ACTA UNIVERSITATIS AGRICULTURAE ET SILVICULTURAE MENDELIANAE BRUNENSIS

Volume LXI 128 Number 4, 2013
http://dx.doi.org/10.11118/actaun201361041153

SHIFT IN TAX BURDEN AND ITS IMPACT ON ECONOMIC GROWTH IN THE EUROPEAN UNION

Irena Szarowská

Received: April 11, 2013

Abstract

SZAROWSKÁ IRENA: *Shift in tax burden and its impact on economic growth in the European Union.* Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis, 2013, LXI, No. 4, pp. 1153–1160

This article deals with a tax burden in the European Union in as financial and economic crisis has impacted also on tax systems in the European Union. Governments' tax measure aims to consolidate public finance and promote an economic growth. The article provides empirical evidence on a shift in a tax burden and its structure and analyzes the effects of shift in tax burden on economic growth in the EU. It is used the Eurostat definition to categorize tax burden by economic functions and implicit rates of consumption, labour and capital are investigated. The analysis is based on annual data of the EU member states in a period 1995–2010. On average, labour taxes have decreased by 1.9 p.p., capital taxes have also decreased – by 2.1 p.p., but consumption taxes have mildly increased by 0.4 p.p. in the European Union in a period 1995–2010. Pairwise Granger Causality Test was used for examining relations between economic growth and tax burden by economic functions in short-term. Results confirm that there is two-way causality between change of implicit tax rate of consumption and GDP growth; and also GDP growth Granger-causes change of implicit tax rate of capital and implicit tax rate of labour through one-way causality.

tax burden, tax shift, implicit tax rates, growth conductive system, economic functions, economic growth

1 INTRODUCTION

Financial and economic crisis has also impacted on tax systems in the European Union. The complexity of today's global economic environment increases importance of identifying and understanding the key factors affecting economic growth. Policymakers are struggling to find ways to adapt and cope with consequences of financial and economic crisis on public revenues. The tax structure is one important aspect of the concept of the quality of taxation. It deals with the design of tax policy to achieve desired policy objectives, while at the same time promoting economic growth, minimizing distortions and reducing the cost of tax collection. Of course, it is necessary to realize tax changes with respect to stay competitive with other countries.

As it is described in The Global Competitiveness Report 2012–2013 (2012), taxation is very important factor for doing business. Respondents – business executives were asked to select from a list of 16 factors the five most problematic for doing business in their economy and rank them. Published data indicates that tax rates and tax regulations belong to the most problematic factors. In a third of the EU countries, the tax measures were identified as the most problematic factor for doing business in the country at all.

The aim of the paper is to examine effects of taxation by economic functions on economic growth and to provide direct empirical evidence in the European Union. It is used the Eurostat's definition to categorize tax burden by economic functions and implicit tax rates of consumption, labour and capital are investigated. The analysis is based on annual panel data of the EU member states in a period 1995–2010. Pairwise Granger Causality Test is used as the main method of research.

2 Literature review

The theoretical effect of taxation on economic performance is not apparent matter. There is voluminous literature on the effects of taxes on

the economy and its rate of growth (Barro, 1991; Mendoza *et al*., 1994; Slemrod, 1995; Leibfritz, Thornton and Bibbee, 1997; Nordhaus and Boyer, 2000; Acemoglu, 2009 or Acemoglu *et al*., 2012). Myles (2009) reviewed different production functions and effects of taxation on GDP and economic growth. However, using statistical data for comparing levels of taxation and economic performance also does not provide unequivocal conclusions (Zipfel and Heinrichs, 2012).

Many studies present negative relationships between taxes and economic growth and recommend lowering tax rates. Plosser (1992) found a significant negative correlation between the level of taxes on income and profits (as a share of GDP) and growth of real per capita GDP. King and Rebelo (1990) simulated changes in the income tax by applying an endogenous growth model and find that an increase from 20 per cent to 30 per cent reduces the rate of growth by 2 percentage points. Hill (2008) estimated the growth–maximizing size of states for the United States in 1960–1990 was between 9% and 29% of GDP. Also Romero-Ávila and Strauch (2008) stated that government consumption and direct taxation negatively affect growth rates of GDP per capita in the EU-15 in the last 40 years. Johansson *et al*. (2008) investigated the design of tax structures to promote economic growth. Corporate taxes were found to be most harmful for growth, followed by personal income taxes, and then consumption taxes. Recurrent taxes on immovable property appear to have the least impact.

