across the municipalities varies significantly. Quite a large number of municipalities have made some changes in the governing systems, more so with respect to the decentralization of decisions than with respect to accountability, while a few have decentralized decisions *and* established explicit accountability arrangements for the school leaders.

The variation in local accountability systems across the municipalities is analyzed from the political economy perspective. The argument goes like this: local councils decide on local governing systems consistent with the opinions of the local electorate, which comprises of gainers and losers from the status quo. The teachers are the main gainers from the status quo; basically because they have earned informational rents in input-oriented governing systems. Teachers seek to protect their rents by voting for politicians who oppose accountability systems. In addition, all public employees, including teachers, realize that they can influence the preferences of their own employers by voting. Thus, we measure the power of the gainers from the status quo by the proportion of public employees in the municipality. Regrettably, this measure is a crude characterization of the gainers from the status quo. Many public employees have their own children in the local schools, and non-teachers may prefer the reform because it improves school quality at no additional personal costs. It should be noted that we were unable to separate out these subgroups. The losers from the status quo are parents and local businesses that suffer from poor student performance and poor productivity in the educational sector. Following a widely-applied assumption in the economics education litera-

ture – that the demand for school quality increases with levels of parental education – the power of the losers from the status quo is measured by the proportion of highly-educated citizens.

It turns out that reform implementation is negatively correlated with the proportion of public employees, and positively correlated with the proportion of highly-educated citizens in the municipality. An instrumental variable approach, using the variation in the proportion of public employees, originating from the fact that national grants to municipalities are based on non-

nipulative municipality characteristics, reveals that the relationship between reform implementation and the proportion of public employees might be causal. The exact size of the effect is hard to pin down; and also hard to make sense of. Nonetheless, the following indicates that the effect is substantial: one standard deviation in the proportion of public employees is transformed into 0.2–0.3 standard deviations in reform implementation. The reported evidence is consistent with the hypothesis that public employees, at least to some extent, are able to block a proper implementation of a productivity-enhancing reform.

These analyses have some limitations. Firstly, they rest heavily on survey data collected from the municipalities at one point in time, implying that nothing can be said about the dynamics of reform implementation. Moreover, the analyses do not reveal whether reforms, when properly implemented, have generated the expected positive effects on student performance. For these reasons we performed a complementary analysis whereby a reduced-form approach is used to investigate the relationships between student performance, resource use, and the characteristics of the inhabitants in the municipalities. In other words, our analyses are based on data for easily observable inputs and outputs, and not on the survey information about reform implementation.

Are post-reform changes in resource use correlated with population characteristics?⁴

An implicit assumption in many education accountability reforms is that improvements in student performance can be achieved without increasing the amounts of purchased school inputs. However, teachers might have responded to the disclosure of national test results by increasing their demands for additional school resources, notably for more teacher man-years. The probability of their success depends on the composition of the local council. We investigate the hypothesis that post-reform resource use in schools has increased more in municipalities where the gainers from the status quo are strong and the losers are weak.

Elementary schools employ ordinary teachers, special education teachers and teacher assistants. A large increase in the numbers of teacher assistants is a salient feature of the post-reform period, but it turns out that the extended use of assistants does not differ across the municipalities according to the composition of the electorate. The two other components are more interesting from our perspective. The number of special education teachers increased, but not much. However, the number of special education students increased significantly; and was largely financed by cutting back on the average treatment per special education student. These features reflect the fact that many municipalities introduced fixed special education budgets in the post-reform period. It is fair to say that the quite dramatic changes in

Figure 2

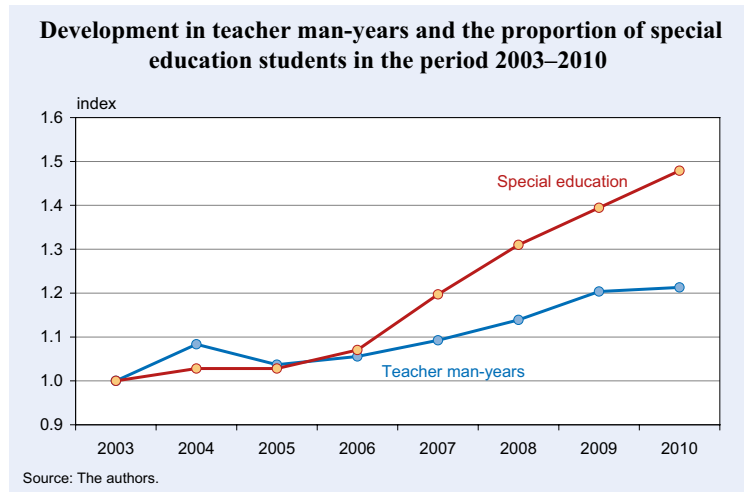


Figure 3

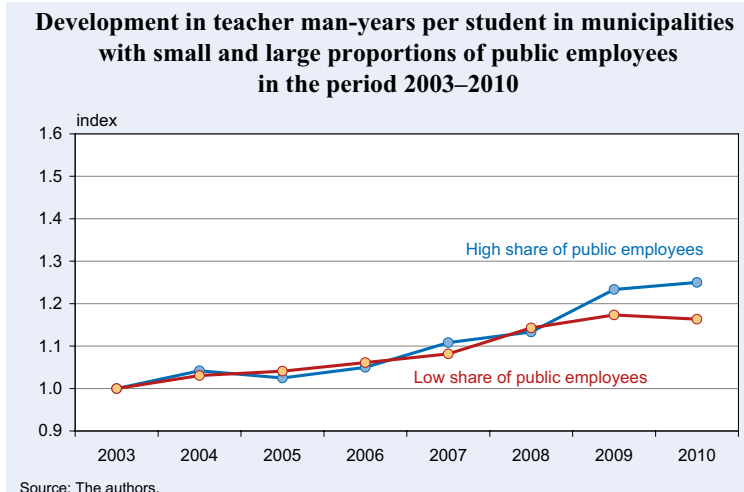
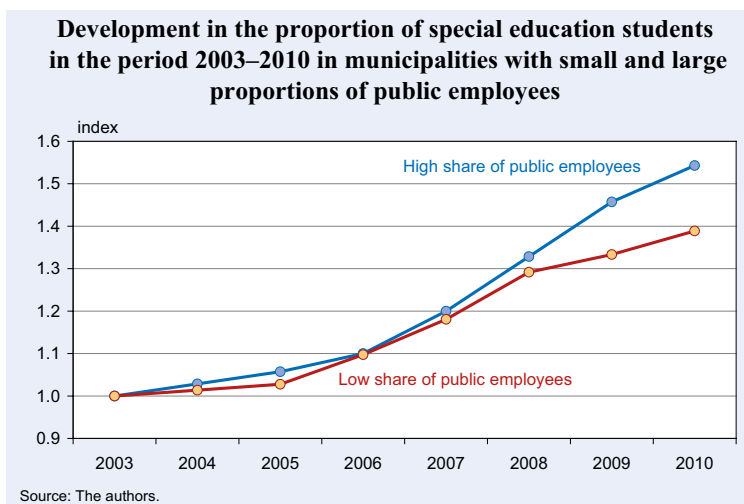


Figure 4



⁴ The rest of this article is based on Bonesrønning and Iversen (2015).

the allocations of the special education budgets were not anticipated by any of the players in the education sector. The increase in the proportion of special education students is highlighted below, together with the development in the number of ordinary teacher man-years.

