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Social security contributions: economic and public finance considerations

Kees Goudswaard & Koen Caminada

Abstract

Social security contributions make up around one fourth of total tax revenue in OECD countries. However, there are concerns on the economic effects of high levies on labour. Recent studies suggest that at least one third of taxes on labour are shifted onto employers, leading to higher wage costs. We find substantial evidence in the literature that the nature of social security contributions matters. With a clear connection between contributions and rights, the employee will perceive this contribution as a price and not as a tax. As a consequence, these contributions will be less distortive in terms of labour supply, wage costs and private savings.

Key words: social security contributions, tax shares, labour market effects, private savings

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1. Introduction

Social security contributions represent a large share of total taxation in OECD countries (24.3 percent in 2013), and an even larger share in Continental Europe. Total employee and employer contributions exceeded 10 percent of GDP in half of the OECD countries. These contributions were originally introduced to finance various aspects of the welfare state (health, pensions, unemployment, disability, etcetera), based on the model of 'social insurance'. Three main functions of the welfare state are redistribution, including poverty alleviation, insurance against several social risks and income smoothing or reallocation of income over the life cycle (Barr, 1992; Barr and Diamond, 2009). Social security contributions can traditionally be associated with the insurance function of the welfare state and, as far as pensions are concerned, with the reallocation function. Over time, these contributions have evolved into (payroll) taxes, although with specific characteristics: (i) the tax base is labour earnings rather than income more broadly; (ii) contribution rates are generally flat, with a minimum and maximum threshold; (iii) contributions are split between employers and employees; (iv) the amount of benefits can be linked to the amount of contributions paid.

Despite the importance of social security contributions, empirical studies of their economic effects are surprisingly rare (European Commission, 2015). This paper provides information on the nature, importance and development of social security contributions in OECD countries, and their effect on labour costs and employment and on private savings. Our motivation is as follows.

Because social expenditure has risen quite rapidly in most countries, social security contributions have also shown an upward trend. At the same time, these contributions, and especially employers' social security contributions, have been blamed for destroying employment. Some European countries have implemented lower employers' social security contributions, funded through general taxation, with the aim to reduce these negative employment effects. The rationale for such policies is a belief that the economic effects of social security contributions, employee social security contributions and income taxes differ. It is often implicitly assumed that a decrease on the employee side leads to a higher labour supply. Similarly, a decrease in the employer social security contributions or payroll taxes is often assumed to raise the demand of labour. However, empirical studies on the effects are less clear cut.

Knowledge on how welfare states should be financed at lowest social cost is lacking. Insight in economic incidence of social security contributions (who is ultimately made worse off by the tax) and their efficiency effects (the impact of these taxes on labor supply and demand) is crucial to identify best-practices among countries for tax policy. Although the incidence and behavioural effects of income taxes are extensively studied, the literature on payroll taxes or social security contributions is less extensive (Saez et al, 2012). The incidence of social security contributions might be different from the incidence of income taxes. First, social security contributions are legally shared between employees and employers. Second, the reactions to social security contributions may depend on the nature of these contributions: are they seen as taxes or as prices with a close link to benefits?

This paper reviews the role of social security contributions in the total tax mix and their economic effects in affluent countries. The paper is organized as follows. Section 2 provides information on the importance and development of social security contributions in OECD countries since 1980. Section 3 addresses a long debated issue in public finance whether social benefits should be financed out of a pure tax or out of a separate social security contribution and discusses the nature of social security contributions. Section 4

investigates economic effects of social security contributions, and possible consequences for welfare state reform. Section 5 contains a case study: how should the Dutch public pension system be financed, by contributions or by general taxes? Section 6 concludes.

2. Descriptives

This section provides information on the importance and development of social security contributions in OECD countries. Table 1 (panel a) shows that social security contributions add up to on average 9.1 percent of GDP in OECD countries. In several European countries, like France, Germany and the Netherlands, this percentage is much higher, while some other countries, like Australia, Denmark and New Zealand, have no or hardly no social security contributions (according to the OECD definition).[1] The general trend is upward: between 1980 and 2013 the average level of social security contributions increased by 1.7%-points of GDP, although this upward trend was lower for Western European countries (+1.3%-points) compared to other OECD countries for which long time-series are available (+2.3%-points).

In most countries social security contributions are an important revenue source. In 2013, social security contributions make up around one fourth of total tax revenue in OECD countries. In a majority of the countries the share of social security contributions in total tax revenue has risen between 1980 and 2013. In France, Italy, Spain and Sweden, however, the share of social security contributions has dropped rather substantially. Note that the general trend in the group of Western European countries is downward, while the data show an increase of 6.5%-points in the other OECD countries for which long time-series are available. As a result, both social security contributions as percentage of GDP and social security contribution as percentage of total tax revenue converged across countries over time; see Table 1.

[1] It should be noted that these countries have mandatory contributions to private pension schemes which are not captured by the declared data.