Lee and Gordon (2005) explored how tax policies in fact affect a country's growth rate, using cross-country data during 1970–1997. They found that statutory corporate tax rates are significantly negatively correlated with cross-sectional differences in average economic growth rates. The coefficient estimates suggest that a cut in the corporate tax rate by 10 p.p. will raise the annual growth rate by one to two percentage points.

Karras and Furceri (2009) examined the effects of changes in taxes on economic growth. Using annual data from 1965 to 2003 for a panel of 19 European economies, the results show that the effect of an increase in taxes on real GDP per capita is negative and persistent. An increase in the total tax rate by 1% of GDP has an effect on real GDP per capita of minus 0.5% to minus 1% in the long run. The findings also imply that increases in social security contributions or taxes on goods and services have larger negative effects on per capita output than increases in income tax.

Prammer (2011) summarized indications on how taxation might influence growth relevant decisions. Taxes on labour can affect decisions in three major ways by altering: i) the allocation of time between labour and leisure ii) human capital accumulation iii) occupational and entrepreneurial behavior and choices. Labour taxes can also affect labour supply decisions, both concerning the decision to participate in the labour market and the amount of hours worked (García *et al*., 2011; Szarowská, 2011; Johansson *et al*., 2008). However, the exact effect of taxation on labour supply can theoretically not be determined as the substitution effect and the income effect work in opposite directions. The exact impact of labour taxes on the labour market depends on the labour demand elasticity, the degree of centralization of the wage bargaining and the distribution of incomes among different income levels (Loretz, 2008).

Taxes on capital can influence the rate of capital accumulation. By changing the return on capital, they might discourage saving and investment by economic agents (firms or individuals); hence capital taxes alter the intertemporal allocation of resources. Lower levels of investment eventually lower the capital stock which in turn impacts on growth. Thus, due to the intertemporal structure capital taxation accumulates the distortions over time (Vermeend *et al*., 2008).

Consumption taxes are often regarded as less distortionary than income taxes, as they do not distort intertemporal decisions the way income taxes do. Consumption taxes fall partly on accumulated assets, which are an inelastic tax base. Moreover, consumption taxes do not impact on the returns to saving and, usually, do not have a progressive tax structure (Carey and Tchilinguirian, 2000).

With respect to literature above, it is possible to summarize that some taxes are more conducive to growth than others. Capital taxes cause very negative on growth. Labour taxes are less growth conducive; strong progressivity of income tax rates is regarded as particularly negative in this context. Consumption taxes are compatible with growth as they have small effect on decisions by economic agents regarding growth factors. Due to the negative growth effect of labour and capital taxes, it can be expected that in a growth-conducive system the tax burden of taxes on these factors should be kept lower in relation to consumption taxes.