Figure 2 portrays developments in the use of ordinary teacher man-years per student and the proportion of special education students for the period of 2003–2010. Both measures are standardized to give them a value equal to one in 2003. From 2005 onwards the use of teacher man-years per student has increased more or less steadily, as has the proportion of special education students. In our context, the most interesting question is whether the growth rates differ substantially across the municipalities.

The cross-municipality variations in resource-use responses in the post-reform period are illustrated in Figures 3 and 4. These figures are based on a rough dichotomy of municipalities; with the two groups containing municipalities with proportions of public employees below and above the population average respectively.

Figure 3 shows that the 20 percent increase in ordinary teacher man-years per student in the period 2003–2010 is unequally distributed across the two types of municipalities. The growth is 25 and 16 percent respectively in municipalities with large and small proportions of public employees. There are no discrepancies in the development in the teacher-student ratio across the two categories of municipalities up until 2008, but from 2008 and onwards the teacher-student ratio increases more in those municipalities with relatively large proportions of public employees. Figure 4 conveys very much the same message for the proportion of special education students: an increase for both categories of municipalities throughout the period, with the increase being larger in municipalities with a high proportion of public employees, especially from 2008 onwards.

Regression analyses are used to investigate whether the changes in teacher man-years and the proportion of special education students in the pre- and post-reform periods are correlated with the characteristics of the electorate. These analyses show that there is no relationship between the two measures of resource use and population characteristics in the pre-reform period. In the post-reform period there are positive and statistically significant correlations between the two measures of resource use and the proportion of public employees, while there are no significant correlations between the

two measures of resource use and the proportion of highly-educated citizens.

These findings are consistent with the hypotheses that teachers increased their demands for more resources in the aftermath of the reform, and that they were more successful in their endeavors in municipalities where proper accountability systems are not established.

The changing roles of school principals might be essential in this respect: accountability systems generate more information and redistribute power from teachers to school principals. Thus, in an accountability system a school principal tends to be more of a representative for the municipal council, and less of a spokesman for teachers. The finding that schools in municipalities with a large proportion of public employees tend to spread special education resources thinly across many students can be interpreted within this framework. Faced with school fixed budgets, individual teachers have incentives to campaign for more special education resources for their own classrooms. The easy way out for a (weak) school leader faced by informational asymmetries, is to allocate some special education resources to all classrooms.

A striking feature conveyed in Figures 3 and 4 is that all types of municipalities experienced growth in resource use in the post-reform period. The losers from the status quo might hold the key. Their likely response to the disclosure of national test results is to increase their demand for school quality (directed at both schools and municipalities) – either by strengthening their requests for accountability, or by joining the teachers in their demand for more resources. A distinct Norwegian institutional feature encourages the “more-resources solution”: multi-purpose municipalities are financed by grants and local taxes with fixed tax rates, implying that an increase in school expenditure is financed by cutting back on inputs to other municipality-provided private goods. More school resources come at zero prices for parents. Thus, the losers from the status quo might be “weak” for at least two reasons. Firstly, they might not be well informed about the resources-performance relationship, and in addition, Norwegian parents have no pecuniary incentives to object to teachers’ demands for more resources.

Are post-reform changes in student performance caused by changes in resource use or by institutional changes?

The analyses presented above provide evidence that local accountability systems are more likely to be installed in municipalities with a small proportion of public employees and a large proportion of highly-educated citizens; and that more resources are allocated to schools across all municipalities, with the largest growth taking place in municipalities with a large proportion of public employees. These patterns are consistent with the hypothesis that crucial reform elements are less likely to be implemented in municipalities where the gainers from the status quo are politically strong.

The fundamental questions in education reform evaluations are whether student performance improves, and, in cases where improvements are observed; whether these improvements originate from elements in the accountability reform. We would like to turn to these questions now, although we begin with an apology that we have been unable to address these issues as thoroughly as we would have liked to. Major reasons are that no information about student performance existed prior to the introduction of the national accountability reform, and that no counterfactuals are available.

Initially we report results from analyses where we have investigated the correlations between the *change* in student performance across the municipalities from 2007 to 2010 (as measured by national test results) and the *changes* in resource use in the same period. Ideally, we would like to include measures of the *change* in local accountability systems in the same analyses, but there are no ways that we could generate credible measures for the change in governing systems across municipalities with the available data. Instead, we have estimated (reduced form) equations with the change in performance against municipality population characteristics, and a “hybrid” equation whereby the change in performance is regressed against the change in resource use and (constant) municipality population characteristics. The latter specification is included to investigate whether population characteristics matter for student performance growth beyond the influences mediated through the “resource channel”. In all equations that include population characteristics among the explanatory variables, the initial 2007 level of student performance is also included as an explanatory variable. This is to take into account that some population subgroups may also have influenced school quality prior to the accountability reform.

Resources and performance

These analyses provide no evidence that an increase in teacher man-years is transformed into better student performance in the post-reform period. This finding, which should come as no surprise to readers familiar with the education production function literature, implies that many municipalities, and especially municipalities with a high proportion of public employees, experienced productivity decline (lower student performance per euro) in their schools in the post-reform period – all else equal.

There is significant evidence that the change in performance for ordinary students is negatively correlated with the change in the proportion of special education students: in schools that experienced a large increase in the proportion of special education students, the performance of ordinary students deteriorated. We know that an increasing number of special education students are financed by cutting back on the number of hours in special education per eligible student. Using the number of hours in special education per eligible student to characterize the development of special education we find – as expected – that the change in the number of hours in special education per eligible student is positively correlated with the change in performance for ordinary students. Taken at face value, these findings constitute another reason for the deterioration in student performance in municipalities with a large proportion of public employees.

But do these findings make sense? In one interpretation, they tell us something about optimal resource allocations: improvements in the learning environment for ordinary students are largest when special education resources are concentrated among a few students. There is substantial international empirical evidence that individual student performance is negatively affected by the presence of misbehaving classmates (see for instance Figlio 2007; Fletcher 2010), and we know that a substantial proportion of “newcomers” to special education in the Norwegian elementary schools in the period after 2006 are misbehaving students associated with negative classroom externalities. More special education resources may offset such negative externalities, especially if the special education resources are directed at a small group of the most seriously misbehaving students, rather than spreading these resources thinner across many students with less serious behavioral problems.

Alternatively, these findings may also tell us something about the importance of governance and management. As pointed out above, weak school principals cannot prevent special education resources from being spread thinly. That is, they cannot stop teachers from engaging in a fight for their part of the school's special education budget. At the same time, weak school principals might be incapable of installing high-quality teaching for ordinary students. In other words, the correlation observed between the allocation of special education resources and student performance is due to a third factor – the quality of school leadership – which, in turn, reflects the quality of the local governing system. Unfortunately, at the present stage we cannot tell which interpretation is most likely.

History and performance

Assuming that education-oriented citizens have “always” voted for education-oriented politicians and have acted as demanding customers for schools, those schools in municipalities with a large proportion of such citizens have been under pressure to perform for a long time. The implication is that there might be less “low-hanging fruit” to harvest for the schools in such locations in the post-reform period, and the disclosure of very good national test results keep their customers satisfied. In municipalities where schools performed poorly prior to the reform, the potential stigmatization following the disclosure of national test results might provide the necessary incentives. Some improvements can be gained quite easily by focusing on basic skills and test preparation. Consistent with this line of reasoning, we find that a low level of pre-reform student performance is associated with high performance growth in the post-reform period. We should hasten to say that, in these analyses, pre-reform student performance is captured by the 2007 national test results.

