MEASURING CORPORATE EFFECTIVE TAX BURDEN IN ROMANIA: A COMPREHENSIVE APPROACH

Sebastian LAZĂR
Faculty of Economics and Business Administration
Alexandru Ioan Cuza University
Iasi, Romania
slazar@uaic.ro

Gheorghe FILIP
Faculty of Economics and Business Administration
Alexandru Ioan Cuza University
Iasi, Romania
gfilip@uaic.ro

Abstract

Within the framework of micro backward looking methodology, we propose and compute an effective overall tax rate for Bucharest Stock Exchange traded companies for 2000 – 2009 period. We tried to capture all public finance liabilities that a company has to cope with as a share of turnover, no matter if they are related to capital or labour, or if they are included or not in the production costs. Therefore, we propose the concept of corporate effective overall tax rate and we make some calculations using detailed data from companies' financial reports. We show that effective overall tax rate have constantly decrease throughout the period surveyed, except for the year 2009, when the economic crisis took its toll from the companies turnover, thus making the effective tax rate to increase. Second, although the effective tax rate due to social security contributions decreased during the period, the share attributable to social security contributions in the overall tax rate increased, mainly due to the corporate income tax rate cut. Third, the tax burden generated by other significant taxes (mainly local taxes) is generally bigger than initially thought. In fact, we show that, among all public finance liabilities, corporate income tax has the lowest share of turnover for Bucharest Stock exchange traded companies.

Keywords: effective tax burden, micro backward looking methodology, corporate taxation
JEL classification: H22, H25

1. INTRODUCTION

Measuring the tax burden that companies have to cope is a matter of great interest both for business managers and policy makers. Doing business in a global market often reveals competitiveness issues that are linked to taxation. Often, the tax rates cuts are partial offset by increasing tax bases. Effective tax burden is a matter that goes far beyond the tax rate itself, although this is one of the most significant determinants. The vast majority of studies focused primarily on effective tax burden triggered by the corporate income tax, but we be-

lieve that this is only one face of the coin. Apart from corporate income tax, a company has to pay real estate taxes, royalties, payroll taxes or social security contributions, etc. Using the micro backward looking methodology, the paper aims at capturing the corporate overall tax burden expressed as all public finance liabilities to company's turnover ratio. Therefore, the terms effective tax burden and effective tax rate are used interchangeable.

We introduce the corporate effective overall tax rate based on several assumptions. First of all, in the actual context, when social security systems all over the developed world are confronted with increasing imbalances, the permanent need for financial resources may urge the governments to levy increasing payroll taxes and social security contributions. This tendency is encouraged by the fact that when it comes to assess the tax burden for businesses, major studies and methodologies deals mainly with corporate income tax and to a lesser extent with real estate taxes. Nicodeme (2007) provides a very concise review of methodologies used in assessing the effective tax rate for companies. Second, when it comes to doing business, the distinction between payroll tax and social security contributions schemes became often irrelevant, especially when the real incidence falls on companies and not on employees, as a series of studies had proved (see next section). Third, the other taxes that a company has to pay, namely real estate taxes, vehicles taxes, some other taxes could play a more significant role the previously thought.

Thus, the main objective of the paper is to assess the corporate effective overall tax burden for Bucharest Stock Exchange traded companies in a comprehensive manner by taking into account not only corporate income tax, but also other significant taxes (i.e. real estate taxes) and social security contributions. We want to determine what share of companies turnover goes to public finance and on this basis to identify what type of public finance liabilities imposes the highest burden on companies.

Particularly in Romania, the corporate income tax is seen as being relatively low, since the tax rate is 16% (from 2005 when flat tax was adopted). In spite of this reduced corporate income tax rate, one of the major criticism when it comes to doing business in Romania is related to relatively high social security contributions for which the statutory incidence falls on companies themselves. Therefore, we want to assess the tax burden induced by social security contributions, for which purpose we have developed a framework that made possible the assessment of the tax burden of each major taxes or social security contributions that falls on companies. The core piece of that is our concept of effective overall tax rate.

Our paper will contribute to existing literature in several ways: (i) it introduces a new measure for the effective tax rate based on micro-backward looking methodology that relies on financial data from companies reports that aims at capturing all public finance liabilities that a company has to cope with; (ii) it surveys the most important Romanian companies, namely those that are traded at Bucharest Stock Exchange for a period of ten years (2000 – 2009); (iii) it provides insights concerning tax burden for Romanian companies with regards to all public finance liabilities, not only to corporate income tax.