Table 1: Social security contributions, 1980-2013

	Panel (a): % of GDP					*Panel (b) % of total tax revenue*				
	1980	1990	2000	2013	Change	1980	1990	2000	2013	Change
Australia	0.0	0.0	0.0	0.0[a]	0.0	0.0	0.0	0.0	0.0[a]	0.0
Austria	12.0	12.9	14.4	14.6	2.6	30.9	32.9	34.1	34.3	3.4
Belgium	11.7	13.7	13.6	14.2	2.5	28.8	33.2	31.0	31.7	2.9
Canada	3.2	4.3	4.8	4.9	1.6	10.5	12.1	13.6	15.9	5.4
Chile	-	1.5	1.4	1.4		-	9.0	7.3	7.1	
Czech Republic	-	-	14.4	14.8		-	-	44.3	43.3	
Denmark	0.6	0.9	1.7	0.8	0.2	1.3	2.0	3.6	1.6	0.3
Estonia	-	-	10.9	11.1		-	-	35.3	34.8	
Finland	8.2	11.0	11.6	12.7	4.5	23.3	25.6	25.2	28.9	5.6
France	16.8	18.1	15.5	16.8	-0.1	42.7	44.1	36.0	37.2	-5.5
Germany	12.5	13.0	14.2	14.0	1.5	34.3	37.5	39.0	38.1	3.8
Greece	6.8	7.6	10.0	10.6	3.8	32.9	30.2	30.3	31.7	-1.2
Hungary	-	-	11.3	12.9		-	-	29.3	33.1	
Iceland	0.6	0.9	2.8	3.6	3.0	2.2	3.1	7.7	10.2	8.0
Ireland	4.3	4.6	3.7	4.4	0.1	14.3	14.1	11.8	15.5	1.2
Israel	-	-	5.2	5.1		-	-	14.7	16.6	
Italy	10.9	12.0	11.6	13.0	2.1	38.0	32.9	28.5	30.4	-7.6
Japan	7.2	7.5	9.4	12.3[a]	5.1	29.1	26.4	35.2	41.6[a]	12.5
Korea	0.2	1.9	3.6	6.4	6.2	1.1	10.1	16.7	26.3	25.2
Luxembourg	9.8	9.2	9.6	11.3	1.5	28.7	27.0	25.7	28.6	-0.1
Mexico	2.0	2.1	2.7	3.1	1.0	14.1	13.4	16.5	14.9[a]	0.8
Netherlands	15.4	15.1	14.4	15.0[a]	-0.4	38.1	37.4	39.1	41.2[a]	3.1
New Zealand	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Norway	9.0	10.8	8.9	9.7	0.8	21.1	26.3	20.9	23.8	2.7
Poland	-	-	12.9	12.1[a]		-	-	39.5	37.8[a]	
Portugal	6.5	7.2	7.9	8.9	2.5	29.5	27.2	25.8	26.7	-2.8
Slovak Republic	-	-	14.0	13.3		-	-	41.5	44.9	
Slovenia	-	-	13.9	14.8		-	-	38.0	40.1	
Spain	10.7	11.2	11.6	11.3	0.6	48.6	35.4	34.8	34.6	-14.0
Sweden	12.6	13.5	12.9	9.8	-2.8	28.8	27.2	26.4	22.9	-5.9
Switzerland	5.5	5.6	6.8	6.7	1.3	23.4	23.6	24.5	24.9	1.5
Turkey	1.9	2.9	4.5	8.0	6.2	14.0	19.7	18.7	27.4	13.4
United Kingdom	5.6	5.8	5.9	6.2	0.6	16.7	17.0	17.0	18.9	2.2
United States	5.6	6.6	6.6	6.2	0.6	21.9	25.2	23.4	24.2	2.3
Mean 34 countries	6.9	7.4	8.6	9.1	-	22.1	21.9	24.6	26.2	-
OECD-average [b]	6.9	7.6	8.0	8.6	1.7	22.1	22.4	22.5	24.3	2.2
- West EU15	9.6	10.4	10.6	10.9	1.3	29.1	28.2	27.2	28.2	-1.0
- Other 11	3.2	3.9	4.6	5.5	2.3	12.5	14.5	16.1	19.0	6.5
Coefficient of variation [b]	0.71	0.67	0.58	0.55	-0.16	0.62	0.54	0.50	0.48	-0.14

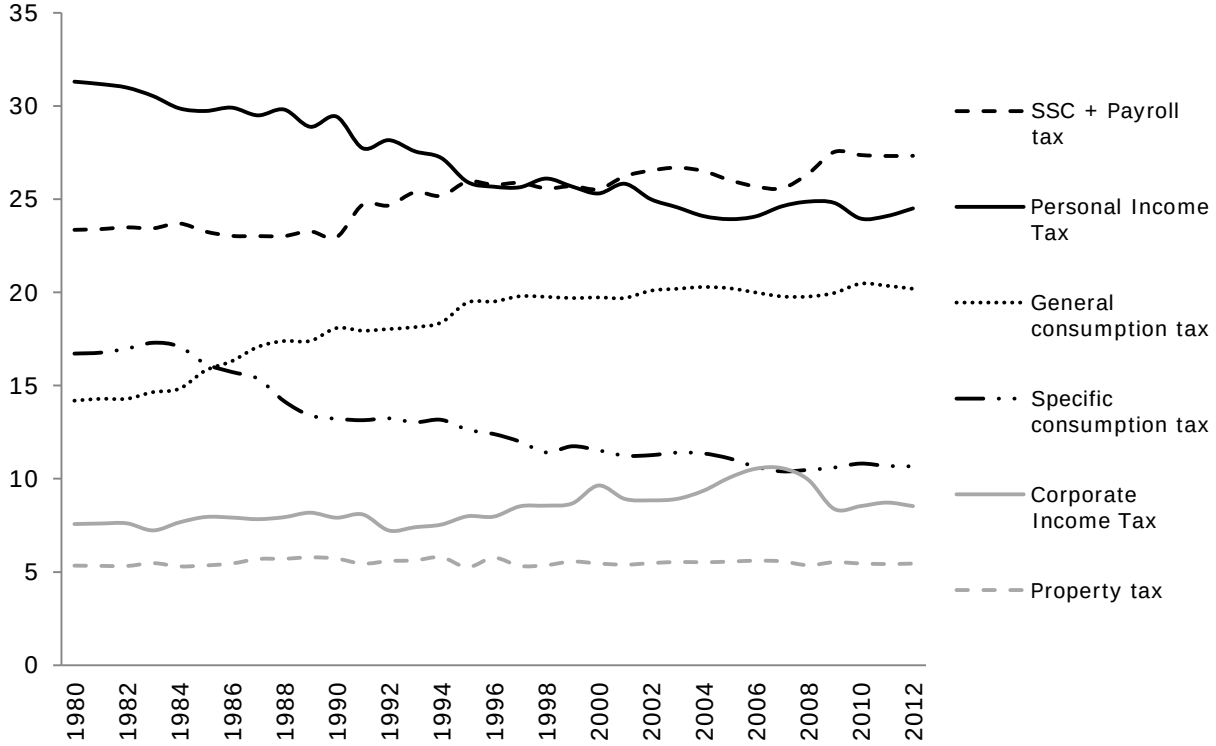
[a] Data refer to the year 2012
[b] Average resp. coefficient of variation of 26 countries for which long time-series are available

