Tax wedge in Croatia, Belgium, Estonia, Germany and Slovakia

ANA GABRILO, mag. math*

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Ana GABRILO
Deloitte d.o.o., Radnička cesta 80, 10000 Zagreb, Croatia
e-mail: ana.gabrilo5@gmail.com

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Abstract

The aim of this paper is to analyse the taxation of labour income in Croatia, Belgium, Estonia, Germany and Slovakia. Having presented an outline of tax system rules, the paper shows the decomposition of the net average tax wedge for different family types and different income levels based on the OECD methodology. The results show that all observed countries apply a progressive tax schedule, apart from Germany where taxation for higher gross wages is not progressive due to a cap on the SIC base. When it comes to a taxpayer earning an average gross wage, a Croatian single worker without children has the lowest tax burden, followed by Estonia, Slovakia, Germany and Belgium. However, as regards taxpayers earning 400% of AGW, Estonia has the smallest tax wedge, followed by Slovakia, Germany, Croatia and Belgium. Similar results are obtained by analyzing the tax wedge for couples with two children where one spouse is out of work.

Keywords: taxation of labour income, progressivity, tax wedge, Belgium, Estonia, Germany, Slovakia, Croatia

1 INTRODUCTION

The tax system of a country and, more specifically, the taxation of labour income are elements that are crucial for a country's competitive advantage in the international market, especially as regards the labour market. The subject of this paper, which is part of a wider research project focusing on the tax burden in Croatia and EU countries (see Urban, 2016), is the analysis of the tax burden on labour income in Croatia, Belgium, Estonia, Germany and Slovakia in 2013.

In order to calculate tax burden indicators, a microsimulation model has been developed. The model is used to calculate SICs, PIT, and cash family benefits for hypothetical units (single workers and families) in each of the selected countries. By decomposing the net average tax wedge, one can see how different elements of the tax system influence the progressivity of the system as a whole and the tax burden imposed on different family types.

The paper is divided into four sections. The introduction is followed by section 2, where the methodological hypotheses are outlined and the fundamental terms are defined. Section 3 outlines the results obtained from the calculation of the net average tax wedge and its elements. The results across selected countries are compared in section 4, followed by the conclusion. The rules and characteristics of labour income taxation in the selected countries are outlined in the annex.

2 METHODOLOGY

For the purpose of calculating the tax burden indicators and the variables necessary for their computation, the methodology used in this paper is based on the OECD Taxing Wages publication (OECD, 2014). All the calculations refer to 2013. Table 1 shows the eight basic hypothetical units for which tax burden indicators in this paper are calculated.

Table 1
Characteristics of observed hypothetical units

Designation	Adults	Number of children	Spouse I (% of AGW)	Spouse II (% of AGW)
1A-67-NC	Single worker	0	2/3 x 100	–
1A-100-NC	Single worker	0	100	–
1A-167-NC	Single worker	0	5/3 x 100	–
1A-67-2C	Single worker	2	2/3 x 100	–
2A-100/0-2C	Couple	2	100	Out of work
2A-100/33-2C	Couple	2	100	1/3 x 100
2A-100/67-2C	Couple	2	100	2/3 x 100
2A-100/33-NC	Couple	0	100	1/3 x 100

Note: The symbols stand for the following: AGW – average gross wage; A – adult; NC – no children; 2C – 2 children.

Source: OECD (2014).

In addition to the eight basic hypothetical units, two more hypothetical unit sets are investigated in this paper: the first comprises single workers without children earning between 50% and 400% of AGW, while the second includes couples with two children where one spouse is out of work and the other spouse's wage is between 50% and 400% of AGW. One of the basic tenets of the model is that the hypothetical unit is assumed to have no income source other than labour income (gross wage) earned by adult members of the family. As shown in table 1, the gross wages of the hypothetical units are defined in relation to the average gross wage (AGW) in a given country. AGW is calculated in accordance with OECD (2014). Table 2 shows AGW values in selected countries.

Table 2
Annual average gross wages in selected countries, 2013

	AGW expressed in national currency	Exchange rate	AGW (in EUR)
Croatia	HRK 93,180	HRK/EUR = 7.5735	12,303
Belgium	EUR 46,810	1	46,810
Estonia	EUR 11,664	1	11,664
Germany	EUR 45,170	1	45,170
Slovakia	EUR 10,015	1	10,015

Source: (1) AGW – for Croatia: author's calculation as per CBS (2016) and Urban (2016); for other countries: OECD (2014); (2) exchange rate for Croatia: CNB (2016).

PIT is paid to the central government, or to local government units in some countries. According to OECD (2014), *total labour cost* indicates the sum of gross wage, payroll taxes, and employer SICs. *Total tax burden* is defined as the sum of the payroll taxes, employee SICs, employer SICs, and PIT, minus cash family benefits. *Net average tax wedge* is the ratio of the total tax burden to the total labour cost. *Employee tax burden* is the sum of employee SICs and PIT minus cash family benefits. *Net average tax rate* is the share of employee tax burden in the gross wage.

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It is important to note that employee and employer SICs refer exclusively to the payments made to the general government, as contributions paid to other funds are not included in the analysis. For instance, the Croatian pension system rests on two pillars: the 1st and the 2nd. Employee SICs paid into the 1st pillar are general government revenue, while the 2nd pillar contributions, though mandatory, are paid into private pension funds. Thus, the former is included in the tax burden calculation and the latter is not. For more information about this topic, see Urban (2016), Blažić and Trošelj (2012), OECD (2014, 2015).

The progressivity of the tax burden is reflected in the fact that the net average tax wedge (net average tax rate) increases with the gross wage. The progressivity of the system as a whole depends on the interaction of the system's elements – SICs, PITs, and cash family benefits. Each of these elements comes with its own particularities. SICs are mostly levied at a fixed rate, which should mean that they do not impact average rates; however, caps on SIC bases can result in regressivity.

PIT progressivity depends on the number and width of tax bands, as well as on the differences between marginal tax rates, especially the highest and the lowest. Moreover, the progressivity of PIT is also contingent on tax reliefs which can shrink the tax base (personal allowances) or the tax liability (tax credit). Tax base reductions are applied in Estonia, Slovakia and Croatia, while tax liability reductions are found in Belgium, Germany, and, again, Slovakia. Tax reliefs normally have a progressive effect, although in some cases they are implemented in such a manner that workers with higher incomes are entitled to comparatively higher tax reliefs.

Individuals and families can claim various cash family benefits. Such benefits are usually targeted at low-income households; however, some benefits are not income tested and are distributed to households solely depending on the number of children. The benefits, however, have a progressive effect in both cases since they reduce the relative tax burden.

Tax burden decomposition presented in section 3 will illustrate how different elements of the tax system applied to different hypothetical units across the selected countries influence its progressivity.

3 TAX BURDEN INDICATORS: COUNTRY OVERVIEW

3.1 CROATIA

The Croatian labour income taxation system is described in annex A1.

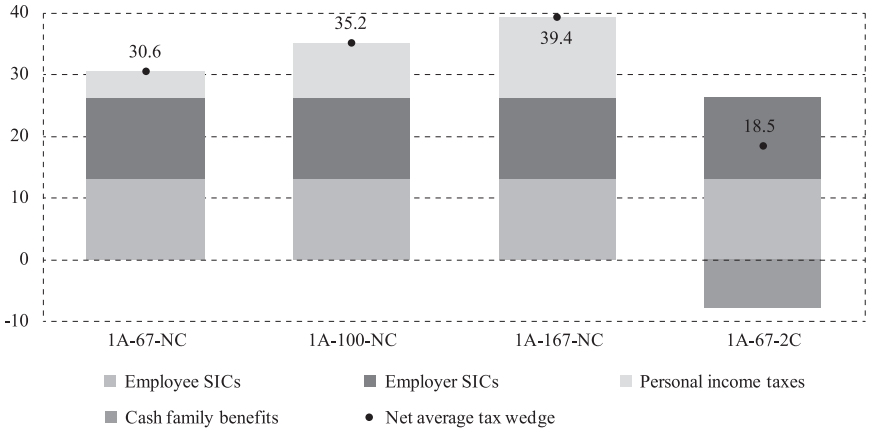
Figure 1 shows the net average tax wedge and its decomposition for one of the basic hypothetical units – single workers. The share of contributions in the labour cost is identical at all gross wage levels due to a single contribution rate and the non-existence of a cap on the SIC base.[1] Combined, employer and employee SICs

[1] The cap on the base applies only on contributions paid to the 1st pension insurance pillar, but not unless 600% of AGW is reached (see annex A1).

make up 26.2% of the total labour cost. Due to a relatively high personal allowance, a single worker with two children earning a gross wage of 67% of AGW (1A-67-2C) does not have to pay PIT. The progressivity of PIT becomes evident when its share in the tax wedge for hypothetical units 1A-67-NC, 1A-100-NC and 1A-167-NC is compared.

Figure 1

Decomposition of net average tax wedge for basic hypothetical units: single workers (Croatia, 2013), in %

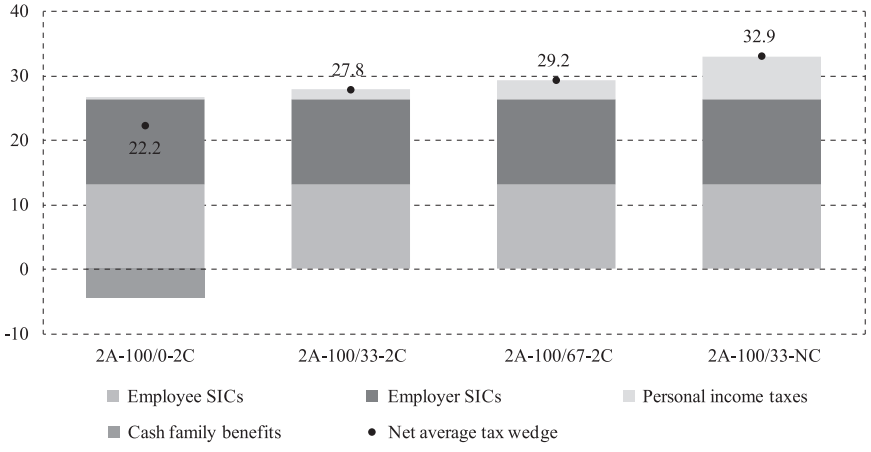


Note: "Personal income taxes" comprises PIT and local government surtax.

