Financial Theory & Practice 2/2016

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Preface to the special issue of Financial Theory and Practice

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Tax wedge on labour income in Croatia and the European Union

Preface to the special issue of Financial Theory and Practice

IVICA URBAN, PhD*

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Abstract

This article is a preface to a special issue of Financial Theory and Practice, which is devoted to the comparison of tax wedge on labour income in Croatia and other EU countries. The articles in this issue have arisen from the students' research project, undertaken in 2015. This Preface outlines the motivation behind the research project, explains the most important methodological issues, and reviews the literature on the measurement of tax wedge in Croatia.

Keywords: tax burden, personal income tax, social insurance contributions, family benefits, microsimulation, Croatia, EU

1 INTRODUCTION

This volume of Financial Theory and Practice (FTP) represents a collection of papers dealing with the tax burden on labour income that arose from a students' research project. Namely, in 2015 four students from the Department of Mathematics (Faculty of Science, University of Zagreb) participated in a research project with the main goal to compare the Croatian tax burden on labour income for different hypothetical units with that in other EU countries. Previous studies dealing with tax burden indicators for Croatia mainly focus on the tax wedge of a "single average worker", and compare it with the tax wedge in OECD countries. All of them repeatedly conclude that Croatia belongs to the group of countries with a moderate tax wedge.[1]

In light of that, the main research issue addressed within this students' research project was to inspect whether the conclusion that Croatian tax burden was moderately high holds in the case of other hypothetical units as well, such as singles with different levels of gross wage, or singles and couples with children. To do so, all students were given the following tasks: (a) to analyse the systems of labour income taxation in Croatia and four selected EU countries; (b) to build a microsimulation model for hypothetical units across selected countries, which calculates the amounts of personal income tax (PIT), social insurance contributions (SICs), other taxes on labour, and cash family benefits; (c) to compute the *tax burden indicators*, such as the net average tax wedge and net personal average tax rate, according to the Taxing Wages methodology (OECD, 2014); and (d) to compare tax burdens across the selected countries.

All students' works were expertly mentored by Katarina Ott (Chief Editor of the FTP) and Ivica Urban (Guest Editor of this volume), both lecturers of Public Sector Economics at the Faculty of Science. Following the research plan, students wrote their graduation papers, which were successfully defended in the summer of 2015. Satisfied with the quality of papers and aware of the recurring importance of the

[1] "Single average worker" is the abbreviation for the most often used hypothetical unit – a single person without children, whose gross wage equals the average gross wage in the country of residence. "Tax wedge" denotes the ratio between total taxes on labour and total labour cost. Refer to section 3 for precise definitions used in OECD (2014) and in this volume.

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topic, in late 2015 the mentors decided to prepare these papers for proposal for publication in a special issue of FTP. Since graduation papers and journal papers do not share the same structure or content, the authors tailored the papers according to scientific journal requirements. In this process, some sections were shortened and left out, while some were added. Such edited versions were subject to the same strict criteria as regular contributed journal submissions and therefore went through the standard reviewing procedure (blind review/two reviewers). The papers significantly benefited from the reviewing process and their final versions are presented in this volume.

In line with the aforementioned main research goal, each paper analyses Croatia and four other EU countries, which differ across the papers. Thus, the analysis embraces a total of 17 countries. Papers are organised in a similar fashion. After the introduction and methodology sections, section three contains detailed information on tax-benefit instruments of each selected country – SICs, PITs, family cash benefits, etc. These data are primarily based on OECD's Taxing Wages (OECD, 2014) and EUROMOD Country Reports.[2] Given all the elements needed to assess income taxation, the third section of the papers presents the country's tax burden indicators (net average tax wedge and net personal average tax rate) compared across two dimensions: first, for different hypothetical units per country, and second, across all analysed countries per household type. It is important to note that the calculations follow the methodology determined by OECD (2014), in which the data relate to 2013. Therefore, Croatian tax burden indicators arise from the 2013 taxation scheme no matter the amendments that followed in subsequent years.

This Preface serves as an overture to the results given in the four papers. It reviews several recent studies on tax burden comparisons, which cover Croatia (section 2). Then, it explains how the sample of countries is selected, and details the methodological issues concerning the calculation of tax burden indicators (section 3). Special attention is given to indicators based on "compulsory payments", which cover both tax and non-tax compulsory payments (section 4).

2 STUDIES OF TAX WEDGE: THE CASE OF CROATIA

The tax wedge is continuously in the focus of both academic researchers and policy makers in Croatia, particularly in the context of competitiveness and investment attraction strategies. This section briefly reviews relevant studies that measured the tax wedge for Croatia. Its purpose is to acquaint the reader with basic and most interesting findings.

Blažić (2006) calculates the tax wedge and its components for the single average worker in Croatia in 2005 and compares it with that in OECD countries. With a tax wedge of 39.1%, Croatia stood somewhere in the middle of the scale com-

[2] EUROMOD Country Reports used in this volume are available at: https://www.euromod.ac.uk/using-euromod/country-reports/f3-g2.

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posed of OECD countries. She concludes that PIT accounts for a relatively small share of the total tax wedge, while, on the other hand, employee SICs are among the highest within the observed countries. Croatia shares common characteristic with other European ex-socialist countries, in which the importance of PITs is relatively low and the relevance of SICs in the tax wedge is relatively high.

Šeparović (2009) calculates the Croatian tax wedge in 2007 for three single workers without children, who earn a gross wage equal to 67%, 100% and 167% of average gross wage, and compares the results with OECD countries. Using the cluster and discriminant analysis, the author investigates the relationship between the level of tax wedge and unemployment rate. She confirms the results of preceding researches (e.g., Dolenc and Vodopivec, 2005), that a higher tax wedge is related with higher unemployment rates. Croatia is classified as a member of the group of countries with a high tax wedge and a high unemployment rate.

Urban (2009) computes the tax wedge for a wide range of gross wages for a single worker without children in Croatia in 2008. He also calculates the marginal tax wedge in Croatia, revealing that even for a modestly high gross wage (equal to 3 average gross wages), the marginal tax wedge reaches 60%, and increases further to more than 65% for high gross wages.

The research by Grdović Gnip and Tomić (2010) is the most comprehensive in this group. Its methodology is similar to Šeparović's (2009), but the authors add several more features to the analysis. Besides the unemployment rate and tax wedge, the list of variables also includes the employment rate and EPL index of labour market rigidity. Croatia falls into the cluster group of countries with a high tax wedge, low employment rate, high unemployment rate and high labour market rigidity. However, the analysis has revealed some interesting results, namely, that certain countries achieve high employment rates despite high tax wedges (e.g., Scandinavian countries, Germany, Austria, Latvia).

Blažić and Trošelj (2012) report on a debatable practice regarding the application of the Taxing Wages methodology when it comes to the measurement of tax burden indicators for Croatia. To explain this problematic application, it is necessary to briefly explain the Taxing Wages methodology and pension SIC system in Croatia.

According to OECD (2014), tax burden indicators do not include "non-tax compulsory payments", which are typically related to contributions to social security schemes outside the general government sector. Namely, the *tax* burden should cover only the payments to various levels of government, and do not include those amounts paid to non-government entities, such as private insurance schemes. Several years ago, OECD started to publish *compulsory burden indicators*, whereby "compulsory" means that the burden includes both tax and non-tax compulsory payments. This alternative method acknowledges that all mandatory payments – whether to government or to non-government bodies – constitute the burden for

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the employee and the employer.[3] Nevertheless, in its basic publication, Taxing Wages, OECD presents *tax* burden indicators.

Following a major reform in 2002, the Croatian pension insurance system introduced two compulsory pillars: the 1st pillar ("intergenerational solidarity") pertains to the general government scheme, while the 2nd pillar ("individual capitalised accounts") relates to private pension funds. As Urban and Bezeredi (2015) explain: "Two parallel contributory schemes are created: (a) scheme A, whereby persons participate in the 1st pillar only, and (b) scheme B, whereby persons participate both in the 1st and the 2nd pillar. Persons who were aged above 50 (below 40) in January 2002 are automatically involved into scheme A (B), while people aged between 40 and 50 could choose whether to become members of scheme A or B. People in scheme A pay contributions to the 1st pillar only [pension insurance contributions A, or shortly PCA]. Correspondingly, people in scheme A receive pension from the 1st pillar only [...]. People in scheme B pay contributions both to the 1st pillar [PCB1] and to the 2nd pillar [PCB2]."

The rates for PCA, PCB1 and PCB2 are 20%, 15% and 5% of gross wage, respectively.[4] Thus, the overall rate of pension insurance contributions is the same for people in schemes A and B, and equals 20%. In terms of OECD methodology, PCA and PCB1 are tax payments, and therefore should be included in the calculation of tax burden indicators. On the other hand, PCB2 represents a non-tax compulsory payment; it pertains to compulsory burden indicators, but not to tax burden indicators.

Thus, one can calculate two sets of tax burden indicators for Croatia: one for persons in scheme A and another for those in scheme B, where the indicators will be significantly lower for the latter group. Blažić and Trošelj (2012) show that all up-to-date measurements of tax burden indicators for Croatia have assumed that the (overall) rate of pension insurance contributions is 20%. This may lead to two conclusions: (a) researchers have considered only persons pertaining to scheme A; or (b) researchers were considering persons pertaining to scheme B, but have erroneously included PCB2 in taxes; however, the exact assumptions are not explicitly stated.

To which group – A or B – should the hypothetical taxpayer belong? Blažić and Trošelj (2012) argue that group B should be taken into consideration. Namely, OECD methodology implies that *younger adult* persons should be considered in calculations. For example, single persons without children, as one of the main hypothetical taxpayer units, are better represented among younger population; furthermore, children are assumed to be under 12 years of age, which implies that the parents are relatively young. Blažić and Trošelj (2012) calculate several tax burden and

[3] Tax burden indicators are available in OECD (2016c). Compulsory burden indicators are available in OECD (2016b; item "B4. Non-tax compulsory payments").
[4] All the mentioned pension contributions are employee SICs. Employer SICs include general health SIC, occupational health SIC and employment SIC, whose rates in 2013 are 13%, 0.5% and 1.7%, respectively.

compulsory indicators for the year 2010 and compare Croatia's results with those in OECD countries; they consider the single average worker pertaining to scheme B. Since the rate of PCB2 is relatively high, the discrepancies in country ranking according to tax burden and compulsory indicators are shown to be significant.

Čok et al. (2013) analyse the tax wedge in the so-called Alps-Adriatic region: Austria, Croatia, Hungary, Italy and Slovenia. They focus on six hypothetical single workers without children. The first one is the single average worker. The remaining five earn yearly gross wages of 10, 20, 30, 50 and 100 thousands EUR, respectively. Notice that Čok et al. (2013) combine two different approaches in choosing hypothetical units' gross wages, which can be referred to as the "relative" and "absolute". The "relative" approach considers each country's average-based wages (e.g., 67%, 100% or some other percentage of AGW); this approach is used to define the "single average worker" (and various other hypothetical units in Taxing Wages; see table 2). On the other hand, the "absolute" approach uses equal amounts of gross wage in each country; this is the case for units 2 to 6 in Čok et al. (2013).

Čok et al. (2013) show that the ranking of countries can change significantly depending on the choice of reference gross wage in the calculation of the tax wedge. Thus, when the "relative" approach is considered, the lower-wage countries (Croatia, Hungary and Slovenia) have a lower tax wedge than higher-wage countries (Italy and Austria). However, when the tax burden is examined according to the "absolute" approach, it is the other way around – Italy and Austria are shown to have a lower tax wedge at all gross wage levels than Croatia, Hungary and Slovenia.[5]

Deskar-Škrbić and Šimović (2014) analyse recent developments in the Croatian tax system. They conclude that, in comparison with countries that have a similar GDP per capita, Croatia has excessive overall tax burden. Being aware of the relatively high tax burden on labour income, the Croatian government has decreased the rate of general health SIC, from 15% to 13% (in May 2012); however, thanks to a significant fall in revenue and a rising deficit, the old rate was reintroduced only 23 months later. The authors also discuss the change in PIT law from March 2012, and conclude that its impact is dubious; the same can be said about the frequent changes in the SICs law. Deskar-Škrbić and Šimović (2014) also compare the tax wedge for single average workers in Croatia and EU countries, showing that the Croatian tax wedge is relatively high.[6] Furthermore, they compute the tax wedge in Croatia for a large range of gross wages and different time periods from 2011 to 2015. In conclusion, the authors state that the tax policy in Croatia suffers from frequent changes, lack of coordination between different government bodies, and inadequacy of policy measures.[7]

[5] For Croatia, Čok et al. (2013) assume that hypothetical units belong to "group A", i.e. they pay PCA.
[6] Deskar-Škrbić and Šimović (2014) are aware of the suggestions proposed by Blažić and Trošelj (2012). Effectively, they analyse the worker from "group A" (who pays PCA).
[7] Also, see Šimović and Deskar-Škrbić (2015) for a detailed analysis of the tax wedge in Croatia, for the period 2010-2015.

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3 THE SAMPLE OF COUNTRIES AND METHODOLOGY

3.1 SELECTED COUNTRIES

As noted in section one, each author's country sample includes Croatia and four other EU countries, making a total of five countries per paper. Thus, the overall number of countries covered in the sample across all four papers is 17. As mentioned earlier, the Taxing Wages publication is the main reference when assessing tax burden indicators. Issued by the OECD, this publication covers only OECD members. Since the research project puts EU in the focus, it was necessary to choose among those EU countries that were also members of the OECD. Therefore, non-OECD EU members excluded from the analysis are Bulgaria, Cyprus, Latvia, Lithuania, Malta and Romania, while OECD and EU members that did not enter the project sample are Denmark, Finland, Luxembourg, Sweden and the United Kingdom.

Countries are chosen with regard to the loosely defined criterion of geographical closeness to Croatia and their list is presented in table 1.[8]

Table 1
Countries included in the sample

	Included
Beketić	(Croatia), the Czech Republic, France, Portugal, Slovenia
Cundić	(Croatia), Ireland, Italy, the Netherlands, Spain
Gabrilo	(Croatia), Belgium, Estonia, Germany, the Slovak Republic
Onorato	(Croatia), Austria, Greece, Hungary, Poland
	Not included
OECD	Denmark, Finland, Luxembourg, Sweden, United Kingdom
non-OECD	Bulgaria, Cyprus, Latvia, Lithuania, Malta, Romania

Source: Author's systematisation.

It is obvious that selected countries significantly differ by the level of economic development. Such differences can be simply shown by comparing the annual average gross wages from 2005 to 2014 for sample countries (figure 1). The countries can be divided into three groups: high-, middle- and low-wage countries. The high-wage group consists of old EU member states: Ireland, the Netherlands, Belgium, Austria, Germany and France. The middle-wage group comprises economically "less successful" old EU member states: Italy, Spain, Greece and Portugal, plus Slovenia. The low-wage group contains several "new" EU member states: Estonia, Croatia, the Slovak Republic, the Czech Republic, Poland and Hungary. All three groups experienced an increase of the gross wage in 2014 with respect to 2005, by 22%, 16% and 40%, respectively. Note that, for diversity reasons, each author's sample includes at least one high-wage country (table 1).

[8] However, the selection was not done systematically. Since various Croatian analysts tend to compare Croatia with Ireland, the latter country has been substituted for one of the less distant (e.g., Luxembourg). The objection could be made that instead of, e.g., Portugal, one of the Scandinavian countries could have been selected.

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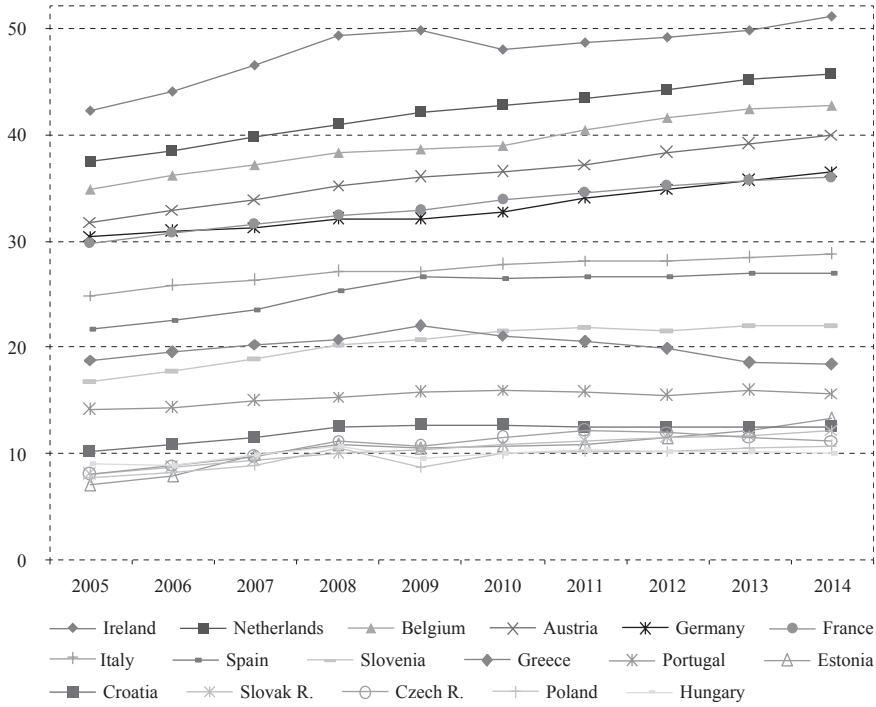
FIGURE 1

Nominal average annual gross wage in selected countries for the period 2005-2014 (in thousands of EUR)



Source: Author's calculation based on OECD (2016a) (for OECD countries) and CBS (2016) (for Croatia).

3.2 METHODOLOGICAL FRAMEWORK FOR THE CALCULATION OF TAX WEDGE INDICATORS

As noted in section one, when assessing the tax burden indicators the authors follow the methodology described in the Taxing Wages publication (OECD, 2014). This subsection provides a non-exhaustive explanation of the most important issues which relate to the definition of hypothetical units, obtaining the average gross wage for hypothetical workers, and the definition of tax- vs. non-tax payments.

All calculations in this volume are done for eight OECD-defined hypothetical units, presented in table 2. The labour income of hypothetical adult members is defined in reference to the tailor-made definition of the *average gross wage* (AGW) which does not capture all workers in one economy, but only those in certain sectors. For Croatia, AGW equals 12 times the weighted average monthly wage of workers employed in sectors B to N, according to NACE Rev. 2.[9] Two studies (Gabrilo and Onorato) introduce additional hypothetical units, whose gross wage range extends to 400% of AGW.

[9] CBS (2016) publishes average gross wages across different sectors for workers employed by legal entities. AGW is obtained as a weighted average of gross wages across sectors B to N, where the number of workers per sector is used as a weight.

Table 2
Hypothetical units and their characteristics

Abbreviation	Adult members	Number of dependent children	Spouse I's gross wage (% AGW)	Spouse II's gross wage (% AGW)
A-67-NC	Single	0	2/3 x 100	–
A-100-NC	Single	0	100	–
A-167-NC	Single	0	5/3 x 100	–
A-67-2C	Single	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

Notes: AGW – average gross wage, according to Taxing Wages methodology; in abbreviations, "A" stands for "adults", "C" for children and "NC" for "no children".

Source: Author's systematisation.

Although Taxing Wages (OECD, 2014) presents various tax burden indicators, the papers in this volume focus on the two main measures: the *net average tax wedge* and the *net average tax rate*.[10] The net average tax wedge is a ratio between *total net tax* and *total labour cost*. The net average tax rate is the ratio between *net employee tax* and the gross wage.[11]

Croatia also imposes a local government surtax (*prirez*), calculated as a percentage of PIT obligation. The rates vary across cities and municipalities in the range from 0 to 18%. The surtax rate used in all calculations across all the papers of the volume is set to 12%, which closely corresponds to the average surtax rate on the national level. Regarding the family benefits, "child benefit" is taken into account for Croatia; it is a means-tested benefit for families with children.

As noted in section 2, Blažić and Trošelj (2012) have cautioned the researchers to properly apply the Taxing Wages methodology regarding the coverage of tax- and non-tax compulsory payments. Since the main reference in the research is Taxing Wages, all papers in this volume concentrate on *tax* burden indicators. Thus, PCB2 is not included in the tax burden for Croatia. It was also noted that OECD now calculates the compulsory burden indicators. One of these indicators is the *net average compulsory wedge*, which is a counterpart of the net average tax wedge.[12]

[10] The names of these indicators are slightly changed in comparison to the original names used in Taxing Wages. Thus, "*net* average tax wedge" is a synonym for OECD's "average tax wedge", while the term "net average tax rate" refers to OECD-s "net *personal* average tax rate".

[11] *Total labour cost* is the sum of gross wage, employer SICs and payroll taxes. *Total net tax* is the sum of all SICs, payroll taxes and PIT, minus cash family benefits. *Net employee tax* is the sum of employee SICs and PIT, minus cash family benefits.

[12] The term "net average compulsory wedge" used in this paper denotes OECD's indicator "average compulsory payment wedge"; see OECD (2015).

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4 THE COMPARISON OF NET AVERAGE TAX AND COMPULSORY WEDGES

Blažić and Trošelj (2012) investigate the differences between several tax and compulsory burden indicators for a single average worker, comparing Croatia and OECD countries in 2010. In a fashion similar to Blažić and Trošelj's (2012), this section calculates the net average tax wedge and net average compulsory wedge for three different hypothetical units defined in table 2. Calculations and comparisons, shown in table 3, are carried out for countries analysed in this volume referring to the year 2014, but for Croatia results for the years 2013 and 2015 are added.[13]

Table 3

Net average tax wedge and net average compulsory wedge, 2014

	A-100-NC				A-167-NC				2A-100/67-2C			
	NATW		NACW		NATW		NACW		NATW		NACW	
	%	R	%	R	%	R	%	R	%	R	%	R
Austria	49.4	2	49.4	4	52.0	4	52.0	5	41.9	5	41.9	6
Belgium	55.6	1	55.6	1	60.8	1	60.8	1	48.4	1	48.4	1
Czech Rep.	42.6	7	42.6	9	45.0	10	45.0	12	35.5	11	35.5	14
Estonia	40.0	13	41.2	11	40.9	14	42.1	15	36.7	10	37.8	9
France	48.4	5	48.4	7	54.3	2	54.3	4	43.7	2	43.7	4
Germany	49.3	3	49.3	5	51.3	5	51.3	6	42.2	4	42.2	5
Greece	40.4	12	40.4	15	48.0	7	48.0	8	41.4	6	41.4	7
Hungary	49.0	4	49.0	6	49.0	6	49.0	7	40.4	7	40.4	8
Ireland	28.2	17	28.2	17	39.6	16	39.6	17	20.3	17	20.3	17
Italy	48.2	6	51.0	3	53.8	3	56.3	2	42.4	3	45.4	3
Netherlands	37.7	14	51.6	2	43.1	13	56.1	3	31.0	15	45.7	2
Poland	35.6	16	40.6	14	36.2	17	41.2	16	32.6	14	37.7	10
Portugal	41.2	9	41.2	12	47.5	8	47.5	9	36.8	9	36.8	13
Slovak Rep.	41.2	10	43.2	8	43.3	12	45.3	11	35.4	12	37.6	12
Slovenia	42.5	8	42.5	10	46.3	9	46.3	10	34.5	13	34.5	15
Spain	40.7	11	40.7	13	45.0	11	45.0	13	37.6	8	37.6	11
Croatia (2014)	36.1	15	40.4	16	40.2	15	44.5	14	30.1	16	34.4	16
Croatia (2013)	35.2		39.5		39.4		43.7		29.2		33.5	
Croatia (2015)	35.3		39.6		39.8		44.1		29.4		33.7	

Notes: NATW – net average tax wedge, NACW – net average compulsory wedge, "%" – average wedge as a percentage of total labour cost, "R" – rank.

Source: OECD (2016b), OECD (2016c) and author's calculation.

Before making a cross-country comparison, let us first focus on Croatian results. The average wedges increase between 2013 and 2014 due to the rise of general health SIC rate from 13% to 15%. However, the wedges decrease in 2015 due to the changes in PIT. Average wedges are roughly the same in 2013 and 2015, at least for A-100-NC and 2A-100/67-2C household types. The difference between the net average tax wedge and the net average compulsory wedge in all observed years and for all hypothetical units is about 4.3 percentage points.

[13] The year 2014 is chosen for this analysis due to the availability of information on the OECD website (see footnote 2); compulsory burden indicators for 2013 are not presented.

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According to the net average tax wedge, Croatia's tax wedge is one of the lowest among selected countries. For A-100-NC and A-167-NC, only Ireland and Poland have lower wedges; for 2A-100/67-2C, only Ireland has a lower tax wedge. Turning to the net average compulsory wedge, Croatia's ranking only slightly changes. For A-100-NC, only Ireland ranks below Croatia, with Poland moving two positions up. For 2A-100/67-2C the rank of Croatia (and Ireland) does not change. Regarding A-167-NC, Croatia moves two positions up, leaving Ireland, Poland and Estonia behind.

Concentrating on percentages rather than ranks, the differences between the two measures of average wedge are more pronounced. Thus, according to net average compulsory wedge, Croatia is much closer to its neighbours on the scale, such as Estonia, the Czech Republic, Greece, Portugal and Spain.

5 ACKNOWLEDGEMENT

As the Guest Editor of this special issue, I would like to thank the authors for accepting the challenge of adapting their student papers into research papers available for publication. The special value of projects like this lies in encouraging young authors to gain initial experience in scientific and expert writing, and I believe that we have succeeded in this.[14]

I am grateful to the reviewers for their patient reading and plentiful and precious advice, both expert and technical.

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[14] Three of the four papers – in their earlier versions – contained supplementary analyses. Beketić analyses the tax wedge effects of the hypothetical replacement of the current three-bracket PIT with a single-rate PIT in Croatia. Gabrilo calculates the tax wedge in Croatia for hypothetical persons from different EU countries, in a situation in which these persons "move" to Croatia, but keep the same gross wage (in absolute terms) as in their country of origin. Cundić analysed the evolution of tax burden on labour income in Croatia in the period between 2008 and 2015 by taking into consideration all the changes in PIT rates, brackets, and personal allowances, as well as some changes in SIC rates that occurred in the observed period. Although these supplemental analyses were interesting and useful, the Editor has decided to exclude them from the final versions of the papers, presented in this volume. This was done to retain the focus of the papers on the main topic and to keep them relatively compact in terms of length. However, the authors will be encouraged to pursue their investigations and publish the results on some other occasion.

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Tax wedge in Croatia, Slovenia, the Czech Republic, Portugal and France

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The views expressed in this paper are solely those of the author and do not necessarily represent those of the institution in which she is employed.
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Abstract

The aim of this paper is to compare the average tax burden on labour income in Croatia, the Czech Republic, France, Portugal and Slovenia. The OECD Taxing Wages methodology was used to make a comparison of the tax wedges applicable to the eight hypothetical individual worker and family types. It was found that Croatia had the lowest tax wedge in all observed cases, while France had the highest tax wedge for all individual worker and family types.

Keywords: taxation of labour income, net average tax rate, tax wedge, Croatia, the Czech Republic, France, Portugal, Slovenia

1 INTRODUCTION

The aim of this paper is to compare the tax burden on labour income in selected EU countries, specifically Croatia, the Czech Republic, France, Portugal and Slovenia. Social insurance contributions (SICs), personal income tax (PIT), and cash family benefit amounts are calculated for the eight hypothetical individual worker and family types in each country. Net average tax wedges and net average tax rate are then compared to find the differences in the tax burden applicable to different hypothetical units in those countries.

The research methodology is based on OECD's Taxing Wages publication (OECD, 2014), which served as the source of information on personal income taxation characteristics in OECD countries: on the application of tax reliefs and rates in the PIT system, SICs rates, and cash family benefits. The values of tax burden indicators have also been taken over from OECD (2014). The information concerning the Croatian labour taxation system have been retrieved from the applicable legislature and the tax burden indicators have been calculated by using the microsimulation model for hypothetical units developed by the author of this paper.

The paper is structured as follows. Section 2 introduces the applied methodology. Section 3 offers a detailed description of the labour taxation system and cash family benefits in each country, as well as the calculation and analysis of tax burden indicators for hypothetical units. Tax burden indicators are then compared across all countries in section 4, which is followed by the conclusion section.

2 METHODOLOGY: MODEL AND INDICATORS

Country analysis is based on data from 2013 published in Taxing Wages (OECD, 2014), which offers detailed information on the taxation of wages in OECD member countries. In order for the results to be comparable among countries, the same methodology had to be used for the calculation of indicators for Croatia, which is not an OECD member. Tax burden indicators are calculated for eight hypothetical units (table 1). Single workers as well as couples are taken into consideration, both without children and with two children. When it comes to families with children, it is assumed, in accordance with the OECD methodology, that the children are between six and eleven years old. The analysis of tax burden on labour income

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rests on the assumption that all taxpayer's income is derived from employment, specifically from the taxpayer's wage, while other income sources are not included in the analysis.[1] At least one adult in each family is a full-time employee; it is assumed that the workers did not use sick leave and that they were not unemployed during any period of the year under observation.

Table 1
Characteristics of 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	unemployed
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, according to Taxing Wages methodology; A – adult; NC – no children; 2C – 2 children.

Source: OECD (2014).

According to Taxing Wages methodology (OECD, 2014), the "average gross wage" (AGW) captures only the selected sectors of economy. To make the calculation compatible with OECD (2014), AGW for Croatia is obtained as a weighted average of gross wages across sectors B to N, where the average number of workers in 2013 per sector is used as a weight. Thus, AGW for Croatia in 2013 is HRK 7,765.[2] For the sake of comparison, the 2013 average gross wage across all sectors was HRK 7,929 (CBS, 2015).