Source: OECD Revenue Statistics; and own calculations

Figure 1 shows that the overall tax structure – the share of main taxes in total revenue – has remained quite stable over the period 1980-2012 in the OECD-area. Two tax categories show an upward trend: social security contributions (including payroll taxes) and general consumption taxes (VAT). The shares of revenues form personal income taxes and from specific consumption taxes (such as taxes on tobacco, alcohol,

fuels, environmental related taxes) have dropped. Taxes on personal income (income taxes and social security contributions) together account for roughly half of total tax revenue, both in 1980 and in 2012. The share of corporate income taxes and property taxes did hardly change over time. A relatively sharp fall in revenue from corporate taxes in 2008 and 2009 did not continue in later years.

Figure 1: Share of tax categories in total tax revenue in the OECD-area, 1980-2012



Note: Data are included from 1980 onwards for Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Korea, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom and United States; from 1990 for Chile; from 1991 for Hungary and Poland; from 1993 for the Czech Republic and from 1995 for Estonia, Israel, the Slovak Republic and Slovenia.

Source : OECD Revenue Statistics; and own calculations

Table 2 indicates that on average some 36 percent of social expenditure in OECD countries for which long time-series are available is financed through social security contributions. But again, there are large differences across countries. In several European countries social security contributions cover more than half of the costs of social programs. This is the case in Austria, Czech Republic, Estonia, France, Germany, Hungary, the Netherlands, Poland, Slovenia and Turkey. Outside Europe, Japan is the only country that relies heavily on social security contributions to finance social expenditure. In Anglo Saxon countries on the other hand, social expenditure is mainly financed out of general revenue. These countries put less focus on the insurance function of the welfare state. Instead, they rely more on private arrangements to cover social risks. The average percentage of contributions financing has dropped by almost 10 percentage points since 1980, indicating that social expenditure has increased more rapidly than social contributions. This phenomenon is witnessed more strongly in West European countries compared to the other OECD countries for which long time-series are available.

Table 2: Social security contributions as % of public social expenditure, 1980-2013

	1980	1990	2000	2010	2013	Change
Australia	0.0	0.0	0.0	0.0	0.0[a]	0.0
Austria	54.1	55.3	55.0	49.4	51.6	-2.5
Belgium	49.8	55.0	55.4	47.6	45.8	-3.9
Canada	24.3	24.4	30.1	26.1	28.2	3.9
Chile	-	15.5	10.8	12.8	14.4	
Czech Republic	-	-	76.6	73.2	72.0	
Denmark	2.3	3.7	6.7	3.3	2.6	0.3
Estonia	-	-	79.1	68.0	68.9	
Finland	45.8	46.2	49.6	42.2	41.6	-4.2
France	81.7	72.5	54.6	50.8	52.3	-29.3
Germany	57.4	61.0	54.1	51.2	54.6	-2.8
Greece	65.9	45.9	52.3	45.2	43.7	-22.2
Hungary	-	-	55.3	50.2	58.2	
Iceland	-	7.0	18.7	21.9	21.2	
Ireland	26.9	26.6	27.9	18.4	20.1	-6.8
Israel	-	-	31.2	33.3	32.7	
Italy	60.7	55.9	49.7	46.8	45.2	-15.4
Japan	70.0	68.0	57.5	51.3	51.5[b]	-18.5
Korea	-	66.6	74.6	58.9	62.8	
Luxembourg	48.0	48.0	48.9	47.9	48.2	0.1
Mexico	-	65.0	54.6	36.5	37.0[a]	
Netherlands	62.0	59.0	72.6	55.5	62.0[a]	0.0
New Zealand	0.0	0.0	0.0	0.0	0.0	0.0
Norway	55.0	49.2	42.9	42.8	44.2	-10.8
Poland	-	-	63.6	52.8	60.3[a]	
Portugal	67.3	58.0	42.5	34.6	34.6	-32.7
Slovak Republic	-	-	78.4	65.4	71.1	
Slovenia	-	-	61.0	62.2	62.0	
Spain	69.3	56.9	58.0	44.0	41.3	-28.0
Sweden	48.5	47.3	45.7	38.6	34.8	-13.7
Switzerland	40.4	43.6	39.4	32.4	33.8	-6.6
Turkey	60.4	53.2	-	51.8	64.3	3.9
United Kingdom	34.2	35.4	32.0	27.4	27.7	-6.6
United States	43.6	50.7	46.8	31.8	33.1	-10.5
Mean 34 countries	46.4	43.3	46.2	40.4	-	-
OECD-average [c]	45.8	43.8	41.9	35.8	36.2	-9.6
- West EU15	51.6	48.4	47.0	40.2	40.4	-11.2
- Other 7 countries	33.3	33.7	30.9	26.3	27.3	-6.1
Coefficient of variation [c]	0.49	0.46	0.44	0.46	0.47	-0.02

[a] Data refer to the year 2012
[b] Data refer to the year 2011
[c] Average resp. coefficient of variation of 22 countries for which long time-series are available

Source: OECD Revenue Statistics and OECD Social Expenditure Database; and own calculations

Detailed information on social security contribution rates is given in Table 3. Much variation is found around the mean of 34 countries covered in this study (29.3 percent). In most countries contribution rates for employers are (much) higher than for insured persons - respectively 64 percent and 36 percent of total social security contribution on average - although there are some exceptions (Chile, Luxembourg, the Netherlands, Poland and Slovenia); see Figure 2. Contributions for old age, disability and survivor programs are by far the largest in all countries. These contributions accounts for two third of total contribution by ensured persons and employers on average. Most countries also have contributions for unemployment and sickness programs. In a minority of the countries separate contributions are paid for work injury programs and family benefits.