Population characteristics and performance

When controlling for the pre-reform level of student performance, it is evident that the post-reform change in student performance is largest in municipalities characterized by a large proportion of highly-educated inhabitants and a small proportion of public employees. These relationships hold both with and without controls for the change in resource use. Recalling that local accountability systems reflect population characteristics,

we interpret these findings as potentially showing the (disciplinary) effects of accountability systems.

Conclusions

The evidence presented above can be read in many ways. From a political economy perspective, it illustrates that the impact of a national reform tends to vary across lower tiers in a federal system due to the “non-neutrality” by which the gains and losses from the status quo are distributed. Read this way, it serves as a reminder for policymakers: national reforms should include elements that empower the losers from the status quo. It also acts as a reminder for researchers: unless political economy issues are addressed, evaluations of national reforms might be seriously flawed. The lack of any positive effects *may* be due to poor reform design, but could also be due to improper implementation of the reform.

Readers mainly interested in education issues should note that the two reform elements – local accountability systems and national tests – may prove a fruitful combination. Schools located in “education-oriented” municipalities might improve due to the discipline introduced by the accountability system, while schools in less “education-oriented” municipalities might improve due to the stigmatization effects associated with the disclosure of national test results.

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CROWDINVESTING

Digitalization has already changed sectors fundamentally. By creating new ways to process information, digitalization will particularly affect those business models that are information intense. Information is at the core of the financial sector. To date, changes have occurred in the financial sector within existing firms. But they often lag behind so-called FinTech start-ups. Among them are online platforms that intermediate between individuals who want to invest their capital (investors) and ventures that need capital to pursue projects (firms). By early 2016, the UK market for crowdinvesting reached a total volume of over 200 million GBP and is the largest market in the European Union (EU). Germany is the closest contestant with an overall market volume of 60 million EUR as of January 1, 2016 (excluding movie and real estate crowdinvesting, as well as fundraising for environmental business projects) (Hornuf and Schmitt 2016).

Information plays a crucial role in each transaction on the financial market. But information is distributed asymmetrically between the parties involved in a contract with those that need capital having better information about their chances to succeed and repay than those that provide capital. Due to this asymmetry the financial sector is subject to many laws and regulations. The aim of these rules is to protect the investors and to avoid fraud. However, the rules also impose costs on firms. Many of the costs, such as auditing fees or the costs of a securities prospectus, are quite substantial and often fixed and the management has to devote a lot of time to fulfilling the respective requirements. Therefore, complying with the rules may make a financial transaction too expensive, especially for smaller firms.

In this database article we provide an overview of the regulations for crowdinvesting in selected countries. Crowdinvesting means that investors provide equity or equity-like capital to firms and participate in the uncertain future cash flows of the venture.¹ The laws for investor protection differ considerably with respect to the areas that they regulate. The regulated areas are the maximum amount that can be issued without a prospectus, the maximum amount that can be sold to an investor, the regulation of intermediating portals as gatekeepers, the disclosure requirements for firms and the need

for investor education. As our discussion below will show, there are also substantial differences between the regulations across countries within each area.

The first area we study is the maximum amount that issuers can offer to non-accredited investors without providing a prospectus. For amounts above this threshold firms have to provide a prospectus in which they specify the terms and conditions of their offer and supply information about the firm and its financial situation. With the prospectus, the investor receives more information about the firm. But preparing the prospectus is costly, also in terms of management working hours. In European countries Directive 2010/73/EU regulates the publication of a prospectus and specifies exemptions. According to the Directive, firms can raise up to 100,000 EUR without a prospectus. EU member states can, however, increase this threshold up to 5,000,000 EUR through national laws. The largest exemptions in Europe can be found in Austrian, English, and Italian laws, with firms (in Italy the implementation law restricts the issues to “innovative startups”) being able to issue up to 5,000,000 EUR without a prospectus. In early 2016, the US also legalized crowdinvesting and set a maximum threshold of 1,000,000 USD (when additional conditions with respect to the usage of a funding portal, the amount per investor and disclosure requirements are met, see below).

The second focus of regulation is on the maximum amount that a single investor can invest. Here the regulations have different base categories: the *single issuer limit* (how much money can the investor invest in a firm) and the *aggregate limit* (how much money can the investor invest in the overall crowdinvesting market). In the US an aggregate limit applies, which relates to the investor's annual income or net assets. If either his income or net assets are below 100,000 USD, he should not invest over 2,000 USD or five percent of his income or net assets (where the respective higher value applies). If either his income or his net assets are above 100,000 USD, the threshold is either ten percent of his income or net assets, but his aggregate investments should in all events not exceed 100,000 USD. The Austrian and the German regulations are similar in spirit, but set a single issuer limit, and not an aggregate limit. In Germany, the basic idea is that an individual investor should not invest more than 1,000 EUR per project without disclosing his average net monthly income or assets. However, the limit increases up to 10,000 EUR if his assets exceed 100,000 EUR. If his assets are below 100,000 EUR, he may invest up to double his average net monthly income,

¹ Please note that apart from equity, there are many other instruments through which the crowd finances firms, which are not always subject to securities regulation, but specific laws regulating investments.

but no more than 10,000 EUR. In the UK the maximum investment is restricted by an aggregate limit for retail clients. These investors are not allowed to invest more than ten percent of their net investible financial assets in unlisted equity and debt securities, unless they confirm that they receive regulated investment advice or investment management services from an authorized person. In Belgium the restriction is a single issuer limit, where investors cannot invest more than 1,000 EUR in a single firm if the issue is between 100,000 EUR and 300,000 EUR (not imposed if an issuer raises no more than 100,000 EUR).

In some countries the platforms are regulated. In the US issuers can use the above-mentioned exemptions of the JOBS Act if the transaction is conducted via a broker-dealer or the newly-created funding portal. In the UK and France portals have to be authorized by the securities regulator. In France, although the portal is not subject to a minimum capital requirement (like other financial intermediaries), it has to register with the securities regulator AMF, which subsequently monitors the portal. In Germany and Austria it is sufficient if portals are authorized by the much laxer standards of trade authorities, and not the securities regulator.

Disclosure requirements are also used. In the US the amount of information that needs to be disclosed depends on the size of the issue. For issues below 100,000 USD, for instance, it is sufficient if the principal executive officer of the firm certifies the most recent income tax returns and the financial statements. For issues between 100,000 USD and 500,000 USD, financial statements have to be reviewed by a public accountant who is independent of the issuer and uses professional standards and procedures. For issues of more than 500,000 USD, the firm has to provide audited financial statements. In France, firms have to provide simplified disclosure for issues between 100,000 EUR and 1,000,000 EUR, which resembles a *light* version of a prospectus that does not have to be certified by the securities regulator. In Germany, for issues of less than 2,500,000 EUR firms only need to provide a small information leaflet, which shall not exceed three pages and includes a salient warning note about the risk of the investment. In Austria, the disclosure requirements depend on the size and the financial instrument. For issues between 250,000 EUR (stocks and bonds) / 1,500,000 EUR (other investments) and 5,000,000 EUR a simplified prospectus is needed.

In some countries, regulations are concerned with investor education and the use of financial advice. In the US, for example, broker-dealers or funding portals need to provide disclosures related to risks and other investor education materials. Sophisticated investors in the UK, which include professional clients, retail clients who are venture capital contacts or corporate finance contacts, certified or self-certify as sophisticated investors, and high net worth investors, can crowdfund without any limitations. Retail clients need to get regulated investment advice or investment management service to be able to crowdfund, unless they certify to invest no more than ten percent of their net investible financial assets. In other jurisdictions the measures are more paternalistic. In France, for example, the regulation has two features. Firstly, issuers can only sell plain stocks or bonds to crowdfunders and cannot offer more sophisticated instruments commonly used by venture capitalists such as convertible preferred stock. Secondly, portals must inquire the previous investment experience, future investment goals and current financial situation of the investor and ensure that the risk of the planned investments is adequate for him.