Table 2
Annual average gross wage in selected countries, 2013

	AGW expressed in national currency	Exchange rate	AGW (in EUR)
Croatia	HRK 93,180	HRK/EUR = 7.5735	12,303
Czech Republic	CZK 298,770	CZK/EUR = 26.0824	11,455
France	EUR 36,980	1	36,980
Portugal	EUR 17,335	1	17,335
Slovenia	EUR 17,611	1	17,611

Source: (1) AGW – for Croatia: author's calculation as per CBS (2016); for other countries: OECD (2014); (2) Exchange rates – for Croatia: CNB (2016); for the Czech Republic: OECD (2014).

[1] There are other types of income to which personal income tax is levied, e.g., income from self-employment, property, capital, or insurance.
[2] For details on the calculation of AGW in other countries, see OECD (2014). Economic activities in Croatia are classified in the National Classification of Economic Activities (*Nacionalna klasifikacija djelatnost*), which is harmonized with NACE Rev. 2.

Table 2 shows AGW for selected countries, expressed in yearly amounts and in EUR. In the case of the hypothetical unit 2A-100/33-NC, one spouse earns 33% of AGW, which amounts to HRK 2,620. That amount is below the statutory minimum wage for Croatia in 2013 (as stipulated by the Regulation on Minimum Wage in 2013), which equalled HRK 2,988. Nevertheless, in order to comply with the Taxing Wages methodology, the mentioned spouse's wage is assumed to amount to 33% of AGW.

As explained in Urban (2016), *total labour cost* is the sum of gross wage, employer SICs and payroll taxes. *Total net tax* is the sum of all SICs, payroll taxes and PIT, minus cash family benefits. *Net employee tax* is the sum of employee SICs and PIT, minus cash family benefits. The *net average tax wedge* is a ratio between total net tax payments and total labour cost. The *net average tax rate* is the ratio between net employee tax payments and the gross wage.

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

3 INCOME TAXATION IN SELECTED COUNTRIES

3.1 CROATIA

3.1.1 Basic components of labour income taxation in Croatia in 2013

Croatian employees set aside 20% of their gross wage amounts for contributions, 15% of which are paid into the intergenerational solidarity pension pillar (the so-called 1st pillar), while 5% go to individual capital savings-based pension (i.e. the so-called 2nd pillar) (table 3).

Table 3

Employee SIC rates (Croatia, 2013)

Pension insurance contribution	Rate (%)
1st pillar	15
2nd pillar	5
Total	20

Source: Social Insurance Contributions Act.

Employer SICs comprise health insurance contributions amounting to 13%, employment contributions amounting to 1.7%, and 0.5% for health protection at work (table 4).

Table 4
Employer SIC rates (Croatia, 2013)

Contribution	Rate (%)
Employment	1.7
Health insurance	13.0
Health protection at work	0.5
Total	15.2

Source: Social Insurance Contributions Act.

The annual personal allowance within the PIT system amounted to EUR 3,486 (HRK 26,400) in 2013. For taxpayers with children, the personal allowance is increased by a factor of 0.5 for the first child, by a factor of 0.7 for the second child, and by the factor of 1 for the third child; the factor increases for every subsequent child progressively relative to the personal allowance factor applied to the last one. In this respect, a child is defined as a dependent child that has not finished its education or is not yet employed. A dependent is any immediate family member who earns less than EUR 1,452 annually. In this case, the personal allowance factor is 0.5. In case of a disability, the additional factor is 0.3, i.e. 1 for total disability (these two cases are mutually exclusive, i.e. only one of these factors can be applied). Personal allowance is higher in state-supported areas, the City of Vukovar, and for retirees.

PIT base is calculated by deducting employee SICs and personal allowance (including child and dependent allowance) from the gross wage. If personal tax allowance exceeds the taxpayer's personal income (the difference between gross wage and employer SICs), the tax base is zero, meaning that the taxpayer will not be liable to pay any taxes in this case. Croatia has three tax bands, their respective rates being 12%, 25%, and 40% (table 5).

Table 5
Personal income tax bands and rates (Croatia, 2013)

Tax base (in EUR)	Rate (%)
<3,486	12
3,486 – 13,943	25
>13,943	40

Source: Personal Income Tax Act.

Local government surtax is an additional tax burden imposed on Croatian taxpayers. It is levied on the PIT amount at a rate depending on the taxpayer's place of residence. Local government surtax rates vary between 0% and 18%: up to 10% for municipalities, up to 12% for cities with a population of 30,000 or less, up to 15% for cities with more than 30,000 inhabitants, and 18% for the City of Zagreb. This rate is the highest local government surtax rate currently applied in Croatia. A 12% local government surtax rate is assumed in all our calculations.

Croatian taxpayers have the right to a monthly *child benefit* amount depending on the total net personal income amount and the number of household members. According to the Child Benefits Act, the following is considered to constitute personal income: income from employment (wage), income from self-employment, income from property and property rights, income from capital, income from insurance, and other receipts (such as foreign pensions, unemployment benefits, etc.). Child benefit is received until the child is 15 years of age if the child is a primary school student or until they are 19 if they are high school students. The right to child benefits persists until the child reaches the age of 27 if the child suffers from serious health impairment (or longer, depending on further expert findings). The monthly "budget basis", used for the calculation of child benefit, was HRK 3,326 (EUR 439) in 2013. Benefit recipients are divided into three income groups: the first group consists of households with average monthly income per member under 16.3% of the budget basis, resulting in monthly child benefits amounting to 9% of the budget basis per child (HRK 299 or EUR 40). The second group is made up of households with average monthly income per household member falling between 16.3% and 33.7% of the budget basis, meaning that child benefit amount amounts to 7.5% of the budget basis per child (which amounts to HRK 250 or EUR 33). Households with average monthly income per household member between 33.7% and 50% of the budget basis and, consequently, received child benefits amounting to 6% of the budget basis for each child (i.e. HRK 200 or EUR 26) are in the third group. The benefit amount for children without parents or children whose parents are incapacitated for independent living goes up by 25%, or 15% for children with one parent. Children with health impairments have the right to a 25% increase in their child benefit amount. In case of serious impairments of the child's health, the child benefit amounts to 25% of the budget basis irrespective of household income. Households with three children are entitled to a so-called "pro-natalist supplement" amounting to a monthly HRK 500 (EUR 66) or HRK 1,000 (EUR 132) for households with four or more children.

Two out of the eight analysed hypothetical units are entitled to child benefits. Since hypothetical family unit 1A-67-2C earns a monthly income of HRK 4,234, they have the right to child benefits pertaining to the third income group. The adult being a single parent, the child benefit is increased by 15% and amounts to HRK 459 (EUR 61) per month. In hypothetical family 2A-100/0-2C, one spouse receives 100% of AGW, while the other spouse is unemployed. They again belong to the third census group (income per family member amounts to approximately HRK 1,588) and receive a monthly child benefit for two children of HRK 400 (EUR 53). The monthly personal income per family member for other couples with two children exceeds 50% of the budget basis (HRK 1,663), rendering those families ineligible for child benefits.

3.1.2 Net average tax rate and net average tax wedge in Croatia

The progressivity of the system for single earners without children is tested by comparing the net average tax rate and net average tax wedge for units 1A-67-NC, 1A-100-NC, and 1A-167-NC with different average wages. Moreover, the pro-

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gressivity of the system is also tested for couples with two children by comparing the net average tax rate and net average tax wedge for hypothetical units 2A-100/0-2C, 2A-100/33-2C, and 2A-100/67-2C, where the gross wages earned by the Spouse II differ.

The following hypothetical units are compared in order to analyse the impact of tax reliefs and child benefits: (a) for single workers – 1A-67-NC and 1A-67-2C; and (b) for couples – 2A-100/33-NC and 2A-100/33-2C. Units 1A-67-NC and 1A-67-2C (2A-100/33-NC and 2A-100/33-2C) show identical characteristics relative to their adult members, but differ in the number of children.

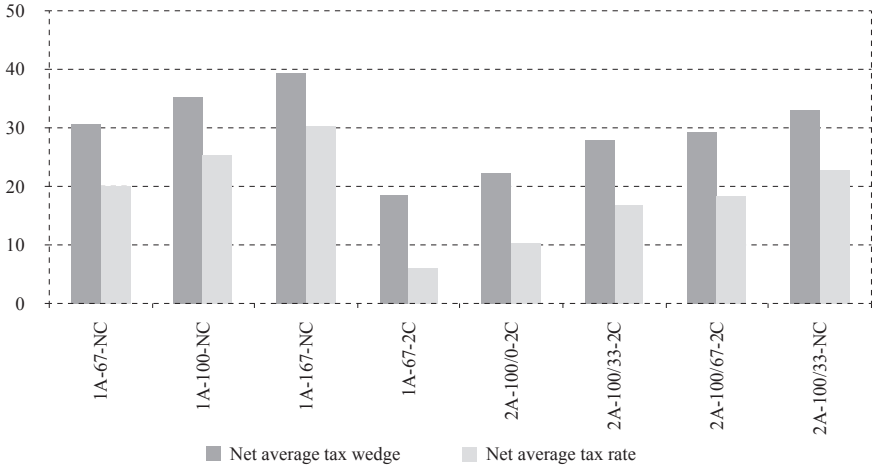
Figure 1 shows the net average tax rate and net average tax wedge for the eight hypothetical units in Croatia, while detailed calculations are shown in tables A1 and A2 in the annex. It is important to point out that the 2nd pillar pension insurance contributions do not factor in the calculation of tax burden indicators (in accordance with the methodology described in OECD, 2014; also, see Urban, 2016, for an explanation).

The taxation system is proved to be progressive for single workers without children since the net average tax rate and net average tax wedge increase as the gross wage increases. The net average tax wedge for 1A-167-NC exceeds that of 1A-67-NC by 9 percentage points. The system is also progressive for couples with two children. The net average tax wedge for 2A-100/0-2C is 7 percentage points higher than for 2A-100/67-2C.

Unit 1A-67-2C's net average tax wedge is 12 percentage points lower than unit 1A-67-NC's, while the tax wedge for unit 2A-100/33-2C is 5 percentage points lower than for unit 2A-100/33-NC.

Figure 1

Net average tax wedge and net average tax rate for hypothetical units (Croatia, 2013), in %



Source: Author's calculation.

3.2 THE CZECH REPUBLIC

3.2.1 Basic components of labour income taxation in the Czech Republic in 2013

Employees in the Czech Republic set 4.5% of their gross wage aside for health insurance and 6.5% for social insurance (see table 6). Since 2012, the maximum SIC base has been capped at EUR 47,635 per year.

Table 6

Employee SIC rates (the Czech Republic, 2013)

Contribution	Rate (%)
Health insurance	4.5
Social insurance	6.5
Total	1.0

Source: OECD (2014).

Employer SICs comprise health insurance (9%) and social insurance (25%), totalling 34% of the gross wage (table 7).

Table 7

Employer SIC rates (the Czech Republic, 2013)

Contribution	Rate (%)
Health insurance	9
Social insurance	25
Total	34

Source: OECD (2014).

In the Czech Republic, the PIT unit is the individual. A tax allowance amounting to 10% of the tax base is available for donations made to municipalities or for the financing of social, health, religious, and sports activities (capped at 2% of the tax base) (OECD, 2014). Taxpayers may claim an allowance of EUR 11,502 for mortgage interest payments or for other interest payments related to home purchase or improvement. Individuals who participate in a supplementary pension plan are entitled to deduct their annual contributions reduced by EUR 230, the maximum tax relief amounting to EUR 460. All taxpayers are entitled to a tax credit of EUR 952. Taxpayers are also entitled to an additional tax credit of EUR 952 for a spouse living with the taxpayer in the same household provided that the spouse's annual income does not exceed EUR 2,607. A tax credit of EUR 514 also applies if the taxpayer has children who are under 18, i.e. 26, years of age and receiving full-time education, or if they have disabled children under 26. Other tax credits for persons with disabilities amount to EUR 97 in case of partial disability or EUR 193 in case of total disability, and EUR 619 for disabled persons who require (third-party) nursing care. If the taxpayer takes part in continued education, they are entitled to a 154 EUR additional tax credit until they are 26, i.e. 28, years old.

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To determine the tax base in the Czech Republic, one deducts tax allowances from the total sum of the gross wage, social benefits included in the tax base, and employer SICs. A single 15% rate levied on the tax base was introduced in 2008 (Kalíšková, Münich and Pavel, 2014).

Families that meet certain income requirements are entitled to a cash family benefit. The income threshold in this case depends on the number of household members and their characteristics (for details regarding the amount of the cash benefit, see OECD (2014) and Kalíšková, Münich and Pavel (2014)).

3.2.2 Average tax rates and tax wedge in the Czech Republic

Figure 2 shows the net average tax rate and the net average tax wedge for the eight hypothetical units in the Czech Republic. For detailed calculations, see tables A3 and A4 in the annex.

The taxation system proves to be progressive for single workers without children since the net average tax rate and net average tax wedge increase as the gross wage increases. The net average tax wedge for 1A-167-NC exceeds that of 1A-67-NC by 6 percentage points. The system is also progressive for couples with two children. The net average tax wedge for 2A-100/0-2C is 11 percentage points higher than for 2A-100/67-2C.

Unit 1A-67-2C's net average tax wedge is 25 percentage points lower than unit 1A-67-NC's, while the tax wedge for unit 2A-100/33-2C is 5 percentage points lower than for unit 2A-100/33-NC.

Figure 2

Net average tax wedge and net average tax rate for hypothetical units (the Czech Republic, 2013), in %

Source: Author's calculations based on OECD (2014).

3.3 FRANCE

3.3.1 Basic components of labour income taxation in France in 2013

French employees pay 0.1% of the total gross wage and 6.75% on the portion of their gross wage up to the EUR 3,086-per-month ceiling into the pension insurance scheme (table 8). For health insurance 0.75% of total gross wage is paid. Unemployment insurance contributions amount to 2.4% of gross wage up to EUR 12,344 (4 times the reference value). Other contributions include supplemental pension insurance amounting to between 3% of gross wage up to the reference value and 8% of gross wage up to the maximum EUR 9,258 (reference value times 3), or between 3% of gross wage up to the reference value and 7.7% of gross wage up to the maximum EUR 12,344 (reference value times 4) for managers. *Association pour la gestion du fonds de financement* (AGFF) is a contribution similar to pension insurance levied at a rate of 0.8% of gross wage up to the reference value and 0.9% of gross wage up to triple the amount of the ceiling.

Table 8

Employee SIC rates (France, 2013)

Contribution	Rate (%)
Pension insurance	6.85
Health insurance	0.75
Unemployment insurance	2.4
Other	Various rates

Source: OECD (2014).

Table 9

Employer SIC rates (France, 2013)

Contribution	Rate (%)
Pension insurance	10.00
Health insurance	12.80
Unemployment insurance	4.00
Work-related accident insurance	2.43
Family contributions	5.40
Other	Various rates

Source: OECD (2014).

French employers pay 10% of gross wage for employee pension insurance, 1.6% of which on the full gross wage amount, and 8.4% up to the EUR 3,086 ceiling (table 9). Health insurance contributions amount to 12.8% of total gross wage, while 4% of gross wage up to a maximum of EUR 12,344 (reference value times 4) is set aside for unemployment contributions. Contributions paid for work-related accidents vary, with the average rate in 2013 being 2.43% of total gross wage. Finally, family contributions amount to 5.4% of gross wage. Other employer contributions include supplemental pension insurance: 4.5% is levied on the gross wage for wages up to the reference value and 12% for gross wages between EUR 3,086 and 9,258, or 4.5% and 12.6%, respectively, for managers. AGFF contribu-

tions amount to 1.2% of the gross wage up to the maximum of EUR 3,086, and 1.2% or 1.3% for managers for gross wages between EUR 3,086 and EUR 9,258, respectively. Enterprises employing 20 or more people pay an additional 3.23% on the gross wage amount.

According to OECD (2014), standard PIT reliefs include work- and dependent children-related expenses. If the children attend school, additional tax reliefs of EUR 61, EUR 153, or EUR 183 apply, depending on the level of education attended. Additional tax reliefs include amounts for home improvement (large capital investments such as thermal insulation or equipping the home to produce energy from renewable energy sources), divorce expenses, child care costs for children under seven years of age, donations to various charities, etc. *Prime pour l'emploi* (PPE) is an individualized tax credit the amount of which depends on the gross wage, tax base, and the number of working hours. For a taxpayer to be eligible for PPE, the gross income of the household must not exceed the following amounts: EUR 16,251 for a single earner, EUR 25,231 for a single parent with two children, EUR 32,498 for couples without children, and EUR 41,478 for couples with two children. An increase of EUR 36 applies to each dependent child or to single-parent earners.

According to Avram and Bouvard (2014), there is a special personal income taxing method in France, called *foyer fiscal*. According to this method, tax is levied on the income of one taxpayer plus fiscally dependent persons. Children under 18 and disabled children (notwithstanding their age) are automatically considered to be dependents. Children under 21 can also be treated as dependents, as well as children up to the age of 25 if they are students at an institution of higher learning. According to the family quotient system applied, both civil status and position in the family are taken into account and a weight is given to each person in the family. The taxpayer, their spouse and third (and every next) child are assigned the factor of 1, while the first and second child are assigned the factor 0.5. There are special cases when factors are added, specifically the following: widow/widower with at least one dependent child (factor 1), disabled adult or child (factor 0.5), and single parent (factor 0.5). The family ratio is the sum of all factors assigned to all persons in a tax group.[3] Net taxable income is the gross income minus the above allowances and tax reliefs, plus social benefits included in the tax base. Finally, to calculate the tax base, total net taxable income of the tax group is divided by the family ratio. If taxes amount to less than EUR 1,016, the payable tax will be additionally reduced by 50% of the difference between the EUR 1,016 and tax before the reduction. Tax rates shown in table 10 are applicable to parts of the tax base.

[3] For instance, a couple with two children is assigned factor 3 (1 for the taxpayer + 1 for the spouse + 0.5 for the first child + 0.5 for the second child).

Table 10
PIT bands and rates (France, 2013)

Tax base (EUR)	Rate (%)
<6,011	0
6,011 – 11,991	5.5
11,991 – 26,631	14
26,631 – 71,397	30
71,397 – 15,1200	41
>15,1200	45

Source: OECD (2014).

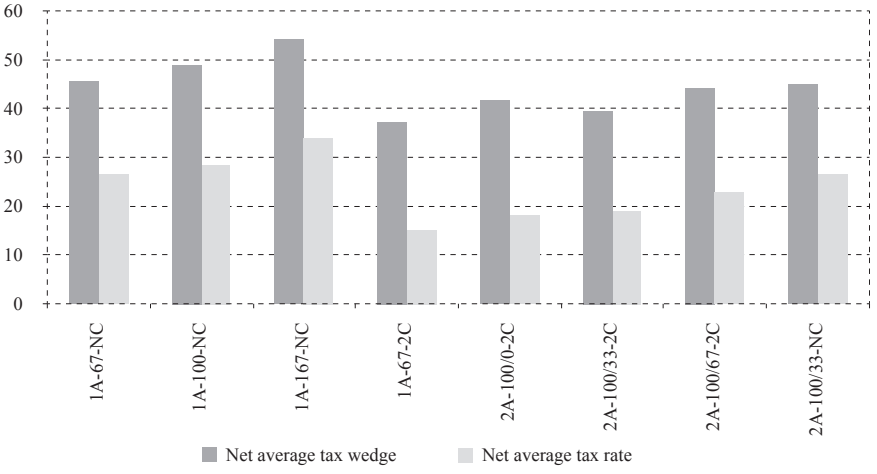
Local government surtax is applied in France, and its rates vary among administrative regions; however, as surtax was not taken into consideration in OECD (2014), this paper does not take it into consideration either.

According to Avram and Bouvard (2014), annual family benefits for children between 6 and 10 amount to EUR 360, for children between 11 and 14 to EUR 380, and EUR 394 for children from 15 to 18 years of age. Families with three or more children are entitled to an additional monthly benefit of EUR 167.

3.3.2 Net average tax rate and net average tax wedge in France

Figure 3 shows the net average tax rate and the net average tax wedge for the eight hypothetical units in France. For detailed calculations, see tables A5 and A6 in the annex.

Figure 3
Net average tax wedge and net average tax rate for hypothetical units (France, 2013), in %



Source: Author's calculations based on OECD (2014).

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The taxation system proves to be progressive for single workers without children since the net average tax rate and net average tax wedge increase as the gross wage increases. The net average tax wedge for 1A-167-NC exceeds that of 1A-67-NC by 9 percentage points. The system is also progressive for couples with two children, but the progression is much slower than for single workers. The net average tax wedge for 2A-100/0-2C is 3 percentage points higher than that for 2A-100/67-2C.

Unit 1A-67-2C's net average tax wedge is 8 percentage points lower than unit 1A-67-NC's, while the tax wedge for unit 2A-100/33-2C is 5 percentage points lower than for unit 2A-100/33-NC.

3.4 PORTUGAL

3.4.1 Basic components of labour income taxation in Portugal in 2013

According to OECD (2014), the rate of employee contributions in Portugal is 11% of gross wage, while the employer SIC rate is 23.75% of gross wage. In both cases, health insurance, parental leave, unemployment insurance, and pension insurance are included in the contributions rate.

PIT comprises the income of the entire family, and includes the receipts of any dependent children. Joint taxation of the family unit with partial income-splitting is applied: joint income of couples is divided by two, and tax rates are then applied to the obtained amount in order to calculate the tax liability, which is then multiplied by two to get the couple's joint tax liability. According to Rodrigues, Junqueira and Figueiras (2014), all children under 18, or under 25 if they are receiving an education and if the child's monthly income is lower than Portugal's minimum wage, are considered to be dependents.

A standard deduction equals the product of 72%*12 (months) and Social Benefit Index (the minimum wage amount being EUR 475), amounting to a final EUR 4,104. Allowances include contributions if they are higher than EUR 4,104 per taxpayer. According to OECD (2014), tax credit comprises: EUR 214 for all single taxpayers or for each spouse, EUR 333 for a single parent, EUR 214 for each dependent child (this amount is doubled for dependent children under the age of 3) and EUR 261 for ascendants whose income does not exceed the minimum pension amount. Other tax credits include non-reimbursed health care costs not covered by social insurance (the tax relief amounts to 10% of total health care costs capped at EUR 838, and the cap is set EUR 126 higher for each dependent), education costs (30% of outlays, limited to 160% of minimum wage, with the limit set 30% higher for each dependent who incurs education costs), costs for sanatoria or retirement homes (25% of the amount, capped at EUR 404), home improvement costs (15% of interests up to EUR 296, with the limit set 50% higher for taxpayers in the first tax band and 20% higher for taxpayers in the second tax band), and alimony payments (20% of payments capped at a monthly amount of EUR 419).

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The total amount of tax credits related to health care costs, education, alimony, and home-related expenses is unlimited if the tax base is under EUR 7,000; if it amounts to between EUR 7,000 and EUR 20,000, it is limited to EUR 1,250. The limit is set lower as the tax base increases – for a tax base exceeding EUR 80,000, the limit is set to 0, i.e. there is no tax credit.

Other tax credits apply to individual retirement savings (20% of the savings, with the limit set at EUR 400 for taxpayers under 35 years of age, at EUR 350 for taxpayers between 35 and 50, and EUR 300 for those older than 50), social security individual accounts (20% of the savings, limited to EUR 350), 25% of donation amounts (for schools, libraries, museums, etc., limited to 15% of the taxpayer's tax base), and 15% of VAT paid to certain services (restaurants, hair salons, car mechanics, etc., limited to EUR 250). There is no limit for tax bases up to EUR 7,000 and the limit is EUR 100 for tax bases amounting to between EUR 7,000 and EUR 20,000. The limit is set lower as the tax base increases – for a tax base exceeding EUR 80,000, the limit is set to 0, i.e. there is no tax credit.

To determine the tax band that applies to the taxpayer, income is divided by 2 (table 11). The tax base is calculated by taking the gross wage, deducting standard allowances and tax reliefs, and adding social benefits included in the tax base (if applicable). There are five tax bands, their rates being 14.5%, 28.5%, 37%, 45%, and 48%, applied to respective tax bases. According to OECD (2014), in the case of taxpayers whose income stems primarily from employment, disposable income after the application of the tax rates may not be less than 120% of the national minimum wage (EUR 8,147 in 2013).

Table 11

Tax rates and allowances (Portugal, 2013)

Tax base (EUR)	Rate (%)	Allowance (EUR)
<7,000	14.5	–
7,000 – 20,000	28.5	980
20,000 – 40,000	37	2,680
40,000 – 80,000	45	5,880
>80,000	48	8,280

Source: OECD (2014).

A special "solidarity tax" amounting to 2.5% applicable to the tax base between EUR 80,000 and EUR 250,000, and 5% if the tax base exceeds EUR 250,000 was introduced in 2012. A local government surtax has also been introduced, amounting to 3.5% if the tax base exceeds the minimum wage (EUR 6,790), with a tax credit of 2.5% of the annual minimum wage per dependent (EUR 170).

According to OECD (2014), monthly benefits for dependent children fall into one of 4 bands, depending on the family's income, which is determined by dividing

the family's annual gross income by the number of dependent children. If the income per child does not exceed EUR 2,935, the monthly benefit amount for a child under 12 months is EUR 141, or EUR 35 for a child older than 1. For families with two children, each next benefit for children between 1 and 3 is EUR 35, and the same benefit for a family with three or more children is EUR 70. Benefit amounts decrease progressively as we go up the band scale. When one reaches the final, fourth, band – families with income per child exceeding EUR 8,804 – the benefit reaches 0. The above benefits increase by 20% for single parents.

3.4.2 Net average tax rate and net average tax wedge in Portugal

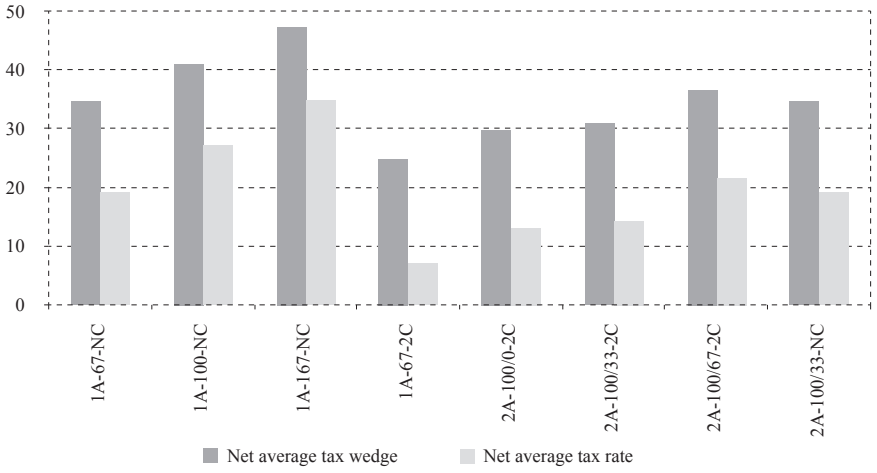
Figure 4 shows the net average tax rate and the net average tax wedge for the eight hypothetical units in Portugal. For detailed calculations, see tables A7 and A8 in the annex.

The taxation system proves to be progressive for single workers without children since the net average tax rate and net average tax wedge increase as the gross wage increases. The net average tax wedge for 1A-167-NC exceeds that of 1A-67-NC by 13 percentage points. The system is also progressive for couples with two children: net average tax wedge for 2A-100/0-2C is 7 percentage points higher than that for 2A-100/67-2C.

Unit 1A-67-2C's net average tax wedge is 10 percentage points lower than unit 1A-67-NC's, while the tax wedge for unit 2A-100/33-2C is 4 percentage points lower than for unit 2A-100/33-NC.

Figure 4

Net average tax wedge and net average tax rate for hypothetical units (Portugal, 2013), in %



Source: Author's calculations based on OECD (2014).

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3.5 SLOVENIA

3.5.1 Basic components of labour income taxation in Slovenia in 2013

The taxable amount on which employee SICs are levied in Slovenia is the gross wage including vacation payments and the remuneration of work-related expenses. Table 12 shows the percentage of employee SICs paid for pension insurance, health insurance, employment insurance, and parental leave insurance. The above items make up 22.1% of employee SICs.

Table 12

Employee SIC rates (Slovenia, 2013)

Contribution	Rate (%)
Pension insurance	15.5
Health insurance	6.36
Unemployment insurance	0.14
Parental leave insurance	0.1
Total	22.1

Source: OECD (2014).

Employer SICs are levied on the gross wage amount. Employer SICs are paid to the same schemes, with a difference in rate as shown in table 13. The total employer SIC rate is 16.1%.

Table 13

Employer SIC rates (Slovenia, 2013)

Contribution	Rate (%)
Pension insurance	8.85
Health insurance	7.09
Unemployment insurance	0.06
Parental leave insurance	0.1
Total	16.1

Source: OECD (2014).

The tax unit in Slovenia is the individual. An annual basic allowance of EUR 3,302 was deductible from income in 2013. When the annual income is lower than EUR 10,866, an additional basic allowance of EUR 3,217 is deductible, and for incomes between EUR 10,866 and EUR 12,571 the amount of EUR 1,116 is deductible. According to Kump, Čok and Majcen (2014), all children under 18 or unemployed children over 18 without own income or if their income is lower than the tax relief applicable to dependent children, as well as children who are still getting a (regular) education and are under 26, are considered to be dependents in Slovenia. The personal allowance applicable to the first child is EUR 2,437, and EUR 2,649 is applicable to the second child.[4] If one of the spouses is unemployed,

[4] The tax reliefs applicable to the third, fourth, fifth, and each next child are EUR 4,419, EUR 6,188, EUR 7,957 and EUR 1,769, respectively, and EUR 8,830 for disabled children.

the other spouse will be entitled to a personal allowance of EUR 2,437 for the dependent family member. Like in all EU members, Slovenian additional pension insurance premiums are not included in the tax base. In 2013, such allowances were limited to an annual EUR 2,819, i.e. 24% of employee SICs paid for compulsory pension insurance. Moreover, taxpayers are entitled to tax-reliefs for various work-related reimbursements, such as those for meals, transportation, business travel, the use of own tools and equipment, as well as bonuses and severance pay.