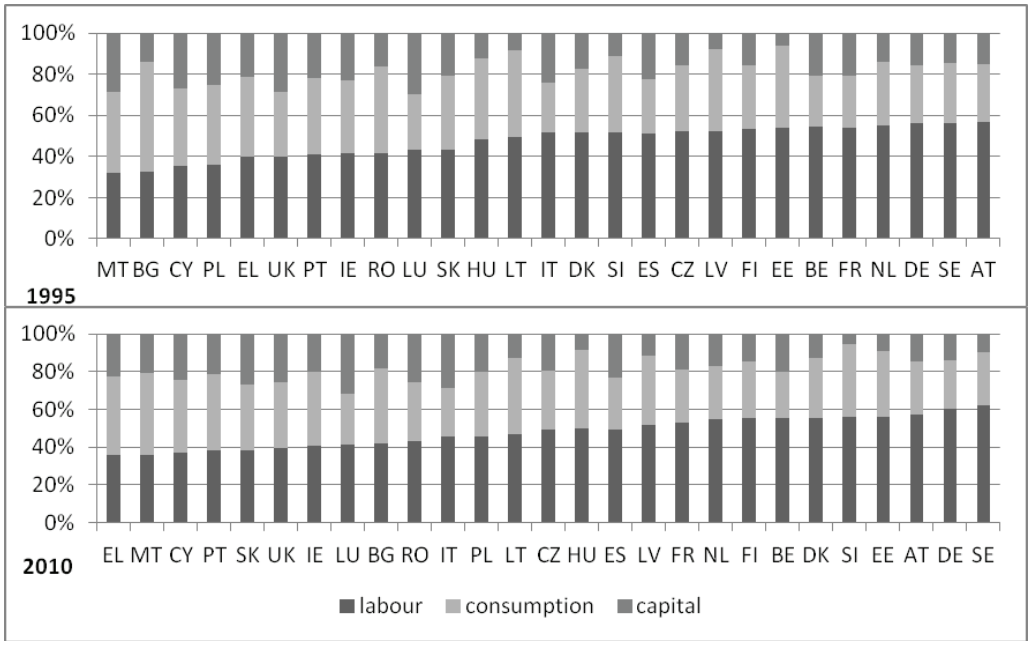
3 METHODS AND RESOURCES

As it is known, tax burden has very different structure and size in each country. The goal of the article is to examine effects of taxation by economic functions on economic growth and to provide direct empirical evidence in the European Union. Hence, it is used the Eurostat's definition to categorize tax burden by economic functions and implicit tax rates of consumption, labour and capital are investigated. The analysis is based on annual panel data of the EU member states in a period 1995–2010 (the longest available time series). Basic panel model identifiers are country *i* and time *t*. The analysis uses data on tax burden by economic functions, namely implicit tax rates of consumption (*ITR_C*), labour (*ITR_L*) and capital (*ITR_K*) from Eurostat. Annual data on GDP at market prices are also taken from Eurostat and they are based on accrual basis. Tab. I presents basic variables and their descriptive statistics.

I: *Descriptive statistics of variables*

	ITR_C	ITR_L	ITR_K	GDP_growth
Mean	21.30	35.66	24.80	2.92
Median	20.40	37.00	23.70	3.30
Maximum	34.20	49.30	49.90	11.70
Minimum	11.10	20.80	4.80	–17.70
Std. Dev.	4.45	6.40	9.24	3.60
Observations	379	379	339	376

Source: author's calculation based on data from Eurostat (2012)



1: *Share of taxes by economic functions in total revenue (1995, 2010)*
Source: author's calculation based on data from Eurostat (2012)

It is necessary to test the stationary time series before starting econometric analysis. A stationary time series is required because any variable which stochastically permanently departs from its mean value cannot be affected by long period variable, which returns to its mean value (effect may be only in a short term). Recent literature suggests that panel-based unit root tests have higher power than unit root tests based on individual time series. Panel unit root tests are similar, but not identical, to unit root tests carried out on a single series (Dougherty, 2007). We used panel unit root tests (Levin, Lin and Chu; Breitung; Im, Pesaran and Shin; Fisher-type tests using ADF and Fisher PP tests) and they identified that all data is stationary I(0). Therefore, it is possible to analyze the effect of taxation on economic performance based on level data.

Finally, we investigate causal relationship between economic growth and tax burden by economic functions using Granger causality methodology. Pairwise Granger Causality Tests can determine dynamic relations between two variables in short-term. A time series *X* is said to Granger cause *Y* if it can be shown, that those *X* values provide statistically significant information about future values of *Y* (Granger, 1969). If a time series is stationary, the test is performed using the level values of two (or more) variables. If the variables are non-stationary, then the test is done using first (or higher) differences. The number of lags to be included is usually chosen using an information criterion. Any particular lagged value of one of the variables is retained in the regression if (1) it is significant according to a t-test, and (2) it and the other lagged values of the variable jointly add explanatory power to the model according to an F-test. Then the null hypothesis of no Granger causality is not rejected if and only if no lagged values of an explanatory variable have been retained in the regression.