Source: Author's calculations.

Figure 2

Decomposition of net average tax wedge for basic hypothetical units: couples (Croatia, 2013), in %



Note: "Personal income taxes" comprises PIT and local government surtax.

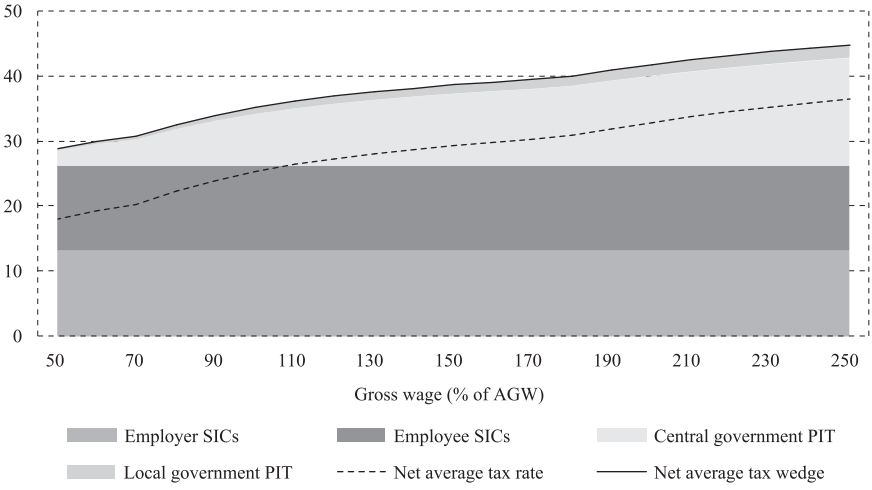
Source: Author's calculations.

Figure 2 illustrates the decomposition of the net average tax wedge for basic hypothetical units – couples. SICs represent the same shares in the total labour cost as in the case of single workers. PIT share varies depending on the income level and the allowance for dependent children, meaning that it is significantly lower for couples with two children earning a total gross wage of 133% of AGW (2A-100/33-2C) than for families without children earning the same income (2A-100/33-NC). The reason for this is the fact that the former family can claim personal allowance for children.

Figure 3 illustrates the decomposition of the net average tax wedge and the net average tax rate for a hypothetical single worker without children earning a gross wage of between 50% and 250% of AGW. SICs constitute a prevailing share of the tax wedge, while the share of PIT in the total labour cost grows proportionally to income. PIT is progressive due to the fact that personal allowance is fixed while the tax schedule is progressive. Net average tax rates are between 18.1% for the lowest income levels and 36.5% for the highest.

FIGURE 3

Decomposition of net average tax wedge for single workers without children earning a gross wage of between 50% and 250% of AGW (Croatia), in %

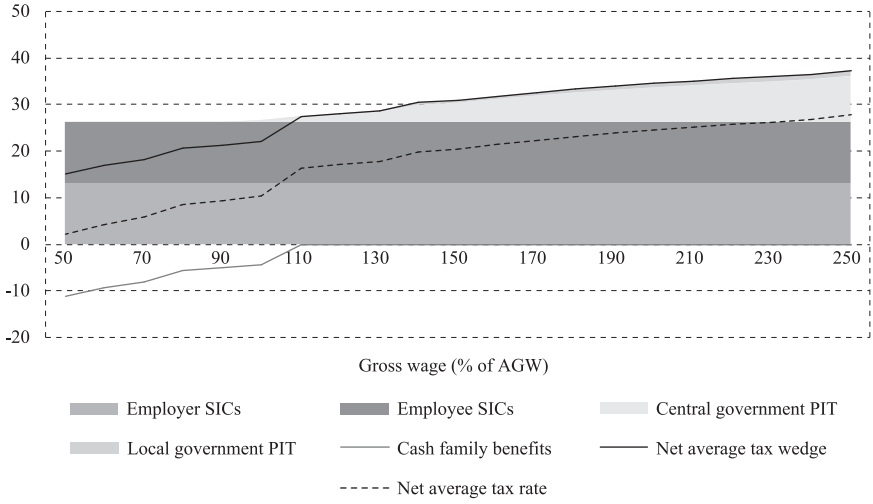


Source: Author's calculations.

Figure 4 shows the decomposition of the net average tax wedge and the net average tax rate for a hypothetical couple with two children, where one of the spouses is out of work and the other earns between 50% and 250% of AGW. PIT equals 0 if the gross wage is less or equal to 100% of AGW, but its share becomes positive and increases as gross wages exceed 100% of AGW. The share of SICs in the total labour cost is a constant. The tax wedge may be reduced in the case of families with a gross wage below 110% of AGW, as they are entitled to cash benefits (in the form of a child benefit).

FIGURE 4

Decomposition of net average tax wedge for a couple with two children, where one spouse is out of work and the other spouse earns a gross wage of between 50% and 250% of AGW (Croatia), in %



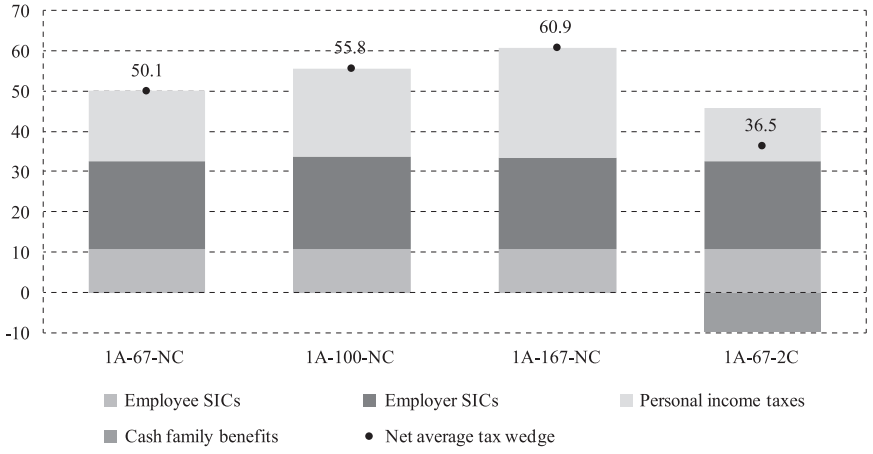
Source: Author's calculations.

3.2 BELGIUM

A description of Belgium's labour income taxation system can be found in annex A2.

FIGURE 5

Decomposition of net average tax wedge for basic hypothetical units with one adult (Belgium, 2013), in %



Note: "Personal income taxes" comprises PIT and local government surtax.

Source: Author's calculations.

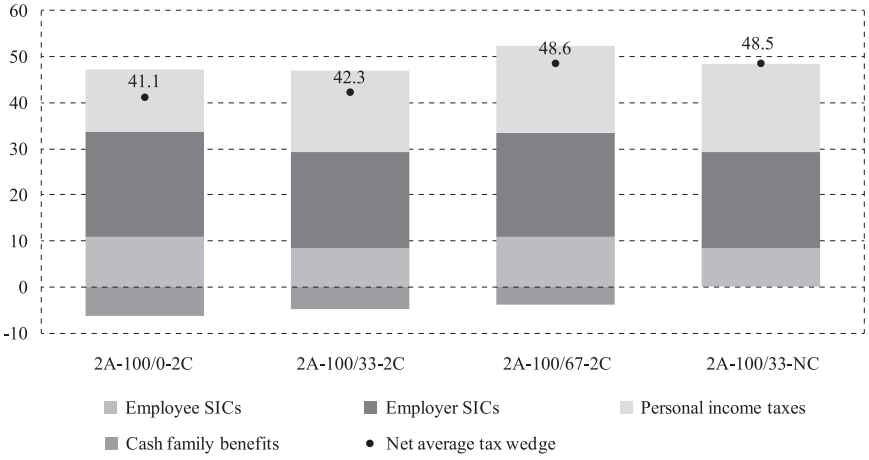
Figure 5 shows the net average tax wedge and its decomposition into employee SICs, employer SICs, PIT, and cash benefits for basic hypothetical units – single

workers. In the case of single workers, the share of contributions in the total labour cost is the same at all income levels due to a fixed SIC amount, with differences in the total tax burden arising from PIT. The applicable cash benefits for families with children are not income-related. A single worker with two children earning a gross wage of 67% of AGW (1A-67-2C) is entitled to a cash benefit that leads to a reduction of the tax burden. Therefore, the net average tax wedge of the above worker is 36.5%. The tax wedge of single workers without children earning a gross wage of 167% of AGW (1A-167-NC) is 60.9%. In view of that, it can be said that the taxation of labour income for single workers without children is progressive due to the effect of PIT.

Figure 6 illustrates net average tax wedge decomposition for basic hypothetical units – couples. The differences in the tax wedge are partially due to cash benefits that families with children are entitled to. Unlike single workers, who pay a fixed SIC amount, SIC shares for couples vary due to the fact that they, i.e. those spouses earning a gross wage of 33% of AGW and therefore classified as low-income workers, are entitled to a reduction of SIC payments.

Figure 6

Decomposition of net average tax wedge for basic hypothetical units: couples (Belgium, 2013), in %



Note: "Personal income taxes" comprises PIT and local government surtax.