Table 3: Social security contributions, insured person and employer contribution rates, by program type, 2014*

Country and contributor	*Old-age, disability, and survivors*	*Sickness and maternity*	*Work injury*	*Unemployment*	*Family benefits*	*Total, all programs*
Australia	9.5	0	c	0	0	9.5 [c]
Insured person	0	0	0	0	0	0
Employer	9.5	0	c	0	0	9.5 [c]
Austria	22.80	7.65	1.4	6	4.5	42.35
Insured person	10.25	3.95	0	3	0	17.20
Employer	12.55	3.70	1.4	3	4.5	25.15
Belgium	16.36	10.85	1.33	2.33	7	37.87
Insured person	7.50	4.70	0	0.87	0	13.07
Employer	8.86	6.15	1.33	1.46	7	24.80
Canada*	9.9	-	-	-	-	14.412 [j]
Insured person	4.95	-	-	-	-	6.83
Employer	4.95	-	-	-	-	7.582 [d, e, f]
Chile*	11.26 [g, h]	-	-	-	-	22.26 [j]
Insured person	10 [g]	-	-	-	-	17.65
Employer	1.26 [h]	-	-	-	-	4.61 [d]
Czech Republic	28.0	15.8	0	1.2	0	45
Insured person	6.5	4.5	0	0	0	11
Employer	21.5	11.3	b	1.2	0	34
Denmark	c	0	a	8	0	8
Insured person	c	0	0	8	0	8
Employer	c	c	a	c	0	0
Estonia	22	13	0	3	0	38
Insured person	2	0	0	2	0	4
Employer	20	13	a	1	0	34
Finland	23.30	4.30	0.1	2.9	0	30.60
Insured person	5.55	2.16	0	0.7	0	8.41
Employer	17.75	2.14	0.1	2.2	0	22.19
France	24,75	13.85	0	6.7	5.4	50.7
Insured person	10.05	0.75	0	2.4	0	13.2
Employer	14.70	13.10	b	4.3	5.4	37.5
Germany	18.90	17.550	1.3	3.0	0	40.750
Insured person	9.45	9.225	0	1.5	0	20.175
Employer	9.45	8.325	1.3	1.5	0	20.575
Greece	20.00	7.65	1	5.00	2	35.65
Insured person	6.67	2.55	a	1.83	1	12.05
Employer	13.33	5.10	1 [a]	3.17	1	23.60
Hungary	35.5	6	a	1.5	0	43
Insured person	8.5	6	a	1.5	0	16
Employer	27.0	a	a	a	0	27
Iceland	19.79	0	0	0	0	19.79
Insured person	4.00	0	0	0	0	4.00
Employer	15.79	a	a	a	0	15.79
Ireland	8.25	a	a	a	a	8,25
Insured person	4.00	a	a	a	a	4.00
Employer	4.25	a	a	a	a	4.25
Israel	1.94	0.15	0.37	0.04	1.32	3.82
Insured person	0.34	0.04	0	0.01	0	0.39
Employer	1.60	0.11	0.37	0.03	1.32	3.43
Italy	33.00	2.68	3	3.51	0.68	42.87
Insured person	9.19	0	0	0	0	9.19
Employer	23.81	2.68	3	3.51	0.68	33.68
Japan	17.474	c	0.25	1.35	0.15	19.224 [c]
Insured person	8.737	c	0	0.50	0	9.237 [c]
Employer	8.737	c	0.25	0.85	0.15	9.987 [c]
Korea	9.0	a	0.6	1.595	...	11.195
Insured person	4.5	a	0	0.695	...	5.195
Employer	4.5	a	0.6	0.900	...	6.000
Luxembourg	16	7.5	1.15	0	0	24.65
Insured person	8	4.7	0	c	0	12.70
Employer	8	2.8	1.15	0	0	11.95
Mexico*	8.65	-	-	-	-	33.7 [j]
Insured person	1.75 [i]	-	-	-	-	2.4
Employer	6.9 [i]	-	-	-	-	31.3 [d, f]
Netherlands	24.2	7.7	a	9.87	0	41.77
Insured person	18.5	c	a	4.20	0	22.70