4 RESULTS AND DISCUSSION

4.1 Shift in a taxation by economic functions

The financial and economic crisis also has an impact on tax systems and the structure of tax mix in the EU. Tax burden and its structure are regularly

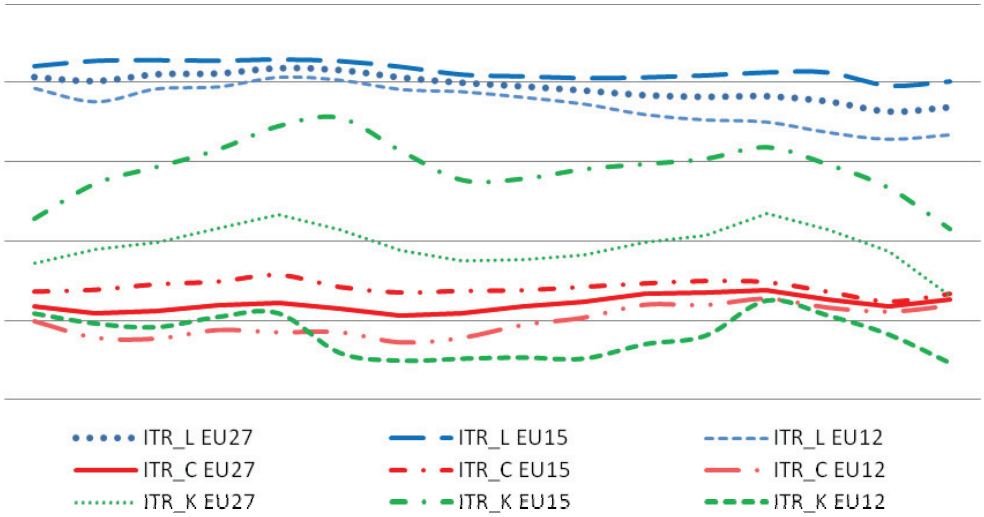
analyzed by Eurostat. Next figures depict following groups of taxes: taxes on labour (including social security contributions), capital (taxes on stocks of capital/wealth and taxes on capital and business income) and consumption (VAT and excise duties). Fig. 1 presents structure of tax mix and share of taxes in total revenues in years 1995 and 2010 – the latest year for which detailed data are available.

The structure of tax burden by economic functions reveals that the eastern EU member states generate a relatively high share of total revenues through consumption taxes. In the northern and central European states, revenues come predominantly from labour taxes. This is the result of a relatively high burden on the factor labour (for details look at Eurostat, 2012) – compared with the EU average. Especially in central EU member states such as Czech Republic, Germany, France and the Netherlands this is due to the large share of social security contributions. Denmark is a special case as social security revenues there only amount to 1% of GDP (in 2010).

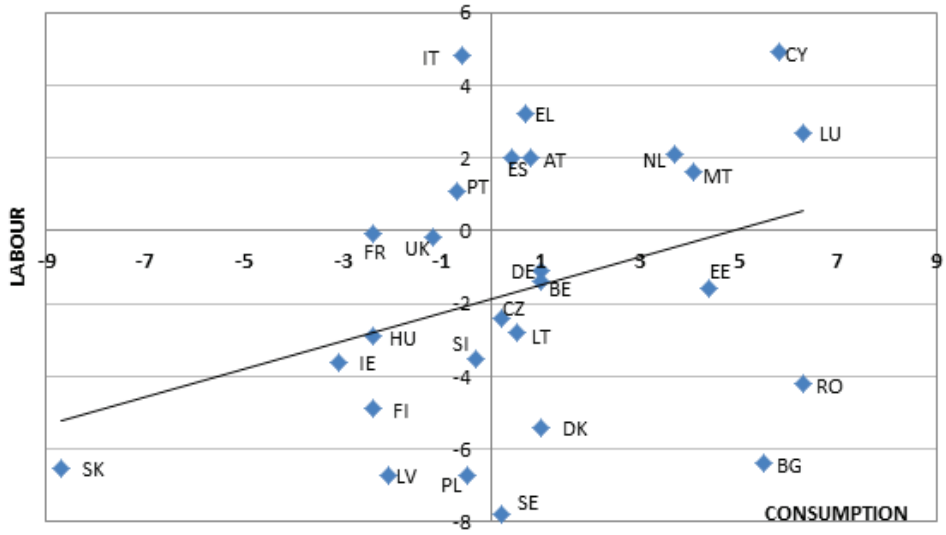
However, governments have to find the way how to face with the difficult of consolidating their budgets while at the same time promoting economic growth. Raising consumption taxes while at the same time lowering taxes on labour and capital can stimulate an economic growth. Taxation of labour and capital should be kept low as it distorts decisions by economic agents, which in turn negatively impacts the use of the growth factors labour, capital and technological progress. Taxation on consumption has less adverse effects in this respect. As Zipfel and Heinrichs (2012) point out, since the turn of the millennium Europe has witnessed a slight trend towards more growth-conducive tax systems. Tax systems have been redesigned mainly in the countries of northern and eastern Europe, whereas central Europe has seen little change.