The comparison of the regulation across countries shows interesting differences. Given that the crowdfunding market is emerging, it is not surprising that neither regulations themselves, nor the areas that are regulated, are uniform. In Italy, Spain and in the Scandinavian countries crowdfunding markets are still nascent. Germany, and in particular the UK, saw a steady rise in crowdfunding activities, despite the fact that regulations differed substantially. While Germany for a long time pursued a *laissez-faire* approach, by leaving certain types of investments largely unregulated, the UK established legal certainty early on. Moreover, unlike under German law, English corporate law allows the transfer of equity shares without the costly involvement of a notary and thus facilitates the direct participation of the crowd in startup firms.

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Table 1

Overview of recent reforms promoting crowdinvesting, 2016

	Reform	Maximum issue w/o prospectus	Maximum amount sold to investor	Regulation of gatekeeper	Disclosure requirements	Investor education
Austria	Alternativfinanzierungsgesetz (AIFG) 2015, reform of the previous Kapitalmarktgesetz in 2013.	€ 5,000,000 (previously € 250,000, before the 2013 reform € 100,000).	Single issuer limit: 10% of net investable financial assets or twice the monthly net income; max. € 5,000 in case the investor has a net income of € 2,500 or less.	Trade authority or securities regulator authorize platform.	Minimum information disclosure regarding the issuer and financial instrument for issues larger than € 100,000 and up to € 250,000 (stocks and bonds)/ € 1,500,000 (other investments) information disclosure requirements (e.g. annual statements) apply; for issues exceeding these thresholds and ranging up to € 5,000,000 simplified prospectus required.	
Belgium	Loi du 25 avril 2014 portant des dispositions diverses, published at the Official Journal Moniteur Belge on 7 May 2014 nr. 36946.	€ 300,000 if no investor can invest more than € 1,000; otherwise € 100,000.	Single issuer limit: € 1,000 for issues between € 100,000 and € 300,000; no single issuer limit for issues below € 100,000.			
France	Ordonnance nr. 2014-559 of 30 May 2014; Décret d'Application nr. 2014-1053 of 16 September 2014.	€ 1,000,000 (previously € 100,000).		Securities regulator authorizes platform (<i>conseiller en financement participatif</i>).	Obligation of the issuers to supply simplified documentation to investors (description of the project for which money is raised, organization chart of management, annual statements and projections, risk assessment etc.); not subject to approval by the securities regulator.	Investors must undergo a test that determines their risk profile, the results of which must be in line with the risks involved in crowdinvesting.
Germany	Kleinvanlegerschutzgesetz 2015.	€ 2,500,000 (previously € 100,000).	Single issuer limit: € 1,000 (if investor does not want to provide personal financial information), otherwise twice the monthly net income, but as a general rule no more than € 10,000 per project.	Trade authority authorizes platform.	Small information leaflet.	
Italy	Decreto Crescita 2.0 2012.	€ 5,000,000 (previously € 100,000) Only 'innovative startups' eligible that fulfill criteria [a] - [g]: [a] The incorporation and business operations of the firm should have taken effect no more than 48 months ago; [b] The management is located in Italy; and the main business activities of the firm take place in Italy; [c] The annual turnover in the second year of business as stated in the last accounts does not exceed € 5,000,000; [d] The firm does not and did not make payouts to shareholders using previous corporate profits; [e] The sole or main purpose of the firm is to develop, produce and sell innovative products or services with a high technological value; [f] The firm was not established as part of a merger, de-merger or sale of a corporation or corporate entity; and [g] The firm fulfills at least one of the following conditions: 1) The firm invests at least 15 percent of the greater of the annual production costs or the production value in R&D; 2) One-third of the employees have obtained a PhD, are enrolled in a university PhD program or two-thirds of the employees have obtained an academic degree or have worked for more than three years in a private or public research institution; or 3) The firm owns a patent on an industrial, biotech or electronic semiconductor innovation or owns the right on a software, which is registered in the public software register, related to the purpose of the corporation.	Aggregate limit: 10% of net investable financial assets for retail clients, who are not professional clients, venture capital contacts or corporate finance contacts, certified or self-certify as sophisticated investors, certified as high net worth investors or cannot confirm that they receive regulated investment advice or investment management services. € 2,000 to € 100,000 annually depending on income and net wealth.	Securities regulator authorizes platform.		Retail clients need to receive regulated investment advice or investment management services from an authorised person unless they are professional clients, venture capital contacts or corporate finance contacts, certified or self-certify as sophisticated investors, certified as high net worth investors or invest no more than 10% of net investable financial assets.
United Kingdom	PS14/4 2014.	€ 5,000,000 (previously € 5,000,000).		Securities regulator authorizes funding portal or broker-dealer.		Funding portal or broker-dealer needs to provide disclosures, including disclosures related to risks and other investor education materials.
United States	JOBS Act (Title III) 2012.	\$ 1,000,000 (previously \$ 0).	Aggregate limit: \$ 2,000 to \$ 100,000 annually depending on income and net wealth.	Securities regulator authorizes funding portal or broker-dealer.	If the overall amount of the issue is \$ 100,000 or less, issuers must provide most recent income tax returns and financial statements, which must be certified by the principal executive officer. For issues of more than \$ 100,000 but less than \$ 500,000, financial statements must be provided and reviewed by a public accountant, who should be independent from the issuer. The accountant must use professional standards and procedures for the review. For issues of more than \$ 500,000, the issuer must provide audited financial statements.	

Source: Homuf and Schwenbacher (2016).

EDUCATION AND POLITICAL PARTICIPATION

Introduction

In the light of a steady decline in voter turnout at the German national elections over the last 40 years (Bundeswahlleiter 2015), political journalists and researchers have started to look for explanations for increasing abstention from voting (e.g., Schäfer 2015). One prominent, if not the most prominent determinant of political participation, is the educational level of an individual. In view of this fact, researchers and politicians have long thought that improving the education level of the population would automatically lead to increasing political participation. However, political participation has declined in Germany and in many other developed countries, despite increasing education levels.

In this article, we begin by providing insights into the general developments in the relationship between education and political participation. Then, we present studies that aim to identify the causal effect of education on political participation. This overview shows that the association between education and political participation is still a hotly debated topic among researchers, raising several research questions that are still to be answered.

General developments in the relationship between education and voting

Research into the relationship between education and political participation yields seemingly opposing results. At the individual level, there are numerous studies showing a strong positive correlation between educational attainment and political participation (Lipset 1959; Wolfinger and Rosenstone 1980; Verba, Schlozman and Brady 1995; Putnam 2000; Schlozman, Verba and Brady 2012). Interestingly, these individual-level findings hardly transfer to the macro level. Although education levels increased worldwide after World War II, this development was not accompanied by a rise in voter turnout. Moreover, voter turnout in general elections is even decreasing in many Western societies, and this development is often especially pronounced among younger cohorts (Gray and Caul 2000; Putnam 2000; Kostadinova 2003; Sondheimer and Green 2010).