PIT base is calculated by deducting the total amount of standard allowances and tax reliefs from the gross wage and adding social benefits included in the tax base (if applicable). Tax bands and applicable rates are shown in table 14. The rates applied to the four tax bands, depending on the tax base, are 16%, 27%, 41%, and 50%. There are no regional, local, or payroll taxes (the latter were abolished in 2009).

Table 14
Tax bands (Slovenia, 2013)

Tax base (EUR)	Rate (%)
<8,021	16
8,021 – 18,960	27
18,960 – 70,907	41
>70,907	50

Source: OECD (2014).

According to OECD (2014), as per legislation introduced in 2012, there are benefits for dependent children (up to 18 years of age) if the family's average monthly net income in the previous year did not exceed average net wage. Income in this case comprises net wages, as well as the imputed value from the use of immovable and movable property assessed annually. Child benefits fall into one of the eight income classes, depending on total income: the first class includes families with income under 18% of average net wage; the eighth class includes families with income between 82% and 99% of average net wage. Minor changes were introduced in 2012 (benefits for classes 5 and 6 were reduced by 10%, and those for classes 7 and 8 were abolished). Each child falls into one of three classes (benefits grow as the class increases): the first child pertains to class 1, the second to class 2, while the third child and all subsequent children pertain to class 3. If the child lives in a one-parent family, the benefit is increased by 10%; for a pre-school child who does not attend kindergarten, the amount of the benefit is increased by 20%.

Slovenian taxpayers are also entitled to monthly benefits for children living in two-parent families from birth to the end of primary school – in 2013, the maximum annual amount for children living with both parents was EUR 1,372 for the first child, EUR 1,509 for the second child, and EUR 1,646 for the third and each subsequent child.

3.5.2 Net average tax rate and net average tax wedge in Slovenia

Figure 5 shows the net average tax rate and the net average tax wedge for the eight hypothetical units in Slovenia. For detailed calculations, see tables A9 and A10 in the annex.

The taxation system proves to be progressive for single workers without children since the net average tax rate and net average tax wedge increase as the gross wage increases. The net average tax wedge for 1A-167-NC exceeds that of 1A-67-NC by 8 percentage points. The system can also be said to be progressive for couples with two children: net average tax wedge for 2A-100/0-2C is 11 percentage points higher than that for 2A-100/67-2C.

Unit 1A-67-2C's net average tax wedge is 26 percentage points lower than unit 1A-67-NC's, while the tax wedge for unit 2A-100/33-2C is 10 percentage points lower than for unit 2A-100/33-NC.

FIGURE 5

Net average tax wedge and net average tax rate for hypothetical units (Slovenia, 2013), in %

Source: Author's calculations based on OECD (2014).

4 COMPARISON OF TAX BURDEN ON LABOUR INCOME IN SELECTED COUNTRIES

This chapter compares the net average tax wedge in all five analysed countries. Four of the eight hypothetical units are taken into account: single earners without children earning either 100% of AGW (1A-100-NC) or 167% of AGW (1A-167-NC), and couples where one spouse earns 100%, and the other 33% of AGW, either without children (2A-100/33-NC) or with two children (2A-100/33-2C). Figure 6 outlines parallel results for all hypothetical units.

The lowest net average tax wedge for 1A-100-NC is found in Croatia: 35.2%. Portugal's 41.1% tax wedge is second-lowest, while Slovenia's (42.3%) is third.

The Czech Republic with 42.4% comes fourth, while France has the highest tax wedge: 48.9%.

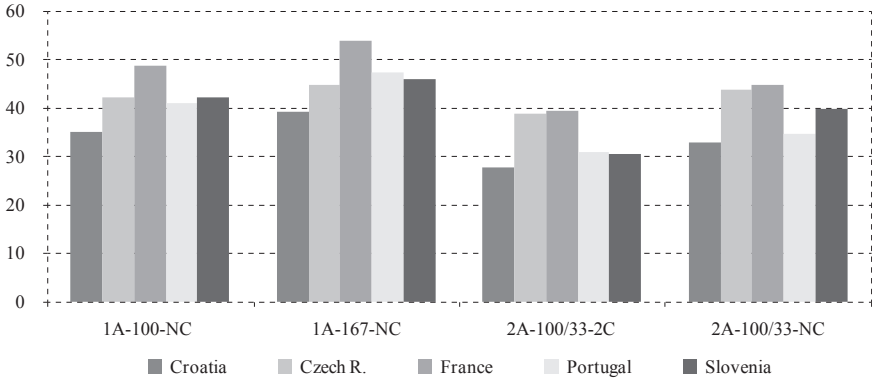
Regarding unit 1A-167-NC, the order is similar to that above: the lowest net average tax wedge, 39.4%, is found in Croatia, with the Czech Republic with 44.9% coming up second, Slovenia with 46.1% third, and Portugal with 47.4% fourth. France has the highest tax wedge in this group, 54.1%. The tax wedge for 1A-167-NC exceeds that for unit 1A-100-NC by several percentage points, showing the progressive nature of the labour taxation system. The smallest difference in tax wedges for 1A-167-NC and 1A-100-NC is found in the Czech Republic (2.5 percentage points), followed by Slovenia (3.8 percentage points), and Croatia (4.2 percentage points). France (5.2 percentage points) is fourth, and Portugal (6.3 percentage points) has the biggest difference.

For unit 2A-100/33-NC, we find that the lowest tax wedge is in Croatia (32.9%) followed by Portugal (34.7%), Slovenia (40%), the Czech Republic (43.9%), and France (44.9%) at the end. For 2A-100/33-2C, the lowest tax wedge is in Croatia (27.8%), followed by Slovenia (30.5%), Portugal (30.9%), and the Czech Republic (38.9%), with France (39.5%) at the end.

As noted above in country analysis, couples and single earners with children are entitled to personal allowances and tax credit for children in the PIT system, plus cash child benefits. This makes their tax liability lower from that of hypothetical units with equal gross income, but without children. The differences in net average tax wedge for 2A-100/33-NC and 2A-100/33-2C are also comparable. The largest difference is found in Slovenia (10 percentage points), followed by France (5 percentage points), Croatia (5 percentage points), and the Czech Republic (5 percentage points). The smallest difference, 4 percentage points, is found in Portugal.

Figure 6

Comparison of net average tax wedge in 2013 for hypothetical units 1A-100-NC, 1A-167-NC, 2A-100/33-NC and 2A-100/33-2C, in %



Source: Author's calculations based on OECD (2014).

5 CONCLUSION

This paper analyses the tax burden on labour income in Croatia, the Czech Republic, France, Portugal and Slovenia. A detailed account of the wage taxation system in all observed countries was made to point out the specific features of their tax systems regarding personal income tax (personal tax allowances, tax credits, tax bands, and tax rates) and social insurance contributions (bases and rates). The methodology and data from OECD's publication Taxing Wages (OECD, 2014) were then applied to each of the countries to analyse net average tax rate and the net average tax wedge.

Tax burden indicator comparison has been made both between and within various countries for the eight hypothetical units which are differentiated according to the number of adults, income level, and number of children. The tax systems of all the chosen countries are progressive: relatively speaking, the tax burden grows as gross wages grow. However, differences in the tax burden between hypothetical units with higher and lower gross income differ among countries.

It was also found that countries alleviated the tax burden for hypothetical units with children relative to hypothetical units without children by introducing allowances, tax credits, and cash family benefits.

Regarding the level of the net average tax wedge, it was found to be highest in France and lowest in Croatia, across all observed hypothetical units.

This analysis has shown that there exists a possibility to "import" some elements from the tax relief and family benefit system in force in other countries into the Croatian system. For instance, Urban (2014) has shown that families earning an average income are not entitled to child benefit, and at the same time, cannot profit from allowances for children, i.e. lower PIT. This problem could be resolved, for instance, by introducing tax credit instruments such as those found in the Czech Republic, where the final tax amount can be negative if the tax credit exceeds the original tax liability (so-called refundable tax credit).

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ANNEX

PERSONAL INCOME TAXATION TABLES FOR HYPOTHETICAL UNITS IN ALL OBSERVED COUNTRIES

Table A1

Personal income taxation for hypothetical units: single earners (Croatia, 2013)

	1A-67-NC	1A-100-NC	1A-167-NC	1A-67-2C
1. Gross wage (EUR)	8,202	12,303	20,506	8,202
2. Employer SICs	1,247	1,870	3,117	1,247
3. Payroll taxes	0	0	0	0
4. Employee SICs	1,640	2,461	4,101	1,640
4.1. Paid into the 1st pension insurance pillar	1,230	1,845	3,076	1,230
4.2. Paid into the 2nd pension insurance pillar	410	615	1,025	410
5. Employee PIT				
5.1. Standard allowances and tax reliefs				
5.1.1. Basic	3,486	3,486	3,486	3,486
5.1.2. For married taxpayers or primary earners	0	0	0	0
5.1.3. For children	0	0	0	4,183
5.1.4. Contributions allowance	0	0	0	0
5.1.5. Work-related expenses	0	0	0	0
5.1.6. Total	3,486	3,486	3,486	7,669
5.2. Cash benefits included in the tax base	0	0	0	0
5.3. Tax base	3,076	6,357	12,919	0
5.4. PIT before tax credit	369	1,136	2,777	0
5.5. Tax credit	0	0	0	0
5.6. PIT after tax credit	369	1,136	2,777	0
5.7. Local government surtax on PIT	44	136	333	0
5.8. Net total personal income taxes	413	1,272	3,110	0
6. Total taxes and employee SICs	2,053	3,733	7,211	1,640
6.1. Tax levies	1,643	3,117	6,186	1,230
6.2. Non-tax levies	410	615	1,025	410
7. Cash family benefits				
7.1. For family members	0	0	0	0
7.2. For children	0	0	0	727
7.3. Total	0	0	0	727
8. Net personal income	6,149	8,570	13,295	6,562
9. Net average tax rate (in %)	20.0	25.3	30.2	6.1
10. Net average tax wedge (in %)	30.6	35.2	39.4	18.5

Note: According to the Taxing Wages methodology (OECD, 2014), employee SICs paid into the 2nd pension insurance pillar are not tax levies. Item no. 6 is therefore divided into tax and non-tax levies, and only tax levies are included in tax burden indicator calculation.

Source: Author's calculations.

Table A2

Personal income taxation for hypothetical units: couples (Croatia, 2013)

	2A-100/ 0-2C	2A-100/ 33-2C	2A-100/ 67-2C	2A-100/ 33-NC
1. Gross wage (EUR)	12,303	16,405	20,506	16,405
2. Employer SICs	1,870	2,493	3,117	2,493
3. Payroll taxes	0	0	0	0
4. Employee SICs	2,461	3,281	4,101	3,281
4.1. Paid into the 1st pension insurance pillar	1,845	2,461	3,076	2,461
4.2. Paid into the 2nd pension insurance pillar	615	820	1,025	820
5. Employee PIT				
5.1. Standard allowances and tax reliefs				
5.1.1. Basic	3,486	6,972	6,972	6,972
5.1.2. For dependents	1,743	0	0	0
5.1.3. For children	4,183	4,183	4,183	0
5.1.4. Contributions allowance	0	0	0	0
5.1.5. Work-related expenses	0	0	0	0
5.1.6. Total	9,412	11,155	11,155	6,972
5.2. Cash benefits included in the tax base	0	0	0	0
5.3. Tax base	431	2,174	5,250	6,357
5.4. PIT before tax credit	52	261	630	1,136
5.5. Tax credit	0	0	0	0
5.6. PIT after tax credit	52	261	630	1,136
5.7. Local government surtax on PIT	6	31	76	136
5.8. Net total personal income taxes	58	292	706	1,272
6. Total taxes and employee SICs	2,519	3,573	4,807	4,553
6.1. Tax levies	1,903	2,753	3,782	3,733
6.2. Non-tax levies	615	820	1,025	820
7. Cash family benefits				
7.1. For family members	0	0	0	0
7.2. For children	632	0	0	0
7.3. Total	632	0	0	0
8. Net personal income	9,785	12,831	15,699	11,851
9. Net average tax rate (in %)	10.3	16.8	18.4	22.8
10. Net average tax wedge (in %)	22.2	27.8	29.2	32.9

Note: See note under table A1.

Source: Author's calculations.

Table A3

Personal income taxation for hypothetical units: single earners (the Czech Republic, 2013)

	1A-67-NC	1A-100-NC	1A-167-NC	1A-67-2C
1. Gross wage (EUR)	7,637	11,455	19,091	7,637
2. Employer SICs	2,596	3,895	6,491	2,596
3. Payroll taxes	0	0	0	0
4. Employee SICs	840	1,260	2,100	840
5. Employee PIT				
5.1. Standard allowances and tax reliefs				
5.1.1. Basic	0	0	0	0
5.1.2. For married taxpayers or primary earners	0	0	0	0
5.1.3. For children	0	0	0	0
5.1.4. Contributions allowance	0	0	0	0
5.1.5. Work-related expenses	0	0	0	0
5.1.6. Total	0	0	0	0
5.2. Cash benefits included in the tax base	0	0	0	0
5.3. Tax base	10,233	15,350	25,582	10,233
5.4. PIT before tax credit	1,535	2,302	3,837	1,535
5.5. Tax credit	952	952	952	1,980
5.6. PIT after tax credit	583	1,350	2,885	-445
5.7. Local government surtax on personal income tax	0	0	0	0
5.8. Net total personal income taxes	583	1,350	2,885	-445
6. Total taxes and employee SICs	1,423	2,610	4,985	395
7. Cash family benefits				
7.1. For family members	0	0	0	0
7.2. For children	0	0	0	1,524
7.3. Total	0	0	0	1,524
8. Net personal income	6,214	8,845	14,106	8,766
9. Net average tax rate (in %)	7.6	11.8	15.1	-5.8
10. Net average tax wedge (in %)	39.3	42.4	44.9	14.3

Source: Author's calculations based on OECD (2014).

Table A4

Personal income taxation for hypothetical units: couples (the Czech Republic, 2013)

	2A-100/ 0-2C	2A-100/ 33-2C	2A-100/ 67-2C	2A-100/ 33-NC
1. Gross wage (EUR)	11,455	15,273	19,091	15,273
2. Employer SICs	3,895	5,193	6,491	5,193
3. Payroll taxes	0	0	0	0
4. Employee SICs	1,260	1,680	2,100	1,680
5. Employee PIT				
5.1. Standard allowances and tax reliefs				
5.1.1. Basic	0	0	0	0
5.1.2. For married taxpayers or primary earners	0	0	0	0
5.1.3. For children	0	0	0	0
5.1.4. Contributions allowance	0	0	0	0
5.1.5. Work-related expenses	0	0	0	0
5.1.6. Total	0	0	0	0
5.2. Cash benefits included in the tax base	0	0	0	0
5.3. Tax base	15,349	20,466	25,582	20,466
5.4. PIT before tax credit	2,302	3,070	3,837	3,070
5.5. Tax credit	2,933	1,980	1,980	952
5.6. PIT after tax credit	-630	1,090	1,857	2,118
5.7. Local government surtax on personal income tax	0	0	0	0
5.8. Net total personal income taxes	-630	1,090	1,857	2,118
6. Total taxes and employee SICs	630	2,770	3,957	3,798
7. Cash family benefits				
7.1. For family members	0	0	0	0
7.2. For children	1,378	1,118	818	0
7.3. Total	1,378	1,118	818	0
8. Net personal income	12,203	13,621	15,952	11,475
9. Net average tax rate (in %)	-5.5	7.1	9.7	13.9
10. Net average tax wedge (in %)	29.5	38.9	40.8	43.9

Source: Author's calculations based on OECD (2014).

TABLE A5

Personal income taxation for hypothetical units: single earners (France, 2013)

	1A-67-NC	1A-100-NC	1A-167-NC	1A-67-2C
1. Gross wage (EUR)	24,653	36,980	61,633	24,653
2. Employer SICs	8,685	14,851	27,020	8,685
3. Payroll taxes	0	0	0	0
4. Employee SICs	3,402	5,103	8,099	3,402
5. Employee PIT				
5.1. Standard allowances and tax reliefs				
5.1.1. Basic	0	0	0	0
5.1.2. For married taxpayers or primary earners	0	0	0	0
5.1.3. For children	0	0	0	0
5.1.4. Contributions allowance	4,637	6,956	11,188	4,637
5.1.5. Work-related expenses	2,002	3,002	5,045	2,002
5.1.6. Total	6,639	9,959	16,232	6,639
5.2. Cash benefits included in the tax base	0	0	0	0
5.3. Tax base	18,014	27,021	45,401	18,014
5.4. PIT before tax credit	3,110	5,402	12,854	1,938
5.5. Tax credit	0	0	0	72
5.6. PIT after tax credit	3,110	5,402	12,854	1,866
5.7. Local government surtax on personal income tax	0	0	0	0
5.8. Net total personal income taxes	3,110	5,402	12,854	1,866
6. Total taxes and employee SICs	6,512	10,506	20,953	5,268
7. Cash family benefits				
7.1. For family members	0	0	0	0
7.2. For children	0	0	0	1,538
7.3. Total	0	0	0	1,538
8. Net personal income	18,141	26,475	40,680	20,924
9. Net average tax rate (in %)	12.6	14.6	20.9	7.6
10. Net average tax wedge (in %)	45.6	48.9	54.1	37.2

Source: Author's calculations based on OECD (2014).

Table A6

Personal income taxation for hypothetical units: couples (France, 2013)

	2A-100/ 0-2C	2A-100/ 33-2C	2A-100/ 67-2C	2A-100/ 33-NC
1. Gross wage (EUR)	36,980	49,307	61,633	49,307
2. Employer SICs	14,851	16,597	23,536	16,597
3. Payroll taxes	0	0	0	0
4. Employee SICs	5,103	6,804	8,505	6,804
5. Employee PIT				
5.1. Standard allowances and tax reliefs				
5.1.1. Basic	0	0	0	0
5.1.2. For married taxpayers or primary earners	0	0	0	0
5.1.3. For children	0	0	0	0
5.1.4. Contributions allowance	6,956	9,275	11,594	9,275
5.1.5. Work-related expenses	3,002	4,003	5,004	4,003
5.1.6. Total	9,959	13,278	16,598	13,278
5.2. Cash benefits included in the tax base	0	0	0	0
5.3. Tax base	27,021	36,029	45,036	36,029
5.4. PIT before tax credit	3,140	4,859	7,100	6,220
5.5. Tax credit	0	722	0	0
5.6. PIT after tax credit	3,140	4,137	7,100	6,220
5.7. Local government surtax on personal income tax	0	0	0	0
5.8. Net total personal income taxes	3,140	4,137	7,100	6,220
6. Total taxes and employee SICs	8,243	10,942	15,605	13,024
7. Cash family benefits				
7.1. For family members	0	0	0	0
7.2. For children	1,538	1,538	1,538	0
7.3. Total	1,538	1,538	1,538	0
8. Net personal income	30,275	39,903	47,566	36,283
9. Net average tax rate (in %)	8.5	8.4	11.5	12.6
10. Net average tax wedge (in %)	41.6	39.5	44.2	44.9

Source: Author's calculations based on OECD (2014).

TABLE A7

Personal income taxation for hypothetical units: single earners (Portugal, 2013)

	1A-67-NC	1A-100-NC	1A-167-NC	1A-67-2C
1. Gross wage (EUR)	11,557	17,335	28,892	11,557
2. Employer SICs	2,745	4,117	6,862	2,745
3. Payroll taxes	0	0	0	0
4. Employee SICs	1,271	1,907	3,178	1,271
5. Employee PIT				
5.1. Standard allowances and tax reliefs				
5.1.1. Basic	4,104	4,104	4,104	4,104
5.1.2. For married taxpayers or primary earners	0	0	0	0
5.1.3. For children	0	0	0	0
5.1.4. Contributions allowance	0	0	0	0
5.1.5. Work-related expenses	0	0	0	0
5.1.6. Total	4,104	4,104	4,104	4,104
5.2. Cash benefits included in the tax base	0	0	0	0
5.3. Tax base	7,453	13,231	24,788	7,453
5.4. PIT before tax credit	1,144	2,791	6,492	1,144
5.5. Tax credit	214	214	214	760
5.6. PIT after tax credit	954	2,803	6,908	384
5.7. Local government surtax on personal income tax	0	0	0	0
5.8. Net total personal income taxes	954	2,803	6,908	384
6. Total taxes and employee SICs	2,225	4,710	10,086	1,655
7. Cash family benefits				
7.1. For family members	0	0	0	0
7.2. For children	0	0	0	841
7.3. Total	0	0	0	841
8. Net personal income	9,332	12,626	18,806	10,742
9. Net average tax rate (in %)	8.3	16.2	23.9	3.3
10. Net average tax wedge (in %)	34.7	41.1	47.4	24.9

Source: Author's calculations based on OECD (2014).

Table A8

Personal income taxation for hypothetical units: couples (Portugal, 2013)

	2A-100/ 0-2C	2A-100/ 33-2C	2A-100/ 67-2C	2A-100/ 33-NC
1. Gross wage (EUR)	17,335	23,114	28,892	23,114
2. Employer SICs	4,117	5,490	6,862	5,490
3. Payroll taxes	0	0	0	0
4. Employee SICs	1,907	2,543	3,178	2,543
5. Employee PIT				
5.1. Standard allowances and tax reliefs				
5.1.1. Basic	4,104	8,208	8,208	8,208
5.1.2. For dependents	0	0	0	0
5.1.3. For children	0	0	0	0
5.1.4. Contributions allowance	0	0	0	0
5.1.5. Work-related expenses	0	0	0	0
5.1.6. Total	4,104	8,208	8,208	8,208
5.2. Cash benefits included in the tax base	0	0	0	0
5.3. Tax base	13,231	14,906	20,684	14,906
5.4. PIT before tax credit	1,919	2,288	3,935	2,288
5.5. Tax credit	855	855	855	428
5.6. PIT after tax credit	1,064	1,433	3,080	1,907
5.7. Local government surtax on personal income tax	0	0	0	0
5.8. Net total personal income taxes	1,064	1,433	3,080	1,907
6. Total taxes and employee SICs	2,970	3,976	6,258	4,450
7. Cash family benefits				
7.1. For family members	0	0	0	0
7.2. For children	701	637	0	0
7.3. Total	701	637	0	0
8. Net personal income	15,065	19,775	22,634	18,664
9. Net average tax rate (in %)	6.1	6.2	10.7	8.3
10. Net average tax wedge (in %)	29.8	30.9	36.7	34.7

Source: Author's calculations based on OECD (2014).

TABLE A9

Personal income taxation for hypothetical units: single earners (Slovenia, 2013)

	1A-67-NC	1A-100-NC	1A-167-NC	1A-67-2C
1. Gross wage (EUR)	11,740	17,611	29,351	11,740
2. Employer SICs	1,890	2,835	4,725	1,890
3. Payroll taxes	0	0	0	0
4. Employee SICs	2,595	3,892	6,487	2,595
5. Employee PIT				
5.1. Standard allowances and tax reliefs				
5.1.1. Basic	4,419	3,303	3,303	4,419
5.1.2. For married taxpayers or primary earners	0	0	0	0
5.1.3. For children	0	0	0	5,086
5.1.4. Contributions allowance	2,595	3,892	6,487	2,595
5.1.5. Work-related expenses	0	0	0	0
5.1.6. Total	7,013	7,195	9,789	12,099
5.2. Cash benefits included in the tax base	0	0	0	0
5.3. Tax base	4,727	10,416	19,562	0
5.4. PIT before tax credit	756	1,930	4,483	0
5.5. Tax credit	0	0	0	0
5.6. PIT after tax credit	756	1,930	4,483	0
5.7. Local government surtax on personal income tax	0	0	0	0
5.8. Net total personal income taxes	756	1,930	4,483	0
6. Total taxes and employee SICs	3,351	5,822	10,970	2,595
7. Cash family benefits				
7.1. For family members	0	0	0	0
7.2. For children	0	0	0	2,716
7.3. Total	0	0	0	2,716
8. Net personal income	8,389	11,789	18,381	11,862
9. Net average tax rate (in %)	6.4	11.0	15.3	0.0
10. Net average tax wedge (in %)	38.5	42.3	46.1	13.0

Source: Author's calculations based on OECD (2014).

Table A10

Personal income taxation for hypothetical units: couples (Slovenia, 2013)

	2A-100/ 0-2C	2A-100/ 33-2C	2A-100/ 67-2C	2A-100/ 33-NC
1. Gross wage (EUR)	17,611	23,481	29,351	23,481
2. Employer SICs	2,835	3,780	4,725	3,780
3. Payroll taxes	0	0	0	0
4. Employee SICs	3,892	5,189	6,487	5,189
5. Employee PIT				
5.1. Standard allowances and tax reliefs				
5.1.1. Basic	3,303	7,876	7,721	7,876
5.1.2. For dependents	2,437	0	0	0
5.1.3. For children	5,086	5,086	5,086	0
5.1.4. Contributions allowance	3,892	5,189	6,487	5,189
5.1.5. Work-related expenses	0	0	0	0
5.1.6. Total	14,718	18,151	19,294	13,065
5.2. Cash benefits included in the tax base	0	0	0	0
5.3. Tax base	2,893	5,330	10,057	10,416
5.4. PIT before tax credit	463	853	1,609	1,930
5.5. Tax credit	0	0	0	0
5.6. PIT after tax credit	463	853	1,609	1,930
5.7. Local government surtax on personal income tax	0	0	0	0
5.8. Net total personal income taxes	463	853	1,609	1,930
6. Total taxes and employee SICs	4,355	6,042	8,096	7,119
7. Cash family benefits				
7.1. For family members	0	0	0	0
7.2. For children	701	637	0	0
7.3. Total	701	637	0	0
8. Net personal income	15,065	19,775	22,634	18,664
9. Net average tax rate (in %)	6.1	6.2	10.7	8.3
10. Net average tax wedge (in %)	29.8	30.9	36.7	34.7

Source: Author's calculations based on OECD (2014).

Tax wedge in Croatia, Italy, Ireland, the Netherlands and Spain

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Abstract

Each country has a unique tax system, comprising a number of components reflecting the taxation and economic policy of a country. The aim of this paper is to analyse and compare the tax burden on labour income in Croatia, Italy, Spain, Ireland and the Netherlands while observing various family types and gross wages. The results show that, of all the countries observed, Italy has the highest tax wedge. When it comes to most of the observed families' and single workers' tax wedges, Croatia falls somewhere in the middle, while Ireland stands out for having a relatively low tax wedge.

Keywords: taxation of labour income, progressivity, tax wedge, net average tax rate, Croatia, Italy, Spain, Ireland, the Netherlands

1 INTRODUCTION

One of the determinants of each modern country is its tax system. The efficiency of the tax system can have a significant effect on the economy, economic development level, income structure of the population, the employment and unemployment rates, as well as the citizens' satisfaction level. There is no generally accepted way of collecting taxes; for instance, each EU country's tax system is unique.

The aim of this paper is to analyse the tax burden on labour income in Croatia and selected EU countries – Italy, Spain, Ireland and the Netherlands – and compare their respective tax burdens in 2013 on the basis of certain tax burden indicators. This parallel analysis is based on the Taxing Wages methodology and constitutes a part of the research project described in Urban (2016).

The principal question is: how does the tax burden correlate with gross wage, family type, and the number of children? In addition, this paper aims to establish the similarities and differences in the personal income tax (PIT) systems and the social insurance contribution (SIC) payments in selected EU countries.

The results show that the tax wedge indeed depends on the level of income from employment, it is inversely proportional to the number of children, and it differs among the same family types in different countries. Furthermore, looking at different gross wages, it is evident that the contributions amounts differ among countries and that the contributions burden is distributed between the employer and employee in different ways, which can also have an impact on the final tax wedge amount.

In section 2 of the paper, the relevant terms are defined, the model according to which indicators are calculated are outlined, and the basic tenets are introduced. Section 3 contains an overview of labour income taxation per country, first describing the general taxation structure in a certain country and then showing the calculations for 2013. The results are compared in section 4, followed by the conclusion.

2 METHODOLOGY: MODEL AND INDICATORS

The methodology used in this paper for the calculation of tax burden indicators and other variables necessary for their calculation is based on the OECD publication Taxing Wages (OECD, 2014). Even though the tax systems differ from one country to another, it is possible to directly compare certain indicators. This paper describes the tenets and the model used to compare those indicators across different countries.

The four observed family types are: single workers, couples without children, couples with two children and single parents with two children. In this context, "single worker" means an individual living without a partner, of either sex, while a "couple" means a married couple. For a couple or single worker with two children, the children are assumed to be between six and eleven, inclusive, and without own income. According to OECD (2014), eight hypothetical units are defined and their characteristics are shown in table 1.

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	Unemployed
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 line with OECD (2014), the family is assumed to have no income source other than full-time employed adult members' gross wage. Different amounts of annual gross wage (AGW) are included in the analysis. More specifically, the model, as well as this paper, uses 1/3 of AGW (33%), 2/3 of AGW (67%), and 5/3 of AGW (167%) (see Urban, 2016). Table 2 presents AGW amounts used in this research. The amounts refer to 2013.

Social insurance contributions (SICs), unlike taxes, are dedicated public revenue. SICs payments are made to health and pension insurance and they are paid both by employers and employees in the manner determined by the country in question. The term *labour cost* denotes the sum of the gross wage and *employer SICs*, while *net wage* means the gross wage minus *employee SICs* and personal income tax (PIT).

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
Italy	EUR 29,704	1	29,704
Spain	EUR 26,027	1	26,027
Ireland	EUR 32,381	1	32,381
Netherlands	EUR 48,109	1	48,109

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).