Fig. 2 summarizes the development of implicit tax rates in the EU27 and also in core (EU15) and new EU member states. Differences between old and new member states are the smallest for consumption taxes, they tend to converge. On the other side, the biggest difference is observed for capital taxes, new member states have, on average, implicit tax rate on capital smaller by 10 p.p than old member states. New member states are often criticized for harmful tax competition (for details look at Szarowská, 2010). On average, labour taxes decreased by 1.9 p.p, capital taxes also decreased – by 2.1 p.p., but consumption taxes mildly increased by 0.4 p.p. in selected period.

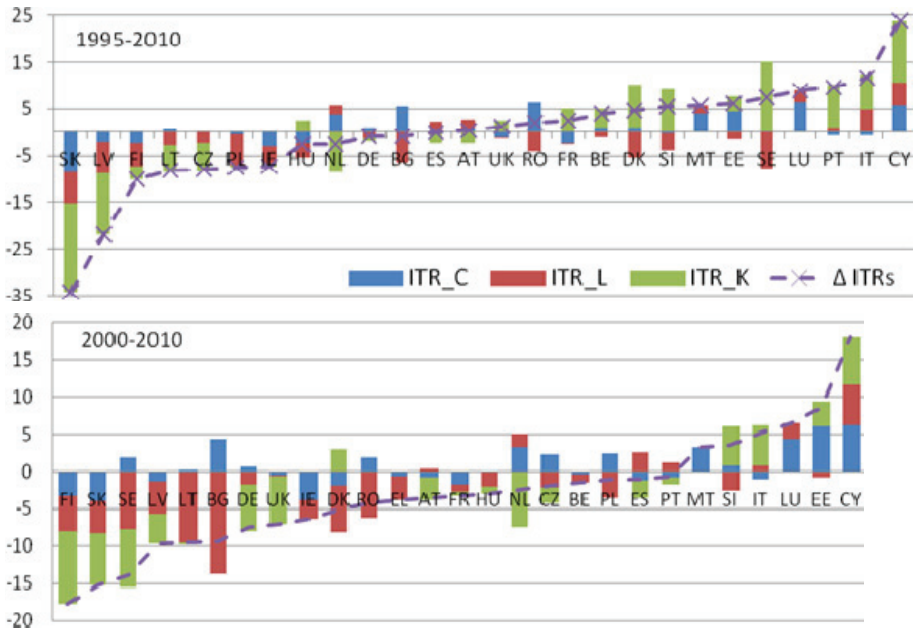
This development is in line with tax and economic theory as most authors point out that the increase of capital mobility has raised concerns that excessive levels of taxation can influence capital and especially move profits to low tax jurisdictions. At the same time, they hope to attract foreign capital investments by offering an attractive tax treatment. Taxes on capital and corporate income may have distorted effects on the market, particularly in highly integrated areas like the EU internal market. These distortions may also impact personal income taxes because taxes on capital reduce capital accumulation and therefore negatively impact productivity levels, which in turn depress wages. Next, the fact that capital is generally more mobile than labour has generated the apprehension that the burden of taxation would be shifted from the former to the latter. Equity considerations also feature prominently in the debate on the taxation of capital held by individuals, given that capital is more lightly taxed than labour income, and is often taxed at flat rates, which calls for an effective taxation of capital income to avoid elimination the progressivity of the income tax of its meaning. The relative mobility of capital has stimulated the apprehension about tax competition and a subsequent race-to-the-bottom in capital tax rates (Hill, 2008; Johansson *et al.*, 2008;



2: *Development of ITRs (1995–2010)*
Source: author's calculation based on data from Eurostat (2012)



3: *Shift between ITRs on consumption and labour in p.p. (1995–2010)*
Source: author's calculation based on data from Eurostat (2012)



4: *Changes of taxation by economic functions – difference in p.p.*
Source: author's calculation based on data from Eurostat (2012)

Acemoglu, 2009; Karras and Furceri, 2009; García *et al*., 2011; Prammer, 2011).