Several conclusions can be drawn from the paper. First, one can noticed a constant decrease of effective overall tax rate throughout the period surveyed, except for the year 2009, when the economic crisis took its toll from the companies turnover, thus making the effective tax rate to increase. Second, although the effective tax rate due to social security contributions decreased during the period, the share attributable to social security contributions in the overall tax rate increased, mainly due to the corporate income tax rate cut. Third, the tax burden generated by other significant taxes (mainly local taxes) is generally bigger than initially perceived. In fact, we show that, among all public finance liabilities, corporate

income tax has the lowest share of turnover for Bucharest Stock exchange traded companies.

The rest of the paper is organized as follows: Section 2 describes methodology and data used, Section 3 provides a brief description of Romanian tax provisions with respect to taxes considered, Section 4 presents the results and Section 5 concludes.

2. METHODOLOGY AND DATA

When it comes to assess the effective tax rates at company level two types of methodologies emerged over time, each having own advantages and shortcomings: forward-looking methodology and back-ward looking methodology.

In terms of forward-looking methodology, the Devereux & Griffith approach, which is based on a hypothetically investment project (King and Fullerton) is generally regarded as the standard in the field. Another well-known methodology, based on model firm approach, is European Tax Analyzer, developed by ZEW Mannheim and University of Mannheim. Both were used by European Commission in a series of studies regarding company taxation (CEE, 2001, Spengel et al, 2008). In the recent years, another model firm approach emerged, namely that of Djankov et al. (2010), which is jointly used by the World Bank, International Finance Corporation and PricewaterhouseCoopers (see doingbusiness portal). That methodology includes under the generic names of labour related taxes, the payroll taxes and social security contributions for which the statutory incidence falls on companies when assessing the "total tax rate" (TTR).

In terms of backward-looking methodology, the first insights were those of Collins and Shackelford (1995), followed by Buijink, W., Janssen, B., Schols, Y. (2002) and Nicodème, G. (2007). The difficulties of getting the firm level data, along with the differences in accounting standards make this methodology harder to implement. Nevertheless, several rankings were made, and for review see Nicodeme (2007). But, up to now, when using firm level data, payroll taxes and social security contributions as well as real estate taxes and other significant taxes were left asides, mainly because of the availability of data. Our paper aims at filling that gap, being the first (from our knowledge) that deals with the concept of effective overall tax rate applied in the framework of micro backward looking methodology.

The methodology used in the paper is called micro backward looking methodology and makes use of the real data as reported by the Bucharest Stock Exchange listed companies. In this purpose, a specific database was created from scratch, which contains all taxes paid by the listed companies to public budgets, taxes that are borne by companies. Such a database was necessary because neither of the well-known databases contains such data for the specific case of Romania. The most wide spread database uses in this kind of research, namely Amadeus database does not contain data regarding social security contributions or other taxes that a company has to pay to the public budgets, but only data related to profit tax. BACH database does indeed contain more detailed data from our research interest perspective, but does not cover Romania. Thus, the only chance was to construct a database (named INFIN – an acronym for financial information, but the other way around, as in Romanian language) which contains the relevant detailed data for the most representative Romanian companies, namely those who are listed within the regulated framework at Bucharest Stock Exchange. We focus on the listed companies, because apart from being the most representative, it is relatively easy to gather the data as they are publicly available (although there were many situations in which this was not quite an easy task). The sixty companies taken into survey

have an aggregate turnover of about 8.3% of Romanian GDP in 2008, and 6.5% in 2009 when global crisis hit Romania. The period surveyed started in 2000, because this particular financial year was the first in which the companies reported data using procedures congruent to the Fourth European Directive accounting regulations and to the International Accounting Standards. Luckily, the year 2000 also coincides with the start of a new era in Romanian tax framework, when the statutory tax rate for profit tax dropped from 38% to 25%. The number of nonfinancial companies surveyed is 60 (these are the companies not only listed, but effectively traded; the comprehensive list of companies can be consulted on the National Commission of Securities Exchange site:
http://www.cnvmr.ro/InfoUtile/ro/RapoarteEmitenti/RapoarteEmitenti.html).