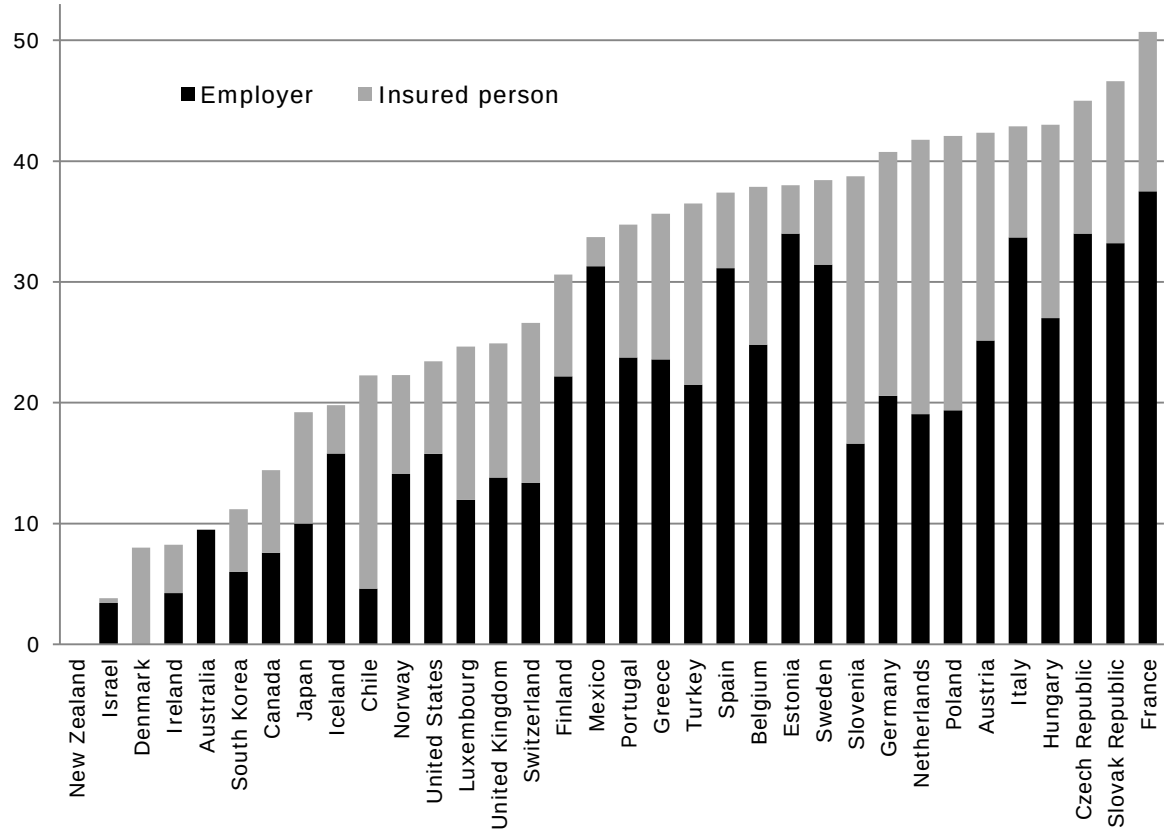
Country and contributor	*Old-age, disability, and survivors*	*Sickness and maternity*	*Work injury*	*Unemployment*	*Family benefits*	*Total, all programs*
Employer	5.7	7.7 [a]	a	5.67	0	19.07
New Zealand	0	0	c	0	0	0 [c]
Insured person	0	0	0	0	0	0
Employer	0	0	c	0	0	0 [c]
Norway	22.3	a	0	a	0	22.3
Insured person	8.2	a	0	a	0	8.2
Employer	14.1	a	a	a	0	14.1
Poland	27.52	11.45	0.67	2.45	0	42.09
Insured person	11.26	11.45	0	0	0	22.71
Employer	16.26	0	0.67	2.45	0	19.38
Portugal	34.75	a	0	a	0	34.75
Insured person	11.00	a	0	a	0	11.00
Employer	23.75	a	a. c	a	0	23.75
Slovak Republic	27	16.8	0.8	2	0	46.6
Insured person	7	5.4	0	1	0	13.4
Employer	20	11.4	0.8	1	0	33.2
Slovenia	24.35	13.65	0.53	0.20	0	38.73
Insured person	15.50	6.46	a	0.14	0	22.10
Employer	8.85	7.19	0.53 [a]	0.06	0	16.63
Spain	28.3	a	1.98	7.10	0	37.38
Insured person	4.7	a	0	1.55	0	6.25
Employer	23.6	a	1.98	5.55	0	31.13
Sweden	22.73	12.48	0.3	2.91	0	38.42
Insured person	7.00	0	0	0	0	7.00
Employer	15.73	12.48	0.3	2.91	0	31.42
Switzerland	23.8	0.50	0	2.2	0.1	26.60
Insured person	11.9	0.25	0	1.1	0	13.25
Employer	11.9	0.25	b	1.1	0.1	13.35
Turkey	20	13.5	0	3	...	36.5
Insured person	9	5.0	0	1	...	15.0
Employer	11	8.5	a	2	...	21.5
United Kingdom	20.95	3.95	a	a	0	24.9
Insured person	9.05	2.05 [a]	a	a	0	11.1
Employer	11.90	1.90 [a]	a	a	0	13.8
United States*	12.4	-	-	-	-	23.42 [j]
Insured person	6.2	-	-	-	-	7.65
Employer	6.2	-	-	-	-	15.77 [f]
Mean 34 countries	19.5	7.8	0.6	2.9	0.8	29.3
Insured person	7.3	3.0	0.0	1.3	0.0	10.4
Employer	12.2	5.6	1.0	1.9	0.7	18.8

Notes: This table provides an overview and contribution rates are not directly comparable across programs and countries. The earnings used to calculate contributions can vary and some rates are subject to contribution ceilings. In some cases, only certain groups, such as wage earners, are represented. When the contribution rate varies, either the average or the lowest rate in the range is used. In most cases, contribution rates for individual accounts do not include administrative fees. In some countries, certain benefits, such as disability and survivors, may be financed under another program. Sickness and Maternity contributions include medical benefits where applicable.

* = The insured and employer contribution rates for the American countries relate to 2013, and not to 2014.
- = not available
... = not applicable
a = All or certain benefits are financed under another program.
b = Total cost.
c = Nonstandard financing.
d = Employers pay the total cost of work injury benefits.
e = Contributions may be higher in some provinces.
f = Government pays the total cost of family allowances.
g = Contributions finance old-age benefits only.
h = Contributions finance disability and survivors insurance only.
i = Also includes the contribution rates for other programs.
j = Includes Old Age, Disability, and Survivors; Sickness and Maternity; Work Injury; Unemployment; and Family Allowances. In some countries, the rate may not cover all of these programs.