Fig. 3 summarizes the shift between implicit tax rates on consumption and labour in percentage points in individual EU countries between 1995–2010. It is necessary to point the fact that figure presents changes in implicit tax burden but it does not express a final value of tax burden. A third of EU member states (BE, BG, CZ, DE, DK, EE, LT, RO, SE) increased consumption taxes and at the same time decreased labour taxes. Average increase of consumption taxes is very low and it is caused by changes of VAT in most countries. Lowering labour taxes is mostly connected with decreasing social security contribution and effort to make labour costs more competitive.

The second third of EU member states (FI, FR, HU, IE, LV, PL, SI, SK, UK) decreased labour and also consumption taxes. This development was mainly connected with the effort to make the tax systems more growth conductive and attractive. Next group of states (AT, CY, EL, ES, LU, MT, NL) increased both types of taxes, only Italy and Portugal decreased consumption and increased labour taxes.

Fig. 4a presents the changes of taxation by economic functions between 1995 and 2010 in individual member states. Development in the beginning of analyzed period was significantly

II: *Pairwise Granger Causality Tests for GDP growth and dITRs (lags: 2)*

Null Hypothesis:	Observations	F-Statistic	Prob.
dITR_C does not Granger Cause GDP_growth	**307**	**4.31991**	**0.0141**
GDP_growth does not Granger Cause dITR_C		**4.50509**	**0.0118**
dITR_L does not Granger Cause GDP_growth	307	1.81689	0.1643
GDP_growth does not Granger Cause dITR_L		**8.89758**	**0.0002**
dITR_K does not Granger Cause GDP_growth	270	1.66551	0.1911
GDP_growth does not Granger Cause dITR_K		**8.88235**	**0.0002**
dITR_L does not Granger Cause dITR_C	307	2.69666	0.0691
dITR_C does not Granger Cause dITR_L		0.05029	0.9510
dITR_K does not Granger Cause dITR_C	270	0.16038	0.8519
DITR_C does not Granger Cause DITR_K		2.22521	0.1101
dITR_K does not Granger Cause dITR_L	270	0.56772	0.5675
dITR_L does not Granger Cause dITR_K		0.31647	0.729

Source: author's calculation based on data from Eurostat (2012)

influenced by transformation process (especially in new member states), hence Fig. 4b shows a shorter period (2000–2010).

The violet lines show the total change of implicit tax burden in EU member states. The figures highlight that some member states only shifted taxation from one type of taxes to another in the period under consideration. The Spain is an example of zero total changes in implicit tax burden as it has shifted the burden of taxation from capital taxes (–2.4 p.p.) to labour (+2 p.p.) and consumption taxes (+0.4 p.p.). Similar development can be seen in Austria or Bulgaria. The highest difference in tax burden can be found in Slovakia (decrease more than 34 p.p.) and Cyprus (increase nearly 24 p.p.) during the period 1995–2010. After the year 2000, the only six countries have positive total change of monitored ITRs. Significant structural changes in fiscal policy are the main reasons for the development and they have different context in the short term and over a medium to longer-term horizon. For the short run, countries have attempted to stimulate demand via tax relief, reducing the effects on the real economy. In the medium to long term, fiscal consolidation and obtaining sufficient public revenues (i.e. the case of Cyprus and Italy) is given priority, which may lead to tax hikes.

4.2 Effects of taxation by economic functions on economic growth

Finally, we used Pairwise Granger Causality Tests for examining relations between economic growth (*GDP_growth*) and tax burden by economic functions (*ITR_C*, *ITR_L*, *ITR_K*) in short-term. The optimal number of lag is two and it was identified using information criteria. It is necessary to note that two-way causation is frequently the case: GDP growth Granger causes implicit tax rate and implicit tax rate Granger causes GDP growth. The null hypothesis should be rejecting if probability is less than 0.05 (usual level of statistical significance).