For the scope of this paper, we propose and compute and effective overall tax burden for Romanian companies by taking into consideration not only the corporate income tax, but also the other taxes that a company pays (e.g. local taxes, mainly real estate taxes) and social security contributions paid by companies as employers. Basically, our effective tax tax burden tries to capture all public finance related liabilities of a company in the most comprehensive way possible, as a first step in assessing the attractiveness for business of a particular jurisdiction, in our case, Romania. Although there is a still a question if the social security contributions are part of the tax burden that a company supports, we choose to perform the computation in the absence/presence of social security contributions borne by companies and to highlight their impact. Nevertheless, we think that there are solid theoretical and practical backgrounds for the inclusion of social security contributions in the effective tax rate computation. First, based on the distinction between the "Bismarckian" or more insurance oriented social security system (in which the amount of benefits is more related to the amount of contributions and hence wages) and a more redistributive oriented social security system (such is the case of Romania), one can argue that the latter does not shift the tax burden to the employees (Knoester and van der Windt – 1987, Tachibanaki and Yokohama – 2008, Ooghe, Schokkaert and Flechet – 2003), thus the tax burden of social security contributions lays on companies themselves. Second, the tax measures taken by Romanian authorities in order to fight the crisis and which were addressed to companies were mainly in the field of social security contributions and not in the field of profit taxation. These two particular reasons encourage us to include the social security contributions as part of the effective "taxation" that a company has to cope with. Basically, we treat social security contributions borne by companies as payroll taxes in order to compute the overall tax burden. Although, social security contributions borne by companies differs from payroll taxes with respect to their basic economic meaning (the former allows for something back, while the latter does not allow for such a thing), we choose to include social security contributions in the overall tax burden based on the assumption that, when it comes to doing business, this distinction loses its relevancy, as the incidence falls on companies themselves both in legal and economic terms.

Basically, we want to capture all public finance related liabilities that a company has to deal with, no matter if they are related to capital or labour, or if they are included or not in the cost of doing business. Moreover, the model-firm approach used by the World Bank, International Finance Corporation and PricewaterhouseCoopers (see doingbusiness portal) introduced the concept of total tax rate for a company, which aggregate the profit tax, the labour related taxes and the property taxes in order to reveal a complete picture of taxes borne by companies. But, in this case, the total tax rate is computed in the framework of forward-looking methodology based on a model middle size company that operates in the

most populous city in the country. We have considered only the tax liabilities that are borne by the companies themselves and not just paid to the public budgets (although it is obvious, to be more specific, we did not considered value added tax or any other taxes which does not impact on companies accounts)

Computing the numerator as described above is just one face of the coin when it comes to measuring effective overall tax rate. Choosing the proper denominator may be quite a challenging task, especially when the purpose consists in capturing the burden of all public finance liabilities. We choose to use as a denominator the turnover as reported by the companies in their annual statements. Our choice is motivated by the fact that turnover constitutes the substance of all the payments made by a company, including those to the public budgets, thus being the most appropriate denominator that is consistent with our research goals.

Thus the effective overall tax rate is computed as:

$$ETR = \frac{CIT + LT + OT}{Turnover} * 100$$

where: *CIT = corporate income tax (profit tax);*
LT = labour related taxes;
OT = other significant taxes;

Our effective overall tax rate has some advantages, but also shortcomings.

Advantages:

- it is always positive, and therefore can provide a more suggestive picture of the tax burden of a company. It is similar in construction and significance with the effective macroeconomic rate of taxation, known as the tax burden, which is used in many studies on taxation and public finance and defined as tax revenues/gross domestic product ratio. Basically, this rate will show how much of the turnover generated by a company is paid in taxes of different types, for which the statutory incidence lays on the company itself;
- it comprises all public finance liabilities, no matter if they are related to capital or labour, thus providing a comprehensive picture of taxation for specific companies or sectors.
- it assesses the share of all major categories of taxes in the overall tax burden, thus allowing to identify which type of taxes is the most burdensome, and also it allows to identify trends over time.

Shortcomings:

- including social security contributions in the overall tax burden might be not in line with conventional approaches in the field, as social security contributions are different from payroll taxes (but we provide a sound justification for doing this);
- using turnover as a denominator could be subject to criticism, but we think that is the most appropriate choice for assessing the effective overall tax burden.

In this framework, we will compute the effective overall tax rate for Bucharest Stock Exchange listed companies for the period 2000 – 2009 and will identify what taxes are more burdensome. Also, we will be able to show if the reduction of the tax rates according to tax law provisions had effects in real world and if the social security contributions have de-

clined or have increased during the period with respect to number of employees of each company.