Sources: Social Security Programs Throughout the World: Europe, The Americas, Asia and the Pacific, International Social Security Association; and own calculation of the mean.

Figure 2: Social security contribution rates and their composition across countries, 2014



Source: See below Table 3

3. Taxes, social security contributions and prices

A long debated issue in public finance is whether social benefits should be financed out of the general budget, or out of a separate source, that is through social security contributions or payroll taxes (Musgrave and Musgrave, 1984). The general idea behind the contributory approach is that the social security system should be considered to provide for insurance, that is retirement income and unemployment compensation. There is a relation between the contributions paid and the entitlement to benefits. Critics, however, have argued that this insurance element is generally fictitious (Musgrave and Musgrave, 1984: 727). Those who pay the contributions are often not those who receive the benefits. In a pay-as-you-go pension scheme for example each generation of retirees has its benefits paid for by those of working age. Moreover, social security contributions or payroll taxes do not rank high on equity and efficiency grounds. Payroll taxes are levied on wage income only rather than income more broadly. And these levies are often regressive, because usually an income ceiling is set.

Social security contributions have strong similarities with taxes.[2] Both levies are compulsory by statutory rule. But there are also important differences. Taxes imply a reduction of purchasing power without anything being directly given in return. Revenues are used for public services, but there is no direct relation between taxes paid and benefits received. As far as social contributions are concerned, a distinction can be made between contributions to occupational insurance schemes and national (universal)

[2] This paragraph is based on Goudswaard et al (2006).

insurance schemes. Social security contributions to occupational insurance programs have traditionally been based on the concept that an entitlement is received in return for the contribution paid. Usually, both the contribution and the benefit are related to the employee's wage level. National social insurance schemes on the other hand, show no (or hardly any) connection between the level of the benefit and the contributions paid in the past. This is generally the case for pay-as-you-go public pension schemes. Therefore, the differences between national social insurance contributions and taxes are only small, probably also in the employees' perceptions.
Because of the link between contributions and benefits in occupational social insurance schemes, it seems plausible that the corresponding contributions are seen as the price for an individual benefit. Freedom of choice of the employee may also be important here. Generally, however, employees are included in occupational schemes even when they would prefer not to participate. The differences between taxes, contributions and prices can be shown as a sliding scale; see Diagram 1.

Diagram 1. Taxes, social insurance contributions, and prices

	Taxes	Social insurance contributions		Prices
Payment	Compulsory payment by statutory rule	Compulsory payment by statutory rule	Payment based on (collective) labor agreement; limited individual freedom of choice	Free choice of consumer
Return	Not direct	More or less direct, but mostly not equivalent	Direct, more or less equivalent	Direct and equivalent

A pure tax is paid compulsory and has no direct return. A pure price is paid voluntarily by an individual or household and has a direct and equivalent return. Social security contributions can be found in between. Contributions are typically forcibly imposed. This gives an inevitable "tax" character to social security contributions. The compulsory nature introduces the possibility of an ex ante redistribution in the arrangement. This is usually the case for national social insurance schemes, like public pension schemes with income related contributions and flat rate benefits. However, social contributions show more resemblance with prices as the connection between payment and return is clearer. This is often the case for occupational insurance schemes.

4. Economic effects

Who bears the burden?
While the importance of social security contributions or payroll taxes has grown, there are serious concerns on their economic effects on labour costs and employment. Labour taxation drives a wedge between labour costs of the employer and real wage income of the employee. As a consequence, both labour demand and labour supply may be affected. Ultimately, high levies on labour may reduce employment and increase unemployment. This is often mentioned as one of the causes of relatively high unemployment figures in Europe. As a consequences, a debate has been triggered on

whether taxation should be shifted from labour to tax bases less detrimental to growth (European Commission, 2013).

The payment of social security contributions is usually shared by employers and employees. At first sight, an increase in employee contributions reduces real wage and may induce labour supply effects, while contributions paid by the employer raise labour costs and therefore reduce the demand for labour. However, the actual effects of social security contributions and payroll taxes depend on their incidence. Economists are interested in who actually bears the burden of taxes and contributions instead of whom they are imposed on. The actual incidence may differ strongly from the intended incidence. The government however has no grip on the shifting of taxes; after all, this is governed by market forces. Who actually bears the burden of labour taxes depends on the elasticities of demand and supply for labour (Stiglitz, 2000). The market party that is the least sensitive to changes in the wage rate will bear the largest part of the tax burden.

There have been many studies on tax shifting. Most studies conclude that there is a positive linkage between the tax level or the tax wedge and real wages. This would imply that taxes are to some extent shifted to employers (OECD, 1995). Nickell (2003) finds on the basis of various studies substantial tax wedge effects on labour costs; on average a 10 percent rise in the tax wedge raises labour costs by 5 percent. As far as the impact on employment is concerned, he finds that a 10 percent increase in the tax wedge reduces labor input by around 2 percent. This is a smaller, but not insignificant effect.

In a recent meta-study Melguizo and González-Páramo (2013) conclude that about two thirds of labour taxes is borne by employees and one third by employers. However, there is much variation across different countries to view this result as a precise estimate. An explanation for this is that who eventually bears the taxes is related to the labour market institutions in a country. If trade unions have a strong influence on wage formation, shifting towards employers is more plausible. The influence of trade unions makes the aggregated labor supply more elastic. The finding that employees bear a larger part of labour taxes is consistent with recent estimates of labour supply estimates, which are quite low. Saez et al (2012) report that the best available estimates of the long run elasticity range from 0.12 to 0.40. Lichter et al (2013) analyzed labour demand elasticities. Their best guess is an average labour demand elasticity of -0.3. The long-run elasticity is found to be higher. This is consistent with the notion that there is some degree of sharing of taxes and contributions.

