GROWTH IMPLICATIONS OF STRUCTURE AND SIZE OF PUBLIC SECTORS

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The relationship between government size and growth has received an enormous attention in the economics literature, and the recent financial crisis has forced this topic back on the agenda. A highly controversial debate in this respect is whether large governments are harmful for growth. Endogenous growth theory provides us with the view that tax structure and the composition of public expenditure may be important for growth, perhaps even more than total tax or expenditure levels. Government size and structure are, however, also reflected in the level and structure of market regulations, which may substitute or complement fiscal intervention.

The study provides an overview of the growth friendliness of fiscal and regulatory structures in a cross-section of EU15- and EU12-members and highly developed OECD countries. Peripheral European (transition) countries are also included, whenever respective data are available. Our analysis is based on several measures capturing the expenditure and the tax side of the budgets, as well as regulatory policies. It is shown that the size and the structure of fiscal and regulatory regimes and, hence, the expected long run-growth impact of government activities, still differ markedly across countries.

1 Introduction

The relationship between government size and growth has received an enormous attention in the economics literature. One of the main questions in this respect is, "are large governments harmful for growth?" While Neoclassical Theory sees only an insignificant role for fiscal policy to impact on the long-run rate of economic growth, Endogenous Growth Theory provides us with the view that fiscal policy can generate permanent effects on the steady state growth rate of output, and not just temporary effects, *i.e.*, on the transitional dynamics towards a higher output level. A number of theoretical models predict that tax structure and the composition of public expenditure may be important for growth, probably even more than total tax or spending levels (e.g., Lucas, 1988; Barro, 1990; Barro and Sala-i-Martín, 1992). Moreover, a non-negligible literature discusses the potential growth effects of international openness or the regulatory regimes on factor and goods markets, which could be seen as a further dimension of public sector size and structure.

Together with the availability of more and better data, both in the cross-section and over time, empirical research on the determinants of economic growth increased remarkably over the last 20 years. Although there is still a substantial model uncertainty leading to a lack of robustness of empirical growth analyses (e.g., Nijkamp and Poot, 2004; Ciccone and Jarocinski, 2010), it is now widely acknowledged that properly designed fiscal and regulatory policies can play an important role in supporting economic growth (e.g., Tanzi and Zee, 1997; Kneller, Bleaney and Gemmell, 1999; Bleaney, Gemmell and Kneller, 2001; Fölster and Henrekson, 2001; Zagler and Durnecker, 2003; Angelopoulos, Economides and Kammas, 2007; Ghosh and Gregoriou, 2008; Romero-Ávila and Strauch, 2008; Gemmell, Kneller and Sanz, 2011). A survey of both older and recent studies, as well as an interpretation of results is available in Bergh and Henrekson (2011).

In this respect it should be emphasized that many empirical analyses focus on developed countries (OECD or EU15), with some notable exceptions (Campos and Coricelli, 2002; Fidrmuc,

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This paper is a considerably shortened version of Pitlik and Schratzenstaller (2011).

2003; Bose, Haque and Osborn, 2007; Pushak, Tiongson and Varoudakis, 2007; Baldacci *et al.*, 2008; Bayraktar and Moreno-Dodson, 2010) which concentrate on transition economies and developing countries, respectively. The suitable design of growth-enhancing policies will nevertheless differ substantially across different countries. Accounting for the stage of economic development, the political and institutional environment and (probably) historical legacies of a country, a one-size-fits-all-fiscal and/or regulatory policy in order to promote growth is almost certainly not appropriate. Moreover, the recent Financial Crisis and the Great Recession might lead to a somehow revised view on the role of the state in supporting growth and long-run economic development (Griffith-Jones, Ocampo and Stiglitz, 2010; Blanchard, Dell'Ariccia and Mauro, 2010).

Against this background the purpose of the present paper is to provide a very brief overview of the literature on the growth impact of fiscal (*i.e.*, tax and expenditure) as well as regulatory policies. The main part of the article addresses the question to what extent European and OECD countries (or country groups) suit to concepts of growth-friendly fiscal and regulatory policies.