The term *income* represents the taxable amount; in some countries, the *personal allowance* is deducted from the income to get the tax base. Personal allowance can comprise the basic allowance, child allowance, allowance for dependents, etc. Another type of tax relief is *tax credit*: unlike personal tax allowances, tax credits are reductions made after the application of tax rates, and can also comprise different components: basic tax credit, tax credit for children, etc. Tax credit is granted in all observed countries except Croatia. Apart from the above, the analysis also covers cash family benefits granted by all levels of government.

Net average tax rate is the term used to denote the share of the sum of total personal income taxes and employee SICs, net of cash family benefits, in the gross wage. *Net average tax wedge* (or tax wedge) is the share of all taxes and SICs, net of cash family benefits, in the labour cost (Urban, 2016).

The tax wedge calculation in this paper is applied only to income from employment, specifically on wages. The taxation of other types of income from employment, such as income from self-employment and second income, has not been taken into account.

All of the observed countries apply a progressive tax schedule, meaning that the net average tax rate imposed on an individual grows as their income increases (IJF, 2016). Apart from the PIT, other taxes can be levied, such as local taxes, municipal taxes, city taxes, etc.

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 plays a role in the tax burden calculation and the latter does not. For more information about this topic, see Urban (2016), Blažić and Trošelj (2012), OECD (2014, 2015).

3 TAXATION OF LABOUR INCOME IN SELECTED COUNTRIES

3.1 CROATIA

3.1.1 Basic components of labour income taxation in Croatia

SICs comprise employee SICs, payable by employees, and employer SICs, payable by employers. The employee SIC rate is 20%: 15% is allocated to the 1st pillar, while 5% is allocated to the 2nd pillar. Employer SICs, calculated and paid by the employer, comprise health insurance contributions (13%), work-related injury contributions (0.5%), and employment contributions (1.7%), adding up to 15.2% of gross wage in 2013 (Social Insurance Contributions Act, 2012).

Personal income taxpayers are all individuals earning a personal income. Personal income can come from the following six sources: employment, self-employment, property and property rights, capital, insurance and other (Personal Income Tax Act, 2015). As noted above, the applied model allows that only income from employment (wages) be taken into account.

Taxpayers are granted a personal allowance in order to reduce the tax base (table 3).[1] Disability allowances also apply, but they have not been taken into account in this research.

Table 3

Taxpayer personal allowance (Croatia, 2013)

Personal allowance	Factor	Annual amount (EUR)
Basic personal allowance	1.0	3,486
Adult dependent	0.5	1,744
First child	0.5	1,744
Second child	0.7	2,441
Third child	1.0	3,487
Fourth child	1.4	4,882
Fifth child	1.9	6,626

Source: Personal Income Tax Act (2012).

The total personal allowances granted are the sum of all allowances the taxpayer is entitled to. When the personal tax allowance is subtracted from the income, the tax base is obtained to which tax rates are applied progressively.

Table 4

Annual tax bands and tax rates (Croatia, 2013)

Annual tax base (EUR)	Rate (%)
Up to 3,487	12
3,487 – 13,950	25
Over 13,950	40

Source: Personal Income Tax Act (2012).

[1] This paper does not take into account areas of special state concern and mountainous areas where special personal allowance rates apply.

A progressive tax schedule is applied, meaning that the final PIT equals the sum of tax amounts per tax band, these tax amounts resulting from the relevant tax rates being applied to relevant tax bands (table 4). This means that amounts falling into the first band up to EUR 3,487 of the tax base are multiplied by 0.12, the following EUR 10,463 (i.e. tax base amounts falling between EUR 3,487 and EUR 13,950) by 0.25, and tax bases exceeding that amount are multiplied by 0.4. The sum of the products is PIT.

Apart from PIT, taxpayers also pay local government surtax, which is a tax that local government units (cities and municipalities) may or may not introduce. Local government surtax is a percentage of PIT (the percentage being determined by the city/municipality) (Personal Income Tax Act, 2012). This paper assumes a local government surtax rate of 12%.

Single parents and couples with children meeting specific conditions are entitled to cash family benefits, i.e. child benefit. According to the Croatian Pension Insurance Institute (HZMO, 2016), a beneficiary is entitled to child benefit if their total monthly personal income earned in the previous calendar year per household member does not exceed 50% of the budget basis. The monthly budget basis is determined for each year in accordance with the Croatian State Budget Execution Act. Thus, in 2013, the budget basis was EUR 439.[2] The child benefit amount depends on the total net monthly personal income per household member.[3] If the total net monthly personal income per family member does not exceed 16.33% of the budget basis, child benefit will amount to 9% of the budget basis per child; if the total net monthly personal income per household member is between 16.34% and 33.66% of the budget basis, the child benefit will amount to 7.5% of the budget basis per child; if the total net monthly personal income per household member falls between 33.67% and 50% of the budget basis, the granted child benefit will be equal to 6% of the budget basis per child. Moreover, the benefit for a child living in a one-parent household is increased by 15%.

3.1.2 Tax wedge in Croatia

A microsimulation model for hypothetical units (table 1) was made to calculate tax burden indicators for Croatia in 2013. The model uses set parameters to calculate SICs, PIT, local government surtax and cash family benefits, as well as net average tax rate and net average tax wedge.

As has been shown above, average monthly gross wage in 2013, according to the Croatian Bureau of Statistics (CBS, 2014), was EUR 1,025, or EUR 12,303 annually. It should be noted that 1/3 of AGW, used as a parameter in the case of hypothetical units 2A-100/33-2C and 2A-100/33-NC, is not in accordance with the 2013 Minimum Wage Act: 1/3 of AGW amounts to EUR 342, which is lower than

[2] According to the Croatian State Budget Execution Act for 2013.
[3] For persons earning personal income from employment (employees), net personal income equals gross wage minus employee SICs and PIT (including local government surtax).

the minimum gross wage (2013 minimum gross wage amounted to EUR 394). However, this amount is used in the calculation of the indicators for hypothetical units in order to meet the OECD (2014) methodology.

When calculating the amount of child benefit it is assumed that the family's net personal income in the preceding year was the same as in 2013. Therefore, for a single worker with two children earning 67% of AGW (1A-67-2C), the amount of child benefit is EUR 727 per year (consisting of the basic amount of EUR 632 and additional EUR 95 to which a beneficiary is entitled as a single parent). For a couple with two children where one spouse earns 100% of AGW and the other is without income (2A-100/0-2C), the yearly child benefit amounts to EUR 632.

For a detailed calculation of tax burden indicators in Croatia in 2013, see tables A1 and A2 in the annex. Figure 1 shows the net average tax wedge and net average tax rate for all eight hypothetical units.

The progressive nature of personal income taxation is evident. The net average tax wedge for a single worker earning 100% of AGW (1A-100-NC) exceeds that of a single worker earning 67% of AGW (1A-67-NC), but not the tax wedge of a single worker earning 167% of AGW (1A-167-NC). In the case of a single parent with two children (1A-67-2C), it can be seen that the tax wedge of this unit is lower than that of a single worker without children earning the same gross wage (1A-67-NC).

The analysis of tax wedges for couples with and without children (table A2) shows significantly smaller amounts of PIT and local government surtax. When calculating total payable taxes, spouses are treated as separate tax units: each spouse will pay a certain amount of PIT, depending on their gross wages, while the child allowance will in this case be granted to the spouse who earns a higher annual gross wage (100% of AGW). Final household outlays paid from the gross wage are the sum of each partner's outlays.

The tax wedge for single workers with two children earning gross wages amounting to 67% of AGW (1A-67-2C) is 18.5% (figure 1), which is significantly less than the tax wedge of a single worker without children earning 67% of AGW (1A-67-NC). The tax wedge for couples with children is notably lower: the tax wedge for a couple with two children earning gross wages amounting to 100% and 33% of AGW (2A-100/33-2C) is 5.1 percentage points lower than the tax wedge for a couple without children earning the same gross wage (100% and 33% of AGW) (2A-100/33-NC). If the tax wedge of a single worker without children earning 100% of AGW (1A-100-NC) and that of a couple with children with only one spouse earning an income, also amounting to 100% of AGW (2A-100/0-2C), are compared, it can be observed that the tax wedge of a taxpayer supporting a spouse and two children falls by 13 percentage points due to an increase in personal tax allowance and granted child benefit.

Figure 1

Net average tax wedge and net average tax rate for hypothetical units (Croatia, 2013), in %

Source: Author's calculations.

3.2 ITALY

3.2.1 Basic components of labour income taxation in Italy

According to OECD (2014), employee SICs rate in Italy is 9.49% on gross wages up to EUR 45,530, 10.49% on wages between EUR 45,530 and EUR 99,034, and a fixed amount of EUR 10,072 is paid on wages exceeding the latter amount. Employer SICs rate is 32.08% on wages up to EUR 99,034 annually. For earnings exceeding that amount the employer pays a fixed amount of EUR 31,770 per year.

Personal income tax reliefs are available in the form of tax credits, the amounts of which depend on income bands (tables 5 and 6).

Table 5

Yearly basic tax credit, in EUR (Italy, 2013)

Taxable income	Basic personal credit
Up to 8,000	1,840
8,001 – 15,000	max + 502 * (15,000 – taxable income)/7,000
15,001 – 55,000	max * (55,000 – taxable income)/40,000
Over 55,000	0

Source: OECD (2014).

The child tax credit is calculated as a function of taxable income, as follows:

– Tax credit for families with one child:

$$CTC1 = 950 * (95{,}000 - \textit{taxable income})/95{,}000. \quad (1)$$

– For families with more than one child, the amount of 95,000 in equation (1) is increased by 15,000 for each child other than the first; the amounts for all children are summed up.

– Families with more than 3 children are entitled to an additional tax credit of EUR 200 per child.

Table 6
Yearly basic tax credit, in EUR (Italy, 2013), continued

Taxable income band	Maximum amount
8,001 – 15,000	1,338
15,001 – 23,000	1,338
23,001 – 24,000	1,348
24,001 – 25,000	1,358
25,001 – 26,000	1,368
26,001 – 27,000	1,378
27,001 – 28,000	1,363
28,001 – 55,000	1,338

Source: OECD (2014).

Table 7 shows tax credit amounts for a dependent spouse and for different taxable income amounts.

Table 7
Yearly tax credit for a dependent spouse, in EUR (Italy, 2013)

Taxable income band	Tax credit
Up to 15,000	800 – 110 * taxable income/15,000
15,001 – 29,000	690
29,001 – 29,200	700
29,201 – 34,700	710
34,701 – 35,000	720
35,001 – 35,100	710
35,101 – 35,200	700
35,201 – 40,000	690
40,001 – 80,000	690 * (80,000 – taxable income)/40,000
Over 80,000	0

Source: OECD (2014).

A five-band system is in place in Italy, as shown in table 8. For instance, a 38% tax rate is applied to the portion of tax base between EUR 28,000 and EUR 55,000 per year.

Table 8
Tax bands and tax rates (Italy, 2013)

Tax band (in EUR)	Rate (%)
Up to 15,000	23
15,000 – 28,000	27
28,000 – 55,000	38
55,000 – 75,000	41
Over 75,000	43

Source: OECD (2014).

Regional and local taxes also apply. Their amount is a percentage of taxable income, depending on the region.

3.2.2 Tax wedge in Italy

The model uses regional and local tax rates of 1.73% and 0.9%, corresponding to the rates applied in Rome. Therefore, total tax is the sum of PIT after the application of tax credits and total local tax amounting to 2.63%. Both spouses' personal incomes are taxed separately.

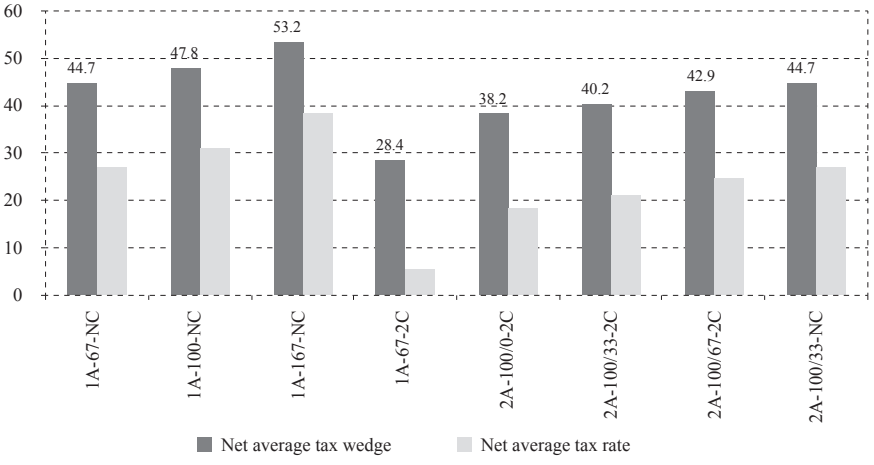
Tables A3 and A4 in the annex present a detailed calculation of tax burden indicators in Italy in 2013. Figure 2 shows the net average tax wedge and net average tax rate for all eight hypothetical units.

The tax burden imposed on single workers earning 167% of AGW (1A-167-NC) is a high 53.2% (table A3). However, the tax wedge for a single parent (1A-67-2C) is significantly smaller (28.4%): apart from receiving tax credit for two children, this hypothetical unit is also entitled to cash family benefits.

If the data on hypothetical units with children and those without children (figure 2) are compared, the impact of tax reliefs and cash family benefits on the tax wedge becomes evident. The tax wedge increases with the gross wage, pointing to the fact that the tax system is progressive (compare units 1A-67-NC, 1A-100-NC and 1A-167-NC; also compare units 2A-100/0-2C, 2A-100/33-2C and 2A-100/67-2C).

Figure 2

Net average tax wedge and net average tax rate for hypothetical units (Italy, 2013), in %



Source: Author's calculations based on OECD (2014).

3.3 SPAIN

3.1.1 Basic components of labour income taxation in Spain

According to OECD (2014) and Adiego et al. (2014), employee SICs in Spain (6.35% of gross wage) are dedicated to old age pension and sick leave, unemployment and professional training schemes, while employer SICs (29.9%) comprise old age pension and sick leave, work-related accidents, wages fund, and professional training. A lower (EUR 9,036) and upper ceiling (EUR 41,108.40) are taken into account when assessing SICs rates.

Spanish spouses can choose how they prefer to be taxed: by imposing taxes on total household income or on each partner's income separately. Couples taxed jointly may claim a tax allowance of EUR 3,400, while a single parent may claim EUR 2,150. Work-related expenses (WRE) can also be deducted from income (gross wage minus employee SICs) as follows:

- For income less than or equal to EUR 9,180 per year: WRE = EUR 4,080.
- For income between EUR 9,180.01 and EUR 13,260:

$$\text{WRE} = 4{,}080 - 0.35 * (\textit{net income} - 9{,}180). \quad (2)$$

- For income exceeding EUR 13,260: WRE = EUR 2,652.

The exempt income is EUR 5,151, the same amount being granted for individuals and families filing jointly. Allowance of EUR 1,836 is granted for the first child and EUR 2,040 for the second. Child allowances are shared equally between spouses when their incomes are taxed separately.

Apart from the standard personal income taxes, regional taxes are also applied.

Tables 9 and 10 show tax bands and relevant PIT and regional tax rates.

Table 9
Tax bands and tax rates (Spain, 2013)

Taxable income (in EUR)	Rate (%)
Up to 17,707.20	12.75
17,707.20 – 33,007.20	16.00
33,007.20 – 53,407.20	21.50
53,407.20 – 120,000.20	25.50
120,000.20 – 175,000.20	27.50
175,000.20 – 300,000.20	29.50
Over 300,000.20	30.50

Source: OECD (2014).

Family cash benefits are granted for dependent children: EUR 291 for families with one child and AGW below EUR 11,490.43, and EUR 582 for families with 2 children and with AGW below EUR 13,213.99.

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TABLE 10

Regional tax bands and tax rates (Spain, 2013)

Taxable income (in EUR)	Rate (%)
Up to 17,707.20	12.00
17,707.20 – 33,007.20	14.00
33,007.20 – 53,407.20	18.50
Over 53,407.20	21.50

Source: OECD (2014).

3.2.2 Tax wedge in Spain

In the OECD (2014) model, each spouse's income is taxed separately, apart from where one spouse's income amounts to 0, meaning that this couple is granted a tax relief of EUR 3,400 per year. A single parent, moreover, is granted a tax relief of EUR 2,150 per year. Any non-standard tax reliefs have not been taken into account.

Tables A5 and A6 in the annex show a detailed calculation of tax burden indicators in Spain in 2013. Figure 3 shows the net average tax wedge and net average tax rate for all eight hypothetical units.

Similarly to the first two countries, Croatia and Italy, the tax burden in Spain is higher for taxpayers earning a higher income. Moreover, the tax wedge of a single parent with two children and earning a gross wage amounting to 67% of AGW (1A-67-2C) is 6.9 percentage points lower than the tax wedge of a single worker earning 67% of AGW (1A-67-NC).

FIGURE 3

Net average tax wedge and net average tax rate for hypothetical units (Spain, 2013), in %

Source: Author's calculations based on OECD (2014).

Evidently, supports for children in Spain, unlike in the case of Croatia and Italy, are not high: for example, the difference between the tax wedge for a couple with children 2A-100/67-2C and a couple without children 2A-100/33-NC is very low, only 1.1 percentage points (figure 3).

3.4 IRELAND

3.4.1 Basic components of labour income taxation in Ireland

It could be said that the Irish tax system was somewhat different from the tax systems observed so far: the total gross wage amount is taxable, while cash family benefits can, in some cases, be relatively high. Moreover, Ireland has a unique *Pay Related Social Insurance* (PRSI) applicable to almost all employees and employers and payable to the national social insurance. The employee shall therefore pay benefits amounting to 4% of gross wage unless the gross wage is under the annual EUR 18,304 threshold, while the employer shall pay a total of 10.75%. These PRSI contributions can fall into one of several categories, depending on the type of work and income amount (for more details, see OECD, 2014 and O'Donoghue, 2014).[4]

Apart from PIT, *Universal Social Charge* (USC), similar to healthcare contribution, is levied at a certain rate. The USC rate is income-tested:

- On income up to EUR 10,036 per year: at 2%.
- On income between EUR 10,036 and EUR 16,016: at 4%.
- On income exceeding EUR 16,016: at 7%.

Table 11

Tax bands and tax rates (Ireland, 2013)

Taxable income (in EUR)				Rate (%)
Single worker	Married couple (single income)	Married couple (two incomes)	Single parent	
Up to 32,800	Up to 41,800	Up to a minimum threshold of (41,800 + lower income) and 65,600	Up to 36,800	20
Other				40

Source: OECD (2014).

Table 11 shows the tax rates applicable to different tax bands. A 20% rate is applied to single workers' income up to EUR 32,800 per year, the income of a married couple receiving only one wage capped at an annual EUR 41,800, and a single parent's income limited to EUR 36,800 per year, while there is no set limit for a couple with two incomes: the threshold of the first tax band for a married couple where both spouses earn a wage is either EUR 65,600 or the lesser income plus

[4] See also: Anon (2016).

EUR 41,800, whichever is lower. Any income exceeding these amounts is taxable at a rate of 40%.

The basic tax credit for an individual is EUR 1,650 per year, or double that amount, i.e. EUR 3,300, for a married couple. Moreover, every worker is entitled to an additional tax credit of EUR 1,650, and a single parent can claim an extra EUR 1,650 in addition to the above. A special tax credit of EUR 180 can be claimed by households in which one spouse does not earn an income while taking care of children, an elderly person, or another family member (OECD, 2014).

Universal child benefit amounts to EUR 1.560 per child yearly. Low-income families can also claim income-tested cash benefit. A family with two children would thus be entitled to a benefit, B, amounting to:

$$B = 0.6 * (31{,}304 - income) \tag{3}$$

3.4.2 Tax wedge in Ireland

Tables A7 and A8 in the annex show a detailed calculation of tax burden indicators in Ireland in 2013. Figure 4 shows the net average tax wedge and net average tax rate for all eight hypothetical units.

Figure 4 shows a tax burden lower than what could be expected on the basis of the analysis of the Irish tax system. Notwithstanding the fact that the tax base comprises the entire gross wage amount, and that the tax rates are high, the net average tax wedge and net average tax rate in Ireland are significantly lower than those in the countries observed so far. This is due to tax credits and relatively high amounts of cash benefits which can even exceed total taxes under certain conditions.

Figure 4

Net average tax wedge and net average tax rate for hypothetical units (Ireland, 2013), in %

Source: Author's calculations based on OECD (2014).

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The case of a single parent with two children earning a gross wage amounting to 67% of AGW (1A-67-2C, figure 4) is particularly interesting. The applicable tax wedge is drastically lower than that of a taxpayer without children earning a gross wage of 67% of AGW (1A-67-NC): it is as low as -24.9%. This unusual negative rate, which is not typical for the countries observed so far, is due to cash family benefits and total tax credits. The net average tax rate is markedly low and negative, amounting to -38.3%. The only outlays are USC payments and a smaller amount for employee SICs. Figure 4 also shows that a couple with two children will have a lower tax burden than a couple without children. A couple where one spouse is a dependent and the other earns 100% of AGW (2A-100/0-2C) is also entitled to higher state supports, leading to significantly lower total tax and a tax wedge of only 6.8%.

3.5 THE NETHERLANDS

3.5.1 Basic components of labour income taxation in the Netherlands

The Dutch tax system is specific in some of its features. Employee SICs to the general unemployment fund are 0% for gross wages between EUR 17,501 and EUR 50,853. Employers pay a premium for their employees' unemployment and disability. An employee will pay EUR 1.250 per year for basic health insurance to a self-chosen private health insurance company; however, this contribution is not considered in the calculation of tax burden indicators because it represents a non-tax compulsory payment (see Urban, 2016). Old age pension contribution rate stands at 17.9% of taxable income if this income is less or equal to EUR 33,363 per year. Otherwise, the contribution is fixed and amounts to EUR 5,972. For annual gross wages lower than EUR 50,853, an employer can pay unemployment, disability, and similar contributions at a rate of up to 17.9% of gross wage.

Tax credit is partially deducted from PIT and partially from contributions. General tax credit amounts to EUR 2,001 per year, and work credit amounts to 17.1% of taxable income and is capped at EUR 1,723; a single parent can claim an additional EUR 947 of credit (OECD, 2014; de Vos and de Agostini, 2014).

Table 12
Tax bands and tax rates (the Netherlands, 2013)

Taxable income (in EUR)	Tax rate (%)	Contributions rate (%)
Up to 19,645	5.85	31.15
19,645 – 33,363	10.85	31.15
33,363 – 55,991	42	–
Over 55,991	52	–

Source: OECD (2014).

Cash benefits for families with two children comprise two components: a basic benefit of EUR 1,861 and an additional allowance which equals *C* and is calculated as follows:

$$C = 1{,}553 - 0.076 * (\textit{taxable income} - 26{,}147) \qquad (4)$$

Additional allowance amounting to *C* is not granted to families with two children whose taxable income exceeds EUR 46,581 per year.

3.5.2 Tax wedge in the Netherlands

Tables A9 and A10 in the annex show a detailed calculation of tax burden indicators in the Netherlands in 2013. Figure 5 shows the net average tax wedge and net average tax rate for all eight hypothetical units.

Net average tax rate and net average tax wedge for single workers show expected tendencies. They are significantly lower for single parents with two children earning 67% of AGW (1A-67-2C), where the tax wedge is lower by as many as 21.1 percentage points when compared with the tax wedge of a single worker without children earning the same gross wage (1A-67-NC). This difference is again the result of cash family benefits. However, figure 5 shows somewhat unexpected tax wedge trends: a couple with two children and annual gross wages amounting to 100% and 0% of AGW (2A-100/0-2C) bears a relatively high tax burden, almost equal to the tax burden of a couple with two children and gross wages amounting to 100% and 33% of AGW (2A-100/33-2C). Moreover, the cash benefits they are granted are similar. Therefore, 2A-100/0-2C bears a higher tax burden than 2A-100/33-2C, but also a higher burden than couples with annual gross wages amounting to 100% and 67% of AGW (2A-100/67-2C).

Figure 5

Net average tax wedge and net average tax rate for hypothetical units (the Netherlands, 2013), in %

Source: Author's calculations based on OECD (2014).

4 COMPARISON OF TAX BURDEN ON LABOUR INCOME IN SELECTED COUNTRIES

Despite numerous differences in the tax systems of the observed countries, their SICs, PITs and cash family benefits are based on similar principles. Progressive tax schedules are applied in all of the observed countries, with a difference in the number and thresholds of tax bands and in the relevant tax rates; employee SICs always include old age pension contributions, while employer SICs comprise health insurance benefits, with a difference in the way in which contributions are determined and in the ways the rates are applied (Čok et al., 2013).

The results of net average tax wedge calculation are summarized in tables 13 and 14, separately for single worker units and couple units.

The results show that Italy has the highest share of taxes and SICs in total labour cost. Italy certainly has the highest tax wedge for all observed family types and all gross wage amounts, apart from the case of single parents with two children earning an annual gross wage of 67% of AGW (1A-67-2C). In the case of hypothetical unit 1A-67-2C, the highest tax wedge is found in Spain (30.3%), followed by Italy (28.4%) and Croatia (18.5%). The smallest tax wedge is found in the Netherlands and Ireland, which stands out as a country with a negative tax wedge. Spain takes the second place in almost all cases, while Ireland always takes the last. Therefore, coming up after Italy and Spain, Croatia and the Netherlands are placed somewhere in the middle when it comes to the size of the tax wedge. Ireland stands out with a very low, sometimes even negative, tax wedge.

Table 13

Comparison of the net average tax wedge for hypothetical units: single workers (as %), 2013

	1A-67-NC	1A-100-NC	1A-167-NC	1A-67-2C
Croatia	30.6	35.2	39.4	18.5
Italy	44.7	47.8	53.2	28.4
Spain	37.2	40.7	44.3	30.3
Ireland	21.0	26.6	38.5	-24.9
Netherlands	32.1	36.9	41.9	11.0

Source: Author's calculations based on OECD (2014).

Table 14

Comparison of the net average tax wedge for hypothetical units: couples (as %), 2013

	2A-100/0-2C	2A-100/33-2C	2A-100/67-2C	2A-100/33-BD
Croatia	22.2	27.8	29.2	32.9
Italy	38.2	40.2	42.9	44.7
Spain	34.8	36.4	37.6	37.5
Ireland	6.8	13.5	19.2	20.1
Netherlands	30.8	28.7	30.5	33.5

Source: Author's calculations based on OECD (2014).

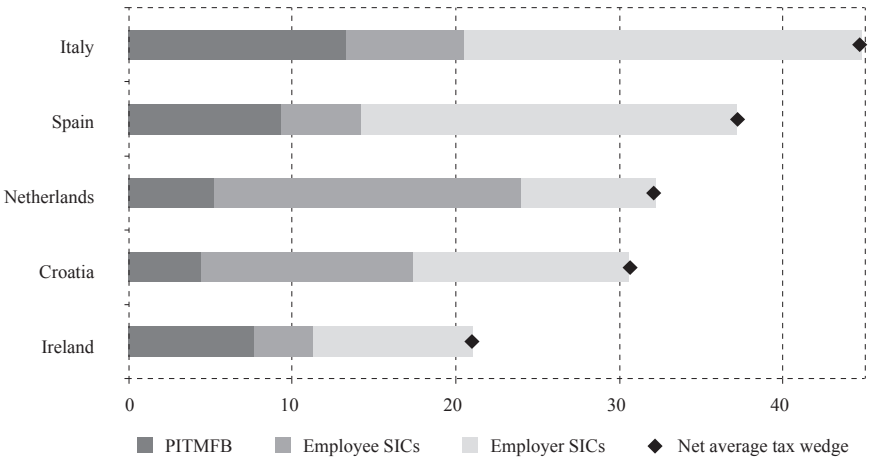
Charts 6 to 13 show a comparative analysis of the net average tax wedge for all selected countries, showing every hypothetical unit separately and decomposing the tax wedge into three elements, which represent the shares of: (a) PIT minus cash family benefits (PITMFB), (b) employee SICs, and (c) employer SICs.

Charts 6 to 9 show a comparison of tax wedge decompositions for single-worker hypothetical units. When it comes to a single worker without children earning a gross wage amounting to 67% of AGW (1A-67-NC, figure 6) and a single parent with two children and the same gross wage (1A-67-2C, figure 7), significant differences in the share of PITMFB in labour costs are found, especially so in Ireland, but in the Netherlands, Italy and Croatia as well. It has been noted above that this is the result of differences in personal allowances and tax credits, as well as of differences in cash family benefits.

If PITMFB shares for hypothetical units without children earning different gross wages are compared, it becomes evident that Italy owes its high tax wedge to its PITMFB share. It is only in the last observed case (1A-167-NC; figure 9) that the Netherlands's PITMFB share is the highest. When it comes to employee SICs share in labour cost, Croatia comes first (13%) for almost all gross wage levels. Employer SICs share in total labour cost is highest in Italy, 24.3%. Next comes Spain with 23%, i.e. 22.1% for taxpayers earning 167% of AGW. Employer SICs share amounts to 13.2% in Croatia and 9.7% in Ireland, and it varies in the Netherlands – it is always under 9%, but varies depending on wage.