While empirical studies using more aggregated data usually find that a major part of labour taxes are shifted onto workers via lower wages, recent micro studies find that a significant part of the burden is borne by employers (Saez et al, 2012). One explanation why studies using micro-data may be more likely to find employers bear a substantial part of the burden of social security contributions than macro-studies do is the type of variation in tax rates utilized (European Commission, 2015). Micro-studies exploit variation between workers and employers, whereas macro-studies exploit variation over time or between countries. Moreover, taxes may be shifted from employers to workers (or vice versa) not at the individual level, but at a higher level, e.g. the employer, sectoral or market level (European Commission, 2015).

Different reactions to taxes and prices

It is plausible that perception of social security contributions depends on the nature of those contributions, as has been argued in section 3. Barr (1992, p772) states: “If

workers discount future benefits entirely, contributions are equivalent to an income tax; but where future benefits are perceived as actuarial fair, contributions are not a tax but simply the price of insurance which, like any other price, has few distortionary effects". Aaron (1982) argues that if the employee sees a clear relation between payments of social insurance contributions and accrued rights, those contributions will actually have the nature of a price and not of a tax. Stated more precisely, the tax element is equal to the difference between the contributions paid and the value the employee attaches to the entitlement received in return. It is then plausible that those contributions will have fewer distorting effects on the labor market than taxes (Summers, 1989).[3] Moreover, Gruber (1997) shows that the strength of the link between the labour taxes (social security contributions) and the benefits received by the workers, strongly affects the incidence both in the short run and in the long run. He interprets this finding by indicating that workers value the type of insurance provided by the social security contribution system, and are therefore willing to pay a price for it. This suggests that the link between social security contributions and benefits matters for their incidence.
Does labor supply indeed react differently to changes in social insurance contributions and taxes? In a recent study Lehmann et al (2013) analyze the relative responsiveness of labor income to payroll taxes (social security contributions) versus income taxes. They argue that empirical evidence so far is not conclusive because the responses to payroll taxes and income taxes could not be analyzed at the same time, due to the absence of simultaneous reforms to both schedules for similar individuals. Therefore, Lehmann et al analyzed reforms of both income taxes and payroll taxes in France for the period 2003-2006. Their estimate for the elasticity of gross labor income with respect to the marginal net-of-income-tax rate is around 0.2, while they find no response to the marginal net-of-payroll-tax rate. According to the authors an explanation for the latter result might be that institutions (the minimum wage and collective bargaining in France) fail to respond to payroll-tax changes, at least in the short-run. Another explanation might be the different nature and perception of payroll taxes. Anyway, Lehmann et al conclude that financing social security expenditure through payroll taxes is less distortive than through income taxes.
Ooghe et al (2003) tested the hypothesis that in collective wage negotiations, social contributions with a clear return have less impact on wage costs than general taxes. Based on data for several European countries they indeed find support for their hypothesis. They argue that trade unions will be more inclined to incorporate increases in the burden of social security contributions into net wage offers if there is a recognizable return for employees.

Pension savings

Relatively much attention in the literature is paid to behavioral reactions to pension contributions. Do employees view higher pension contributions as being the price for higher personal entitlements, so that they reduce their private savings? In a well-known paper, Feldstein (1974) found that public pension provisions leads to a substantial reduction of private savings. This paper, however, has been criticized in the literature.

[3] This is consistent with a recent review of the literature by the European Commission (2015): different taxes do have different effects on net real wages. In studies looking at income tax, payroll tax and social security contributions only, employees are found to bear 59 percent of the burden of taxes. But in studies that look at the overall fiscal or salary wedge (including indirect taxes, or in the latter instance, all factors that contribute to wedge between producer and consumer purchasing power), employees are found to bear 79 percent of the total burden.

Barr (1992) shows that the results of empirical research are mixed. Gale (1998) finds for the US a small substitution between pension wealth and private financial wealth, but a much larger substitution between pension wealth and private non-financial wealth (mainly houses). Attanasio and Rohwedder (2003) did an empirical study for the United Kingdom. They conclude that changes in the flat rate basic pension do not have a clear effect on private savings, while changes in wage-related supplementary pension schemes have a negative effect. Bottazzi et al (2006) studied the effects of Italian pension reforms. They find that there is substantial substitution between private wealth and pension wealth, especially by workers that are better informed about their pension wealth. It can be concluded from these studies that pension contribution are seen, at least to some extent, as savings.
Disney (2004) analyzed the economic effects of pension contributions for several countries. He distinguishes between a tax component in the pension contribution and a savings component. The savings component reflects the buildup of individual rights. Disney concludes that the distortive effects of pension contributions are smaller when the savings component in the contributions is larger, that is, as the pension system is more "actuarially fair".
We can conclude that there is ample evidence for the conclusion the nature of pension contributions is relevant for their economic effects.