To observe more recent trends in voter turnout, we use data from the European Social Survey (ESS). The ESS is a cross-national survey that was first conducted in 2002, and has given rise to seven survey waves to date. The ESS covers over 30 European countries and aims to measure the attitudes, beliefs, and behavior of the population. The survey consists of a core module, which is repeated in every wave, and of several rotating modules. The core module contains detailed information about sociodemographic and household characteristics, as well as numerous questions about media usage, social trust, politics, subjective well-being and values, religion, and national and ethnic identity. The ESS is representative for each participating country, and its panel structure enables the analysis of longer-term trends.¹

Figure 1 shows the average turnout for national elections that individuals report in the ESS, by respondents' education level and birth cohorts. Consistent with the findings of the literature on this topic, individuals with higher education levels are on average more likely to participate in elections than individuals with lower education levels. This pattern holds for all birth cohorts. Figure 2 shows that the share of respondents with at least upper-secondary education rises with their year of birth, while the share of respondents who voted at the last national election is lower among younger birth cohorts. This is in line with the literature on this topic, which shows that abstention from voting is more prevalent among younger birth cohorts, although they are better educated. Figure 3 presents developments over time, also showing the increase in the education level of the population. The development in voter turnout has to be interpreted with some caution, however, since it is based on all countries from all waves, but national elections take place more infrequently than the ESS surveys. Therefore, voting behavior from different ESS waves could refer, in some cases, to the same national elections. If anything, the time series points to a slight decrease in voter turnout over time.

The results presented to date show that individuals with higher education levels are more likely to vote. However, this correlation does not yet prove that higher education causes higher political participation. This issue will be discussed in the next section.

¹ Like all social surveys, the ESS suffers from measurement error. But Pelkonen (2012) and Milligan, Moretti and Oreopoulos (2004), using different survey data, provide evidence that results on the relationship between education and voter turnout are not driven by measurement error.

Figure 1

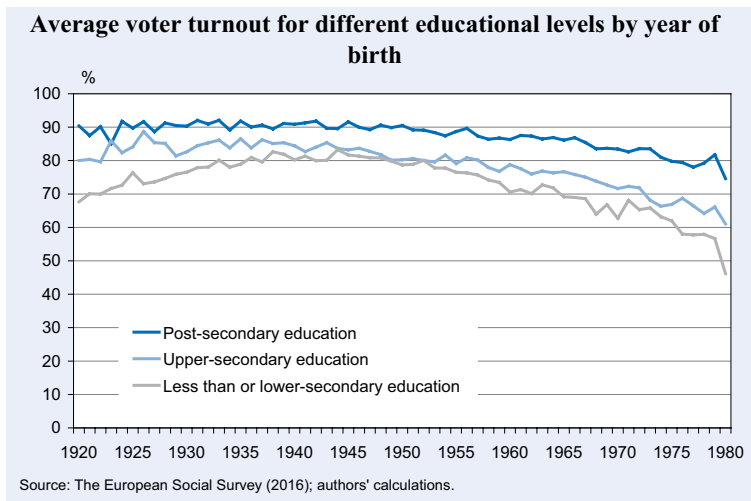


Figure 2

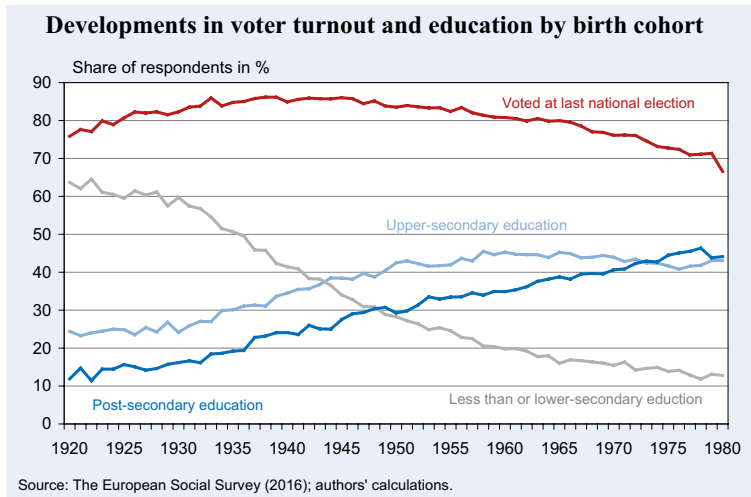
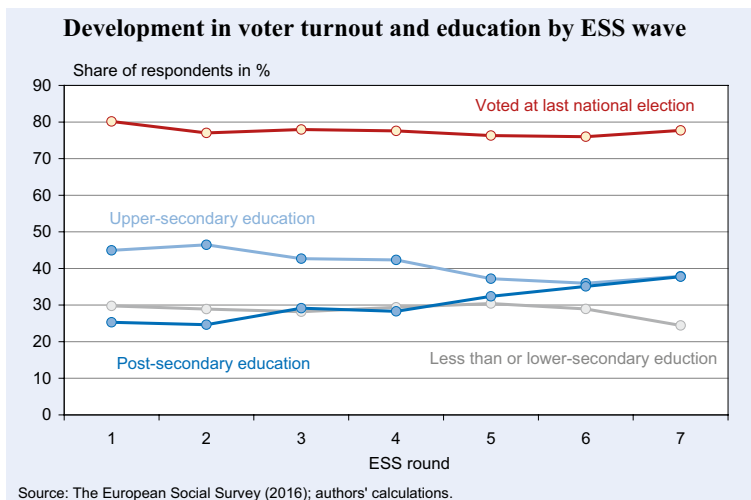


Figure 3



Education as a cause versus education as a proxy

As in empirical research in general, correlation does not necessarily imply causation. Different mechanisms could drive the relationship between education and political participation. Let us consider two different theoretical models.² First, the *absolute education model* considers education as a cause. The idea is that education increases the cognitive ability of individuals, which, in turn, increases civic skills and political knowledge. For example, well-educated individuals are better able to process the necessary information for political participation. Furthermore, courses on politics and citizenship in school may increase an individual's likelihood of voting. Second, the *pre-adult socialization model* is based on the idea that education is only a proxy for other underlying factors, such as the socio-economic status of the family, political socialization as a child, or individual traits like innate cognitive ability. These other factors could affect both the education level of the individual and his/her likelihood of participating in elections. In this model, education is not the cause of political participation. In empirical research, however, it is very difficult to distinguish between these two different models, and some researchers erroneously conclude from correlations that a higher level of education causes a greater degree of political participation.

² For more details on this and a third model, see, e.g., Persson (2015).

Recent research on the causal effects of education

Much of the research conducted over the last 15 years tries to find evidence in favor of or against the view that education is a direct cause of political participation. In a hypothetical world, one could run an experiment that randomly assigns a lot of education to some individuals and little education to others.³ One could subsequently investigate whether individuals that received more education are more likely to vote than individuals who received less education. If this were to prove the case, one could establish that education does indeed have a causal effect on political participation. Obviously, such an experiment cannot be run in practice. Researchers instead look for events that come as close as possible to such an experiment. We will now present two groups of studies that aim to identify the causal impact of education on political participation.