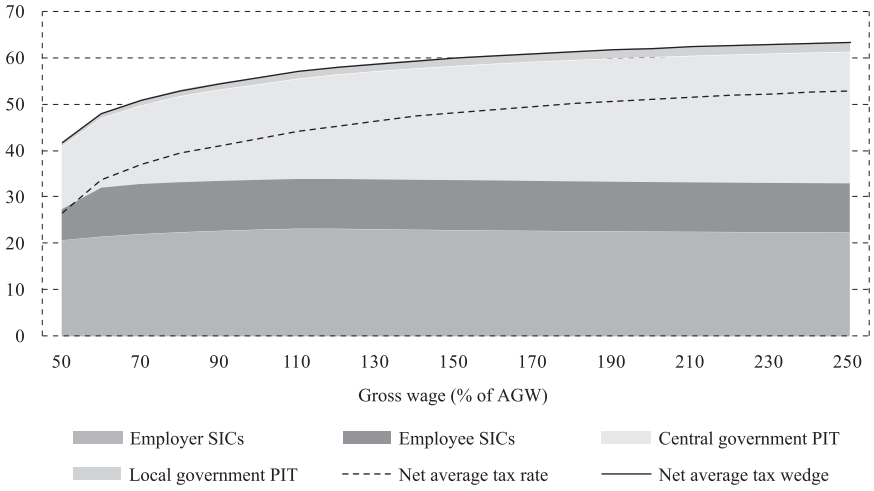
Source: Author's calculations.

Figure 7 shows the decomposition of the net average tax wedge and the net average tax rate for a hypothetical single worker without children earning a gross wage of between 50% and 250% of AGW. The tax wedge in the observed gross wage range is between 41.8% and 63.4%. Employer SICs (approximately 20%) and employee SICs account for the majority of the burden. When it comes to employee SICs, it is noticeable that the SIC share for those earning gross wages of 50% to 60% of AGW is lower due to the taxpayers' right to a reduction of employer SICs for low-income workers. PIT accounts for 13.4% of the total labour

cost for gross wages of 50% of AGW, and 28% for gross wages of 250% of AGW, meaning that PIT accounts for taxation progressivity in the case of single workers.

Figure 7

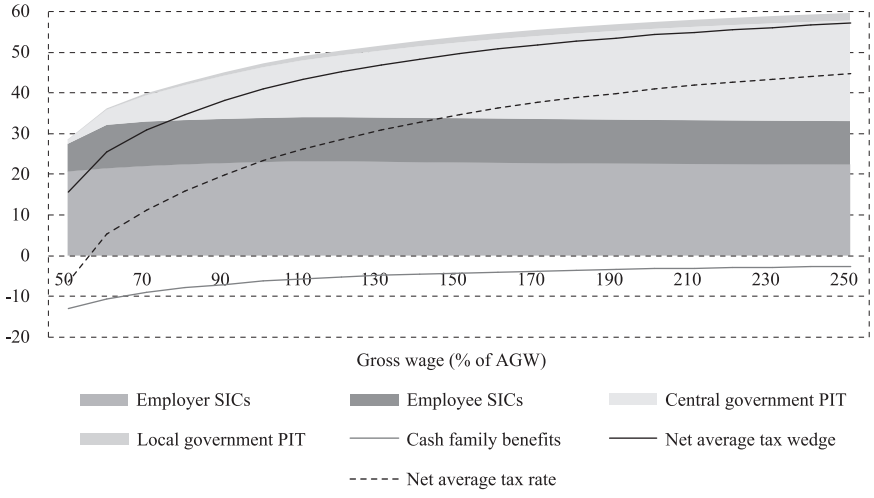
Decomposition of net average tax wedge for single workers without children earning a gross wage of between 50% and 250% of AGW (Belgium, 2013), in %



Source: Author's calculations.

Figure 8

Decomposition of net average tax wedge for a couple with two children, where one spouse is out of work, while the other earns a gross wage of between 50% and 250% of AGW (Belgium, 2013), in %



Source: Author's calculations.

Figure 8 illustrates the decomposition of the net average tax wedge and the net average tax rate for a hypothetical couple with two children, where one spouse is

out of work while the other earns a gross wage of between 50% and 250% of AGW. Cash benefits result in the reduction of the total tax wedge in the range between 15.7%, for gross wages amounting to 50% of AGW, and 57.1%, for gross wages amounting to 250% of AGW. Cash benefits effectively increase the progressivity of the tax system. Once again, a reduction of SICs for low-income workers leads to an "anomaly" in SIC payments. PIT is progressive; its share in the total labour cost at the lowest observed income level is 1.0%, while its share at the highest observed income level is 24.7%. The net average tax rate is between -6% for the lowest and 44% for the highest income level.

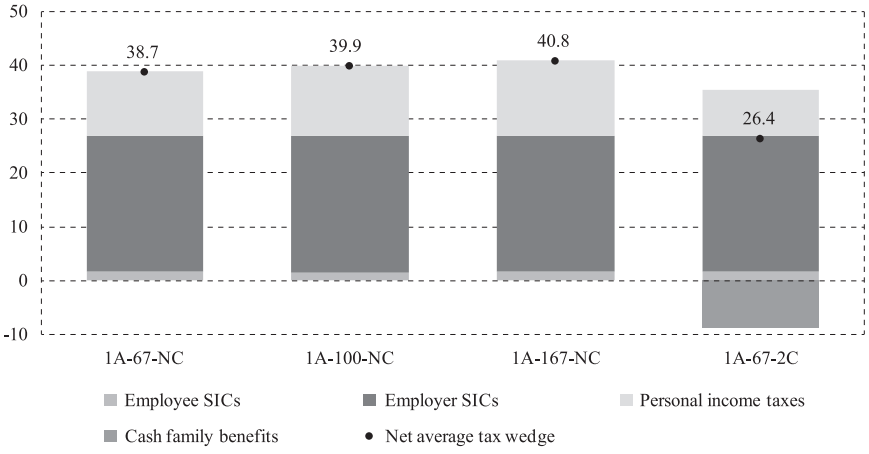
3.3 ESTONIA

For a description of Estonia's labour income taxation system, see annex A3.

Figure 9 shows the net average tax wedge and its decomposition for basic hypothetical units – single workers. The SIC share in the total labour cost is constant. The tax share in the total labour cost is lower for families with two children due to the fact that they are entitled to higher tax reliefs. The difference in the share of PIT in the total labour cost is due to lump-sum tax reliefs, the relative relevance of which decreases as the income grows. This means that the tax liability of taxpayers with higher incomes is relatively higher. The tax wedge for the hypothetical unit 1A-67-2C is lower than that for single workers without children due to the former's right to claim cash family benefits.

FIGURE 9

Decomposition of net average tax wedge for basic hypothetical units: single workers (Estonia, 2013), in %



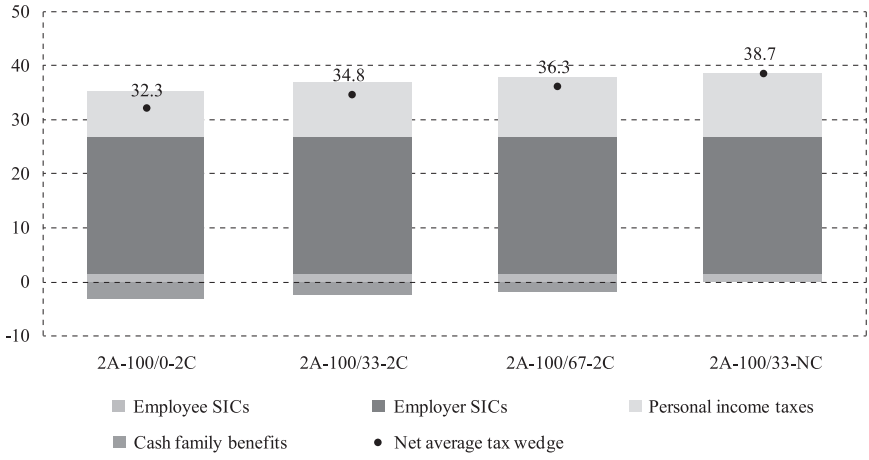
Source: Author's calculations.

Figure 10 illustrates the decomposition of the net average tax wedge for basic hypothetical units – couples. The SIC rate is fixed. The differences in the PIT share in the total labour cost result from differences in the number of children and

differences in income levels. Families with children are entitled to higher tax reliefs, resulting in the reduction of the tax base. Tax reliefs are lump sum, which represents a relative advantage for low-income families. Since Estonia has a single-rate PIT schedule, the mild progressivity of the PIT is the result of tax reliefs. The progressivity of the system is partially due to cash family benefits.

Figure 10

Decomposition of net average tax wedge for basic hypothetical units: couples (Estonia, 2013), in %



Source: Author's calculations.

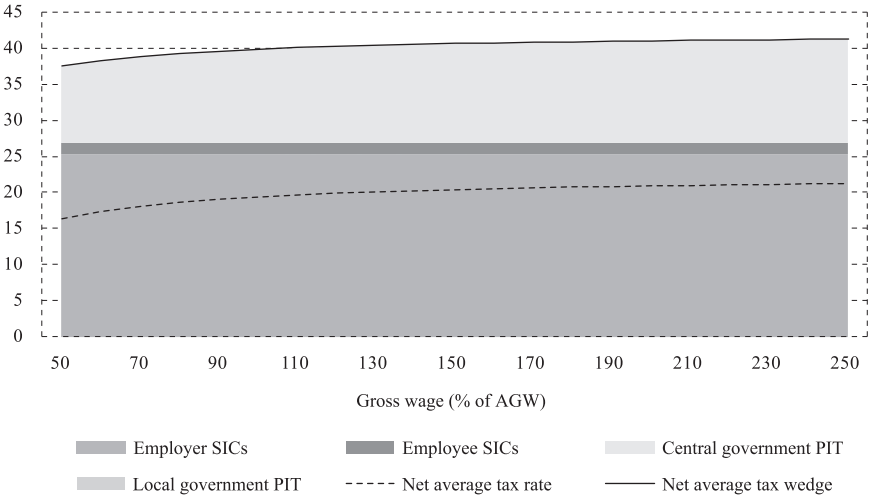
The decomposition of the net average tax wedge and the net average tax rate for a hypothetical single worker without children earning a gross wage of between 50% and 250% of AGW is shown in figure 11. The tax wedge for gross wages amounting to 50% of AGW is 37.6%, and the wedge for the highest observed gross wage (250% of AGW) is 41.3%. Employer SICs account for the majority of the tax wedge, 25.4% of the total labour cost. Employee SICs account for approximately 1.5% of the total labour cost, while the PIT share is between 10.7% and 14.4% of the total labour cost. The degree of progressivity is very small due to a lump-sum basic tax allowance. The net average tax rate is between 16.4% and 21.3%.