Consequences for welfare state reform?
The studies discussed above give support for welfare state reforms that lead to a more direct connection between the payment of contributions and the individual return. Lindbeck (1994) views the replacement of taxes by prices as an important reform strategy for the welfare state. He argues that if social security benefits are actuarially fair on the margin, and the fees are based on marginal costs, then marginal tax wedges in these (welfare state) systems would, in principle, be eliminated. On the basis of similar arguments, several authors have suggested that introducing mandatory private saving accounts would contribute to the sustainability of the welfare state (Bovenberg and Sørensen, 2004; Orszag and Snower, 1999; and Fölster, 2001). Individual savings may be used for pensions, but also for unemployment or temporary disability. By using individual saving accounts, the incentives for labor participation will be strengthened, because periods of nonparticipation would reduce savings and thus also future income. However, social saving accounts have also some drawbacks. Redistribution is more difficult. Also, savings accounts lack both the efficiency of risk pooling. People may save inefficiently high amounts. Others may not have enough savings after a long spell of unemployment. Those problems can be relaxed to some extent by combining social savings accounts with a basic level of social insurance.
In general, a more visible relationship between social contributions and associated benefits would help to reduce the distortive effects of contributions. It is important that citizens get a good view of their entitlement to various benefits and other arrangements. The visibility and the nature of social contributions can be important for the perception of the costs of social insurances and – associated with that – for the behavioral responses to these contributions. When contributions are seen as a price instead of as a tax there will probably fewer distorting effects on the labor market, such as decrease of labor supply or a shift onto the employer, causing higher wage costs.

5. Contributions or general taxes: a case study for the Dutch public pension scheme

As argued in section 3, contributions to national social insurance programs with a redistributive character can be seen as taxes. This may raise the question why (earmarked) contributions are used to finance these programs instead of general taxes. The case of the Netherlands is an interesting example. In this country there has indeed been a lot of debate on the way the public pensions should be financed: through earmarked contributions or through general taxes. The public old age pension scheme provides a flat rate benefit from the age of 65 (as of 2015 65 and three months). The pension age is gradually increased to 67 in the year 2021. Entitlement for a public pension benefit accumulates at a rate of 2 per cent for each year of residence between 15 and 65 years of age. The benefit level for two pensioners living together is approximately equal to the net minimum wage, while a person living alone receives 70 percent of the net minimum wage. The public pension is financed on a pay-as-you-go basis, through earmarked contributions, that depend on taxable income. These contributions are only paid by persons under the age of 65 and not by the elderly.[4] This is based on the so-called insurance principle: those who receive benefits from an insurance should not pay premiums any more. This argument is not very strong though. The public old age pension scheme can hardly be seen as an insurance scheme. Essential for an insurance is that there is a relationship between premiums and entitlement to benefits. There is no such relationship in the public pension scheme: contributions are income-dependent and benefits are flat rate. Non-working residents are also entitled to a public pension, even if they have never paid any contributions.

A first step towards financing out of general tax revenue was taken by a policy measure in 1997 to set a ceiling on the contribution rate (17.9 percent). Because expenditures on public pensions have grown rapidly in the last decades, this policy measure implied that a growing share of total public pension expenditure is financed out of general tax revenue, in 2015 about one third. In terms of economic effects public pension contributions or taxes do not make any difference. There is no link between the payment of public pension contributions and the build-up of rights. As a consequence, the distortive effects on the labour market will be the same, as has been argued in section 4. However, there is another important difference: the elderly do not pay contributions for the public old age pension, but they do pay all other taxes. A larger share of tax financing thus implies higher taxes and lower net incomes for the elderly.

Several committees and political parties have suggested to further increase the share of general revenue financing of the public pension scheme. For example the Dutch Social and Economic Council, an advisory body of government, argues that in order to cope with the rapidly rising costs of the public pension scheme, it is necessary to systematically broaden the base for public pension financing (Social and Economic Council, 2005). Future costs as a result of the ageing population should be borne by society as a whole, including the elderly. This should contribute, according to the Social Economic Council, to a more even distribution of income within and between generations. At this point, it should be mentioned that the net public pension benefit is indexed to the net minimum wage. This implies that higher taxes on the elderly will be born especially by pensioners with additional (pension) income on top of the public old age pension benefit. In general, reliance on general tax revenue will be more progressive than contributions.

[4] This only holds for the contributions for the old age pension program. There is a separate contribution for the survivors program, which is also paid by the elderly.

Until now, the government has not decided to speed up the increase in the share of general revenue financing. Tax increases for the elderly are obviously not very popular, although recent research shows that the financial position of pensioners in the Netherlands has improved substantially during the last decades, also relative to the younger population (Knoef et al, 2013). Another concern is put forward by Diamond (2001), who studied the Dutch pension system. He argues that reliance on general tax revenue can inject too much short-run budgetary concern into what should be a slowly evolving long-run system.

6. Conclusions

A long debated issue in public finance is whether social benefits should be financed out of the general budget, or out of a separate source, that is through social security contributions or payroll taxes. In actual practice, most countries have chosen to use social security contributions as an important revenue source. In 2014, social security contributions make up around one fourth of total tax revenue in OECD countries. In a majority of the countries the share of social security contributions in total tax revenue has risen since 1980. On average, more than one third of social expenditure in OECD countries is financed through contributions.

While the importance of social security contributions has grown, there are serious concerns on their economic effects. High levies on labour may reduce employment and are seen as one of the causes of high unemployment figures. The problem is that we do not know exactly who actually bears the burden of taxes on labour, if behavioral responses are taken into account. Recent estimates suggest that about two thirds of taxes on labour are born by employees and one third by employers. Micro studies, however, find that a higher part of the burden is borne by employers.

We find substantial evidence in the literature that the nature of social security contributions matters for the behavioral responses to these contributions. With a clear connection between payment of contributions and accrued rights, the employee will perceive this contribution as a price instead of as a tax. As a consequence, these contributions will be less distortive, in terms of labour supply, wage costs and private savings. This can be the case for social contributions paid for occupational insurance schemes. This finding gives some support for welfare state reforms leading to a closer link between contributions and the individual return. Also, in order to reduce distortive effects, it is important to make the relationship between social contributions and associated benefits more visible for citizens.

On the other hand, contributions paid for national social insurance schemes with a redistributive character can be seen as taxes and will have similar economic effects as taxes. As shown in a case study for the Netherlands, there are several arguments to finance such schemes out of general revenue instead of separate earmarked social security contributions.

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