Figure 6

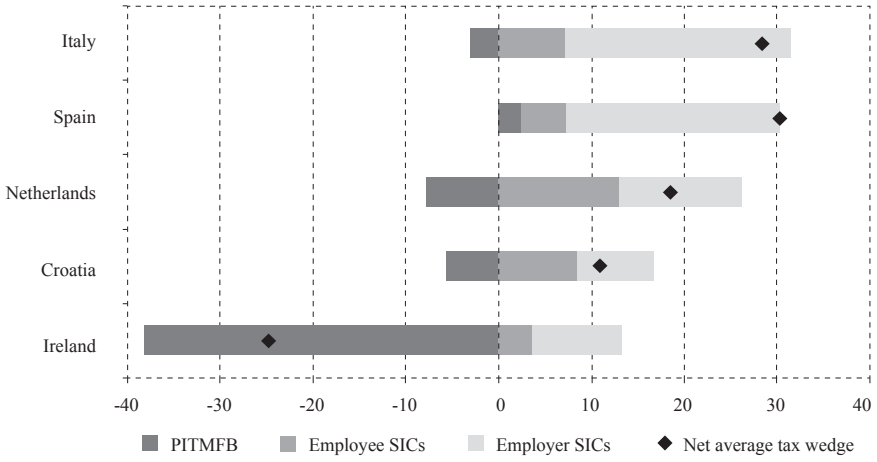
Decomposition of net average tax wedge for hypothetical unit 1A-67-NC, 2013, in %



Source: Author's calculations based on OECD (2014).

FIGURE 7

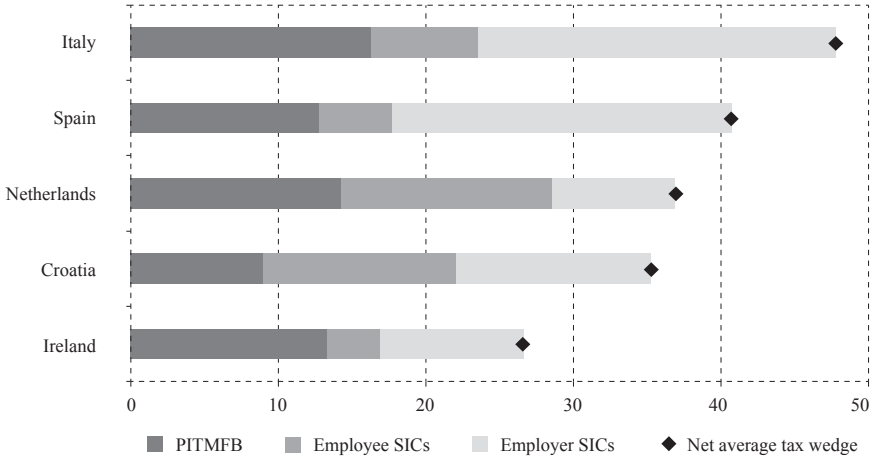
Decomposition of net average tax wedge for hypothetical unit 1A-67-2C, 2013, in %



Source: Author's calculations based on OECD (2014).

FIGURE 8

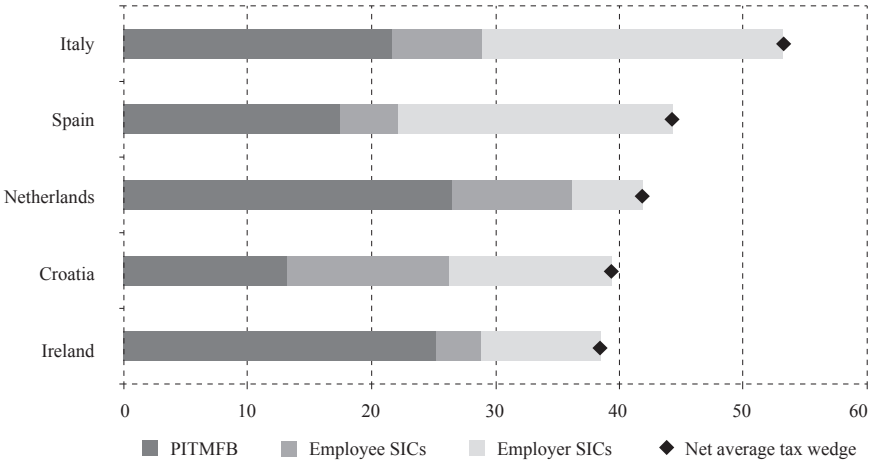
Decomposition of net average tax wedge for hypothetical unit 1A-100-NC, 2013, in %



Source: Author's calculations based on OECD (2014).

FIGURE 9

Decomposition of net average tax wedge for hypothetical unit 1A-167-NC, 2013, in %



Source: Author's calculations based on OECD (2014).

Charts 10 to 13 show comparative decompositions of net average tax wedge for hypothetical units – couples.

If couples with two children (figures 10, 11 and 12) are observed, the greatest share of PITMFB in the tax wedge is again found in Italy, apart from 2A-100/0-2C (figure 10), where the Netherlands comes first with 10.4%. For 2A-100/0-2C, Spain comes second and Italy comes third. The share of PITMFB for 2A-100/67-2C (figure 11) is lowest in Croatia, only 3%, followed by Ireland (5.8%), the Netherlands and Spain (8.2% and 9.7%, respectively), and Italy, with the highest share amounting to 11.5%. Employee contributions are still highest in Croatia, followed by the Netherlands, Italy, Spain, and Ireland as the country with the lowest share of employee contributions. Employer SICs share is still highest in Italy (24.3%), with Spain coming up second. Croatia is in the third place with 13.2%. The Netherlands and Ireland have lower employer SICs, under 10%.

Figures 12 and 13 show a couple with two children and a couple without children earning the same gross wages (2A-100/33-2C and 2A-100/33-NC, respectively), where one would expect that the tax wedge for the couple without children would always be higher. The greatest difference of 6.6 percentage points is observed in Ireland, followed by Croatia with a difference of 5.2 percentage points, while a difference of only 1.1 percentage points was found in Spain.

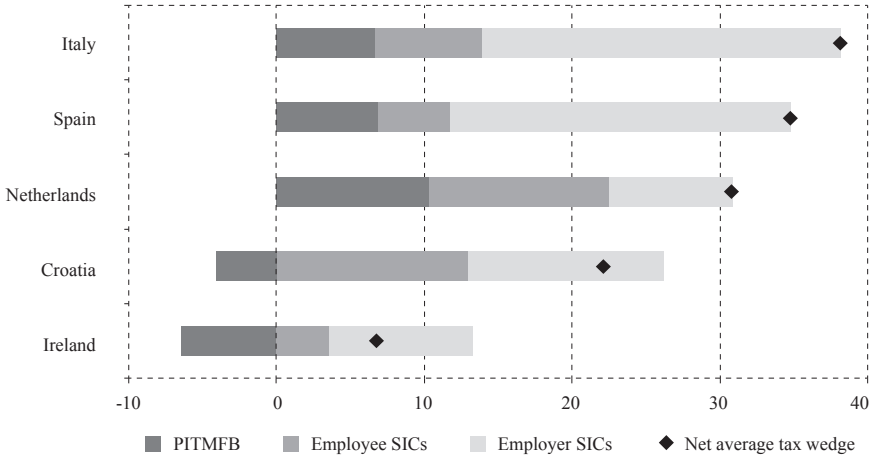
The Netherlands differs from other observed countries by the fact that the tax wedge falls from 30.8% for couples with two children earning 100 and 0% of AGW (2A-100/0-2C) to 28.7% for couples with two children earning 100 and

33% of AGW (2A-100/33-2C) and then rises again to 30.5% for couples with two children earning 100 and 67% of AGW (2A-100/67-2C).

The tax wedge for almost all observed wages is highest in Italy, and lowest in Ireland, while Croatia, in most cases, comes in the middle.

Figure 10

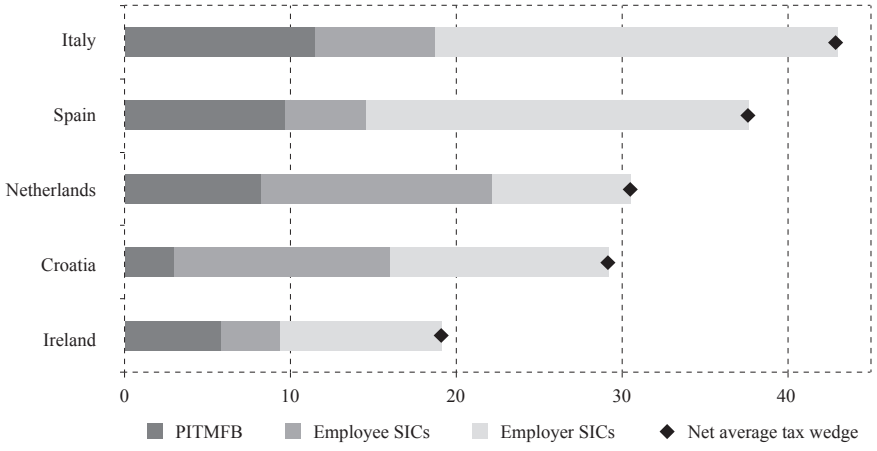
Decomposition of net average tax wedge for hypothetical unit 2A-100/0-2C, 2013, in %



Source: Author's calculations based on OECD (2014).

Figure 11

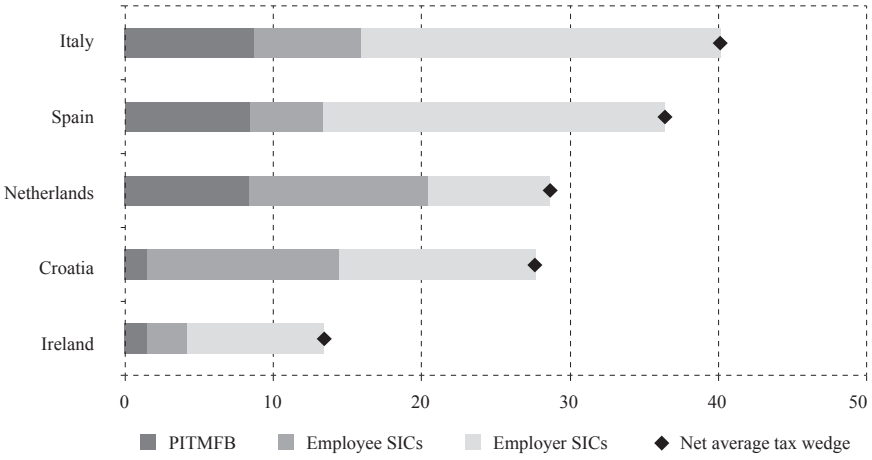
Decomposition of net average tax wedge for hypothetical unit 2A-100/67-2C, 2013, in %



Source: Author's calculations based on OECD (2014).

FIGURE 12

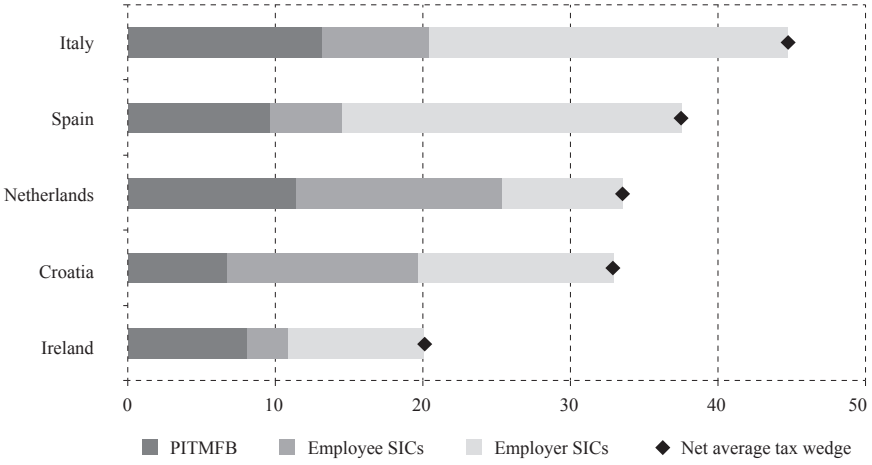
Decomposition of net average tax wedge for hypothetical unit 2A-100/33-2C, 2013, in %



Source: Author's calculations based on OECD (2014).

FIGURE 13

Comparative decomposition of net average tax wedge for hypothetical unit 2A-100/33-NC, 2013, in %



Source: Author's calculations based on OECD (2014).

5 CONCLUSION

This paper has compared the tax burden on labour income for different family types in Croatia, Italy, Spain, Ireland and the Netherlands. The results show that Italy's tax wedge is, without a doubt, the highest for almost all observed family types. The Netherlands and Ireland in the northwest of Europe are characterized by low tax wedges, Ireland especially so.

Lower net average tax rates and lower tax wedge may imply a healthier economy when compared with a country imposing a higher tax on its citizens. Of course, a lower tax wedge is not a necessary condition for citizen satisfaction; citizens can be satisfied even if they pay higher taxes, under the condition that they are provided with satisfactory public services and goods from the state in return. The amount of taxes and other levies imposed on individuals of a certain country depends on a number of factors, but most citizens will be happier if more of their wage is spent on private spending than on state-imposed levies. However, private spending will again lead to an increase in government revenue from other taxes. The question therefore remains what amount of tax wedge is optimal.

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ANNEX

CALCULATION OF TAX BURDEN INDICATORS FOR HYPOTHETICAL UNITS IN SELECTED COUNTRIES

CROATIA

Table A1

Calculation of tax burden indicators for hypothetical units: single workers (Croatia, 2013)

	1A-67-NC	1A-100-NC	1A-167-NC	1A-67-2C
1. Gross wage (in EUR)	8,202	12,303	20,505	8,202
2. Employer SICs	1,247	1,870	3,117	1,247
3. Employee SICs	1,640	2,461	4,101	1,640
3.1. Paid into the 1st pension insurance pillar	1,230	1,845	3,076	1,230
3.2. Paid into the 2nd pension insurance pillar	410	615	1,025	410
4. Work-related expenses	–	–	–	–
5. Tax relief	–	–	–	–
6. Personal income	6,562	9,842	16,404	6,562
7. Personal allowance	3,486	3,486	3,486	7,671
8. Tax base	3,076	6,357	12,918	0
9. PIT	369	1,136	2,776	0
10. Tax credit	–	–	–	–
11. PIT after tax credit	369	1,136	2,776	0
12. Local taxes (12% local government surtax)	44	136	333	0
13. Total taxes	413	1,272	3,110	0
14. Cash family benefits	0	0	0	727
15. Net wage	6,148	8,570	13,294	6,562
16. Labour cost	9,449	14,173	23,622	9,449
17. Total taxes and contributions	3,300	5,603	10,327	2,887
17.1. Tax levies	2,890	4,987	9,303	1,750
17.2. Non-tax payments	410	615	1,025	410
18. Net average tax rate (%)	20.0	25.3	30.2	6.1
19. Net average tax wedge (%)	30.6	35.2	39.4	18.5

Note: According to the Taxing Wages methodology (OECD, 2014), employee SICs paid into the 2nd pension insurance pillar are not tax payments. Item no. 17 is therefore divided into tax (17.1.) and non-tax payments (17.2.), and only tax payments are included in tax burden indicators calculation.

Source: Author's calculations.

TABLE A2

Calculation of tax burden indicators for hypothetical units: couples (Croatia, 2013)

	2A-100/ 0-2C	2A-100/ 33-2C	2A-100/ 67-2C	2A-100/ 33-NC
1. Gross wage (in EUR)	12,303	16,404	20,505	16,404
2. Employer SICs	1,870	2,493	3,117	2,493
3. Employee SICs	2,461	3,281	4,101	3,281
3.1. Paid into the 1st pension insurance pillar	1,845	2,461	3,076	2,461
3.2. Paid into the 2nd pension insurance pillar	615	820	1,025	820
4. Work-related expenses	–	–	–	–
5. Tax relief	–	–	–	–
6. Personal income	9,842	13,123	16,404	13,123
7. Personal allowance	9,412	11,155	11,155	6,972
8. Tax base	431	2,174	5,249	6,357
9. PIT	52	261	630	1,136
10. Tax credit	–	–	–	–
11. PIT after tax credit	52	261	630	1,136
12. Local taxes (12% local government surtax)	6	31	76	136
13. Total taxes	58	292	706	1,272
14. Cash family benefits	632	0	0	0
15. Net wage	9,785	12,831	15,698	11,851
16. Labour cost	14,173	18,897	24,161	18,897
17. Total taxes and contributions	3,756	6,066	7,923	7,047
17.1. Tax payments	3,141	5,246	6,899	6,226
17.2. Non-tax payments	615	820	1,025	820
18. Net average tax rate (%)	10.3	16.8	18.4	22.8
19. Net average tax wedge (%)	22.2	27.8	29.2	32.9

Note: See note under table A1.

Source: Author's calculations.

ITALY

Table A3

Calculation of tax burden indicators for hypothetical units: single workers (Italy, 2013)

	1A-67-NC	1A-100-NC	1A-167-NC	1A-67-2C
1. Gross wage (in EUR)	19,802	29,704	49,506	19,802
2. Employer SICs	6,353	9,529	15,882	6,353
3. Employee SICs	1,879	2,819	4,738	1,879
4. Work-related expenses	–	–	–	–
5. Tax relief	–	–	–	–
6. Personal income	17,923	26,885	44,768	17,923
7. Personal allowance	–	–	–	–
8. Tax base	17,923	26,885	44,768	17,923
9. PIT	4,239	6,659	13,332	4,239
10. Tax credit	1,240	969	342	2,831
11. PIT after tax credit	2,999	5,690	12,990	1,409
12. Local taxes	471	707	1,177	471
13. Total taxes	3,470	6,397	14,167	1,880
14. Cash family benefits	0	0	0	2,671
15. Net wage	11,453	20,487	30,601	18,714
16. Labour cost	26,155	39,233	65,388	26,155
17. Total taxes and contributions	11,703	18,745	34,787	10,112
18. Net average tax rate (%)	27.0	31.0	38.2	5.5
19. Net average tax wedge (%)	44.7	47.8	53.2	28.4

Source: Author's calculations based on OECD (2014).

Table A4

Calculation of tax burden indicators for hypothetical units: couples (Italy, 2013)

	2A-100/ 0-2C	2A-100/ 33-2C	2A-100/ 67-2C	2A-100/ 33-NC
1. Gross wage (in EUR)	29,704	39,605	49,506	39,605
2. Employer SICs	9,529	12,705	15,882	12,705
3. Employee SICs	2,819	3,758	4,698	3,758
4. Work-related expenses	–	–	–	–
5. Tax relief	–	–	–	–
6. Personal income	26,885	35,846	44,808	35,846
7. Personal allowance	–	–	–	–
8. Tax base	26,885	35,846	44,808	35,846
9. PIT	6,659	8,720	10,898	8,720
10. Tax credit	3,094	4,175	3,722	2,740
11. PIT after tax credit	3,565	4,545	7,176	5,980
12. Local taxes	707	943	1,178	943
13. Total taxes	4,272	5,488	8,354	6,923
14. Cash family benefits	1,644	932	861	0
15. Net wage	24,257	31,290	37,314	28,923
16. Labour cost	39,233	52,310	65,388	52,310
17. Total taxes and contributions	16,620	21,951	28,934	23,387
18. Net average tax rate (%)	18.3	21.0	24.6	27.0
19. Net average tax wedge (%)	38.2	40.2	42.9	44.7

Source: Author's calculations based on OECD (2014).

SPAIN

TABLE A5

Calculation of tax burden indicators for hypothetical units: single workers (Spain, 2013)

	1A-67-NC	1A-100-NC	1A-167-NC	1A-67-2C
1. Gross wage (in EUR)	17,351	26,027	43,378	17,351
2. Employer SICs	5,188	7,782	12,291	5,188
3. Employee SICs	1,102	1,653	2,610	1,102
4. Work-related expenses	2,652	2,652	2,652	2,652
5. Tax relief	0	0	0	2,150
6. Personal income	13,597	21,722	38,116	11,447
7. Personal allowance	–	–	–	–
8. Tax base	13,597	21,722	38,116	11,447
9. PIT	3,365	5,587	11,016	2,833
10. Tax credit	1,275	1,275	1,275	2,289
11. PIT after tax credit	2,091	4,312	9,741	543
12. Local taxes	–	–	–	–
13. Total taxes	2,091	4,312	9,741	543
14. Cash family benefits	0	0	0	0
15. Net wage	14,159	20,062	31,027	15,706
16. Labour cost	22,539	33,809	55,670	22,539
17. Total taxes and contributions	8,380	13,747	24,643	6,834
18. Net average tax rate (%)	18.4	22.9	28.5	9.5
19. Net average tax wedge (%)	37.2	40.7	44.3	30.3

Source: Author's calculations based on OECD (2014).

TABLE A6

Calculation of tax burden indicators for hypothetical units: couples (Spain, 2013)

	2A-100/ 0-2C	2A-100/ 33-2C	2A-100/ 67-2C	2A-100/ 33-NC
1. Gross wage (in EUR)	26,027	34,703	43,378	34,703
2. Employer SICs	7,782	10,376	12,970	10,376
3. Employee SICs	1,653	2,204	2,755	2,204
4. Work-related expenses	2,652	6,732	5,304	6,732
5. Tax relief	3,400	0	0	0
6. Personal income	18,322	25,767	35,320	25,767
7. Personal allowance	–	–	–	–
8. Tax base	18,322	25,767	35,320	25,767
9. PIT	4,567	6,588	8,952	6,588
10. Tax credit	2,234	2,756	3,509	2,276
11. PIT after tax credit	2,333	3,832	5,443	4,312
12. Local taxes	–	–	–	–
13. Total taxes	2,333	3,832	5,443	4,312
14. Cash family benefits	0	0	0	0
15. Net wage	22,041	28,666	35,180	28,187
16. Labour cost	33,809	45,079	56,348	45,079
17. Total taxes and contributions	11,768	16,412	21,168	16,892
18. Net average tax rate (%)	15.3	17.4	18.9	18.8
19. Net average tax wedge (%)	34.8	36.4	37.6	37.5

Source: Author's calculations based on OECD (2014).

IRELAND

Table A7

Calculation of tax burden indicators for hypothetical units: single workers (Ireland, 2013)

	1A-67-NC	1A-100-NC	1A-167-NC	1A-67-2C
1. Gross wage (in EUR)	21,587	32,381	53,968	21,587
2. Employer SICs	2,321	3,481	5,802	2,321
3. Employee SICs	863	1,295	2,159	863
4. Work-related expenses	–	–	–	–
5. Tax relief	–	–	–	–
6. Personal income	21,587	32,381	53,968	21,587
7. Personal allowance	–	–	–	–
8. Tax base	21,587	32,381	53,968	21,587
9. PIT	4,317	6,476	15,239	4,317
10. Tax credit	3,300	3,300	3,300	4,950
11. PIT after tax credit	1,017	3,176	11,939	0
12. Local taxes (USC)	830	1,585	3,097	830
13. Total taxes	1,847	4,762	15,036	830
14. Cash family benefits	0	0	0	9,966
15. Net wage	18,876	26,324	36,774	29,860
16. Labour cost	23,908	35,862	59,770	23,908
17. Total taxes and contributions	5,031	9,538	22,996	4,014
18. Net average tax rate (%)	12.6	18.7	31.9	-38.3
19. Net average tax wedge (%)	21	26.6	38.5	-24.9

Source: Author's calculations based on OECD (2014).

Table A8

Calculation of tax burden indicators for hypothetical units: couples (Ireland, 2013)

	2A-100/ 0-2C	2A-100/ 33-2C	2A-100/ 67-2C	2A-100/ 33-NC
1. Gross wage (in EUR)	32,381	43,175	53,968	43,175
2. Employer SICs	3,481	4,398	5,802	4,398
3. Employee SICs	1,295	1,295	2,159	1,295
4. Work-related expenses	–	–	–	–
5. Tax relief	–	–	–	–
6. Personal income	32,381	43,175	53,968	43,175
7. Personal allowance	–	–	–	–
8. Tax base	32,381	43,175	53,968	43,175
9. PIT	6,476	8,635	10,794	8,635
10. Tax credit	5,760	6,600	6,600	6,600
11. PIT after tax credit	716	2,035	4,194	2,035
12. Local taxes	1,585	1,816	2,415	1,816
13. Total taxes	2,302	3,851	6,609	3,851
14. Cash family benefits	4,632	3,120	3,120	0
15. Net wage	33,416	41,148	48,320	38,028
16. Labour cost	35,862	47,573	59,770	47,573
17. Total taxes and contributions	7,078	9,544	14,569	9,544
18. Net average tax rate (%)	-3.2	4.7	10.5	11.9
19. Net average tax wedge (%)	6.8	13.5	19.2	20.1

Source: Author's calculations based on OECD (2014).

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THE NETHERLANDS

Table A9

Calculation of tax burden indicators for hypothetical units: single workers (the Netherlands, 2013)

	1A-67-NC	1A-100-NC	1A-167-NC	1A-67-2C
1. Gross wage (in EUR)	32,073	48,109	80,182	32,073
2. Employer SICs	2,862	4,405	4,864	2,862
3. Employee SICs	6,562	7,462	8,245	2,985
4. Work-related expenses	–	–	–	–
5. Tax relief	2,413	3,590	3,941	2,413
6. Personal income	31,129	46,328	76,727	31,129
7. Personal allowance	–	–	–	–
8. Tax base	31,129	46,328	76,727	31,129
9. PIT	2,395	8,083	22,924	2,395
10. Tax credit	589	550	403	1,355
11. PIT after tax credit	1,806	7,533	22,521	1,040
12. Local taxes	–	–	–	–
13. Total taxes	1,806	7,533	22,521	1,040
14. Cash family benefits	0	0	0	3,035
15. Net wage	23,705	33,114	49,416	31,083
16. Labour cost	34,935	52,514	85,046	34,935
17. Total taxes and contributions	11,230	19,400	35,630	6,887
18. Net average tax rate (%)	26.1	31.2	38.4	3.1
19. Net average tax wedge (%)	32.1	36.9	41.9	11.0

Source: Author's calculations based on OECD (2014).

Table A10

Calculation of tax burden indicators for hypothetical units: couples (the Netherlands, 2013)

	2A-100/ 0-2C	2A-100/ 33-2C	2A-100/ 67-2C	2A-100/ 33-NC
1. Gross wage (in EUR)	48,109	64,146	80,182	64,146
2. Employer SICs	4,405	5,751	7,267	5,751
3. Employee SICs	6,339	8,453	12,275	9,689
4. Work-related expenses	–	–	–	–
5. Tax relief	3,590	4,825	6,003	4,825
6. Personal income	46,328	62,258	77,457	62,258
7. Personal allowance	–	–	–	–
8. Tax base	46,328	62,258	77,457	62,258
9. PIT	8,083	9,015	10,478	9,015
10. Tax credit	761	1,296	1,467	1,064
11. PIT after tax credit	7,322	7,719	9,011	7,951
12. Local taxes	–	–	–	–
13. Total taxes	7,322	7,719	9,011	7,951
14. Cash family benefits	1,880	1,861	1,861	0
15. Net wage	36,328	49,835	60,757	46,505
16. Labour cost	52,514	69,897	87,449	69,897
17. Total taxes and contributions	18,066	21,923	28,553	23,391
18. Net average tax rate (%)	24.5	22.3	24.2	27.5
19. Net average tax wedge (%)	30.8	28.7	30.5	33.5

Source: Author's calculations based on OECD (2014).

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

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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.

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.

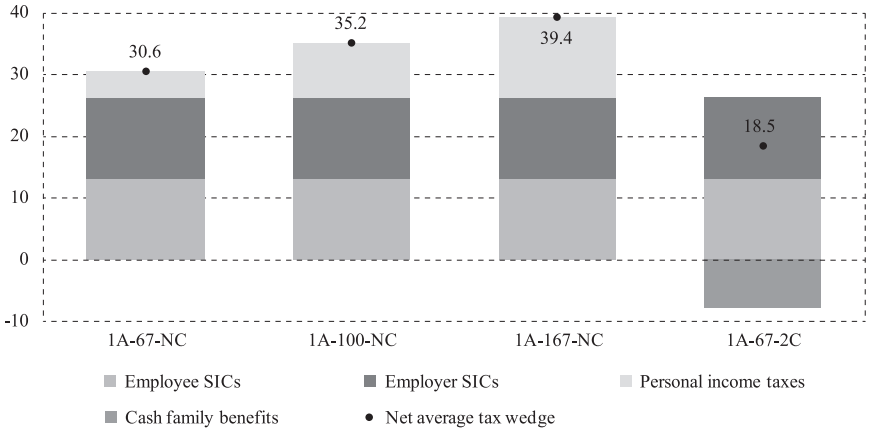
Figure 1 shows the net average tax wedge and its decomposition for one of the basic hypothetical units – single workers. The share of contributions in the labour cost is identical at all gross wage levels due to a single contribution rate and the non-existence of a cap on the SIC base.[1] Combined, employer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

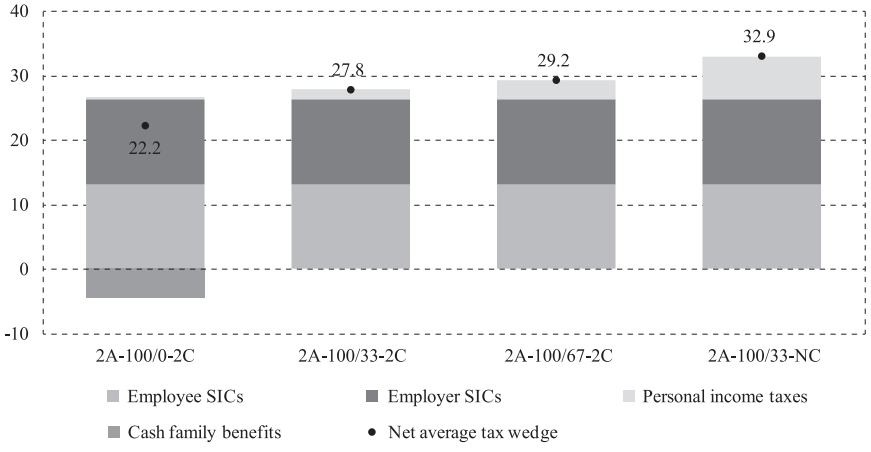


Note: "Personal income taxes" comprises PIT and local government surtax.

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.