Figure 12 illustrates the decomposition of the net average tax wedge and the net average tax rate for a hypothetical couple with two children with one spouse out of work and the other earning a gross wage of between 50% and 250% of AGW. As is the case with single workers, the SIC share is fixed due to the fact that the SIC rate is proportional and that there is no cap on the tax base. The PIT share in the tax wedge grows as the gross wage increases due fixed tax reliefs. The tax wedge is between 22.4% and 38.2%. Cash family benefits are lump sum, making the system more progressive since their impact on the total labour cost is more pronounced at the lower income interval. The net average tax rate is between -4% at the lowest income levels and 17.3% at the highest income levels. The progres-

sivity of the system in this case is therefore more pronounced than in the case of single workers, owing to the relatively high tax allowances and cash family benefits.

Figure 11

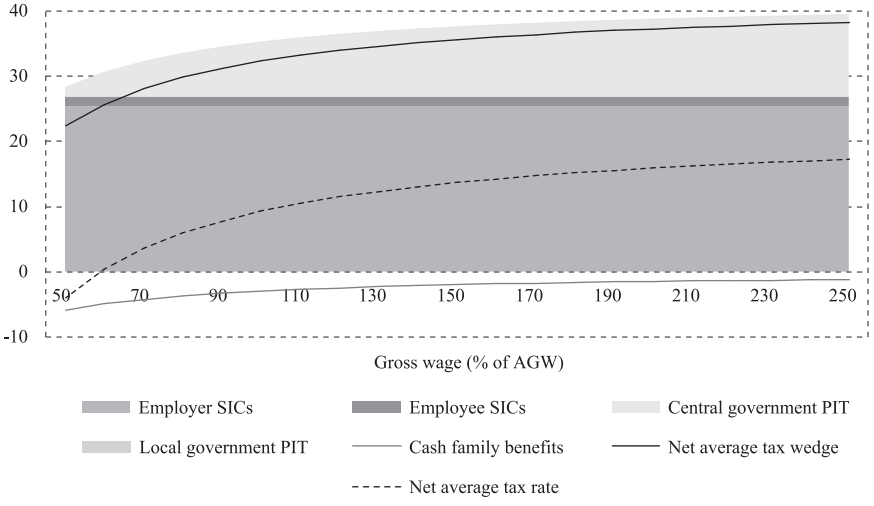
Decomposition of net average tax wedge for single workers without children earning a gross wage of between 50% and 250% of AGW (Estonia, 2013), in %



Source: Author's calculations.

Figure 12

Decomposition of net average tax wedge for couples with two children where one spouse is out of work and the other spouse earns a gross wage of between 50% and 250% of AGW (Estonia, 2013), in %



Source: Author's calculations.

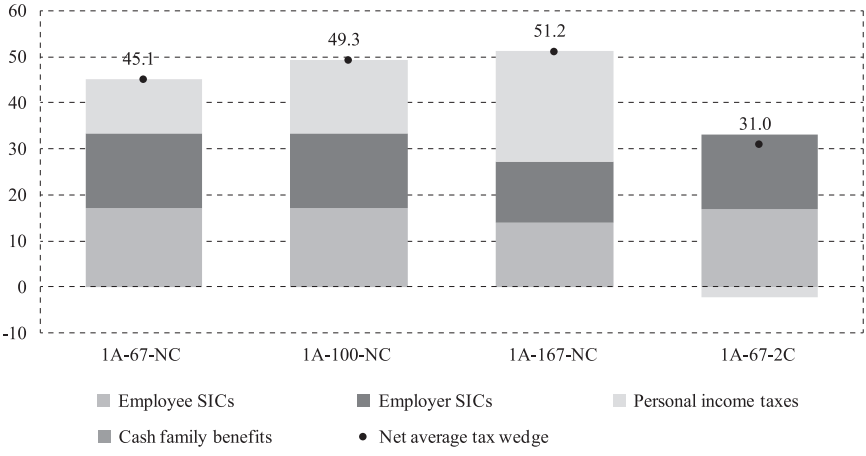
3.4 GERMANY

The German labour income taxation system is described in annex A4.

Figure 13 shows the net average tax wedge and its decomposition for basic hypothetical units – single workers. The German system is particular for its relatively low cap on the maximum SIC base, due to which hypothetical unit 1A-167-NC's SIC share in the tax wedge is lower than that of units earning a lower gross wage, 1A-67-NC and 1A-100-NC. However, the progressive PIT "compensates" for the above, making the system as a whole progressive. Due to tax reliefs for children, the PIT for a single worker with two children earning a gross wage of 67% of AGW (1A-67-2C) in fact has a negative effect on the tax wedge.

Figure 13

Decomposition of net average tax wedge for basic hypothetical units: single workers (Germany, 2013), in %



Source: Author's calculations.

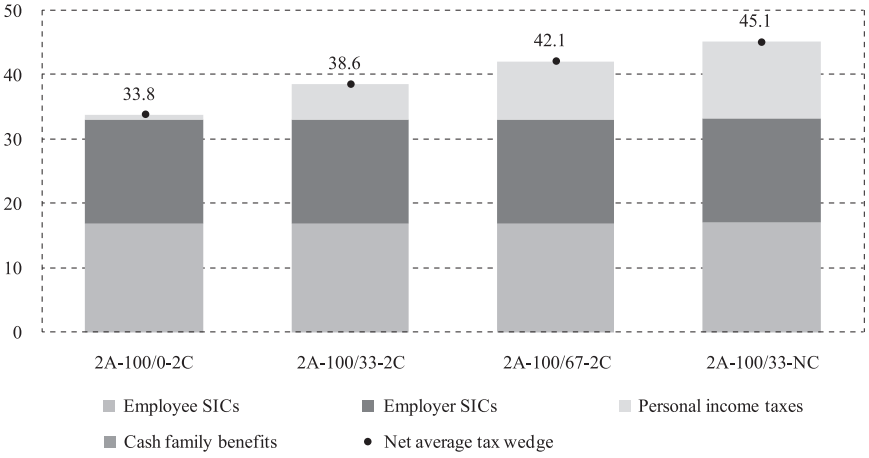
Figure 14 shows the decomposition of the net average tax wedge for basic hypothetical units – couples. In the case of the observed couples, SIC shares in the total labour cost are comparable due to the rule that the income of spouses assessed jointly is divided in two, resulting in neither of those two amounts exceeding the threshold above which SICs turn constant (150% of average gross income). PIT share in the total labour cost is lowest for the couple 2A-100/0-2C (33.8%) whose total gross wage is lower than that earned by couples 2A-100/33-2C and 2A-100/67-2C. Couple 2A-100/33-NC has the highest tax wedge (45.1%), exceeding by 6.5 percentage points the tax wedge of a couple earning the same gross wage and having two children (2A-100/33-2C); this difference is the result of tax reliefs for children.

The decomposition of the net average tax wedge and the net average tax rate for a hypothetical single worker without children earning a gross wage of between 50% and 250% of AGW is shown in figure 15. SICs comprise the greater part of the tax

wedge at lower gross wage levels. At higher income levels the SIC share starts to decline due to a SIC base ceiling, and PIT comprises the greater part of the wedge. PIT share in the total labour cost at the highest observed gross wage level is 30%. Unlike in other observed countries, the tax wedge in Germany does not increase monotonically; it reaches its maximum at wages amounting to 150% of AGW and starts declining. This is a consequence of a SIC base ceiling, which makes the tax system regressive: above this ceiling, PIT cannot compensate for the regression effect caused by SICs. The net average tax rate is between 30.9% and 43.9%.

FIGURE 14

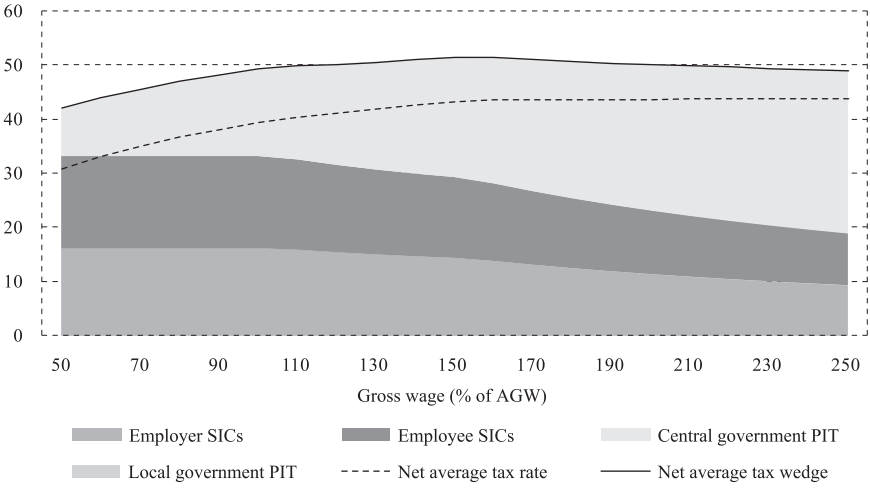
Decomposition of net average tax wedge for basic hypothetical units: couples (Germany, 2013), in %



Source: Author's calculations.