The first group of studies analyzes field experiments or exploits natural experiments. The basic idea is that sometimes educational reforms or institutional features provide a setting that comes close to a real experiment. One prominent example that was used in several studies is the change in the amount of compulsory schooling individuals have to obtain. For example, in Denmark individuals only had to obtain seven years of compulsory schooling until 1971. After 1971, individuals received nine years of compulsory schooling. Such a reform can be analyzed with different econometric methods and is able to provide causal estimates, particularly in cases where the reform has been introduced gradually in different regions of a country, as was the case in Germany and Finland, for example. Pelkonen (2012) studies the effects of such an educational reform in Norway and finds that education has no significant effects on different types of political participation. Siedler (2010) analyzes an educational reform in Germany and also finds little evidence of a causal effect. Berinsky and Lenz (2011) use the natural experiment of military conscription that took place during the Vietnam War, leading to different levels of education among young males. They similarly find that education has no effect on political participation. Exploiting changes in compulsory schooling laws, Milligan, Moretti and Oreopoulos (2004) find positive causal effects for the United States, but not for the United Kingdom. Dee (2004) also finds evidence of causal effects in the United States, using school-leaving laws and the geographical distance to higher education institutions as a natural experiment. Sondheimer and

³ See, for example, Angrist and Pischke (2015) on why experiments allow identifying causal effects.

Green (2010) also find that education has positive causal effects on political participation when using results from three different field experiments. However, these field experiments do not include many individuals, and they are focused on individuals with a low socio-economic status, which makes it difficult to generalize the results to the entire population.

Many studies focus on only one country, and it is not clear why education has significant causal effects on political participation in some countries, but not in others. One study tries to provide more general results by estimating the effects of compulsory schooling reforms for a whole group of European countries (Borgonovi, d’Hombres and Hoskins 2010). The authors use data from the European Social Survey and combine that with information about compulsory schooling reforms in European countries from Brunello, Fort and Weber (2009). They find that education has no effect on voter turnout, but do find positive effects on the acquisition of information on politics.

The second group of studies tries to estimate causal effects via so-called matching procedures. These studies are based on panel data, that is, repeated observations of the same individuals. The basic idea behind matching is to pair people (i.e., to find “matches”) who are very similar with respect to their socio-economic characteristics, but who differ in their education level, and then to compare the participation outcomes for these matched individuals. While there is an ongoing debate over which exact matching procedure performs best, and if matching is indeed able to yield causal estimates at all, the results are not very promising for the education-as-a-cause view. Several papers do not find any significant differences in political participation between higher- and lower-educated individuals (Kam and Palmer 2008, 2011; Henderson and Chatfield 2011; Persson 2014). Only one study that uses a matching procedure finds some evidence that post-secondary education might have a causal effect on political participation (Mayer 2011).

To sum up, results on the causal effects of education on political participation are mixed. Hence, more research on this topic is needed.

Conclusion

In this article, we provide evidence on the correlation between education and political participation in Europe. The rising educational level in a population over time is

typically not followed by the same development in voter turnout. Younger cohorts, in particular, seem to stay away from the polls. At an individual level, however, we observe that people with more education are more likely to vote. The existing literature tries to find evidence that this relationship is driven by a causal effect of education. The results with regard to this question are rather mixed and therefore provide only limited hope that further increasing education levels will also increase voter turnout. Of course, there are forms of political participation other than voter turnout that might be especially attractive for younger people. Voting is nevertheless crucial to a functioning democracy.

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AN INTERNATIONAL COMPARISON OF ENERGY TAXATION IN 2015

In modern economies across the globe, energy use is of crucial importance to production and consumption. A central socio-economic issue is that of limiting the detrimental environmental effects of energy use whilst ensuring sufficient and stable energy supplies. In this respect, price signals are central to economic agents' efficient decision-making, since their behaviour is influenced strongly by energy taxation, which ideally leads them to internalise the negative external effects of energy use. Thus, it is our goal in this report to analyse differential energy taxations and their effects on the respective economies.

In order to do so, we consider a sample of 41 countries comprising the OECD countries as well as selected economic partners. These countries account for 80 percent of global energy use, with China being the most prominent and the US the second most prominent user. A rising trend can be seen in the percentage share of global energy use taken up by the emerging economies: Chinese energy use is forecasted to rise from 19 percent in 2013 to 28 percent in 2030 and 29 percent in 2050. This is partly due to the growing use of transport energy. The OECD countries' shares of world energy use, however, are likely to decline from 62 percent in 2013 to 49 percent in 2030 and 43 percent in 2050 (OECD 2015).

Although countries pursue a common goal of pricing in negative effects to use resources efficiently and to provide incentives to search for alternative cleaner technologies, their taxation policies differ considerably in terms of the tax levels for different energy sources and uses. Comparing taxation in terms of GJ (Gigajoule)

allows us to draw conclusions on taxation in terms of energy value, whilst a comparison of taxation with regard to CO₂ enables us to focus on the social cost of carbon emissions, one of the goals of energy taxation. As can be seen from the DICE table on "Energy taxation" (DICE Database 2016), the overall economy-wide level of energy taxation ranges from EUR 0 per GJ (Gigajoule) and tonne CO₂ in Indonesia and Russia to EUR 6.58 per GJ in Luxembourg and EUR 107.3 per tonne CO₂ in Switzerland. The highest effective tax rates are found in EU countries. These countries' energy taxation policies are significantly shaped by the EU Energy Tax Directive, implementing minimum rates for energy taxation. Chinese and American energy taxation are comparatively low at EUR 0.31 per GJ and EUR 3.4 (China) and EUR 4.83 (US) per tonne of CO₂. This is in line with these countries' high share of world energy use, thus indicating that their low effective tax rates on energy use incentivise a high use of resources. Generally, countries with a higher level of GDP per capita tend to use more energy per capita and to tax energy use at higher effective rates.

However, we can observe common patterns across our sample countries from Table 1 and 2, which show weighted average effective tax rates on energy by fuel type and use in energy and carbon terms. On average, one unit of energy is taxed at EUR 1.1 per GJ and EUR 14.8 per tonne of CO₂, but these values vary for energy from different fuels and for different users. Transport energy is taxed more highly than energy derived from other fuels. As opposed to average values, for transport energy average, effective tax rates are EUR 5 per GJ and EUR 70.1 per tonne of CO₂. The reason for this lies in the broader range of policy goals that governments typically attach to taxing transport energy, as well as revenue purposes. Many governments want to use revenues from transport energy taxation for infrastructure and aim to internalise the externalities from transport

Table 1

Weighted average effective tax rates on energy by fuel type and use (EUR per GJ)

Effective tax rates on fuels (EUR per GJ)		Oil products	Coal & peat	Natural gas	Biofuels & waste	Renewables & nuclear	All fuels
	% of base	27%	34%	20%	9%	11%	100%
Transport use	18%	5.20	0.00	0.12	3.74	0.00	4.96
Heating & process use	42%	0.82	0.05	0.21	0.00	0.00	0.26
Electricity production	40%	0.50	0.13	0.43	0.65	0.38	0.27
Total use	100%	3.52	0.10	0.28	0.30	0.38	1.11

Source: Adopted from OECD (2015).

Table 2

Weighted average effective tax rates on CO2 emissions from energy use by fuel type and use (EUR per tonne CO2)

Effective tax rates on fuels (EUR per tonne CO2)		Oil products	Coal & peat	Natural gas	Biofuels & waste	All fuels
	% of base	26%	46%	15%	13%	100%
Transport use	17%	72.89	0.00	2.13	51.84	70.05
Heating & process use	48%	11.60	0.48	3.75	0.01	3.07
Electricity production	35%	6.87	2.31	5.85	16.36	3.37
Total use	100%	49.32	1.58	4.37	3.61	14.78

Source: Adopted from OECD (2015).