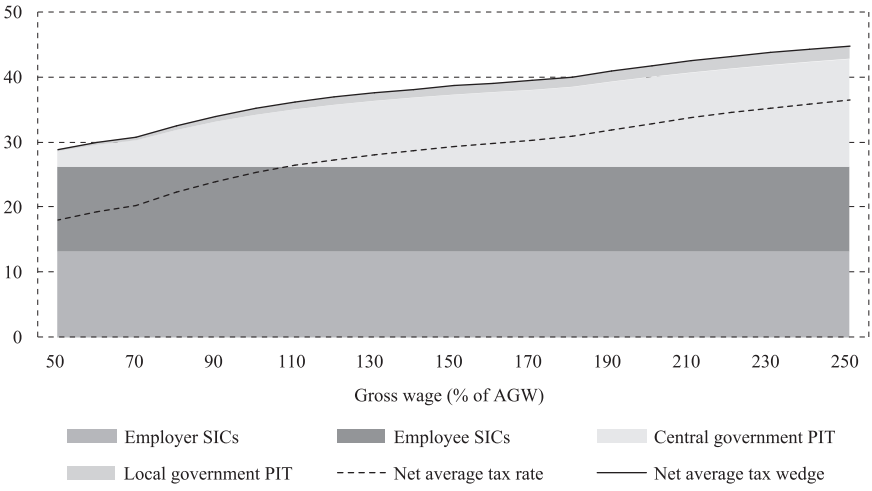
Source: Author's calculations.

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 %

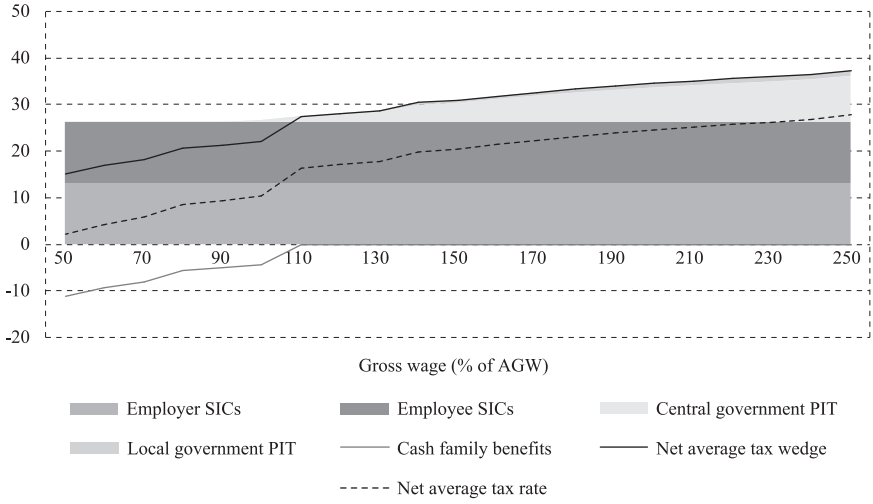


Source: Author's calculations.

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 %



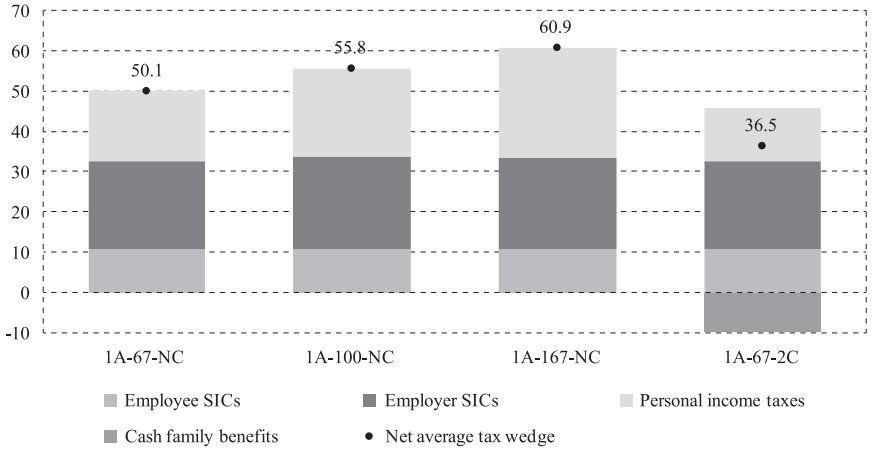
Source: Author's calculations.

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.

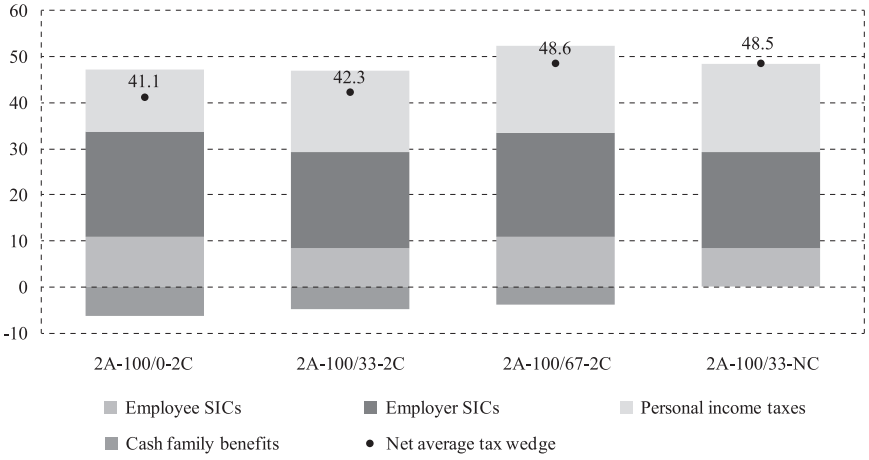
Figure 5 shows the net average tax wedge and its decomposition into employee SICs, employer SICs, PIT, and cash benefits for basic hypothetical units – single

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.

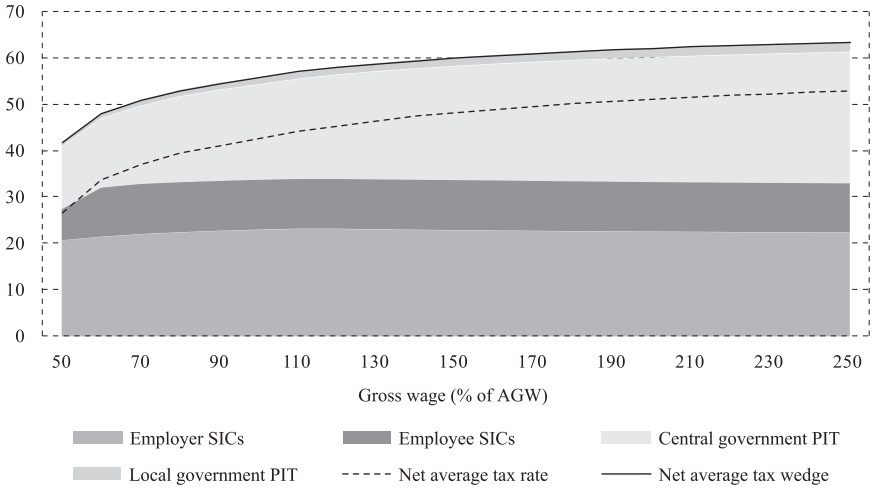
Source: Author's calculations.

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

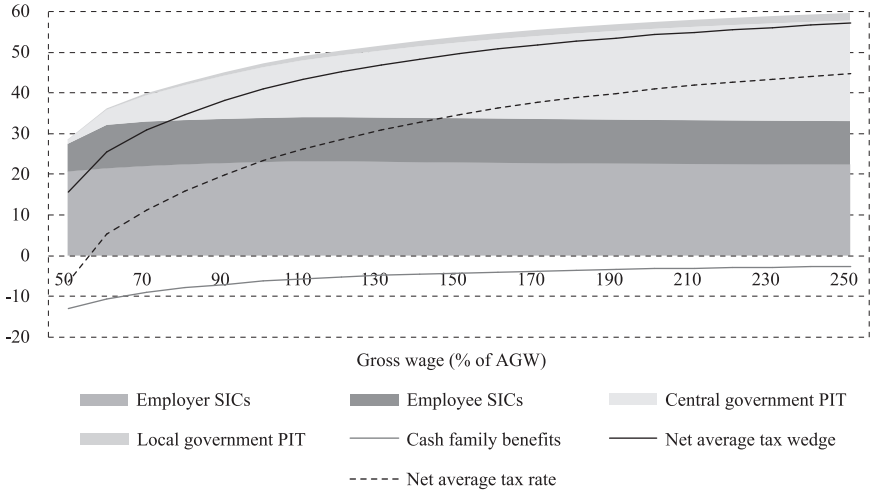
Decomposition of net average tax wedge for single workers without children earning a gross wage of between 50% and 250% of AGW (Belgium, 2013), in %



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.

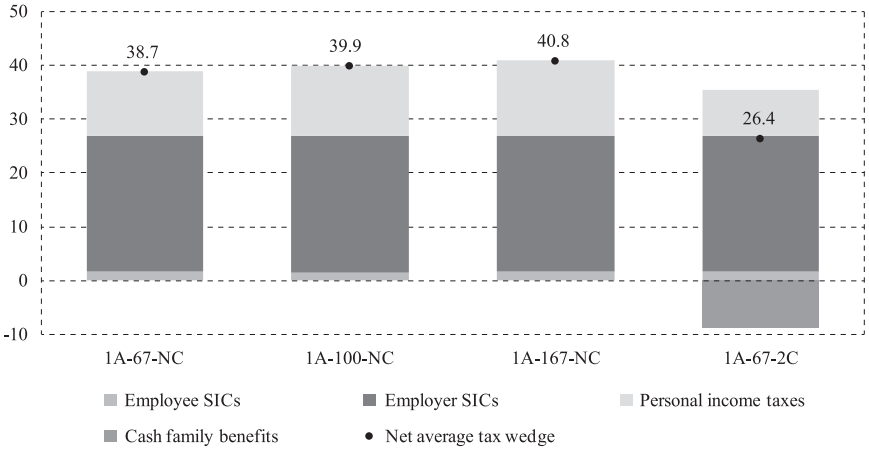
3.3 ESTONIA

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 %



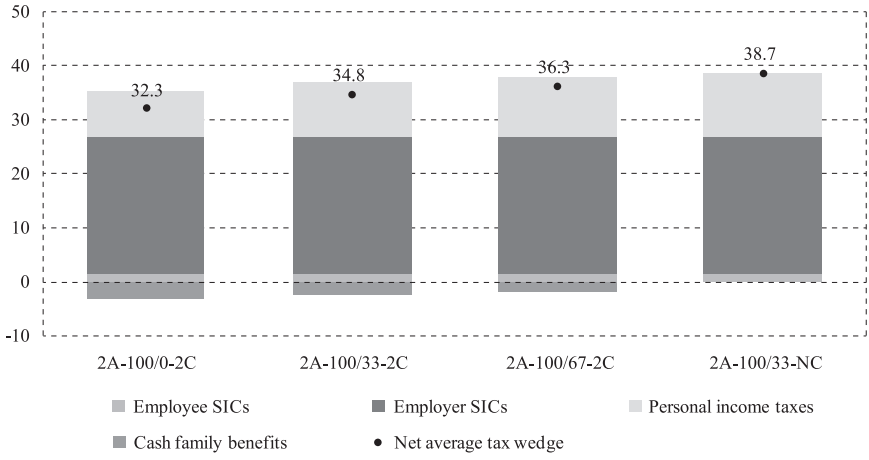
Source: Author's calculations.

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.

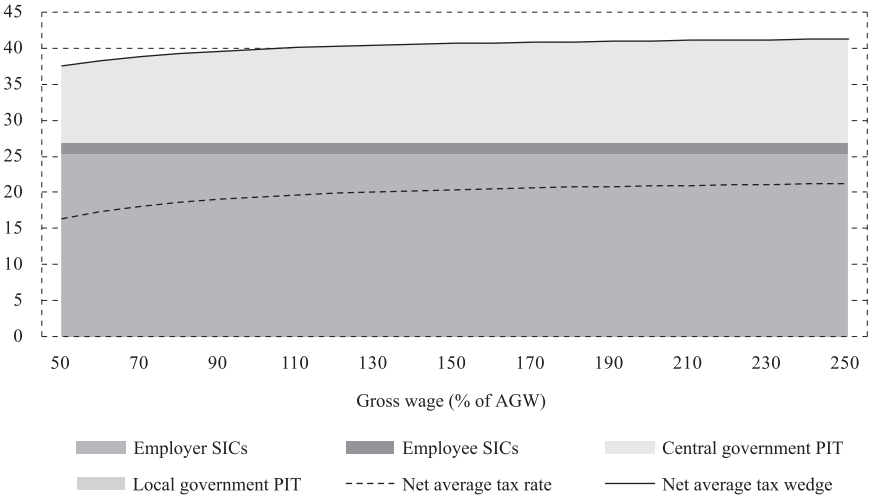
The decomposition of the net average tax wedge and the net average tax rate for a hypothetical single worker without children earning a gross wage of between 50% and 250% of AGW is shown in figure 11. The tax wedge for gross wages amounting to 50% of AGW is 37.6%, and the wedge for the highest observed 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

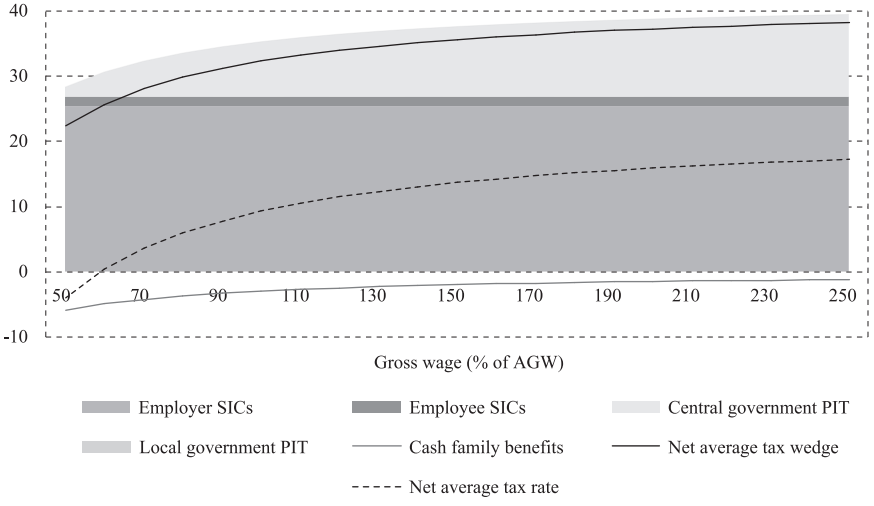
Decomposition of net average tax wedge for single workers without children earning a gross wage of between 50% and 250% of AGW (Estonia, 2013), in %



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.

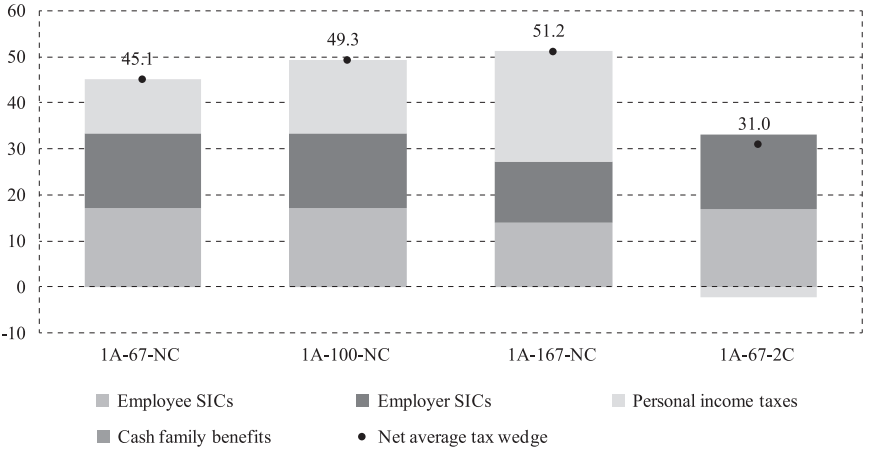
3.4 GERMANY

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.

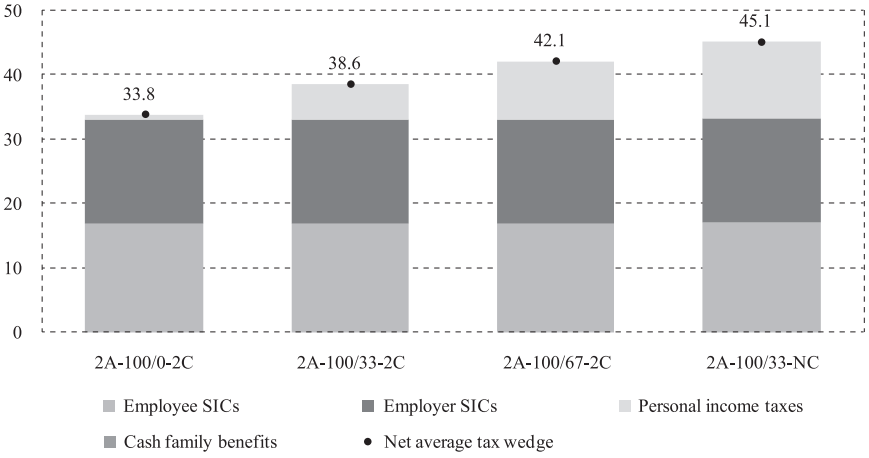
Figure 14 shows the decomposition of the net average tax wedge for basic hypothetical units – couples. In the case of the observed couples, SIC shares in the total labour cost are comparable due to the rule that the income of spouses assessed jointly is divided in two, resulting in neither of those two 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

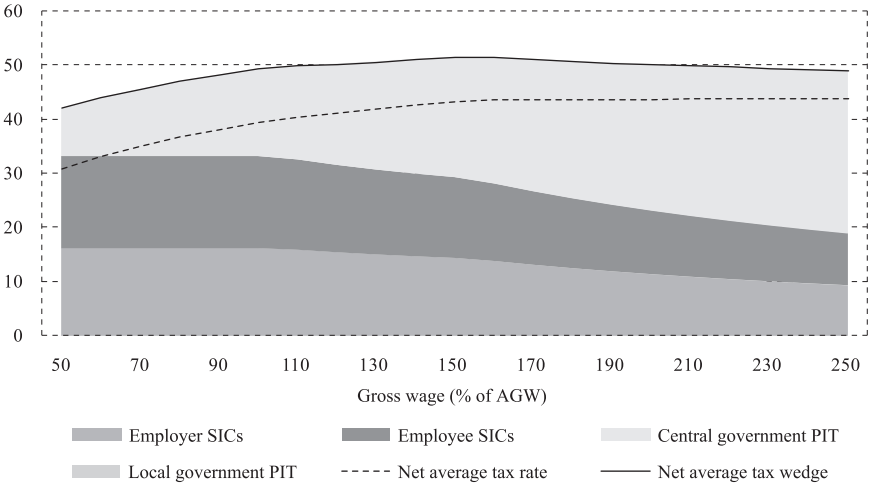
Decomposition of net average tax wedge for basic hypothetical units: couples (Germany, 2013), in %



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 %

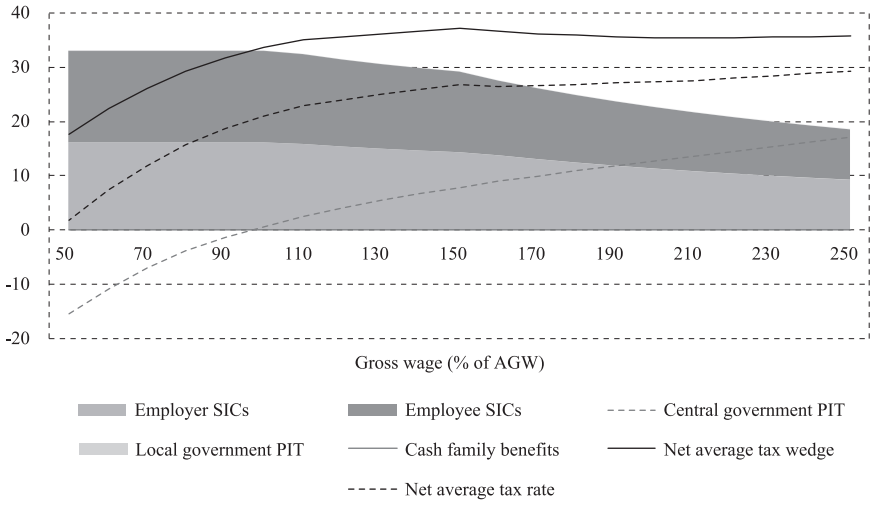


Source: Author's calculations.

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

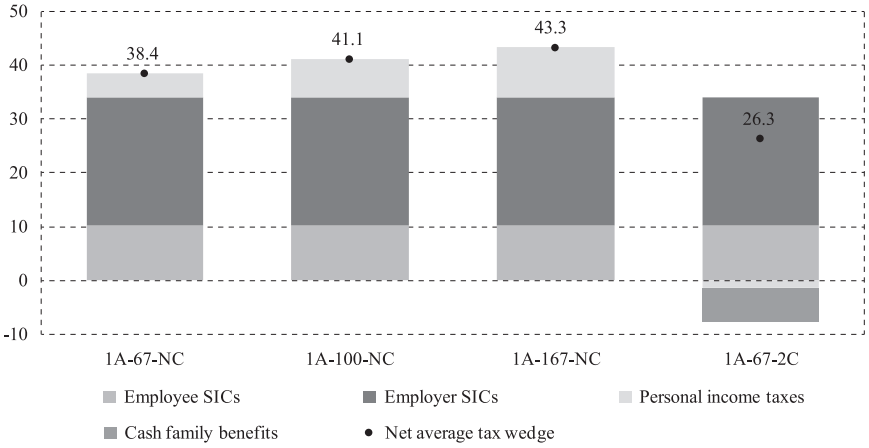
The Slovak labour income taxation system is described in annex A5.

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.

FIGURE 17

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



Source: Author's calculations.

FIGURE 18

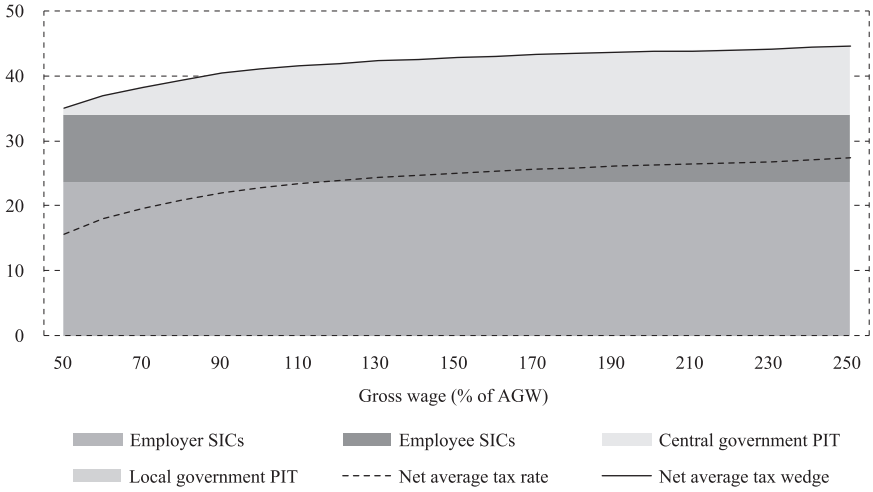
Decomposition of net average tax wedge for basic hypothetical units: couples (Slovakia, 2013), in %

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 %

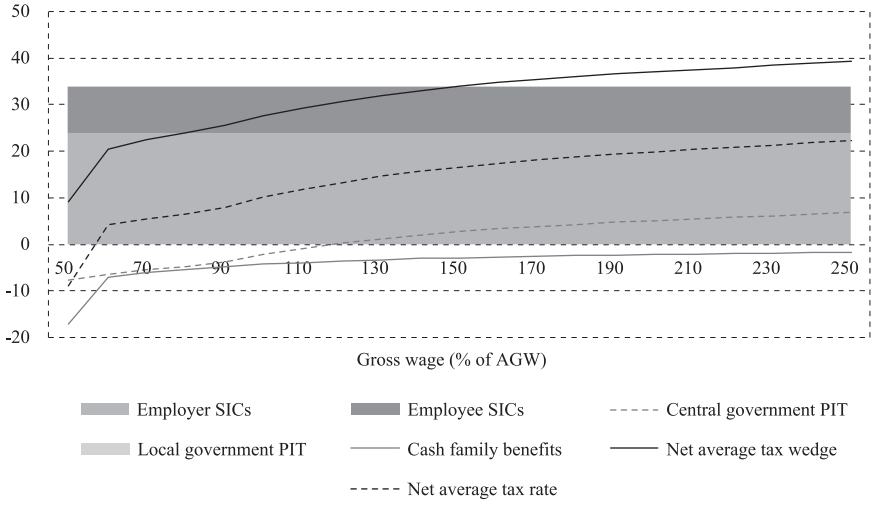


Source: Author's calculations.

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.

4 COMPARISON OF WAGE TAXATION ACROSS OBSERVED COUNTRIES

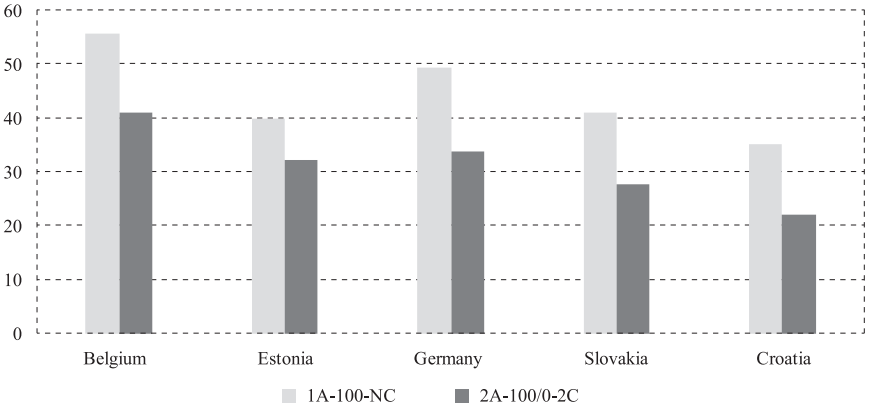
Having analysed the tax systems of each of the countries separately, this section compares the tax burden for different family types and different gross wages across all observed countries.

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).

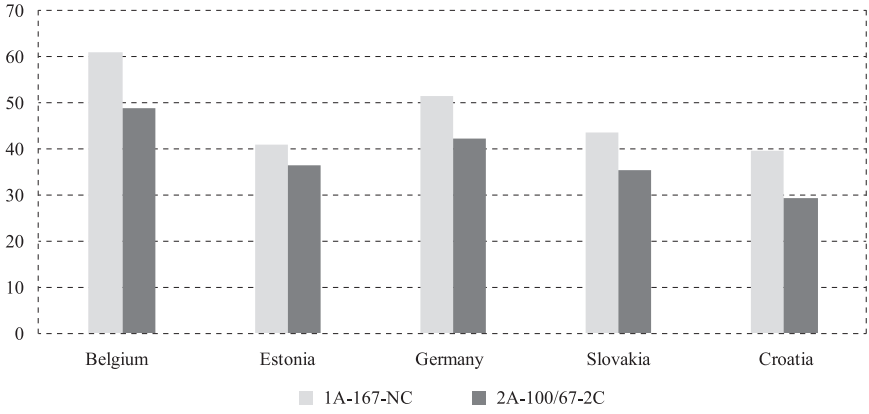
For both hypothetical units the tax wedge is the highest in Belgium and the lowest in Croatia. There are similarities to be found in the tax burden levels in Croatia, Estonia and Slovakia. Estonia has not introduced tax bands, while in Slovakia the

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 %



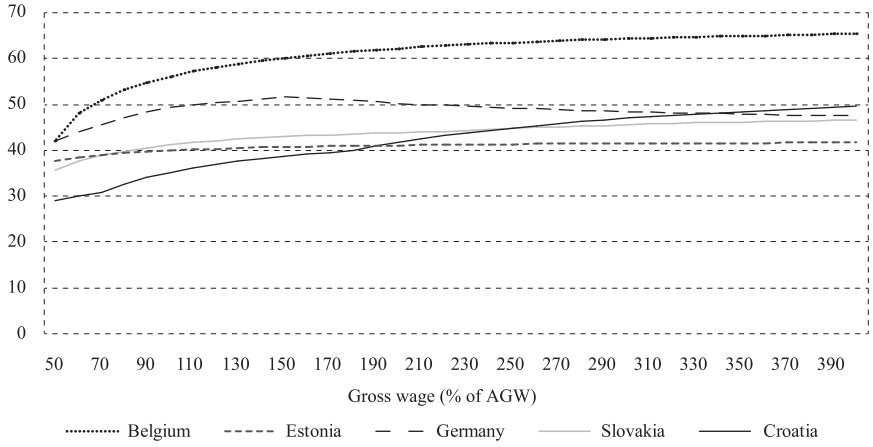
Source: Author's calculations.

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 %

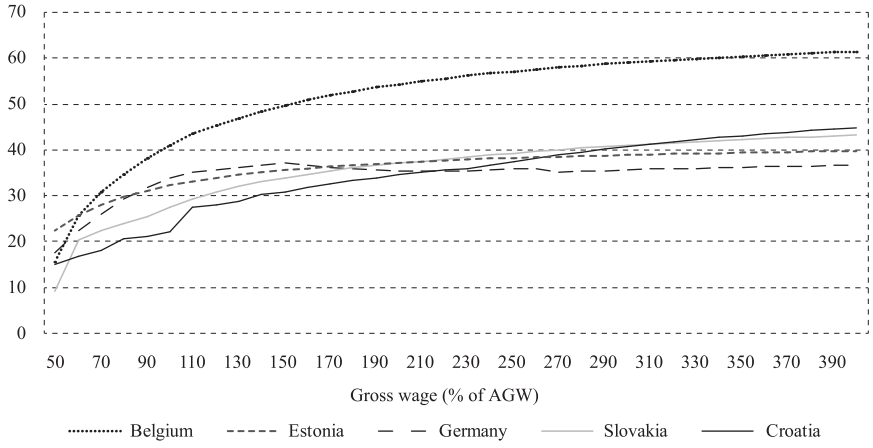


Source: Author's calculations.