FIGURE 15

Decomposition of net average tax wedge for single workers without children earning gross wages of between 50% and 250% of AGW (Germany, 2013), in %

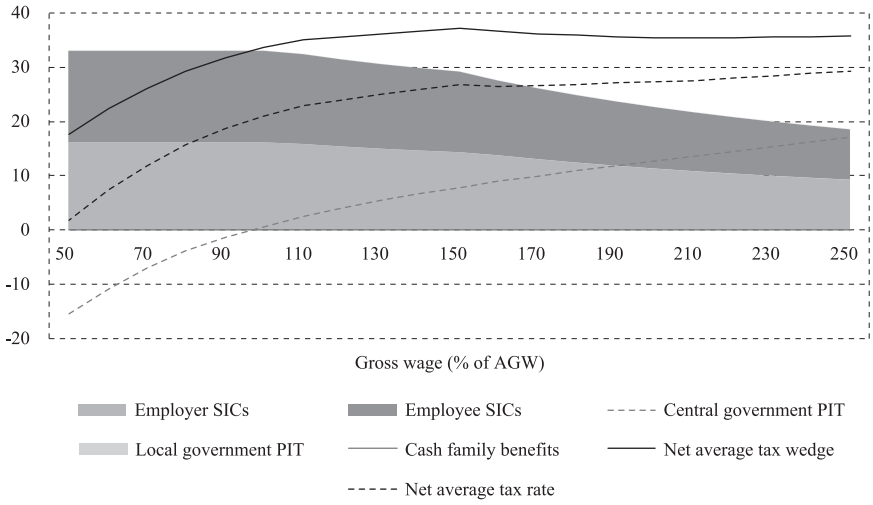


Source: Author's calculations.

Figure 16 shows the decomposition of the net average tax wedge and the net average tax rate for hypothetical couples with two children where one spouse is out of work, and the other spouse earns a gross wage of between 50% and 250% of AGW. The net average tax rate is between 1.7% and 29.2%. Again, the SIC share in the total labour cost decreases, rendering the taxation system regressive. PIT is progressive, i.e. its share in the labour cost increases proportionally to income. At low income levels, PIT is negative due to the fact that tax the credit for children exceeds the initial tax amount.

Figure 16

Decomposition of net average tax wedge for couples with two children where one spouse is out of work, and the other spouse earns a gross wage of between 50% and 250% of AGW (Germany, 2013), in %



Source: Author's calculations.

3.5 SLOVAKIA

The Slovak labour income taxation system is described in annex A5.

Figure 17 shows the net average tax wedge and its decomposition for basic hypothetical units – single workers. The SIC share in the total labour cost is constant since there is no SIC base ceiling, meaning that SICs increase proportionally to the labour cost. Tax becomes negative for single workers with two children (1A-67-2C) due to the fact that they are entitled to a tax credit for children. PIT is not progressive in itself since the threshold of the second tax band is significantly higher than the income taken into account in this analysis. However, it becomes progressive due to personal tax allowances which are constant in relation to income.

Figure 18 illustrates the decomposition of the net average tax wedge for basic hypothetical units – couples. The SIC share in the total labour cost is constant. The PIT share is negative for unit 2A-100/0-2C due to tax credits for children. Cash family benefits additionally reduce the tax wedge.

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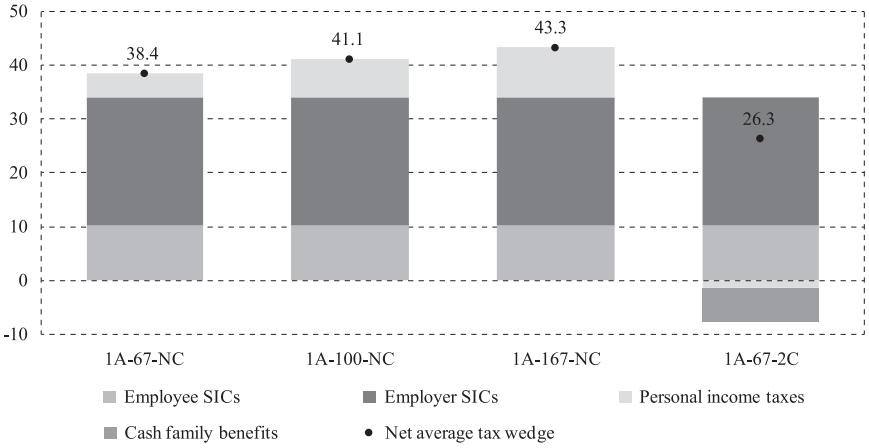
FIGURE 17

Decomposition of net average tax wedge for basic hypothetical units: single workers (Slovakia, 2013), in %



Source: Author's calculations.

FIGURE 18

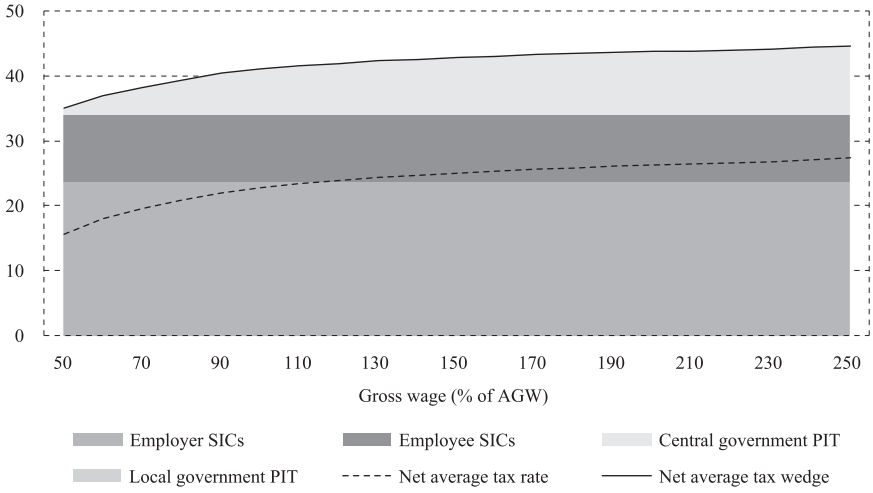
Decomposition of net average tax wedge for basic hypothetical units: couples (Slovakia, 2013), in %

Source: Author's calculations.

Figure 19 shows the decomposition of the net average tax wedge and the net average tax rate for a hypothetical single worker without children with a gross wage of between 50% and 250% of AGW. The labour income taxation system is progressive, and the SIC share is constant. The taxable income amount does not exceed the threshold of the second tax band to which a 25% tax rate is applied, resulting in a 19% rate being applied to the entire base amount. PIT is still progressive due to tax credits: the absolute amount of the basic tax credit is standard and it declines after the income reaches a certain level, increasing the progressivity of the system. The net average tax rate is between 15.7% and 27.4%.

FIGURE 19

Decomposition of net average tax wedge for single workers without children earning a gross wage of between 50% and 250% of AGW (Slovakia, 2013), in %

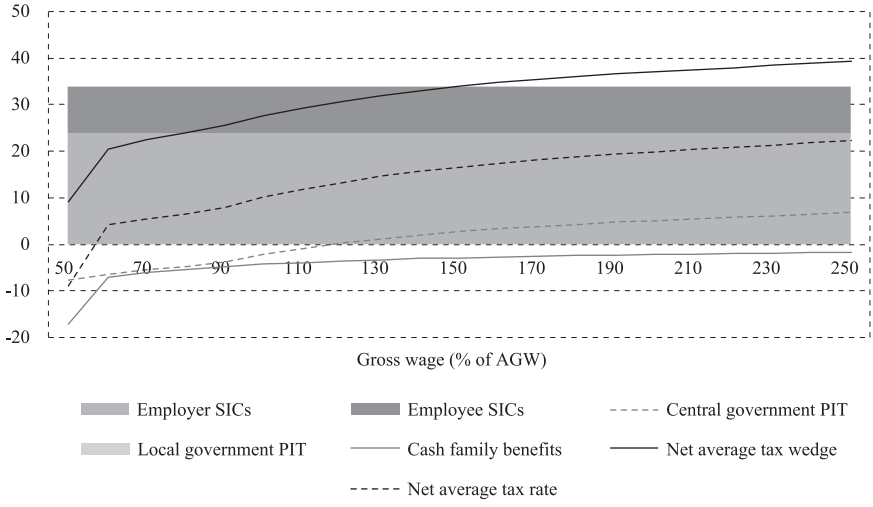


Source: Author's calculations.

Figure 20 illustrates the decomposition of the net average tax wedge and the net average tax rate for a hypothetical couple with two children where one spouse is out of work and the other earns a gross wage of between 50% and 250% of AGW. The SIC share in the labour cost is constant. The line representing the tax wedge shows that the system is progressive due to constant tax allowance amounts and cash family benefits as well.

FIGURE 20

Decomposition of net average tax wedge for a couple with two children where one spouse is out of work and the other earns a gross wage of between 50% and 250% of AGW (Slovakia, 2013), in %



Source: Author's calculations.

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4 COMPARISON OF WAGE TAXATION ACROSS OBSERVED COUNTRIES

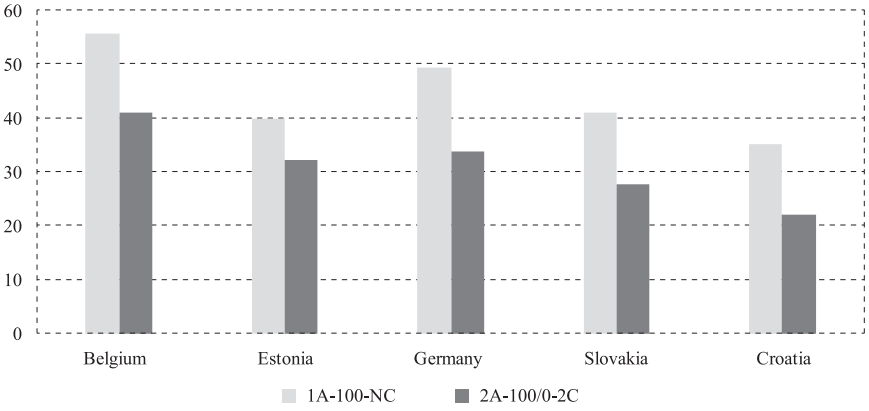
Having analysed the tax systems of each of the countries separately, this section compares the tax burden for different family types and different gross wages across all observed countries.