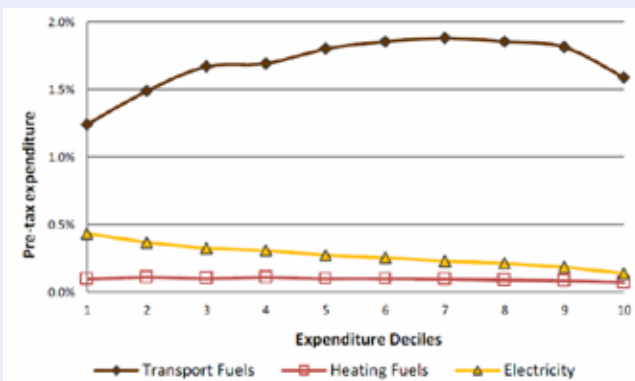
other than carbon emissions, e.g. congestions, accidents and noise. Heating and process energy, as well as energy used for electricity generation, are typically taxed at lower effective rates, with similar average values in energy and carbon terms. We observe a weighted average of EUR 0.3 per GJ and EUR 3.1 per tonne of CO2 (OECD 2015).

In addition, there are different weighted average effective tax rates for different fuels. Oil is more heavily taxed than other energy sources, mainly because oil accounts for a dominant share of energy for transport uses. However, very high effective tax rates are also seen for energy derived from oil in other categories. Other fossil fuels are often untaxed or taxed at very low effective rates. Natural gases, biofuels and waste are typically taxed at lower effective rates of EUR 0.3 per GJ and EUR 4.4 and EUR 3.6 per tonne of CO2. Energy derived from coal shows the lowest effective tax rates in both energy and carbon terms. On average, coal in the heating and process category shows the lowest rates (OECD 2015).

On the whole, these common taxation trends are evaluated by the OECD (2015) as not being in line with effective environmental taxation. Taxes on energy use for heating and process energy, as well as taxes on the energy used to generate electricity, are generally too low to reflect and price in the negative environmental effects, especially for highly polluting energy sources such as coal (OECD 2015). In addition, even though taxes on road transportation are sufficiently high, they often fail to reflect the differential effects of energy use on pollution that arise through differences in time such as rush hours versus night, and geographical differences such as urban versus rural areas. Furthermore, many governments in our sample pursue counteracting policy measures such as tradable carbon permits systems and differential rates of value added taxes. Even though governments' awareness of this issue has increased and many of them are reconsidering price signals and taxes on harmful forms of energy use, it is clear that current energy taxation policies still leave considerable scope for improvement (OECD 2015).

Figure 1

Average taxes on energy carriers as % of net pre-tax expenditure (21-country averages)



Source: Adopted from Flues and Thomas (2015).

The question that arises is why governments have often been reluctant to implement more effective energy taxation in the past. Firstly, governments face two opposing policy goals: economic growth and environmental protection, of which economic growth is often the more popular one. In addition, energy taxation comes along with distributional effects and the concern that the poor might be hit harder by taxation than the rich, i.e. that energy taxation is regressive. Across a sample of 21 OECD countries, we see that distributional effects differ by energy carrier, as shown in

Figure 1. Taxes on transportation fuels are not regressive on average; but this is heterogeneous across countries with some facing progressive and others facing proportional taxation. By contrast, taxation on heating fuels and electricity is slightly regressive. These results are dependent on socio-demographic characteristics: Larger households and households in rural areas spend larger shares of their expenditure on energy taxation, while households with a household head who is older than 60 years spend a lower share of their expenditure on energy taxation (Flues and Thomas 2015).

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THE NATURE OF SELF-EMPLOYMENT

Growth in the self-employment rate is often praised as the sign of an active and innovative economy where individuals have the chance to pursue entrepreneurial goals. However, a large proportion of self-employed individuals may also be the symptom of a highly frictional labour market, where individuals are forced into precarious and insecure jobs. This is particularly the case for workers at a disadvantage in the regular labour market, and who are not supported by a social security net.

The following essay sheds some light on the variety of European countries' experience with regard to self-employment.¹

Innovation or escape?

A worker's decision to go on his/her own-account depends on several factors. The institutional environment, for example how easy it is to start a business or obtain credit, is crucial for the implementation of business ideas. Equally important is the attractiveness of existing employment (or unemployment) alternatives. This is determined by wage premiums in other sectors, as well as social benefits for the unemployed. Finally, individual skills (education and innate talent) will also play a major part in the worker's decision. The combination of these factors will influence the sorting of workers in or out of self-employment, and the nature of their self-employment.

On the one hand, in countries where a relatively large proportion of high-skilled individuals turn to self-employment, one should expect the creation of new and innovative businesses. Moreover, a business-friendly institutional environment should reinforce this effect. On the other hand, for countries with a large concentration of low-skilled workers among the self-employed, a relatively high unemployment rate, as well as few activation policies for the unemployed, one should expect self-employment to be an escape route from unemployment. To assess the nature of the self-employment experienced by a country, it is useful to distinguish self-employment rates by education and compare them with unemploy-

ment rates, the generosity of the social security system and the ease of doing business in that country.

Table 1 ranks European countries by the proportion of self-employed (age 25–64 with lower secondary education or less) of the employed in the population with the same education level (column 1) in 2013. Columns two and three present the corresponding proportions for those with upper secondary education, and tertiary education, respectively. The next three columns (four to six) show the unemployment rate in the same age group, divided according to the same education levels. Column seven proxies the generosity of the State by the social protection benefits for unemployed in Purchasing Power Standard per inhabitant. Finally, column eight presents the country-rank in the Doing Business index from the World Bank.

As of 2013, three countries had about half of their low-skilled employed workforce being self-employed: Romania, Greece and Macedonia. This was double the average of the European Union (23.8 percent). The upper end of the table is also occupied by countries that have been severely hit by the recent European financial and banking crisis (Cyprus, Greece, Ireland, Italy, Portugal and Spain). For countries above the EU-average, the proportion of the self-employed in the employed labour force tends to decrease rapidly with education (except for Italy). Conversely, at the other end of the scale, German-speaking countries and some Eastern European countries display a relatively low level of self-employed having lower secondary education or less. Furthermore, the proportion of the self-employed increases with education levels (107.1 percent increase in Germany), and in most cases, the proportion of the high-skilled self-employed exceeds the EU-average. Hence columns one to three suggest very different characteristics of self-employment across Europe.

The relationship of the self-employment rate to the unemployment rate is not straightforward. Seven countries out of the top ten in Table 1 have a higher than average unemployment rate among low-skilled workers. Nevertheless, some countries like the Slovak Republic, Lithuania and Hungary combine a high level of unemployment in the low-skilled population and a lower than average self-employment rate. For these once-called transition economies, Earle and Sakova (2000) suggest the possibility of a “disguised unemployment”, that is enforced self-employment in a residual sector by a lack of opportunities. Interestingly, the unemployment rates of middle-educated and highly-educated individuals

¹ See also Hatfield (2015) for a detailed description of the socio-demographic characteristics of self-employed individuals across Europe.

are highly correlated with the concentration of the low-skilled in self-employment (coefficient of correlation of 0.51 and 0.61 respectively). These empirical facts suggest that the low-skilled, who are generally disadvantaged in terms of job competition, find self-employment to be an easier route into the labour market.

Column seven shows that the concentration of the low-skilled in self-employment is negatively correlated with the level of social benefit available to unemployed individuals (correlation of -0.18). With the exception of

Greece and Cyprus (whose governments were bailed out during the recent Eurozone financial and banking crisis), the countries with the highest concentration of low-skilled, self-employed individuals provide little monetary support to unemployed individuals. Finally, the ease of starting up and running a business also seems to influence the proportion of low-skilled individuals. The higher the ranking is, the larger is the concentration. Hence business starting by low-skilled individuals may depend less on a business-friendly environment than on the tightness of the labour market.