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 %

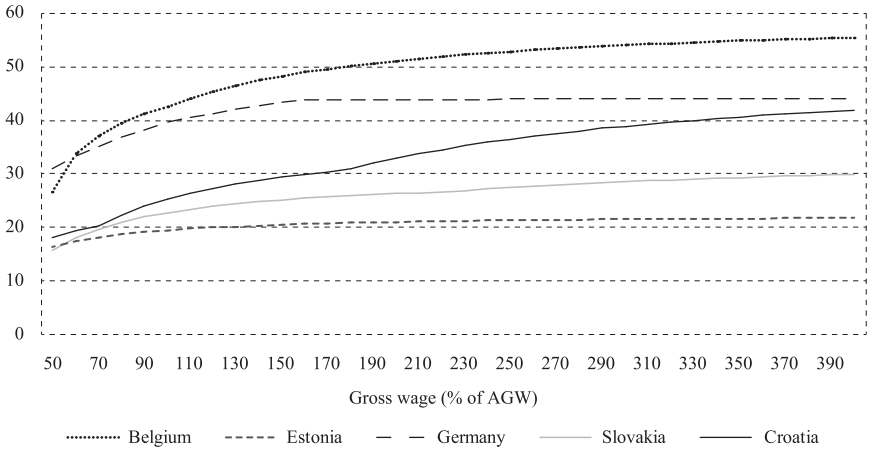


Source: Author's calculations.

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

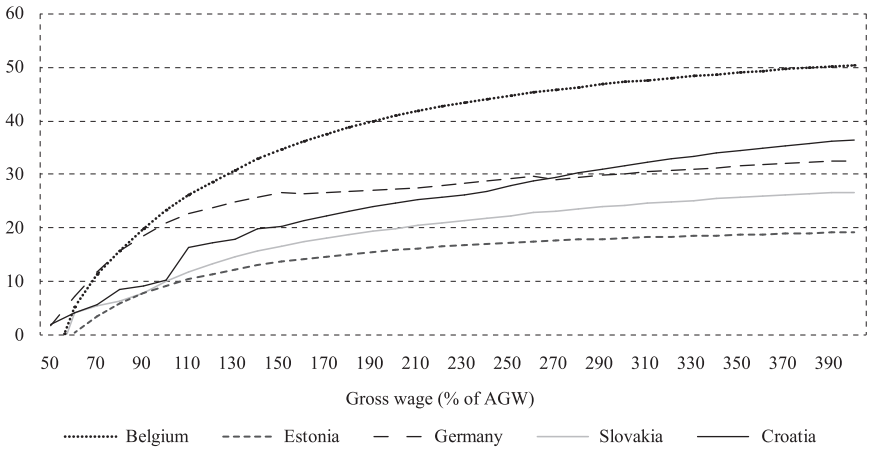
Comparison of the net average tax rate for single workers without children earning a gross wage of between 50% and 400% of AGW, in %



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).

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).

Tax wedge in Croatia, Austria, Hungary, Poland and Greece

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Preliminary communication**
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Abstract

The aim of this paper is to compare the tax burden on labour income in Croatia, Austria, Greece, Hungary and Poland in 2013. The Taxing Wages methodology has been applied to hypothetical units across a range of gross wages in order to calculate net average tax wedge, net average tax rate, as well as other relevant indicators. When it comes to single workers without children, the smallest tax wedge for workers earning less than the average gross wage was found in Croatia, while Poland had the smallest tax wedge for above-average wages. Due to a progressive PIT system, the tax wedge for a single worker in Croatia reaches 50% at 400% of the average gross wage, equalling that of Austria, Greece and Hungary. Tax wedges for couples with two children show a similar trend.

Keywords: tax burden, tax wedge, average tax rate, personal income tax, social insurance contributions, Croatia, Austria, Hungary, Poland, Greece

1 INTRODUCTION

This paper investigates the tax burden on labour income in EU countries, looking into Croatia, Austria, Hungary, Poland and Greece. The paper offers a detailed account of the labour taxation components in those countries: personal income taxes (PITs), employer and employee social insurance contributions (SICs), and social family benefits. Additionally, the paper presents calculations of several tax burden indicators, defined in accordance with the Taxing Wages methodology, for each country. The indicators were calculated by using the author's microsimulation model, which allows the computation of the amounts of taxes, contributions, and social benefits for hypothetical family units in the five countries.

The key aim of this paper is to compare the average tax burdens in the five observed countries for eight hypothetical family units defined in OECD (2014). In order to gain insight into the tax burden of units earning higher personal incomes, additional detailed analyses are performed on two sets of hypothetical units – single workers and couples with two children – which are allocated a relatively wide range of gross wages.

The paper is structured as follows. Section 2 introduces some basic information about the methodology used. Section 3 offers a detailed overview of the labour taxation system in the observed countries and tax burden calculations; the net average tax wedge for single workers and couples with children across a wide range of gross wages is compared in section 4, which is followed by the conclusion section.

2 METHODOLOGY

2.1 AVERAGE WAGE

One of the basic concepts of the Taxing Wages methodology (OECD, 2014) is the average gross wage (AGW) in a specific country. The AGW is calculated based on sector-specific data, not for general economy. AGW is used to define hypothetical

units, where adult workers are allocated gross wages equal to a percentage of AGW. Table 1 shows 2013 AGW amounts that were used in this research.

Table 1

Annual average gross wage in selected countries, 2013

	AGW expressed in national currency	Exchange rate	AGW (in EUR)
Croatia	HRK 93,180	HRK/EUR = 7.5735	12,303
Austria	EUR 41,693	1	41,693
Hungary	HUF 2,914,514	HUF/EUR = 303.0270	9,618
Poland	PLN 41,442	PLN/EUR = 4.1945	9,880
Greece	EUR 20,604	1	20,604

Notes: In calculation of yearly gross wage for Austria, 14 monthly wages are taken into consideration, since it is common practice that employers pay Christmas bonuses and leave bonuses equal to average monthly wages.

Source: (1) AGW – for Croatia: author's calculation as per CBS (2015) and Urban (2016); for other countries: OECD (2014); (2) Exchange rates – for Croatia: middle HRK/EUR exchange rate (CNB, 2016); for Hungary and Poland: OECD (2014).

2.2 HYPOTHETICAL UNITS

Hypothetical units for which indicators are calculated comprise one or two adults (couple), either without children or with two children. The composition of all eight hypothetical units is shown in table 2.

Table 2

Characteristics of observed hypothetical unit types

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

The first three hypothetical units (A-67-NC, A-100-NC, A-167-NC) constitute single workers without children whose gross wage equals 2/3, 100%, or 5/3 of AGW. Unit A-67-2C represents a single worker with two children whose gross wage equals 66.7% of AGW. The following three units represent families with two children (2A-100/0-2C, 2A-100/33-2C, 2A-100/67-2C), with Spouse I's gross wage amounting to 100% of AGW and Spouse II's wage amounting to, re-

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spectively, 0, 1/3, and 2/3 of AGW. The final hypothetical unit comprises a couple without children (2A-100/33-NC), with Spouse I's gross wage amounting to 100% of AGW and Spouse II's wage amounting to 1/3 of AGW. The minimum wage in Croatia stipulated by the Regulation on Minimum Wage in 2013 exceeded 33% of the average gross wage; however, this has been disregarded in order to comply with the OECD model.

This paper introduces two units in addition to the abovementioned eight OECD typical units: single workers without children earning between 50 and 500% of AGW and couples with two children, where the author takes into account various combinations of spouses' wages, the family's total gross earning thus being between 100% of AGW and 500% of AGW (as an example, see figure 2).

2.3 TAX BURDEN INDICATORS

Two main tax burden indicators are used in this paper: average tax wedge and net average tax rate. Net average tax wedge is defined as the ratio of total net tax to total labour costs. Net average tax rate represents the ratio of net tax paid by the employee to gross wage.

To calculate total labour costs, total net taxes, and net taxes paid by the employee, formulas (1), (2), and (3) are used.

Total labour cost
= gross wage
+ employer SICs
+ payroll taxes (1)

Total net tax
= personal income taxes at all levels of government
+ employee SICs
+ employer SICs
+ payroll taxes
– cash family benefits (2)

Net tax paid by the employee
= personal income taxes at all levels of government
+ employee SICs
– cash family benefits. (3)

In addition to the two key indicators, further two were used in the analysis: average PIT rate (ratio of PIT to gross wage) and average employee SIC rate (ratio of employee SICs to gross wage).

It is important to note that employee and employer SICs include only those payments made to the general government, while 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 are paid to mandatory private pension funds. Thus, the former plays a role in the tax burden calculation and the latter does not. For more information about this topic, see Urban (2016), Blažić and Trošelj (2012), OECD (2014, 2015).

3 OVERVIEW OF LABOUR TAXATION

3.1 CROATIA

3.1.1 Basic components of labour taxation in Croatia

Croatian employers and employees pay five different social insurance contributions – their 2013 rates are shown in table 3. The maximum SIC base, EUR 74,790, is stipulated for the 1st pillar pension insurance contributions (Order on SIC Base Amounts for 2013). No such maximum base amount has been defined for other contributions.

Table 3

SIC rates (Croatia, 2013)

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

Source: Social Insurance Contributions Act.

The PIT base equals the taxpayer's gross wage minus pension insurance contributions and personal allowances. Personal tax allowance is the sum of the basic personal allowance and allowance for dependent family members (table 4).

Table 4

Personal tax allowance (Croatia, 2013)

Personal tax allowance	Annual amount	
	HRK	EUR
Basic personal allowance	26,400	3,486
Adult dependent	13,200	1,743
First child	13,200	1,743
Second child	18,480	2,440
Third child	26,400	3,486
Fourth child	36,960	4,880
Fifth child	50,160	6,623
Partial disability allowance	7,920	1,046
Total disability allowance	26,400	3,486

Source: Personal Income Tax Act.

Table 5 shows the range and rates of the three PIT bands in 2013.

Table 5
PIT bands and rates (Croatia, 2013)

Tax band (in EUR)	Tax rate (%)
[0, 3,486]	12
‹3,486, 13,943]	25
‹13,943, +∞›	40

Source: Personal Income Tax Act.

Local government surtax is a tax calculated as a percentage of the PIT amount. Its rates are determined by cities and municipalities. These rates were set at between 0% and 18% (for the City of Zagreb) in 2013. For the purpose of this analysis, the local government surtax rate was set at 12%, which represents, approximately, the average local government surtax rate calculated on the basis of all Croatian cities and municipalities.

Payroll taxes are not levied in Croatia. When it comes to cash family benefits, this analysis takes into account child benefits, which is a means-tested benefit for families with children paid by the central government. Child benefit amounts depend on personal income per family member. Table 6 shows how child benefits are calculated for a family with one or two children. The benefits received by the children of a single parent increase by 15%.

Table 6
Child benefits: annual bands and amounts (Croatia, 2013)

Gross personal income per family member (EUR)	Benefit amount per child (EUR)
[0, 875]	474
‹875, 1,765]	395
‹1,765, 2,635]	316

Source: Child Benefits Act.

3.1.2 Tax burden indicators

Detailed calculations for the eight hypothetical units in Croatia are shown in tables A1, A2 and A3 in the annex. Table 7 shows tax burden indicators. The net average tax wedge of a single parent with two children (A-67-2C) is 12 percentage points lower that the tax wedge of a single worker earning the same wage (A-67-NC), as a consequence of the child benefits the former is entitled to. Similarly, there is a 5-percentage-point difference between units 2A-100/33-2C (couple with two children) and 2A-100/33-NC (couple without children), due to the former unit's right to claim child allowance.

Table 7

Tax burden indicators for basic hypothetical units (Croatia, 2013), in %

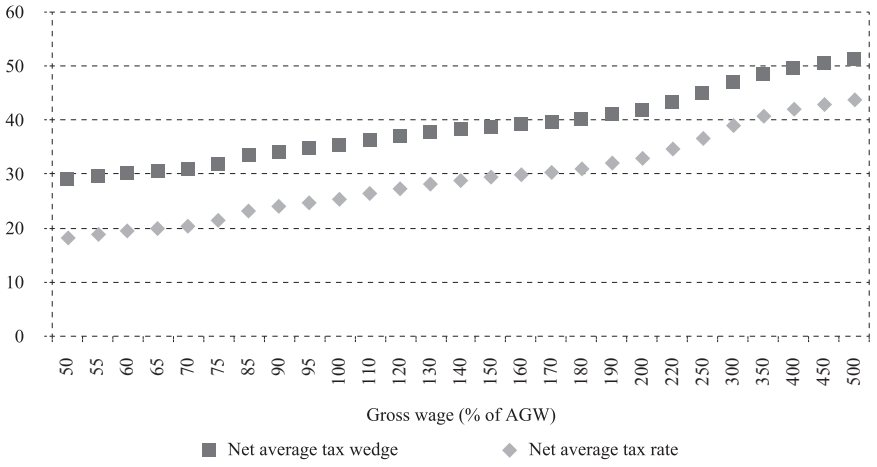
	A-67-NC	A-100-NC	A-167-NC	A-67-2C	2A-100/0-2C	2A-100/33-2C	2A-100/67-2C	2A-100/33-NC
Average PIT rate	5.04	10.34	15.17	0.00	0.47	1.78	3.44	7.76
Average employee SIC rate	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Net average tax rate	20.04	25.34	30.17	6.13	10.33	16.78	18.44	22.76
Net average tax wedge	30.59	35.19	39.38	18.52	22.16	27.76	29.20	32.95

Source: Author's calculations.

Figures 1 and 2 outline net average tax wedge and net average tax rate trends for additional hypothetical sets of single workers and couples with two children across a wide range of gross wages. The figures clearly show that the Croatian wage taxation system is progressive, i.e. that the average tax rate grows as the gross wage increases. The net average tax wedge for single workers in the observed wage range increases from 29% to 51%. When it comes to couples with two children the tax wedge increases up to 42% for couples with gross wages amounting to 300% and 200% of AGW. The smallest tax wedge, 22%, is observed in married couples with gross wages of 100% and 0% of AGW. One can see that the tax wedge sharply rises to 28% for the next family (with 100% and 33% of AGW), due to them not being eligible for child benefits.

Figure 1

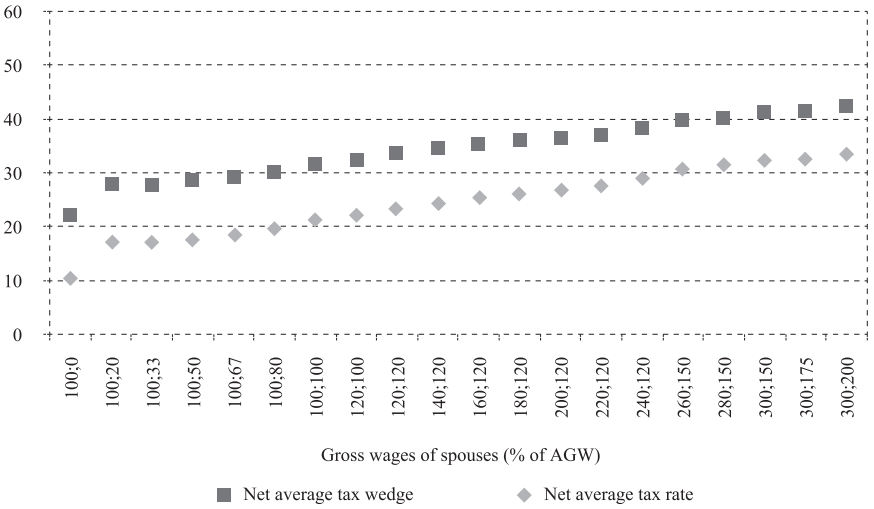
Net average tax wedge and net average tax rate for single workers without children (Croatia, 2013), in %



Source: Author's calculation.

Figure 2

Net average tax wedge and net average tax rate for couples with two children (Croatia, 2013), in %



Source: Author's calculation.

3.2 AUSTRIA

3.2.1 Basic components of labour taxation in Austria

Table 8 shows social insurance contributions and rates in Austria. The maximum SIC base amounts to EUR 52,800 annually for the basic wage, while the ceiling for allowances is set at EUR 8,800.

Table 8

SIC rates (Austria, 2013)

Contribution	Employee SICs (% of gross wage)	Employer SICs (% of gross wage)
Health insurance	3.95	3.70
Unemployment insurance	(a)	3.00
Pension insurance	10.25	12.55
Accident insurance	–	1.40
Contribution to the labour chamber	0.50	–
Contribution for the promotion of residential building	0.50 (b)	0.50
Bankruptcy insurance	–	0.55

Notes (OECD): (a) employees' unemployment insurance rate depends on the taxpayer's monthly earnings, making it 0% for monthly gross wages lower than EUR 1,219, 1% for wages up to EUR 1,330, 2% for monthly gross wages up to EUR 1,497, and 3% for all gross wages above EUR 1,497; (b) no contributions to the labour chamber or contributions for the promotion of residential building are levied on allowances such as Christmas and leave bonus.

Source: OECD (2014).

As can be seen above, employee SICs depend on monthly gross wages and amount to between 15.2% and 18.2% of gross income, contributions on Christmas bonus and leave bonus amount to between 14.2% and 17.2% of gross income, while employer SICs amount to 21.7% of gross income for all gross wages.

A detailed account of tax reliefs applicable to the Austrian PIT system can be found in table 9.

Table 9
PIT base reductions (Austria, 2013)

(1) Employee SICs and contributions levied on Christmas and leave bonuses: full amount
(2) Work-related allowance: EUR 132
(3) Basic annual allowance: EUR 60
(4) Child allowance: EUR 220 per child if granted to one spouse only or EUR 132 per child if the tax relief is granted to both parents
(5) Christmas and leave bonus allowance: EUR 620

Source: OECD (2014).

Just like in Croatia, a progressive tax schedule is applied in Austria. Tax bands and tax rates can be found in table 10.

Table 10
PIT bands and rates (Austria, 2013)

Tax band (in EUR)	Tax rate (%)
[0, 11,000]	0
‹11,000, 25,000]	36.50
‹25,000, 60,000]	43.21
‹60,000, +∞›	50.00

Source: KPMG (2014).

Following the calculation of the tax liability, some taxpayers may be eligible for tax credits. There are three types of tax credit: basic employee tax credit (EUR 54 per year), commuting tax credit (EUR 291 per year), and primary earner's and sole parent's tax credit (EUR 494 per year for the first child, EUR 175 for the second child, and EUR 220 for each subsequent child). The total tax credit is limited to EUR 110 above the initially calculated personal income tax.

Payroll taxes in Austria are levied if the monthly gross wage exceeds EUR 1,095. There are two payroll taxes: the family burden equalisation contribution amounting to 4.5% of gross wage and the community tax amounting to 3% of gross wage.

Austrian taxpayers are entitled to child benefits which depend on the number of children and their age. For the purposes of this paper, the children are assumed to be between 10 and 15 years old. A fixed benefit for two children amounts to EUR 4,897.

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3.2.2 Tax burden indicators

Table 11 shows the tax burden indicators in Austria. Average PIT rate grows as gross personal income increases, meaning that PIT is progressive. It is worth noting that the subjects of such comparisons are always the same – single workers without children or couples with two children. The contributions are proportional, until we reach higher wages, when the contributions become regressive. The tax wedge of a single parent with two children (A-67-2C) is 16 percentage points lower than the tax wedge of a single worker without children who earns the same wage (A-67-NC), which is a consequence of the impact of tax reliefs and cash benefits on families with children.

Table 11

Tax burden indicators for basic hypothetical units (Austria, 2013), in %

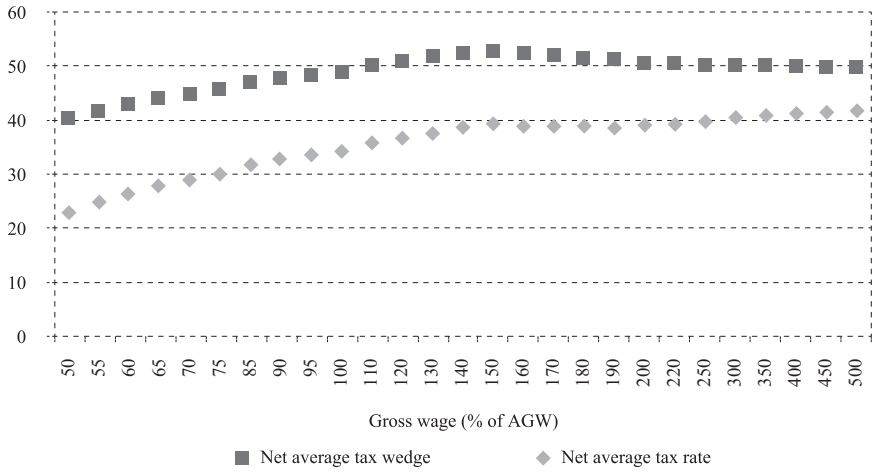
	A-67-NC	A-100-NC	A-167-NC	A-67-2C	2A-100/0-2C	2A-100/33-2C	2A-100/67-2C	2A-100/33-NC
Average PIT rate	10.23	16.24	22.93	7.24	14.18	11.64	13.53	11.98
Average employee SIC rate	18.06	18.06	16.01	18.06	18.06	17.31	18.06	17.31
Net average tax rate	28.29	34.29	38.94	7.68	20.49	20.14	24.54	29.29
Net average tax wedge	44.46	49.12	51.92	28.51	38.42	38.15	41.56	45.24

Source: OECD (2014) and author's calculations.

Figures 3 and 4 show net average tax wedge and net average tax rate trends across a wide range of gross wages for additional sets of hypothetical single workers and couples with two children. Data for single workers (figure 3) show that the ceiling for contribution calculation is reached at 160% of average gross wage with the tax wedge starting to decline afterwards; the tax wedge thus decreases towards 50% for the highest gross wages presented in figure 3.

Figure 3

Net average tax wedge and net average tax rate for single workers without children (Austria, 2013), in %

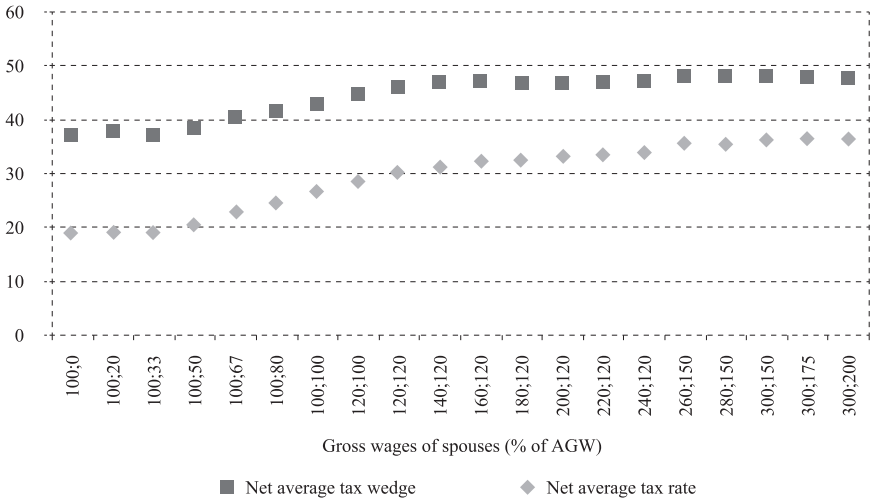


Source: Author's calculation.

Net average tax wedge for couples (figure 4) has intervals where the wedge is "stagnant", i.e. it remains the same when the wage earned by one spouse increases. The first such interval appears in the tax wedge of couples where one spouse earns 100% of AGW, while the second spouse's wage is between 0 and 50% of AGW; the second interval starts with a couple whose gross wage is 140% and 120% of AGW. This interval continues to the end of the observed range.

Figure 4

Net average tax wedge and net average tax rate for hypothetical units (Croatia, 2013), in %



Source: Author's calculation.

3.3 GREECE

3.3.1 Basic components of labour taxation in Greece

There are three types of social insurance contributions in Greece, all paid by both employees and employers (table 12). The total rate payable by employers is relatively high: 27.46%. The maximum annual SIC base is EUR 66,562.

Table 12

SIC rates (Greece, 2013)

Contribution	Employee SICs (% of gross wage)	Employer SICs (% of gross wage)
Social insurance (IKA)	9.22	18.43
Social insurance (ETEAM)	3	3
Other insurance funds	4.28	6.03
Total	16.50	27.46

Note: IKA and ETEAM are social insurance management funds.

Source: OECD (2014).

Deductions for social insurance contributions are the only allowance recognized in PIT base calculation. PIT bands and rates are shown in table 13.

Table 13
PIT bands and rates (Greece, 2013)

Tax band (in EUR)	Tax rate (in %)
[0, 25,000]	22
‹25,000, 42,000]	32
‹42,000, +∞›	42

Source: OECD (2014).

Another special tax has been introduced in Greece, called "solidarity contribution", which is calculated as a percentage of the gross wage minus employee SICs. For solidarity contribution rates, see table 14.

Table 14
Solidarity contribution rates (Greece, 2013)

Gross income minus SICs (in EUR)	Solidarity contribution (in %)
[0, 12,000]	0
‹12,000, 20,000]	1
‹20,000, 50,000›	2
‹50,000, 100,000›	3
‹100,000, +∞›	4

Source: OECD (2014).

There is only one tax credit type in Greece, which is calculated as follows: let x be the gross wage. If $x \leq 21{,}000$, the tax credit will be EUR 2,100. If $x > 21{,}000$, the EUR 2,100 tax credit is reduced by EUR 100 for each EUR 1,000. Therefore, if the gross wage is EUR 30,000, the tax credit equals EUR 1,200.

No payroll taxes are levied, and there are no cash family benefits. There is, however, a unique feature which may be classified as a sort of cash benefit. If the employee is married, the employer shall increase their standard gross wage by 10%. For each child, the wage will be increased by an additional 5%. For example, if the employee is married and has two children, their gross wage will increase by 20%.

3.3.2 Tax burden indicators

Table 15 shows tax burden indicators in Greece. The tax wedge of a single parent with two children (A-67-2C) is higher than the tax wedge of a single worker without children earning the same wage (A-67-NC). Similarly, the tax wedge for 2A-100/33-2C (couple with two children) exceeds 2A-100/33-NC (couple without children). This is a result opposite to the one found in Croatia and in Austria, where a lower tax burden is imposed on hypothetical units with children as compared to units without children earning the same wage. The reason for this is the

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special employer's child allowance in Greece. This allowance is a component of the gross wage, meaning that its effect cannot be seen in this analysis since it is based on equivalent initial gross wages.

Table 15

Tax burden indicators for basic hypothetical units (Greece, 2013), in %

	A-67-NC	A-100-NC	A-167-NC	A-67-2C	2A-100/0-2C	2A-100/33-2C	2A-100/67-2C	2A-100/33-NC
Average PIT rate	3.08	9.01	18.78	5.31	12.76	9.57	10.24	7.79
Average employee SIC rate	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5
Net average tax rate	19.58	25.51	35.28	21.81	29.26	26.07	26.74	24.29
Net average tax wedge	36.91	41.56	49.22	38.65	44.5	42	42.52	40.6

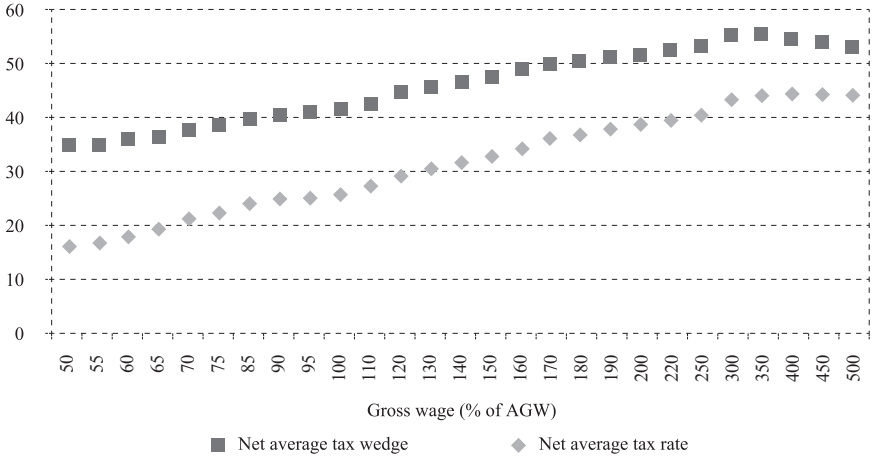
Source: OECD (2014) and author's calculations.

Figures 5 and 6 show net average tax wedge and net average tax rate trends applicable to a wide range of gross wages, for additional hypothetical sets of single workers and couples with two children. The tax wedge at relatively high gross wage levels exceeds 55% for single workers (figure 5) but starts decreasing towards 50% when 300% AGW is exceeded, due to the SIC base ceiling.

An interesting development for couples (figure 6) is a mild regressive trend of the net average tax wedge and net average tax rate, which show a decreasing tendency when couples with gross wages equalling 100 and 0% of AGW and couples with gross wages amounting to 100 and 50% AGW are observed.

Figure 5

Net average tax wedge and net average tax rate for single workers without children (Greece, 2013), in %



Source: Author's calculation.