Figure 21 shows the comparison of the net average tax wedge for single workers without children earning a gross wage of 100% of AGW (1A-100-NC) and a couple with two children, where only one spouse is employed and earns a gross wage of 100% of AGW (2A-100/0-2C).

The tax wedge for both hypothetical units is lowest in Croatia and highest in Belgium. In all countries under consideration, single workers are in a less favourable position than families with children. The tax wedge of Belgian single workers reaches 55.8% of the total labour cost. The reason for this are high tax rates and relatively narrow tax bands, due to which even single workers earning average gross wages cross the upper band threshold and pay a high 50% tax on a part of their tax base.

FIGURE 21

Comparison of net average tax wedge for hypothetical units 1A-100-NC and 2A-100/0-2C, in %



Source: Author's calculations.

Figure 22 shows the share of the tax burden in the total labour cost for single workers without children earning a gross wage of 167% of AGW (1A-167-NC) and a couple with two children whose total gross wage also amounts to 167% of AGW, but is distributed so that one of the spouses earns 100%, and the other spouse 67% of AGW (2A-100/67-2C).

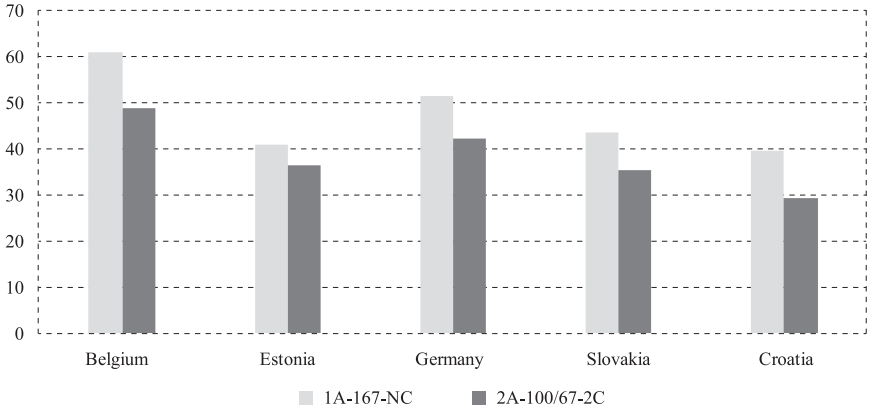
For both hypothetical units the tax wedge is the highest in Belgium and the lowest in Croatia. There are similarities to be found in the tax burden levels in Croatia, Estonia and Slovakia. Estonia has not introduced tax bands, while in Slovakia the

threshold of the higher tax band to which a tax rate of 25% is applied is very high. Croatia has several tax bands, but relatively low tax rates (12% and 25%) are applied to this income level. Unlike Croatian, Estonian, and Slovak tax rates, German and Belgian tax rates are higher, which accounts for the noticeable differences among the countries. As noted above, in Belgium even taxpayers earning an average income pertain to the highest tax band to which a 50% tax rate is applied.

The tax wedge of hypothetical units with children (2A-100/67-2C) in all countries is lower than the tax wedge of hypothetical units without children (1A-167-NC). The spread between these two units is widest in Belgium (12%) and narrowest in Estonia (4.5%).

FIGURE 22

Comparison of the net average tax wedge for hypothetical units 1A-167-NC and 2A-100/67-2C, in %



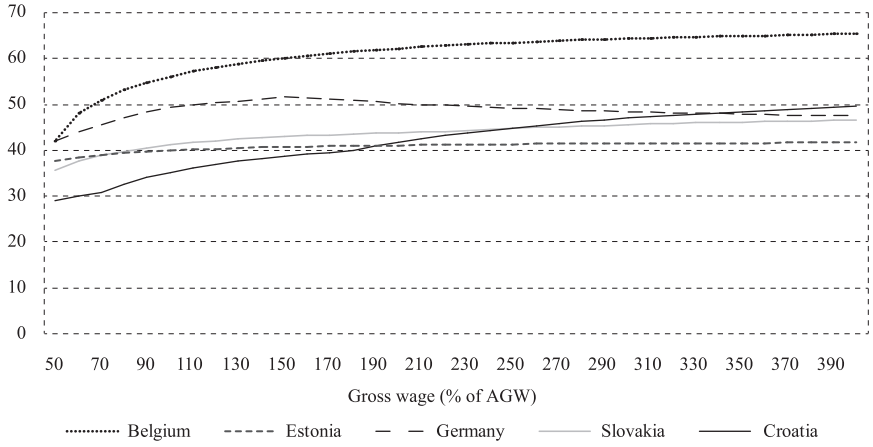
Source: Author's calculations.

Figure 23 shows the correlation between the tax wedge and the gross wage of single workers without children across all five observed countries for gross wages between 50% and 400% of AGW.

The country that stands out again is Belgium, where the tax wedge for the highest observed gross wage is 65%. When their gross wage reaches approximately 200% of AGW, taxpayers in Croatia cross the threshold and enter the highest tax band, where a tax rate of 40% is applied to a part of their tax base, while local government surtax further heightens the marginal tax rate, resulting in the tax wedge in Croatia being higher than that in Estonia, Slovakia and Germany at wages amounting to 190%, 230%, and 330% of AGW. Thus, when it comes to relatively high wages, the tax wedge in Croatia is second only to that in Belgium.

FIGURE 23

Comparison of net average tax wedge for single workers without children earning a gross wage of between 50% and 400% of AGW, in %

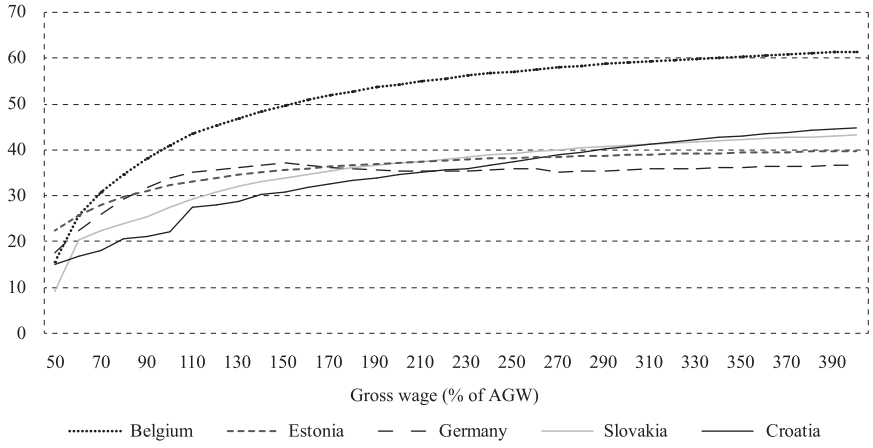


Source: Author's calculations.

Figure 24 shows the correlation of the tax wedge and the gross wage for hypothetical couples with two children, where one spouse is out of work and the other earns 50% to 400% of AGW. Other than in the case of low gross wages, the tax wedge is the highest in Belgium. The progressive taxation of the labour income is characteristic for all countries apart from Germany (within a certain income interval). Once again, it is evident that the tax wedge at relatively high income levels in Croatia is the highest of all the observed countries apart from Belgium.

FIGURE 24

Comparison of the net average tax wedge for couples with two children where one spouse is out of work and the other earns a gross wage of between 50% and 400% of AGW, in %

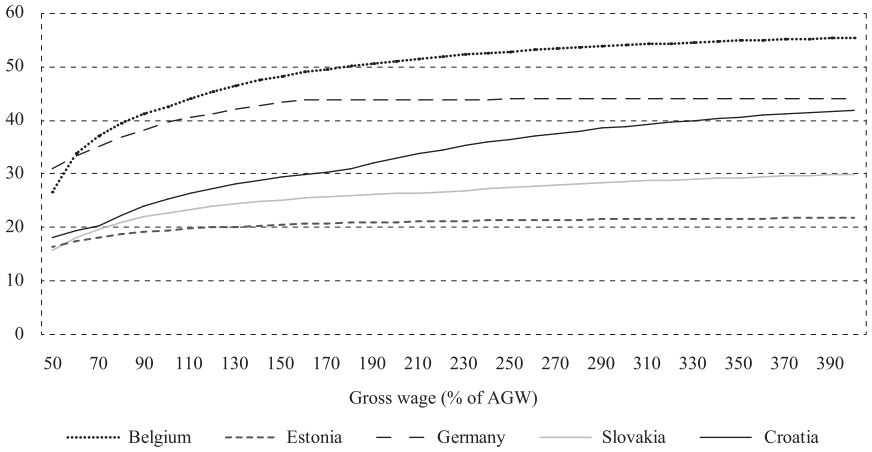


Source: Author's calculations.

Figure 25 shows the net average tax rate for single workers without children in all observed countries. The rate is the highest in Belgium, except for low-income units. Germany comes second, and Croatian rates come close to Germany's at high income levels. The highest average tax rate (in Belgium) is twice the lowest average tax rate (in Estonia).