The example of null hypothesis is that economic growth does not Granger-cause the implicit tax rate of consumption (labour, capital) and that the implicit tax rate of consumption (labour, capital) does not Granger-cause economic growth. Bold values in Tab. II indicate hypothesis which should be rejected.

Results in Tab. II express that there is two-way causality between change of implicit tax rate of consumption and GDP growth and one-way causality between change of implicit tax rate of capital and implicit tax rate of labour and GDP growth. It is interesting that Pairwise Granger Causality Tests have not confirmed inverse causality, as the theory presents negative impact of labour taxes on economic growth (Johansson *et al.*, 2008; Prammer, 2011). The reason can be found in using different type of data – we used cumulated implicit tax rates whereas other researchers have used individual tax rates.

It is important to mention that the statement for example 'implicit tax rate of consumption Granger causes GDP growth' does not imply that GDP growth is the effect or the result of implicit tax rate of consumption. Granger causality measures precedence and information content but does not by itself indicate causality in the more common use of the term.

5 CONCLUSION

The goal of the article was to examine effects of taxation by economic functions on economic growth and to provide direct empirical evidence in the European Union. It was used the Eurostat's definition to categorize tax burden by economic functions and implicit rates of consumption, labour and capital

have been investigated. The analysis was based on annual data in a period 1995–2010. Pairwise Granger Causality Test was used as the main method of research.

The first part of article deals with theoretical effect of taxes and tax burden on economic growth. Next, we examined development of tax burden in the European Union in a monitored period as financial and economic crisis has impacted also on tax systems. The structure of tax burden by economic functions reveals that the eastern EU member states generate a relatively high share of total revenues through consumption taxes. In the northern and central European states, revenues come predominantly from labour taxes. This is the result of a relatively high burden on the factor labour compared with the EU average. Between 1995 and 2010, labour taxes have decreased on average by 1.9 percentage points, capital taxes have also decreased – by 2.1 p.p., but consumption taxes have mildly increased by 0.4 p.p. This development is in line with tax and economic theory as most authors recommend raising consumption taxes while at the same time lowering taxes on labour and capital can stimulate economic growth. Taxation of labour and capital should be kept low as it distorts decisions by economic agents; taxation on consumption has less adverse effects in this respect.

Finally, we investigated relationship between economic growth and tax burden by economic functions using Granger causality methodology. In short-term, there is two-way causality between change of implicit tax rate of consumption and GDP growth and also GDP growth Granger-cause change of implicit tax rate of capital and implicit tax rate of labour through one-way causality.

Acknowledgement

This article ensued thanks to the support of the grant GA ČR 403/11/2073 *Procyclicality of financial markets, asset price bubbles and macroprudential regulation.*

REFERENCES

ACEMOGLU, D., 2009: *Introduction to Modern Economic Growth*. New York: Princeton University Press, 552 p. ISBN 9780691132921.

BARRO, R. J., 1991: Economic growth in a cross-section of countries. *Quarterly Journal of Economics*, 106, 2: 407–43. ISSN 0033-5533.

CAREY, D., TCHILINGUIRIAN, H., 2000: Average Effective Tax Rates on Capital, Labour and Consumption. *OECD Economics Department Working Papers*, No. 258, Paris: OECD Publishing. http://dx.doi.org/10.1787/247874530426.

DOUGHERTY, CH., 2007: *Introduction To Econometrics.* Oxford: Oxford University Press, 464 p. ISBN 0199280967.

Eurostat, 2012: *Taxation trends in the European Union*. Luxembourg: Publications Office of the European Union, 269 p. ISBN 978-92-79-22788-2.

GARCÍA, S., RODRIGUÉZ, E., ARIAS, A., 2011: Corporate Tax Burden in the European Union. *EC Tax Review*, 20, 1: 41–55. ISSN 0928-2750.

GRANGER, C., 1969: Investigating Causal Relations by Econometric Models and Cross-spectral Methods. *Econometrica*, 37, 3: 424–438. ISSN 0012-9682.

HILL, R., 2008: Optimal taxation and economic growth. *Public Choice,* 134, 3–4: 419–427. ISSN 0048-5829.