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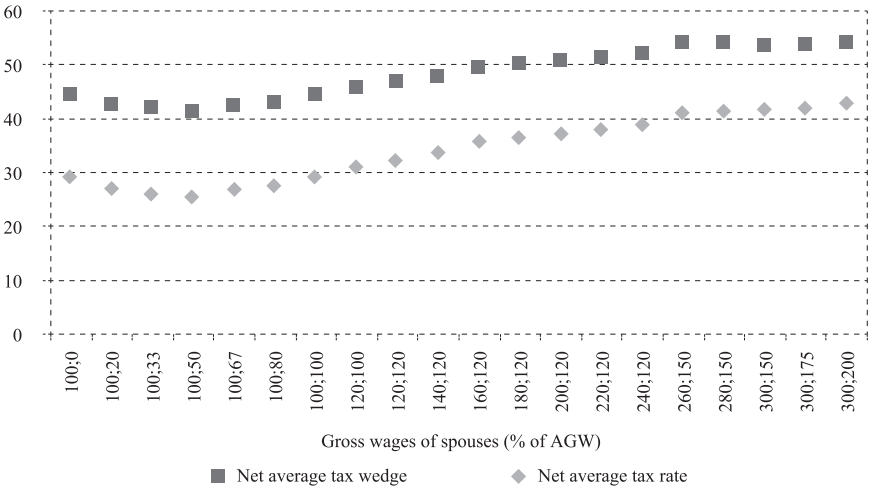
FIGURE 6

Net average tax wedge and net average tax rate for couples with two children (Greece, 2013), in %



Source: Author's calculation.

3.4 HUNGARY

3.4.1 Basic components of labour taxation in Hungary

Three types of social insurance contributions, payable by employees and employers, are levied in Hungary. Just like in Greece, employer SICs are relatively high and total 27% of the gross wage. The rates are shown in detail in table 16.

TABLE 16

SIC rates (Hungary, 2013)

Contribution	Employee SICs (% of gross wage)	Employer SICs (% of gross wage)
Pension insurance	10.0	24.0
Health insurance	7.0	2.0
Unemployment insurance	1.5	1.0
Total	18.5	27.0

Source: OECD (2014).

PIT can be reduced by claiming a child allowance of EUR 206 monthly per child. PIT rate is universal and stands at 16%. There is no tax credit.

Payroll taxes amount to 1.5% of gross wage.

Cash transfers amount to EUR 98 per month for a single worker with two children and 88 EUR per month for a couple with two children.

3.4.2 Tax burden indicators

Table 17 shows tax burden indicators in Hungary. The tax wedge of a single parent with two children (A-67-2C) is as many as 24 percentage points lower than that of a single worker without children earning the same wage (A-67-NC). If we compare hypothetical couples 2A-100/33-2C (with two children) and 2A-100/33-NC (without children), we find a difference of 11 percentage points. Allowances in the PIT system and child benefits thus have a significant impact on the tax burden in Hungary.

Table 17

Tax burden indicators for basic hypothetical units (Hungary, 2013), in %

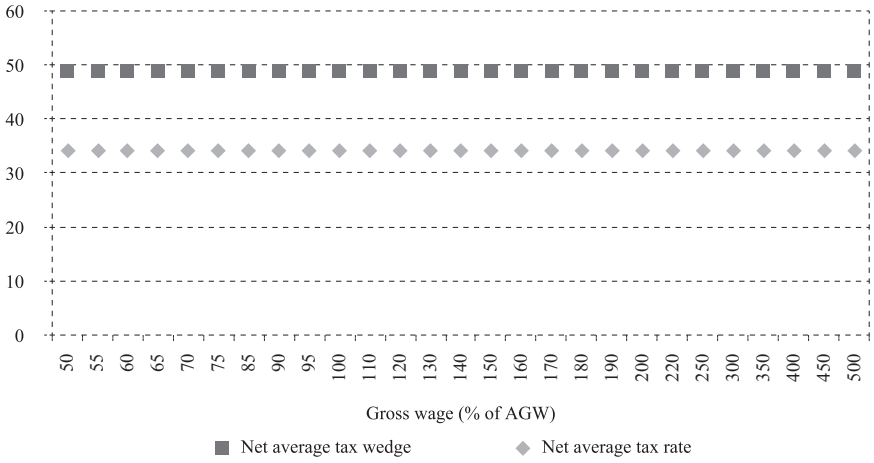
	A-67-NC	A-100-NC	A-167-NC	A-67-2C	2A-100/0-2C	2A-100/33-2C	2A-100/67-2C	2A-100/33-NC
Average PIT rate	16.00	16.00	16.00	3.65	7.77	9.82	11.06	16.00
Average employee SIC rate	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50
Net average tax rate	34.50	34.50	34.50	3.87	15.31	20.11	22.99	34.50
Net average tax wedge	49.03	49.03	49.03	25.19	34.10	37.83	40.07	49.03

Source: OECD (2014) and author's calculations.

The analysis of the system shows that single workers without children are not entitled to any tax reliefs, tax credit, or cash transfers; only one PIT rate and one employee SIC and employer SIC rate is applied. This makes the tax wedge and ratio of paid taxes to gross wage equal for all gross wages earned by single workers without children (table 17 and figure 7). Therefore, the Hungarian tax system is proportional for single workers without children.

Figure 7

Net average tax wedge and net average tax rate for single workers without children (Hungary, 2013), in %

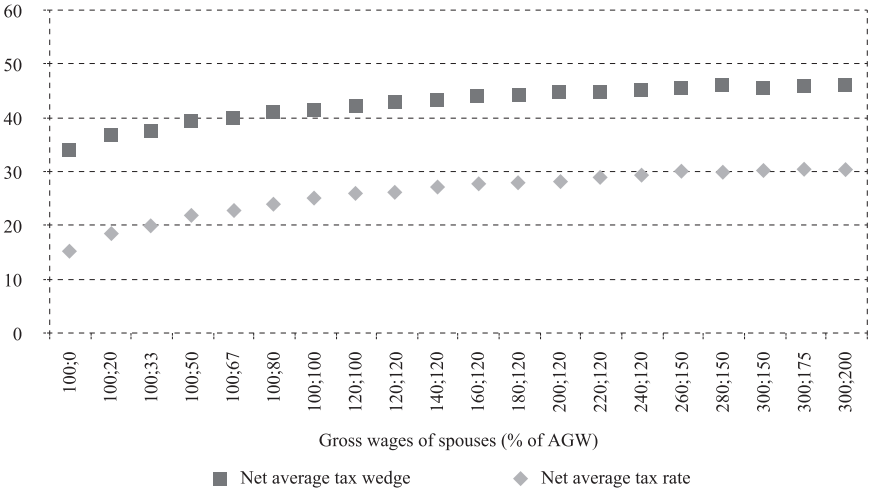


Source: Author's calculation.

On the other hand, the system applied to couples with children is progressive, owing to a personal allowance for dependent children and a universal child benefit (figure 8).

FIGURE 8

Net average tax wedge and net average tax rate for couples with two children (Hungary, 2013), in %



Source: Author's calculation.

3.5 POLAND

3.5.1 Basic components of labour taxation in Poland

The basic information on SIC rates in Poland are shown in table 18. However, the relatively complicated calculation of payable contributions does not fit the simple pattern applied in most of the other observed countries. For the calculation method, see OECD (2014). Pension insurance contributions and unemployment contributions are levied on a maximum base of EUR 26,555.

TABLE 18

SIC rates (Poland, 2013)

Contribution	Employee SICs (% of gross wage)	Employer SICs (% of gross wage)
Pension insurance (ZUS[a])	6.11	6.11
Pension insurance (ZUS II)	2.25	2.25
Pension insurance (OPF)	1.40	1.40
Unemployment contribution	1.50	6.50
Sickness insurance	2.45	4.17
Health insurance	9.00	–

[a]ZUS and ZUS II are pension fund management institutions. OPF is short for "open pension fund".

Source: OECD (2014).

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There are two different allowances in the Polish PIT system: the basic work-related relief is capped at EUR 318 for all workers, while the other relief amounts to a part of the employee's contributions and is calculated using a specific formula.

PIT calculation in Poland is based on two tax rates and two tax bands (table 19). Having applied the tax rate, the taxpayer can use three types of tax credit. The basic tax credit amounts to EUR 133 per year or EUR 265 per year for a single worker with children. The tax credit for children is EUR 133 per year for each child, if the annual gross wage received by one parent does not exceed EUR 26,700, while the threshold for the other parent is EUR 13,350. Health insurance contributions can almost entirely be claimed as tax credit.

No payroll tax is levied and no cash family benefits are received.

Table 19
PIT bands and rates (Poland, 2013)

Tax band in PLN	Tax rate
[0, 20,390]	18%
‹20,390, +∞›	3,538 + 32%

Source: OECD (2014).

3.5.2 Tax burden indicators

Table 20 shows the tax burden indicators in Poland. It is noteworthy that the average PIT rate is relatively low and shows a relatively slow upward trend as the taxpayer's income grows. The tax wedge of a single parent with two children (A-67-2C) falls 5 percentage points behind that of single workers without children earning an equal wage (A-67-NC). If we compare hypothetical couples 2A-100/33-2C (with two children) and 2A-100/33-NC (without children), the difference amounts to 3.5 percentage points.

Table 20
Tax burden indicators for basic hypothetical units (Poland, 2013), in %

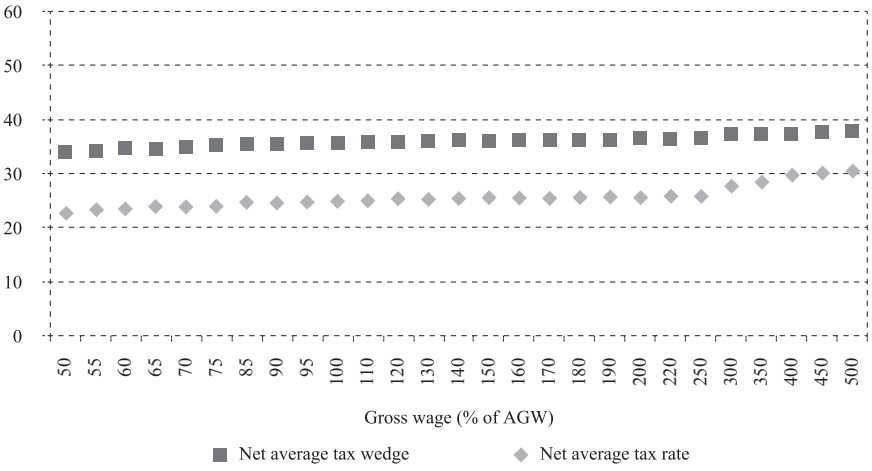
Family type	A-67-NC	A-100-NC	A-167-NC	A-67-2C	2A-100/0-2C	2A-100/33-2C	2A-100/67-2C	2A-100/33-NC
Average PIT rate	5.96	6.92	7.69	0.00	0.22	1.94	3.32	5.96
Average employee SIC rate	17.83	17.83	17.83	17.83	17.83	17.83	17.83	17.83
Net average tax rate	23.79	24.75	25.52	17.83	18.04	19.76	21.14	23.79
Net average tax wedge	34.74	35.56	36.22	29.63	29.82	31.29	32.48	34.74

Source: OECD (2014) and author's calculations.

The Polish progressive taxation system is applied both to single workers and couples with children; however, net average tax wedge and tax rate variations across a wide range of gross wages are relatively small (figures 9 and 10).

FIGURE 9

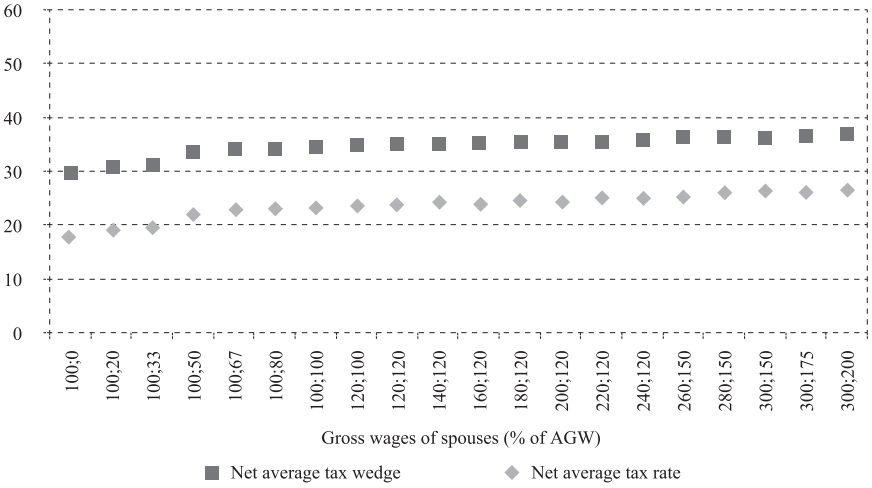
Net average tax wedge and net average tax rate for single workers without children (Poland, 2013), in %



Source: Author's calculation.

FIGURE 10

Net average tax wedge and net average tax rate for couples with two children (Poland, 2013), in %



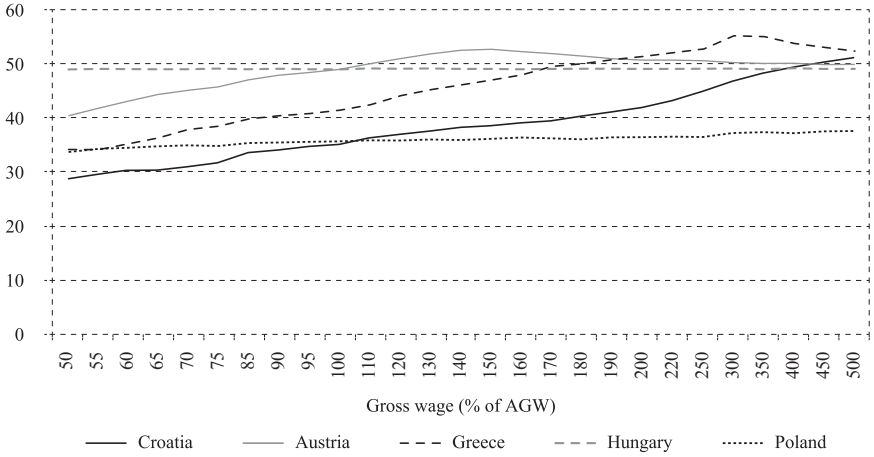
Source: Author's calculation.

4 COMPARATIVE ANALYSIS

This chapter offers a comparative analysis of the results presented in chapter 3. To find out which country imposes the highest taxes on its taxpayers, we will again take a look at hypothetical couples with two children and single workers without children in order to compare the net average tax wedge.

Figure 11

Net average tax wedge for single workers (2013), in %

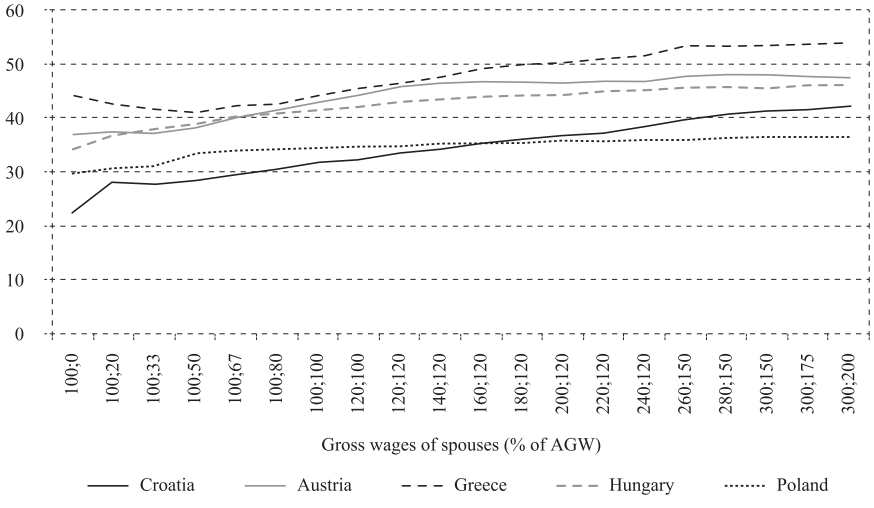


Source: Author's calculation.

The lowest tax wedge for single taxpayers earning less than 100% of AGW is found in Croatia, followed by Poland and Greece (figure 11). If we look at the interval in which the gross wage exceeds 100% of AGW, Poland's tax wedge is convincingly the lowest, while the curves indicating Hungary's, Austria's and Greece's tax wedge are "intertwined" in this interval. The Croatian tax wedge curve rises steeply in the interval indicating wages between 180% and 400% of AGW and meets the level of the aforementioned three countries as wages reach the highest amounts.

Figure 12

Net average tax wedge for couples with two children (2013), in %



Source: Author's calculation.

Greece has the highest tax wedge for couples with two children at all wage levels (figure 12). Even though Hungary's and Austria's PIT systems are significantly different, it is noticeable that the two countries' tax wedges are very similar across all gross wage levels. Among the analysed countries, Croatia's and Poland's tax wedges are the lowest; as is the case for single workers, the tax wedge is initially higher in Poland, but the tax wedge in Croatia exceeds the Polish tax wedge at a certain point. When comparing figures 12 and 11, it becomes evident that the correlation between tax wedge curves for single workers and those for couples with children differs substantially. This is due to the fact that significantly different tax reliefs and cash benefits for families with children apply.

5 CONCLUSION

The aim of this paper was to compare the average tax burden imposed on taxpayers in Croatia, Austria, Greece, Hungary and Poland. OECD data and methodology presented in OECD's Taxing Wages publication were used to calculate indicators for the eight hypothetical family units defined by the OECD. Moreover, such indicators were calculated for a number of other hypothetical units across a wide range of gross wages in order to gain an insight into the tax burden at higher income levels. A microsimulation model for hypothetical units across all five countries developed by the author specifically for this research was used for the above calculations.

Even though the observed countries are geographically relatively close and are all EU members, substantial differences in the labour income taxation systems are found. Each of the countries has its own unique features. For instance, Poland's system for calculating social insurance contributions is relatively complicated; Hungary has only one PIT rate; Greece lacks the usual child benefits: instead, employers increase the employee's gross wage by a certain percentage for each child; there is no tax credit in Croatia, but taxpayers are entitled to child benefits (which are means-tested), etc.

In spite of the differences in the taxation systems, some countries follow similar patterns and have similar net average tax wedge levels for different wage levels (for instance, Hungary and Austria in the case of couples with children). The comparison of hypothetical units with and without children has shown that the relative amounts of tax reliefs and child benefits differ among countries.

The analysis has also shown that Croatia has the lowest net average tax wedge for single workers with lower wages, while the tax wedge for single workers with above-average wages is lowest in Poland. However, it is worth noting that both Polish and Croatian taxpayers pay additional social insurance contributions which are not included in the tax burden calculations under the methodology used in this paper (see Urban, 2016).

The analysis of a wide range of income levels sheds a brighter light on the Croatian tax wedge pattern: even though the tax wedge for low gross wages is relatively low, it sharply increases to reach the same level as that of other countries (Austria, Hungary and Greece) for higher wages.

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ANNEX

TAX AND CONTRIBUTION CALCULATIONS FOR THE EIGHT HYPOTHETICAL FAMILY UNITS IN CROATIA

TABLE A1

Elements of tax burden indicator calculation: part 1 (Croatia, 2013)

	A-67-NC	A-100-NC	A-167-NC	A-67-2C
1. Gross wage	8,202	12,303	20,505	8,202
2. Employee SICs	1,640	2,461	4,101	1,640
2.1. Paid into the 1st pension insurance pillar	1,230	1,845	3,076	1,230
2.2. Paid into the 2nd pension insurance pillar	410	615	1,025	410
3. Personal income tax	369	1,136	2,777	0
3.1. Tax base reductions	5,126	5,947	7,587	9,309
3.1.1. Employee SICs	1,640	2,461	4,101	1,640
3.1.2. Personal allowance	3,486	3,486	3,486	7,669
3.2. PIT base	3,076	6,357	12,919	0
4. Local government surtax on PIT	44	136	333	0
5. Total personal income taxes	413	1,272	3,110	0
6. Child benefits	0	0	0	727
7. Net wage	6,148	8,570	13,295	7,289
8. Employer SICs	1,247	1,870	3,117	1,247
9. Total employee taxes (= 2.1 + 5 – 6)	1,643	3,117	6,186	503
10. Total employee and employer taxes (= 8 + 9)	2,890	4,987	9,303	1,750
11. Total labour cost (= 1 + 8)	9,449	14,174	23,623	9,449
12. Net average tax rate (= 9 / 1 x 100)	20.04	25.34	30.17	6.13
13. Net average tax wedge (= 11 / 12 x 100)	30.59	35.19	39.38	18.52

Note: According to the Taxing Wages methodology (OECD, 2014), employee SICs paid into the 2nd pension insurance pillar are not tax levies and are therefore not included in item 9.

Source: Author's calculations.

TABLE A2

Elements of tax burden indicator calculation: part 2 (Croatia, 2013)

	2A-0/100-2C			2A-100/33-2C		
	A1	**A2**	**Total**	**A1**	**A2**	**Total**
1. Gross wage	12,303	0	12,303	12,303	4,101	16,404
2. Employee SICs	2,461	0	2,461	2,461	820	3,281
2.1. paid into the 1st pension insurance pillar	1,845	0	1,845	1,845	615	2,460
2.2. paid into the 2nd pension insurance pillar	615	0	615	615	205	820
3. Personal income tax	52	0	52	261	0	261
3.1. Tax base reductions	11,872	0	11,872	10,130	4,306	14,436
3.1.1. Employee SICs	2,461	0	2,461	2,461	820	3,281
3.1.2. Personal allowance	9,412	0	9,412	7,669	3,486	11,155
3.2. PIT base	431	0	431	2,174	0	2,174
4. Local government surtax on PIT	6	0	6	31	0	31
5. Total personal income taxes	58	0	58	292	0	292
6. Child benefits	632	0	632	0	0	0
7. Net wage	10,417	0	10,417	12,831	0	12,831
8. Employer SICs	1,870	0	1,870	1,870	623	2,493
9. Total employee taxes (= 2.1 + 5 – 6)	1,271	0	1,271	2,137	615	2,752
10. Total employee and employer taxes (= 8 + 9)	3,141	0	3,141	4,007	1,238	5,245
11. Total labour cost (= 1 + 8)	14,174	0	14,174	14,174	4,725	18,899
12. Net average tax rate (= 9 / 1 x 100)			10.33			16.78
13. Net average tax wedge (= 11 / 12 x 100)			22.16			27.76

Note: (a) see the note under table A1; (b) A1 – Spouse I, A2 – Spouse II, "Total" – sum of values for Spouse I and Spouse II.

Source: Author's calculations.

TABLE A3

Elements of tax burden indicator calculation: part 3 (Croatia, 2013)

	2A-100/67-2C			2A-100/33-NC		
	A1	**A2**	**Total**	**A1**	**A2**	**Total**
1. Gross wage	12,303	8,202	20,505	12,303	4,101	16,404
2. Employee SICs	2,461	1,640	4,101	2,461	820	3,281
2.1. paid into the 1st pension insurance pillar	1,845	1,230	3,075	1,845	615	2,460
2.2. paid into the 2nd pension insurance pillar	615	410	1,025	615	2,015	2,630
3. PIT	261	369	630	1,136	0	1,136
3.1. Tax base reductions	10,130	5,126	15,256	5,947	4,306	10,253
3.1.1. Employee SICs	2,461	1,640	4,101	2,461	820	3,281
3.1.2. Personal allowance	7,669	3,486	11,155	3,486	3,486	6,972
3.2. PIT base	2,174	3,076	5,250	6,357	0	6,357
4. Local government surtax on PIT	31	44	75	136	0	136
5. Total personal income taxes	292	413	705	1,272	0	1,272
6. Child benefits	0	0	0	0	0	0
7. Net wage	15,699	0	15,699	11,851	0	11,851
8. Employer SICs	1,870	1,247	3,117	1,870	623	2,493
9. Total employee taxes (= 2.1 + 5 – 6)	2,137	1,643	3,780	3,117	615	3,732
10. Total employee and employer taxes (= 8 + 9)	4,007	2,890	6,897	4,987	1,238	6,225
11. Total labour cost (= 1 + 8)	14,174	9,449	23,623	14,174	4,725	18,899
12. Net average tax rate (= 9 / 1 x 100)			18.44			22.76
13. Net average tax wedge (= 11 / 12 x 100)			29.20			32.95

Note: (a) see the note under table A1; (b) A1 – Spouse I, A2 – Spouse II, "Total" – sum of values for Spouse I and Spouse II.

Source: Author's calculations.

Inequality: what can be done?

ANTHONY B. ATKINSON
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Triggered by Thomas Piketty's English version of the book *Capital in the Twenty-First Century*, published in 2014, many recent academic, political, and public discussions have focused on the growing income and wealth inequality in developed countries, particularly among the wealthiest 1%, who are accumulating an ever-increasing share. However, authors such as Saez, Piketty, Davies, and particularly Anthony Atkinson, have been analysing this tendency for many years. Coming as it does from a pioneer in the analysis of inequality and poverty, the 71-year-old Atkinson's book is an excellent summary of his lifelong research on this topic. The "added value" of the work is twofold. Firstly, the author's experience in this topic is reflected in the historical overview of changes in tax and social policy – primarily in the United Kingdom (UK), but in other European countries as well – since the early 20th century. Secondly, Atkinson clearly sets out 15 proposals and five ideas that, if pursued, would reduce inequality. Even though most proposals are either taken from UK history or aimed at making changes in the UK, they can easily be transferred to other European countries (EU members) or even worldwide.

The book is divided into three parts. First, Atkinson sets the scene by analysing the available global data, showing that the "inequality turn" of the 1980s has made increasing worldwide inequality inevitable. The UK and US have experienced a more rapid growth of inequality than have most EU countries, particularly those in Scandinavia. Atkinson is careful to examine the comparability of the data and highlights two important features: the comparability of the data sources (e.g., household budget surveys, income tax data, data on wealth); and that inequality should be quantified by more than one indicator but should be analysed using no more than twenty different variables. He concludes that inequality declined after the Second World War, during the period in which most of today's social policies were introduced, but started to rise in the 1980s. Atkinson proposes a set of mechanisms that could be used, in combination, to reduce the UK's Gini coefficient – a standard inequality measure – by some 3 per cent.

The second part of the book analyses and suggests 15 sets of proposals to reduce inequality. Each chapter deals with a specific topic, such as technological change, progressive taxation, social policy, and sharing of capital – the resulting sets of proposals are specific for each topic analysed. Some proposals are related to the reintroduction of UK policies that were abolished in the 1980s and 1990s. Interestingly enough, eight of the 15 proposals are related to UK taxation and social security policy and, in the final part, are analysed in terms of distributional analysis, using tax-benefit models. The suggestions include: (a) the reintroduction of a top progressive rate at 65 per cent, accompanied by a broadening of the tax base; (b) introduction of a progressive lifetime capital receipts tax for taxation of inheritance and gifts *inter vivos*; (c) introduction of proportional or progressive property taxation based on up-to-date property assessments; (d) introduction of an earned income discount; (e) introduction of a participation income for any citizen defined as "participating in society"; (f) renewal of social insurance and (g) broadening of child benefit to all children. At the global level, Atkinson proposes: (h) an

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introduction of official development assistance of 1 per cent of gross national income of rich (developed) countries.

Some of these sets of proposals are UK-specific, but Atkinson believes that they can be applied to other countries, particularly those in the EU. The remaining seven proposals include: (a) the need to focus the direction of technological changes s on the encouragement of innovation, especially in terms of employability of workers; (b) the introduction of a distributional dimension into competition policy and the establishment of a legal framework for active support of trade unions and the establishment of a social and economic council; (c) the government adoption of a mechanism to reduce unemployment, if necessary by providing public employment; (d) the identification by national policy of a statutory minimum wage (set as a living wage) as well as a code of practice for pay above the minimum; (e) the offer, via national savings bonds, of a guaranteed positive real rate of interest on savings, with a maximum holding per person; (f) a capital endowment paid at adulthood (or later); (g) a public investment authority should be created.

Furthermore, Atkinson proposes five ideas that ought to be pursued. These are: (a) an ongoing review of the access of households to the credit market for borrowing not secured by housing; (b) re-examination of the case for an annual wealth tax; (c) a global tax regime for personal taxpayers based on total wealth; (d) an "income-tax based" re-examination of contributions to private pension schemes; (e) a minimum tax for corporations.

The final part evaluates the proposed measures in terms of their feasibility. Some proposals are statistically evaluated as far as they relate to the UK. The most interesting part examines the ability of countries, especially those in the EU, to carry out these measures in the light of the current Europe 2020 strategy. Atkinson carefully highlights the possibility of EU regulations constraining national governments, and discusses the affordability of the measures proposed as well as the significance of globalisation in this context. Sceptics might fear that globalisation would impede successful application of his sets of proposals, but Atkinson disagrees, arguing that most social policies in the early 19th century were created in the midst of globalisation.

The whole book is very optimistic – reforms *can* be successfully made, and *we* are solely responsible for making them. Atkinson targets the whole population, from politicians and governments to individuals (in their roles as voters or lobbyists). He strongly believes that inequality can be reduced, but highlights the significance of institutional factors as well as that of investment in education and training. The two most significant proposals with an institutional dimension are the establishments of a social and economic council and a public investment authority at the national level (UK). Furthermore, he proposes greater inter-country institutional cooperation (e.g., tax administration, social and economic councils, etc.) that should benefit all.

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What can transition countries learn from this book? There are no explicit suggestions or recommendations for them, but some aspects of this book are applicable to all EU members, some of which are former transition countries. Atkinson states that even though EU members differ in their historical backgrounds and political standpoints, they all managed to agree on a set of objectives for the EU. These especially relate to reducing poverty, eliminating social exclusion and diminishing inequality.

Overall, this excellent book gives a valuable insight into the tendency of inequality to grow in the world's developed countries. Its most notable contribution is a move from a political debate on inequality towards a more economic and pragmatic evaluation of what we can all do to reduce both inequality and poverty. Furthermore, Atkinson uses the results of a complex statistical and mathematical analysis in a very simple way in order to show the applicative nature of his proposals, using the UK as an example. He also promotes international cooperation – and optimism – with his proposals of measures to reduce worldwide inequality and poverty.

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