3. A SHORT DESCRIPTION OF ROMANIAN TAX FRAMEWORK

The Romanian tax framework bears the mark of the transition process that follows after the fall of the communist regime, which in our opinion can be summarized as follows: unpredictability, lack of objectiveness and impartiality, poor efficiency.

As far as the tax assessment is concerned, the Romanian tax framework followed closely the international trend of a tax rate cut cum base broadening policies. The statutory corporate tax rate has declined from 25% to 16% in 2005, when the flat tax was adopted.

Table no. 1 Corporate tax rate in Romania during 2000 - 2009

Period	Corporate tax rate	Type of taxation
2000 - 2004	25%	proportional
2005 - 2010	16%	proportional

Source: [tax legislation]

Our study will compute corporate overall effective tax rate, starting from the year 2000, when the corporate income tax rate dropped from 38% to 25%. Throughout the period, the losses could be carried-forward in the following five years (seven since 2009)

The other major tax burden consists in social security contributions whose statutory incidence falls on companies. The social security contributions in Romania consist in three major categories: pensions, unemployment and healthcare schemes, all of them financed by contributions paid both by employers and employees. For the scope of this paper we will focus only on those paid by companies, for which the rates are presented in table no. 2.

Table no.2 Social security contributions rates borne by companies in Romania during 2000 - 2009

Period	Social security contributions rates for public pensions schemes
01.01.2000 – 31.03.2001	40%, 35%, 30% - depending on working conditions
01.04.2001 – 31.12.2002	33.33%, 28.33%, 23.33% - depending on working conditions
01.01.2003 – 31.12.2003	34.5%, 29.5%, 24.5% - depending on working conditions
01.01.2004 – 31.12.2005	32%, 27%, 22% - depending on working conditions
01.01.2006 – 31.12.2006	29.75%, 24.75%, 19.75% - depending on working conditions
01.01.2007 – 30.11.2008	29.5%, 24.5%, 19.5% - depending on working conditions
01.1.2008 - 31.12.2008	28%, 23%, 18% - depending on working conditions
01.01.2009 – 31.01.2009	28.5%, 23.5%, 18.5% - depending on working conditions
01.02.2009 – 31.12.2009	30.8%, 25.8%, 20.8% - depending on working conditions
Period	**Social security contributions rates for unemployment insurances**
01.01.2000 – 31.12.2002	5%
01.01.2003 – 31.05.2004	3.5%
01.06.2004 – 31.12.2005	3%
2006	2.5%
2007	2%
01.01.2008 – 30.11.2008	1%
01.12.2008 – 31.12.2009	0.5%
Period	**Social security contributions rates for health insurances**
2000 – 2006	7%

Period	Social security contributions rates for public pensions schemes
2007	6%
01.01.2008 – 30.11.2008	5.5%
01.12.2008 – 31.12.2009	5.2%

Source: [tax legislation]

As for the other taxes that came into our attention, the major part belong to local taxes borne by companies, which are property taxes on buildings, land and vehicles, and also to royalties for companies activating in oil and gas industry. Presenting their evolution in the period followed is beyond the scope of our paper due to the numerous changes in the field. Briefly, the building tax, which is the most important among local taxes consists in a tax rate that varied between 0.25% şi 1.5% on book (historical) value of buildings.

4. RESULTS

The results of our computation are depicted in Appendix A. Several remarks could be made.

The effective overall tax rate decreased along the period surveyed from 13.01% in 2000 to 7.30% in 2009, although the minimum was recorded in 2008 (6.86%). This reduction in tax rate was in line with the changes in tax law provisions. The effective tax rate due to social security contributions decreased from 7.06% in 2000 to 4.91% in 2009, although in relative terms, the share of social security contributions in effective overall tax rate increased from approximately 54% - 58% in 2000 – 2004 period to 62% - 67% in 2005 – 2009 period. Consequently, the share of corporate income tax dropped from 19% - 22% in 2000 – 2004 to 13% - 19% in 2005 – 2009. The same kind of evolution is also valid for the other significant taxes (e.g. local taxes) which decreased from 22 – 25% in 2000 – 2004 to 16% - 20% in 2005 – 2009. This is due mainly to the decrease of corporate income tax rate from 25% to 16% in 2005. The year 2005 reveals itself as a major milestone that left its mark on the effective tax rate for Romanian companies. The adoption of flat tax is better reflected in the effective tax burden due to corporate income tax which dropped from around 2% in the first half of the period surveyed to around 1.2% in the second half of the period.