JOHANSSON, A., HEADY, CH., ARNOLD, J., BRYS, B., VARTIA, L., 2008: *Tax and economic growth*. [cit. 2009-04-23]. Cited from http://www.olis.oecd.org/olis/2008doc.nsf/linkto/eco-wkp(2008)28.

KARRAS, G., FURCERI, D., 2009: Taxes and growth in Europe. *South-Eastern Europe Journal of Economics,* 13, 2: 181–204. ISSN 1109-8597.

KING, G., REBELO, S., 1990: Public policy and economic growth. *Journal of Political Economy*, 98, 5: 126–150. ISSN 0022-3808.

LEE, Y., GORDON, R. H., 2005: Tax Structure and Economic Growth. *Journal of Public Economics,* 89, 5–6: 1027–1043. ISSN 0047-2727.

LEIBFRITZ, W., THORNTON, J., BIBBEE, A., 1997: Taxation and Economic Performance OECD Economics Department Working Papers, No. 176, Paris: OECD Publishing. http://www.oecd.org/eco/publicfinanceandfiscalpolicy/1863834.pdf.

LORETZ, S., 2008: Corporate taxation in the OECD in a wider context. *Oxford Review of Economic Policy*, 24, 4: 639–660. ISSN 1460-2121.

MENDOZA, E. G., RAZIN, A., TESAR, L. L., 1994: Effective tax rates in macroeconomics. *Journal of Monetary Economics*, 34, 3: 297–323. ISSN 0304-3932.

MYLES, G. D., 2009: Economic Growth and the Role of Taxation – Theory. *OECD Economics Department Working Papers*, No. 713, OECD publishing. Available online: http://www.oecd-ilibrary.org/docserver/download/5ksf3jjb2j36.pdf?expires=1369227767&id=id&accname=guest&checksum=E88466F856B18B3427D509B992B63B6B.

NORDHAUS, W. D., BOYER, J., 2000: *Warming the World: Economic Modeling of Global Warming*. Cambridge: MIT Press, 232 pp. ISBN 9780262140713.

PLOSSER, C. I., 1992: *The search for growth*. Cited from http://www.kansascityfed.org/publicat/sympos/1992/s92ploss.pdf.

PRAMMER, D., 2011: Quality of taxation and the crisis: tax shifts from a growth perspective. *Taxation Papers*, No. 29, Luxembourg: Office for Official

Publications of the European Communities. Available online: http://ec.europa.eu/taxation_customs/resources/documents/taxation/gen_info/economic_analysis/tax_papers/taxation_paper_29_en.pdf.

ROMERO-ÁVILA, D., STRAUCH, R., 2008: Public finances and long-term growth in Europe: Evidence from a panel data analysis. *European Journal of Political Economy,* 24, 1: 172–191. ISSN 0176-2680.

SLEMROD, J., 1995: Involvement, prosperity, and economic growth? *Brookings Papers on Economic Activity*, 26, 2: 373–431. ISSN 1057-8641.

SZAROWSKÁ, I., 2011: Changes in taxation and their impact on economic growth in the European Union. *Acta Univ. Agric. et Silvic. Mendel. Brun.*, 59, 2: 325–332. ISSN 1211-8516.

The Global Competitiveness Report 2012–2013: Full Data Edition, 2012. SCHWAB, K. (Ed.). Geneva: World Economic Forum, 527 pp. ISBN 978-92-95044-35-7.

VERMEENDE, W., PLOEG, R., TIMMER, J. W., 2008: *Taxes and the economy: A Survey on the Impact of Taxes on Growth, Employment, Investment, Consumption and the Environment*. Cheltenham (UK): Edward Elgar Publishing, 504 pp. ISBN 9781847201157.

ZIPFEL, F., HEINRICHS, C., 2012. The impact of tax systems on economic growth in Europe. [cit. 2013-01-23]. Cited from http://www.dbresearch.com/PROD/DBR_ INTERNET_EN-PROD/PROD0000000000295266.pdf.

Address

Ing. Irena Szarowská, Ph.D., Department of Finance, School of Business Administration, Silesian University, Univerzitní nám. 1934/3, 733 40 Karviná, Czech Republic, e-mail: szarowska@opf.slu.cz