FIGURE 25

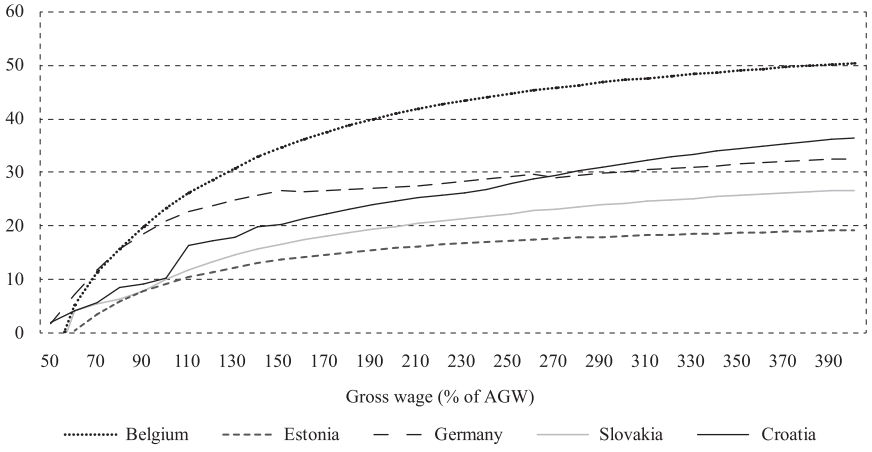
Comparison of the net average tax rate for single workers without children earning a gross wage of between 50% and 400% of AGW, in %



Source: Author's calculations.

FIGURE 26

Comparison of net average tax rate for couples with two children where one spouse is out of work and the other earns a gross wage of between 50% and 400% of AGW, in %



Source: Author's calculations.

The average tax rate for a hypothetical couple with two children where one spouse is out of work and the other earns a gross wage of between 50% and 400% of AGW is shown in figure 26. The line representing Croatia is broken as a consequence of child benefit bands.[2] In Croatia, the tax rate for above-average wages continues to grow, while the growth of the average tax rate in Germany slows down at the point where the benefits become constant. The net average tax rate is the highest in Belgium for all income levels except the lowest. The position of the taxpayers in Slovakia and Estonia is the most favourable. In some countries, the net average tax rate is negative due to cash benefits that exceed taxes and SIC amounts.

5 CONCLUSION

The research subject of this paper is the tax burden on labour income in five EU countries: Croatia, Belgium, Estonia, Germany and Slovakia. The comparison of net average tax wedges for single workers has shown that the tax wedge for single workers without children earning an average gross wage is the lowest in Croatia; however, at high gross wage levels (350% of AGW and more), the tax wedge in Croatia was second only to the tax wedge in Belgium. Similar results are obtained when comparisons are made among the tax wedges of couples with two children, where only one of the spouses is employed.

Tax progressivity should, in theory, be a means of distributing the tax liability in such a manner that the heaviest burden is borne by those with the highest income, with the consequences reflected in a more balanced income structure after the application of taxes and cash benefits. This paper presents conclusions regarding income tax progressivity in countries under observation. The efficiency of those systems as to the distribution of tax liabilities with the end of creating a balanced income structure is an interesting and complex issue which merits further, detailed research.

[2] For the analysis of child benefits in Croatia, see Urban (2014).

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ANNEX
TAXATION OF LABOUR INCOME IN SELECTED COUNTRIES

A1. Croatia

There are three types of SICs payable by employers, their rate in 2013 having amounted to a total of 15.2% (table A1). Croatian employees set aside 20% of their gross wage amounts for contributions paid into two pension insurance pillars: the intergenerational solidarity pension pillar payments (the so-called 1st pillar) are disbursed to the central government, while the individual capital savings-based pension pillar payments go to private pension funds (the 2nd pillar).[3] A cap on the SIC base exists only in the case of 1st pillar contributions and was set at HRK 571,608 per year in 2013.

TABLE A1
SIC rates (Croatia, 2013)

Contribution	Employee rate (% of gross wage)	Employer (% of gross wage)
1st pillar pension insurance contributions	15.0	–
2nd pillar pension insurance contributions	5.0	–
Health insurance contributions	–	13.0
Work-related injury contributions	–	0.5
Employment contributions	–	1.7
Total	20.0	15.2

Source: Contributions Act.

Taxable personal income in Croatia includes income from employment (wage and pension), income from self-employment, income from property and property rights, income from capital, income from insurance, and other receipts (according to the Personal Income Tax Act).

Employee SICs paid to either of the two pension insurance pillars are not subject to tax. All taxpayers are entitled to a basic personal allowance, plus additional personal allowances for dependent children and adult family members (table A2). Spouses' incomes are taxed separately. If both spouses earn an income and support immediate family members, one of two options can be applied: the additional personal allowance for children can be split in two or an alternative distribution method can be arranged. This paper assumes that the personal allowance is used fully by the spouse earning the higher income.

Three tax bands (table A3) and a local government surtax rate of between 0% and 18% were applied in Croatia in 2013. This paper assumes a local government surtax rate of 12%.

[3] In accordance with the Taxing Wages methodology, 2nd pension insurance pillar contributions are not paid to the general government and are therefore not taken into account in the calculation of tax burden indicators. For more details, see Urban (2016).

Table A2

Personal allowance factors and annual amounts (Croatia, 2013)

	Personal allowance factor	Annual amount (in HRK)
Basic personal allowance	1.00	26,400
Adult dependent	0.50	13,200
First child	0.50	13,200
Second child	0.70	18,480
Third child	1.00	26,400
Fourth child	1.40	36,960
Fifth child	1.90	50,160
Disability	0.30	7,920
Total disability	1.00	26,400

Note: Taxpayers resident in areas of special state concern (cities and municipalities) are entitled to higher personal allowance amounts. For the purpose of this paper, it is assumed that the taxpayers are not residents of such areas.

Source: Ministry of Finance (2013).

Table A3

Tax bands and marginal rates (Croatia, 2013)

Annual tax base	Rate (in %)
Up to HRK 26,400	12
From HRK 26,400 to HRK 105,600	25
Over HRK 105,600	40

Source: Ministry of Finance (2013).

The child benefit is an income-tested cash benefit received by families with children, and their amount depends on the net income (gross income minus pension insurance SICs, tax, and local government surtax) per household member. Income bands and amounts are shown in table A4.

Table A4

Child benefit schedule (Croatia, 2013)

Net income per family member (annually, in HRK)	Child benefit per child (annually, in HRK)
0 – 6,518	3,592
6,518 – 13,434	2,993
13,434 – 19,956	2,395
>19,956	0

Source: Child Benefit Act.

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A2. Belgium

Spouses are taxed separately. If one spouse's income is below 30% of joint income, a certain amount can be added to the income of that spouse, this amount being capped at 30% of joint net income minus the income of the spouse to which the amount is transferred. The ceiling for the above amount is EUR 10,090. Spouses file jointly.

Employee SICs amount to 13.07% of the gross wage (table A5). Employees are entitled to a reduction of SICs, depending on their gross wage. The 2013 reduction schedule varied, and this paper uses a weighted arithmetic mean which is presented in table A6.

TABLE A5

Employee SICs as a percentage of gross wage (Belgium, 2013)

Employee SICs	Rate (in %)
Employment contributions	0.87
Work-related injury insurance	1.15
Health insurance	3.55
Pension insurance	7.50
Total	13.07

Source: OECD (2014).

TABLE A6

Weighted arithmetic mean: employee SIC reduction schedule (in EUR) (Belgium, 2013)

Annual gross wage (S)	SIC reduction
0 < S < 18,021.84	2,181
18,021.84 < S < 28,624.92	Min (2,181, (2,181 – 0.2057 * (S – 18,021.84)))
28,624.92 < S	0

Source: OECD (2014).

Employees are entitled to a standard tax deduction for work-related expenses, the schedule of which is shown in table A7.

TABLE A7

Tax deduction for work-related expenses as a percentage of gross income minus employee SICs (Belgium, 2013)

Gross income – SICs = B (in EUR)	Rate (in %)
B < 5,650	28.7
5,650 < B < 11,220	10
11,220 < B < 18,670	5
18,670 < B	3

Source: OECD (2014).

All employees are liable for a special SIC which depends on the wage and is applied according to the schedule shown in table A8.

Table A8

Special SIC schedule (Belgium, 2013)

Taxable income (in EUR)	Amount due on the lower limit (in EUR)	% of taxable income minus lower limit amount
0 – 18,592.02	0	0
18,592.02 – 21,070.96	0	9
21,070.96 – 60,161.85	223.10	1.30
60,161.85 and above	731.29	0

Source: OECD (2014).

Total employer SICs, shown in table A9, amount to 34.67% of the gross wage. Employers can benefit from a 1% reduction in the total SIC amount. This deduction does not affect the liability of the employee but only reduces the amount of employer SICs to 33.67% of the total wage.

Table A9

Employer SICs on employee gross wage (Belgium, 2013)

Contribution	Percentage of gross wage
Employment	3.16
Health insurance indemnities	2.35
Health insurance	3.80
Placement services	0.05
Family allowances	7.00
Pension insurance	8.86
Child care	0.05
Work-related illnesses	1.01
Work-related injury	0.32
Education leave	0.05
Business closure	0.43
Wage restraint	7.59
Total	34.67

Source: OECD (2014).

The reduction schedule varied in the course of 2013. The calculations in this paper are based on the weighted arithmetic mean presented in table A10.

Table A10

Weighted arithmetic mean: employer SIC reduction schedule (in EUR) (Belgium, 2013)

Annual gross income (S)	Fixed amount	Variable amount
0 – 22,627.9	1,757.50	0.162 * (22,627.79 – S)
22,627.9 – 53,314.20	1,757.50	0
53,314.20 and above	1,757.50	0.06 * (S – 53,314.20)

Source: OECD (2014).

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Tax base reductions can be applied to employee SICs (table A7) and business expenses (table A9). The tax rate applied to the resulting taxable income depends on the tax band. Tax bands and tax rates are shown in table A11.

Table A11

Tax bands and marginal tax rates (Belgium, 2013)

Taxable income (in EUR)	Marginal rate (in %)
0 – 8,590	25
8,590 – 12,220	30
12,220 – 20,370	40
20,370 – 37,330	45
37,330 and above	50

Source: OECD (2014).