A detailed global picture is provided in figure no. 1.

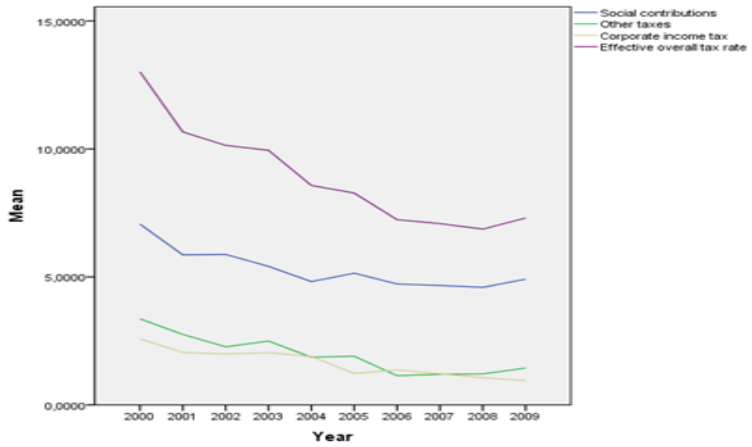

Figure no. 1 The dynamics of effective tax rate for Bucharest Stock Exchange traded companies (2000 – 2009)

It is quite obvious that the biggest share of the effective overall tax rate belongs to social security contributions. With only one exception (2000),

The effective tax burden induced by social security contributions was generally varying between a minimum of 4.59% in 2008 and 5.87% in 2002. The extreme value recorded in 2000 (7.06%) is due to the highest nominal social security contributions rates that were in place at that time (see table no. 1), thus corresponding to an extreme value of nominal social security contributions. In general, micro data are in line with the development over time of social security contributions rates.

Another interesting result is the relatively low share of corporate income tax in the effective overall tax rate. This is due mainly to the fact, that under Romanian tax legislation, all the other taxes are deductible when computing taxable profits, therefore the bigger the social security contributions and local taxes, the smaller the corporate income tax. This finding is in line with our assumption that corporate income tax is just one part of the broader picture of taxation, all other public finance liabilities having a major role in the effective overall tax burden.

When performing a sector analysis, the results show that hotels and restaurants and transport are the most burdensome industries, while energy and commerce are the least burdensome. This is due to the fact that hotels and restaurants on one hand and transport on the other hand are the most personnel intensive sectors (personnel costs to turnover ratio), while energy and commerce enjoys the lowest labour intensity. Also, hotels and restaurants and transport have also one of the highest capital intensity ratio (first and third) which causes high tax burden for other taxes (local taxes). As for energy, which is the second most capital intensive sector, the low tax burden due to other taxes is caused by the fact that, under Romania tax legislation, buildings are not taxed under building tax. Also, energy sector enjoys higher turnovers irrespective of the economic conditions, since there is a relatively monopoly on the market (there is only one energy company that is traded at Bucharest Stock Exchange). In these circumstances, energy sector is the least burdensome. The second least burdensome under effective overall tax rate is the commerce sector. In particular, this sector enjoys the lowest both capital intensity and labour intensity.

5. CONCLUSIONS

Introducing the concept of corporate effective overall tax rate, the paper tries to capture the tax burden induced by all public finance liabilities that a company has to pay, no matter if they are related to capital or labour. Using turnover as a denominator for our effective overall tax rate, assessing the share of each kind of taxes or contributions became quite straightforward, thus allowing both analyses over time and sector comparisons. Also, our concept of effective overall tax rate provide a comprehensive picture of the share of the turnover that a company has to pay in taxes or other public finance liabilities, thus providing insights into the attractiveness of a tax regime for doing business.

When performing analysis over 2000 – 2009 period we find that effective overall tax rate decreased on a constant basis, except for the year 2009, when economic crisis had left its mark on companies turnover, which in turn induced an increase in the effective overall tax rate. Indeed, when a look at a raw data, one can easily notice the decline of turnover for the majority of Bucharest Stock Exchange companies traded companies in 2009. The share of social security contributions in the overall tax burden increased starting from 2005 as a result of corporate income tax rate cut from 25% to 16%. Another interesting finding is that the tax burden induced by corporate income tax is the lowest among the taxes considered, which is confirms our assumption that looking only at corporate income tax could often be misleading.