Table 1

Cross-country comparison of self-employment rates by education, unemployment rates by education, level of social benefits and ranking from the Doing Business Index

Countries	Self-Employment rate ^{a)}			Unemployment rate ^{b)}			Social benefits ^{c)}	Doing Business ^{d)}
Romania	56.4	21.0	7.8	8.5	6.6	4.3	24	37
Greece	51.4	35.6	28.4	27.6	23.3	16.2	372	60
Macedonia	46.7	20.1	15.0	33.9	25.1	18.1	71	12
Turkey	38.5	22.4	13.0	7.6	5.7	5.2	23	55
Croatia	33.7	17.9	13.1	20.5	15.4	9.5	72	40
Cyprus	32.4	19.8	17.9	22.4	14.1	10.8	337	47
Poland	32.3	23.9	19.2	18.2	8.5	4.3	55	25
Ireland	31.1	28.0	18.2	22.4	15.7	7.2	1041	17
Italy	28.2	26.1	32.6	13.7	7.8	5.5	419	45
Spain	25.2	21.5	18.0	31.9	21.6	13.4	836	33
Finland	25.2	18.7	13.8	11.7	7.6	5	612	10
Portugal	24.8	15.3	17.7	17.6	12.8	9.8	333	23
Malta	24.0	13.6	13.4	7.9	2.1	1.9	120	80
European Union (28 countries)	23.8	18.5	18.5	18.1	8.2	5.4	412	27
United Kingdom	22.1	20.9	15.6	10.8	5.7	3.4	187	6
Bulgaria	20.0	13.0	17.0	28.6	11.5	6.1	74	38
Netherlands	18.9	20.2	20.5	9.1	6.6	3.8	565	28
Iceland	17.8	19.4	14.0	4.9	4.4	3	398	19
Lithuania	16.8	14.1	12.9	32.2	14.4	4.1	79	20
Sweden	16.7	15.6	10.3	12.7	5	4.4	387	8
Slovenia	16.7	17.5	13.2	16.8	8.8	4.9	159	29
Belgium	15.1	18.7	20.4	13.7	6.5	4.1	1.101	43
Norway	14.6	9.9	6.8	5.4	2.3	1.8	275	9
Denmark	13.0	14.4	10.1	9.2	4.7	4.5	613	3
France	12.9	15.9	15.1	14.1	8.3	5.5	548	27
Czech Republic	12.8	21.4	21.2	23.2	4.8	2.1	146	36
Switzerland	12.4	16.4	16.6	8.9	3.6	2.8	312	26
Latvia	11.3	12.5	16.2	21.2	12.7	5.2	83	22
Slovak Republic	11.3	20.7	22.5	42.5	11.6	5.6	145	29
Austria	11.1	12.5	22.9	11.6	4.6	2.8	498	21
Germany	9.8	11.0	20.3	14.3	5.4	2.2	390	15
Hungary	5.1	13.4	19.5	22.2	8.6	3.1	100	42
Estonia	4.8	11.4	17.6	14.6	8.7	5.3	88	16

Notes: ^{a)} Self-employment rate year 2013 – except Lithuania, year 2014. ^{b)} Unemployment rate year 2013. ^{c)} Social protection benefits for unemployed in Purchasing Power Standard per inhabitant year 2012. ^{d)} Doing Business 2014; for EU-28: median ranking of countries.

Source: EUROSTAT, World Bank Group, Author's calculations.

Summary

Overall, statistics suggest a variety of situations with regard to self-employment. For most Western and Northern European countries, self-employment seems to attract low, middle and high-skilled individuals in equal measure, a *prima facie* sign of innovative entrepreneurship. Conversely, for countries severely hit by the recent crisis, the evidence supports the interpretation that (low-skilled) individuals may be pushed into own-account status by a lack of work opportunities.

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NEW AT DICE DATABASE

Recent entries to the DICE Database

In the first quarter of 2016, the DICE Database received a number of new entries, consisting partly of updates and partly of new topics. Some topics are mentioned below.

- Integration policies for asylum seekers and humanitarian migrants in OECD countries
- Asylum I: Procedures
- Asylum II: Reception
- Controlled immigration: Points attributed under different recruitment systems
- Brain drain: Skilled emigration
- Education level of foreign- and native-born population
- Employment rates of national and foreign-born persons
- Cluster development support policies and specialisation patterns
- Tax subsidy rate for R&D outlays
- Summary of available R&D incentives
- Decisions on payments for teachers in public institutions
- Effective tax rates for energy use per country

The interactive graphics application [Visual Storytelling](#) has been further expanded.

FORTHCOMING CONFERENCES

CESifo Area Conference on Global Economy

13–14 May 2016, Munich

CESifo will hold its annual meeting for the Global Economy research area, intended to allow presentation of current research undertaken by its members and to stimulate interaction and co-operation between area members. Papers can be on any topic under the Global Economy field, covering trade, international finance, migration, global environmental issues, and others. Papers will be discussed in seminar format. Accepted papers will be published as CESifo Working Papers after revision.

Scientific organisers: Prof. Dr. Peter Egger,
Prof. John Whalley

CEMIR Junior Economist Workshop on Migration Research

24–25 June 2016, Munich

The Ifo Center of Excellence for Migration and Integration Research (CEMIR) is organising a junior economist workshop on migration research to be held on 24 and 25 June 2016 at the Ifo Institute in Munich, Germany.

The keynote lecture will be given by Jesús Fernández-Huertas Moraga, Universidad Carlos III de Madrid. Interested Ph.D. students, post docs and assistant professors in economics with a firm interest in the field of migration are invited to submit a research paper they would like to present.

Scientific organisers: Prof. Panu Poutvaara, Till Nikolka

CESifo Delphi Conference 2016 on Innovation

1–2 July 2016, Munich

CESifo and the Department of International and European Economic Studies (DIEES) of the Athens University of Economics and Business (AUEB) will organise a conference on Innovation. The organisers invite the submission of papers or extended abstracts (300–500 words).

Scientific organisers: Prof. Dr. Oliver Falck,
Prof. Thomas Moutos

NEW BOOKS ON INSTITUTIONS

Bank Resolution and Crisis Management

Law and Practice

Simon Gleeson and Randall Guynn

Oxford University Press, 2016

Beyond the Regulatory Polity?

The European Integration of Core State Powers

Edited by Philipp Genschel and Markus Jachtenfuchs

Oxford University Press, 2016

Institutions, Innovation, and Industrialization: Essays in Economic History and Development

Edited by Avner Greif, Lynne Kiesling &

John V. C. Nye

Princeton University Press, 2015

CESifo DICE

THE DATABASE FOR INSTITUTIONAL COMPARISONS IN EUROPE

The Database for Institutional Comparisons in Europe – DICE – was created to stimulate the political and academic discussion of institutional and economic policy reforms. DICE is a unique database offering comparative information on national institutions, regulations and economic policy. Although DICE is not a statistical database, it also contains data on the outputs (economic effects) of institutions and regulations where relevant.

DICE covers a broad range of institutional themes: Business and Financial Markets, Education and Innovation, Energy and Natural Environment, Infrastructure, Labour Market and Migration, Public Sector, Social Policy, Values and Other Topics.

The information is presented in tables (text or data), graphics (interactive application Visual Storytelling), and reports. In most cases, all EU countries are covered as well as some other major OECD countries. Users can choose between current comparisons and time series that show developments over time.

DICE combines systematic information from a wide range of sources, presenting a convenient one-stop service for your data needs.

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