Tax credits can be applied on the following bases:

(a) Taxable income, *S*. Conditions and amounts are shown in table A12.

(b) Dependent child (table A13).

(c) Special tax credits. Only the tax credit for single parents applies and amounts to EUR 1,490.

Table A12

Tax exemption base (in EUR) (Belgium, 2013)

Taxable income (S)	Fixed amount	Variable amount
0 – 25,990	7,270	0
25,990 – 26,270	6,990	26,270 – S
26,270 and above	6,990	0

Source: OECD (2014).

Table A13

Dependent child tax credit base (Belgium, 2013)

Number of children	Base (in EUR)
1	1,490
2	3,820
3	8,570
4	13,860

Source: OECD (2014).

Local taxes in Belgium are levied as a percentage of the PIT liability before the deduction of special tax credits for low-income earners or for energy-saving expenses. Local surtax rates are determined by municipalities, and no ceiling applies. The average rate for Belgium is deemed to be 7.4%.

Universal cash benefits are granted to workers with children. For the purpose of this paper, it is assumed that the employee has either two or no children. In the case of taxpayers with two children, it is assumed that one is between seven and ten, and the other between eleven and twelve years old. Total amounts of cash benefits in that case amount to 1,330.71 + 2,462.94 = 3,793.65 EUR per year.

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A3. Estonia

The tax unit in Estonia is the family. Employees and employers pay SICs as shown in table A14. The total SIC amount payable by the employee is 2% of the gross wage, while the total SIC amount payable by the employer is 34% of the gross wage; evidently, a larger SIC burden falls on the employer.

Table A14

SIC schedule (Estonia, 2013)

Contribution	Employee (% of gross wage)	Employer (% of gross wage)
Employment	2	1
Health insurance	0	13
Pension insurance	0	20

Source: OECD (2014).

The basic tax allowance is EUR 1,728. A tax allowance is granted for employment contributions, and there are special tax allowances for dependent children (table A15).

Table A15

Tax reliefs for dependent children (Estonia, 2013)

Number of children	Tax relief (in EUR)
1	0
2	1,728
3	3,456
4	5,184

Source: OECD (2014).

Moreover, there are non-standard tax reliefs such as private pension fund contributions, insurance, housing loan interests, and education costs. Non-standard tax reliefs are not taken into account in the models used in this paper; it is, however, important to note that these non-standard tax reliefs have an effect in reality.

The PIT rate is 21%, and no regional or local taxes are applied. Taxpayers are entitled to a child benefit for children up to 16 years of age or up to 19 years of age if they are still receiving an education. These payments are non-taxable. The cash benefit schedule is shown in table A16.

Table A16

Cash benefits: child benefits (Estonia, 2013)

Benefit type	Annual amount (in EUR)
Child benefit (up to the age of 16 or 19)	
First and second child	230.16
Third child and any subsequent children	690.48
Child of a single parent	230.16
Families with seven or more children	2,024.88

Source: OECD (2014).

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A4. Germany

Even though spouses can file their taxes separately, this paper assumes that they file jointly.

SICs in Germany are paid by both employees and employers. SIC payment schedule is shown in table A17.

TABLE A17

SIC liability schedule (Germany, 2013)

Contribution	Employee (% of gross wage)	Employer (% of gross wage)
Employment	1.50	1.50
Sick leave	8.20	7.30
Pension insurance	9.45	9.45
Long-term care (no children)	1.275	1.025
Long-term care (at least one child)	1.025	1.025

Source: OECD (2014).

Tax reliefs for SICs and other expenses incurred in provision for the future (such as life insurance) are calculated as follows:

1) All contributions made to pension funds (i.e. both employee's and employer's contributions) are added up.
2) The resulting amount is limited to EUR 20,000.
3) A certain percentage is applied on the resulting amount: in 2005 this percentage was 60% and was increased by 2% in each subsequent year to reach 76% in 2013, i.e. 100% in 2025.
4) Non-taxable employer SICs are deducted from the resulting amount, and this amount constitutes the tax relief.

Tax reliefs can include employee SICs for health insurance, which are presumed to constitute 96% of total payments for health care, and mandatory long-term care insurance. Employment contributions and other contributions can also constitute tax reliefs up to the EUR 1,900 ceiling for single workers and EUR 3,800 for couples. There are no basic allowances in the German tax system.

Work-related expenses up to EUR 1,000 are deductible. If the taxpayer can prove that their expenses exceed the aforementioned lump-sum, the entire amount can be deducted. A lump-sum allowance of EUR 36 for single workers or EUR 72 for couples is deductible as a tax accountancy expense.

Tax bands are based on the following formulas:

X = *taxable income*

T = *tax liability*

$$Y = \frac{X - 8{,}130}{10{,}000} \tag{A1}$$

$$Z = \frac{X - 13{,}469}{10{,}000} \tag{A2}$$

$T = 0$, *for* $X \leq 8130$

$T = (933.70Y + 1{,}400)Y$, *for* $8{,}131 \leq X \leq 13{,}469$

$T = (228.74Z + 2{,}397)Z + 1{,}014$, *for* $13{,}470 \leq X \leq 52{,}881$

$T = 0.42X - 81{,}96$, *for* $52{,}882 \leq X \leq 25{,}0730$

$T = 0.45X - 15{,}718$, *for* $250{,}731 \leq X$.

These formulas are used to calculate the income tax liability for single workers. The tax liability for couples who file jointly is computed by calculating PIT for ½ of joint taxable income, then doubling the resulting amount to obtain the tax liability for both spouses.

Taxpayers are also liable to pay so-called *solidarity surcharge* amounting to 5.5% of the PIT liability. An exemption of EUR 972 for single workers and EUR 1,944 for couples is applied. If the PIT liability exceeds the exemption amount, the *solidarity surcharge* shall be charged at the rate of 20% of the difference between the tax liability and the exemption limit. Tax reliefs for children are taken into account when calculating the tax liability.

A5. Slovakia

The tax unit in Slovakia is the individual.

Employer SICs amounting to 13.4% of the gross wage constitute a tax relief. Employee SICs are shown in table A18. Tax relief amounts are limited to $5*AW_{t-2}$, where AW_{t-2} is the average wage earned two years before. This amount for 2011 was EUR 9,432 per year.

TABLE A18

Employee SIC rates (Slovakia, 2013)

Contribution	Rate (% of gross wage)
Health insurance	4
Sick leave	1.4
Pension insurance	4
Disability insurance	3
Employment insurance	1

Source: OECD (2014).

Employer SICs amount to 35.2% of the gross wage. Starting from 2005, a part of these contributions is paid into a private pension fund. Since these payments are not made to government schemes, they shall not be taken into account when calculating the average PIT rate. Therefore, total employer SICs for the purpose of this paper are 31.2% of the gross wage in 2013. Employer SICs are shown in table A19.

TABLE A19

Employer SIC rates (Slovakia, 2013)

Contribution	Rate (% of gross wage)
Health insurance	10
Sick leave insurance	1.4
Disability insurance	3
Pension insurance	14
Guaranteed fund	0.25
Work-related accident insurance	0.80
Unemployment insurance	1
Reserve fund	4.75

Source: OECD (2014).

The schedule of the income-tested non-standard employee tax credit (*ETC*), introduced in 2009, is shown in table A20. For the purpose of this research, only families in which one spouse is out of work are entitled to an allowance of EUR 3,735.94.

Table A20

ETC Schedule (Slovakia, 2013)

Annual income P (in EUR)	ETC (in EUR)
6 * 337.7 < P < 12 * 337.7	0.19 * (3,735.94 – 3,509.76)
P > 12 * 337.7	0.19 * max(3,735.94 – tax base, 0)

Source: OECD (2014).

The basic tax allowance is subject to the criteria shown in table A21.

Table A21

Tax allowance (Slovakia, 2013)

Income levels	Tax relief (in EUR)
Gross income < 19,458	19.2 * 3,735.94
19,458 < gross income	44.2 * 3,735.94 – 0.25 * (gross income – SICs)
gross income – SICs > 34,401	0

Source: OECD (2014).

In 2013 two tax bands were introduced, as shown in table A22. There are no local taxes.

Table A22

Tax bands and marginal rates (Slovakia, 2013)

Annual taxable income (in EUR)	Rate (in %)
0 – 34,401.74	19
34,401.74 and above	25

Source: OECD (2014).

The 2013 annual tax credit for children was set at EUR 254.64 for each child. If the tax liability goes into the negative, and the taxpayer's earnings are at least EUR 2,026.2 per year, this amount will be paid to the taxpayer. Only one spouse can claim this tax relief. For the purposes of this paper, the tax relief is claimed by the spouse earning the higher income. Table A23 shows the tax credit schedule.

Table A23

Tax credit schedule (Slovakia, 2013)

Number of children	Tax credit (in EUR)
1	254.64
2	509.28
3	763.92
4	1,018.56

Source: OECD (2014).

Cash benefits apply and amount to EUR 23.10 for each child. Some families are also entitled to social benefits for families in need. If the family's total income is

below the minimum living standard determined for the particular family type, they are entitled to monthly social benefits according to the schedule shown in table A25. Minimum living standard criteria are shown in table A24.

Table A24

Minimum living standard amounts (in EUR) (Slovakia, 2013)

	Until June 30th, 2013	Since July 1st, 2013
First adult	194.58	198.09
Second adult	135.74	138.19
Child	88.82	90.42

Source: OECD (2014).

Table A25

Social benefit schedule (Slovakia, 2013)

Family type	Monthly amount (in EUR)
Single worker without children	60.50
Single worker with one to four children	115.10
Couple with one to four children	157.60
Couple without children	105.20
Single worker with more than four children	168.20
Couple with more than four children	212.30

Source: OECD (2014).