In terms of sector analysis, we find that the most burdensome are those who are more labour intensive, (due to the social security contributions), but also capital intensive (due to other taxes, merely real estate taxes and vehicles taxes). In this category we have hotels and restaurants (15.94%) and transport (15.85%). Energy enjoys a specific situation since there is only one major company that have a dominant position on the market and also having a special tax regime concerning building taxation, thus having the most reduced effective overall tax rate (3.11%). The second most reduced effective overall tax rate belongs to commerce (3.63%), while in the middle of the ranking we find manufacturing industry (8.19%), construction (8.46) and extractive industry (10.60%).

Our study is the first one that measured the tax burden induced by all public finance liabilities in a comprehensive manner, assessing the size of each of them as a share of turnover. We have been able to prove using micro-backward methodology that social security contributions for which the statutory incidence falls on companies themselves are the most burdensome tax liability for Romanian companies and therefore to justify the need for their reduction. Also, we have shown that the share of other taxes (mainly real estate taxes) in the overall tax burden is generally bigger that it seems at a first look, corporate income tax being the tax with the lowest share in the effective overall tax rate.

Aknowledgment
This work was supported by CNCSIS-UEFISCSU, project no. PN-II-RU-PD, code 340/2010

References

[1] Buijink, W., Janssen, B., Schols, Y., Evidence of the effect of domicile on corporate average effective tax rates in the European Union, *Journal of International Accounting, Auditing and Taxation*, 11, 115-130, 2002.

[2] Collins, J.H., Shackelford, D.A., Corporate Domicile and Average Effective Tax Rates: The Cases of Canada, Japan, the UK and USA, *International Tax and Public Finance*, Vol 2, 55-83, 1995.
[3] Commission of the European Communities, *Company Taxation in the Internal Market*, available at http://ec.europa.eu/taxation_customs/resources/documents/company_tax_study_en.pdf, 2001
[4] Consiliul National al Intreprinderilor Private Mici si Mijlocii CNIMPMM, *100 de zile în Europa*, Clubul Diplomatic, Bucureşti, 2007;
[5] Devereux, M.P., Griffith, R., Taxes and the Location of Production: Evidence from a Panel of US Multinationals, *Journal of Public Economics* 68(3), 335–367, 1998a
[6] Devereux, M.P., Griffith, R., The Taxation of Discrete Investment Choices, *Working Paper* 98/16, Institute for Tax Studies, 1998b.
[7] Devereux, M.P. Griffith, R., Evaluating tax policy for location decisions, *International Tax and Public Finance*, 2003, 10, 107-126.
[8] Devereux, M.P., Elschner, C., Endres, D., Spengel, C., Bartholmeß, A., Dreßler, D., Finke, K., Heckemeyer, J.H., Zinn, B., *Effective Tax Levels Using The Devereux/Griffith Methodology* -, Project for the EU Commission TAXUD/2008/CC/099 available at http://www.zew.de/en/publikationen/publikation.php3?action=detail&nr=5633, 2009
[9] Djankov, S., Ganser, T., McLiesh, C., Ramalho, R., Shleifer, A., The Effect of Corporate Taxes on Investment and Entrepreneurship, *American Economic Journal Macroeconomics*, 2010.
[10] Filip, Gh., Dimensiunea financiară a întreprinderii şi fiscalitatea, *Dimensiunea financiară a întreprinderii*, Editura Eco'Art, 1995.
[11] Jedrzejowicz, T., Kiss, G., Jirsakova, J., How to measure tax burden in an internationally comparable way?, *National Bank of Poland Working Papers 56*, National Bank of Poland, Economic Institute, 2009.
[12] King, M.A., Fullerton, D., The Taxation of Income from Capital, *NBER*, University of Chicago Press, Chicago, 1984.
[13] Knoester, A., Van der Windt, N., Real Wages and Taxation on Ten OECD Countries, *Oxford Bulletin of Economics and Statistics*, Vol. 49, pp. 151–69, 1987.
[14] Martinez-Mongay, C., The ECFIN Effective Tax Rates, Properties and Comparisons with Other Tax Indicators, *Economic Paper*, No 146, European Commission, 2000.
[15] Nicodème, G., Comparing Effective Corporate Tax Rates, *Frontiers in Finance and Economics*, Volume 4, Issue 2, 102-131, 2007.
[16] Ooghe, E., Schokkaert, E., Flechet J., The Incidence of Social Security Contributions: An Empirical Analysis, *Empirica*, 30**:** 81–106, 2003.
[17] Polito, V., Measuring the Effective Tax Burden in the Real World, *Tax Studies*, Volume 30, Number 2, June 2009, pp 247-278, 2009.
[18] Spengel, C., Oestreicher, A., Elschner, C., Reister, T., Ernst, C., Grünewald, M., Finke, K., Prassel , J., Cui, L., *Study on the impact of reforms of corporate income taxation systems at the EU level on the size of the tax bases of the EU companies, using the model European Tax Analyzer*, Project for the EU Commission TAXUD/2007/DE/325, Mannheim and Gottingen, 2008, available at http://ec.europa.eu/taxation_customs/resources/documents/common/publications/studies/ccctb/eta.pdf;
[19] Tachibanaki, T., Yokoyama, Y., The Estimation of the Incidence of Employer Contributions to Social Security in Japan, *The Japanese Economic Review*,Vol. 59, No. 1, 2008.
[20] World Bank, Global Competitiveness Report 2009–2010, available at https://members.weforum.org/pdf/GCR09/GCR20092010fullreport.pdf, 2009.
[21] http://www.doingbusiness.org/

Appendix A. Descriptive statistics for major taxes and social security contributions for 2000 – 2009 period

Descriptive Statistics							
		N	Minimum	Maximum	Mean	% of effective overall tax rate	Std. Deviation
2000	Social security contributions	39	1,83	16,2541	7,066596	54,2969708	3,8931391
	Other significant taxes	39	0,4858	32,4102	3,363923	25,8470739	6,3777039
	Corporate income tax	39	0	13,7816	2,584196	19,8559554	2,8095053
	Effective overall tax rate	39	2,875	38,472	13,014715		7,1982598
2001	Social security contributions	44	0,1092	14,2748	5,859934	54,9483775	3,4018382
	Other significant taxes	44	0,0188	25,0412	2,75585	25,8415003	4,6543256
	Corporate income tax	44	-4,681	9,133	2,048651	19,2101222	2,3922206
	Effective overall tax rate	44	0,152	29,9845	10,664435		5,4743862
2002	Social security contributions	49	0,1407	12,3227	5,878763	57,9726333	3,4804435
	Other significant taxes	49	0,0161	27,7535	2,270382	22,3890678	4,9990451
	Corporate income tax	49	0	10,4591	1,991438	19,6382989	2,218199
	Effective overall tax rate	49	0,3714	30,0422	10,140583		6,2425427
2003	Social security contributions	58	0,0948	12,6394	5,412345	54,3999213	3,2454412
	Other significant taxes	58	0,0248	28,5623	2,496036	25,0878615	5,5361325
	Corporate income tax	58	-1,9895	13,2116	2,040797	20,5122172	2,762365
	Effective overall tax rate	58	0,4021	30,9247	9,949178		6,4341867
2004	Social security contributions	60	0,0648	11,7227	4,818824	56,1999143	3,0846409
	Other significant taxes	60	0,0687	27,3744	1,86406	21,7397465	4,7203781
	Corporate income tax	60	0	8,4815	1,891549	22,0603392	1,6913745
	Effective overall tax rate	60	0,5847	30,1677	8,574433		5,5902891
2005	Social security contributions	60	0	14,3489	5,148522	62,1973667	3,3690425
	Other significant taxes	60	0,0351	25,2492	1,900215	22,955786	4,3857128
	Corporate income tax	60	0	4,7539	1,22898	14,8468473	1,0958756
	Effective overall tax rate	60	0,8955	30,623	8,277717		5,3119354
2006	Social security contributions	60	0,0838	15,092	4,724271	65,2756321	2,8951274
	Other significant taxes	60	0,0004	5,5629	1,143315	15,7972752	1,2287538
	Corporate income tax	60	0	6,717	1,369833	18,9270927	1,5377266
	Effective overall tax rate	60	0,1749	17,3769	7,237419		3,7124664
2007	Social security contributions	60	0,1823	14,7448	4,667421	65,8992481	3,0238734
	Other significant taxes	60	0,0372	6,9642	1,197134	16,9023172	1,2537005
	Corporate income tax	60	0	7,7888	1,218106	17,1984206	1,4766991
	Effective overall tax rate	60	0,2195	17,5256	7,082662		4,0317559
2008	Social security contributions	60	0,1784	12,7683	4,592195	66,8560209	2,8734796
	Other significant taxes	60	0,0024	11,1118	1,211773	17,6417424	1,7335815
	Corporate income tax	60	0	5,0095	1,064815	15,5022367	1,3577501
	Effective overall tax rate	60	0,2359	19,1301	6,868783		4,0087415
2009	Social security contributions	60	0,1827	12,9994	4,912952	67,2858726	2,8240042
	Other significant taxes	60	0,0146	10,5214	1,441052	19,7360856	1,9840886
	Corporate income tax	60	0,0005	5,7224	0,947606	12,9780418	1,3772235
	Effective overall tax rate	60	0,2005	19,9392	7,30161		4,3647519

Appendix B. Descriptive statistics for major taxes and social security contributions for sectors of activity

Descriptive Statistics

Sectors		N	Minimum	Maximum	Mean	Std. Deviation
Extractive industry	Capital intensity	27	23,3538	67,7104	49,708118	9,4016302
	Personnel intensity	27	10,4180	31,5573	18,215569	6,0131515
	Social security contributions	27	2,4383	9,0492	4,509995	1,6660737
	Other significant taxes	27	,1582	32,4102	3,944706	6,2190567
	Corporate income tax	27	,0000	5,0095	2,150639	1,3454778
	Effective overall tax rate	27	2,8365	38,4720	10,605340	6,6907556
Manufacturing industry	Capital intensity	397	7,2536	96,7492	50,667732	15,4969234
	Personnel intensity	397	,7802	60,6534	21,382519	11,4368098
	Social security contributions	397	,1784	16,2541	5,305577	2,9408549
	Other significant taxes	397	,0004	28,5623	1,596143	4,0409572
	Corporate income tax	397	-4,6810	9,1330	1,294353	1,5461320
	Effective overall tax rate	397	,2913	32,2660	8,196073	4,9883277
Energy	Capital intensity	8	52,1872	85,8534	72,546949	10,6438990
	Personnel intensity	8	3,4671	7,8008	5,557316	1,5618855
	Social security contributions	8	,7839	2,0030	1,302343	,4642806
	Other significant taxes	8	,2304	,7623	,485658	,2012513
	Corporate income tax	8	,2061	2,4659	1,330253	,8503914
	Effective overall tax rate	8	1,7824	4,7404	3,118254	1,0586031
Construction	Capital intensity	34	7,3307	87,0909	40,387459	24,8884077
	Personnel intensity	34	1,4192	45,3815	18,372853	11,3835112
	Social security contributions	34	,0000	11,5615	4,732929	3,1395502
	Other significant taxes	34	,3845	9,4678	1,636315	1,7058364
	Corporate income tax	34	,0000	12,2410	2,098081	2,7543528
	Effective overall tax rate	34	3,4470	16,6271	8,467325	3,3225045
Commerce	Capital intensity	34	,0000	33,2829	15,159280	10,1578941
	Personnel intensity	34	,2598	10,9249	4,679810	3,9193134
	Social security contributions	34	,0648	2,4192	1,062825	,8966529
	Other significant taxes	34	,0146	19,4959	1,006308	3,3574183
	Corporate income tax	34	,0000	13,7816	1,563437	2,7585601
	Effective overall tax rate	34	,1520	21,3919	3,632570	4,8948411
Transport	Capital intensity	26	35,7718	88,6230	68,020570	12,5053875
	Personnel intensity	25	12,5265	59,4684	38,170414	15,3704842
	Social security contributions	25	3,2995	15,0920	9,736072	4,1510485
	Other significant taxes	25	,9550	11,1118	2,959832	2,9132386
	Corporate income tax	25	,3196	8,4815	3,155123	2,2960429
	Effective overall tax rate	25	11,5474	20,9325	15,851026	2,5614047
Hotels and restaurants	Capital intensity	25	8,8626	93,2614	80,159057	17,9208704
	Personnel intensity	25	21,5918	35,2684	28,565600	3,8864812
	Social security contributions	25	5,4539	11,1483	7,532031	1,8543730
	Other significant taxes	25	2,1073	11,2734	5,040634	2,0317937
	Corporate income tax	25	,0000	13,2116	3,367494	3,2875041
	Effective overall tax rate	25	9,9134	25,8063	15,940160	3,5025769