We proceed as follows. Section 2 is devoted to government expenditure structures. Following a brief discussion of the categorization of public spending categories into "productive" and "unproductive" types, we analyze the development of several spending categories. In a next step we investigate the growth friendliness of expenditure structures. Section 3 presents the tax structures and their evolution over time in a sample of European countries, using adequate macroeconomic and microeconomic indicators. We evaluate the growth friendliness of tax structures and their evolution based on the "tax and growth"-hierarchy derived by the OECD. In Section 4 we turn to the regulation issues. The growth impact of regulatory regimes is less well documented and even more controversially debated than the fiscal size and structure of government. Nevertheless, several empirical investigations support the view that stricter regulation of goods and factor markets is detrimental to economic development. Recent theoretical and empirical research emphasizes the notion of complementarities between institutions and policies in order to enhance growth. Section 5 therefore aims to provide an overall assessment of economic policy regimes and their growth friendliness in a comparative way. Of special interest in this respect is whether there are systematic deficiencies of certain countries (country groups) in providing a combination of growth-friendly economic policies. We will also consider the possibility that some countries provide more (less) regulation (or more/less taxes and expenditure) as a compensation for a lack of (more) reforms in another policy area. Section 6 concludes.

2 Government expenditure

2.1 Productive vs. unproductive public spending: theoretical background

The connection between government spending and growth is probably one of the most controversially debated topics in economics. In theory the relationship is ambiguous. On the one hand, government expenditure is deemed an indispensable prerequisite for economic development. The protection and enforcement of private property rights and contracts appear to be the most important factors for economic prosperity and growth. A well-functioning legal system (including expenditure for the courts) and enforcing public order and safety (including the police and the armed forces) are a precondition for economic specialization and the operation of markets (e.g., Hayek, 1960; Buchanan, 1975; North, 1990).

In addition to these essential functions of government, a number of further public goods are considered as potentially growth-enhancing. The operation of a high-quality physical infrastructure as well as basic educational services clearly fall under this category, given that governments will produce or provide these goods more efficiently than markets. At least according to Welfare

Economics, market-failures from public goods, information asymmetries, (network) externalities, and natural monopolies, can be corrected by different categories of public spending (and also by taxation or regulation measures, all subject to cost-benefit-considerations), thus potentially leading to a more efficient allocation of scarce resources through additional government health expenditure, spending on environmental issues, etc.

Beyond such core allocative functions the Musgravian tradition of Public Finance (Musgrave, 1959) advocates a distributional role as well as a stabilization function of government spending. Although not evidently linked with the goal of enhancing economic growth, government spending on these two functions nevertheless has an impact on growth performance, which may be either positive or negative. Higher government spending and a larger public sector may be better able to stabilize the economy if it is hit by macroeconomic shocks (e.g., Fatás and Mihov, 2001), which might also be conducive to longer-run growth (e.g., Ramey and Ramey, 1995; Martin and Rogers, 2000). Higher social transfer spending may not only improve the distribution of income and wealth, and thus satisfy political equity considerations, but may also improve the functioning of labor markets and – under certain circumstances – reduce social conflict in society and thereby enhance growth (e.g., Perotti, 1996).

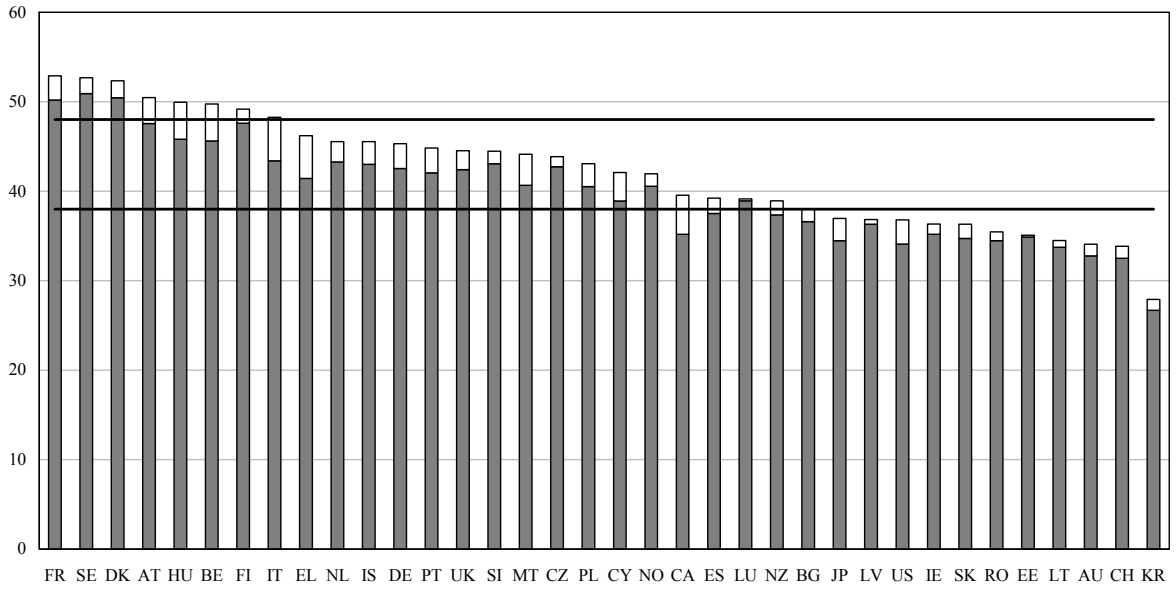
On the other hand, the debate about the appropriate role and size of the state has also shown that in general an ever increasing government sector, as measured by total spending, will slow down or inhibit growth for a number of (partially interconnected) reasons:

- disproportionally increasing distortionary effects of higher levels of taxation to fund increasing expenditures are detrimental for growth, probably also depending on the tax structure. This will be discussed in more detail in Section 3;
- long-run growth effects of most (if not all) public spending categories are subject to diminishing marginal returns, *i.e.*, at higher expenditure levels the marginal productivity of additional public spending is expected to decline. Also, the stage of development of a country will matter. Highly developed countries probably require a different expenditure composition as compared to less developed or transition economies;
- several types of expenditures yet create disincentives for the recipients (households as well as enterprises), leading to a crowding out of productive private spending and a reduction of economic efforts of beneficiaries, which, in turn, impedes growth;
- inside the public bureaucracy resources are often wasted and/or used inefficiently, due to lack of appropriate incentives. Public sector governance will play a crucial role in this respect, as inefficient provision of public services is more likely if institutions are weak. This effect will exacerbate if expenditure levels are high.

Summing up, the theoretical link between government expenditure and economic growth is rather complex. At least, the relationship between public spending and growth appears to be of a non-linear type, depending on factors like type of expenditure under consideration, initial spending level, internal efficiency of public provision, and the level and structure of taxation. In any case there is a theoretical optimum in which a certain level of public expenditure maximizes economic growth, given the disincentive effects of taxation and the level of bureaucratic efficiency. Empirically, these nonlinear effects between spending levels and economic growth are not easy to test because governments do not necessarily prioritize core productive functions of government responsibility over other forms of intervention. Ultimately, as a clear-cut theoretical relation cannot be derived, it is a matter of empirical testing whether and which types of government spending should be classified as “productive” or “unproductive”.

Figure 1

Aggregate Government Expenditure Shares
(averages 2004-08; percent of GDP)



Source: EUROSTAT, OECD, and WIFO calculations.

2.2 Size and structure of government spending

2.2.1 Aggregate expenditure

The most commonly used measure for government size is its expenditure share over GDP. As noted above, there is some evidence that high aggregate spending levels can be an impediment for growth. At least, even if empirical results are sometimes not robust, no recent study finds a positive relationship between long-run growth and high total public expenditure levels.

To get a first impression on the level of government spending, we employ a sample of 36 OECD- and EU27-countries,[1] and display 5-year-averaged values over the years 2004-08 in Figure 1.[2] A 5-year-period is chosen in order to smooth out effects of the business cycle on spending levels. 2009 is not included as during that year most countries' spending-over-GDP ratios are biased upwards, due to a rapid GDP decline plus fiscal stimulus programs as a response to the recent Financial Crisis and the Great Recession.[3] The average 5-year spending level in the sample was 42.1 per cent of GDP, with a minimum of 27.9 per cent (Korea) and a maximum of 52.9 per cent (France). Primary spending levels amounted on average to 39.9 per cent of GDP, with

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[1] The sample includes all 27 EU-members plus all OECD-members that are not members of the EU27, except for Mexico, Israel, Chile and Turkey, both due to a lack of data and structural dissimilarities.

[2] If not noted otherwise, we always refer to general government figures. Of course, the degree of decentralization of a country's fiscal responsibilities may also have an effect on the growth effects of government spending. These issues are, however, not dealt with in this paper. See, e.g., Schaltegger and Torgler (2006).

[3] Except for Malta and Iceland all countries in the sample increased primary spending over GDP between 2008 and 2009. In Iceland, primary spending already in 2007 exploded from 39.7 to 54.2 per cent of GDP (2008). A simple regression shows that spending increases were somewhat larger in countries with an initially smaller spending level in 2008.

a maximum of 50.9 per cent (Sweden) and a minimum 26.7 per cent in Korea. Interest payments reached on average 2.2 per cent, but Greece and Italy already faced an interest burden of 4.8 per cent of GDP over 2004-08. In any case, interest payments are considered as least productive spending type, as they are exclusively related to past political decisions, and reduce the margin for strategic future-oriented spending of governments currently in office.[4]

Somewhat arbitrarily, we can divide the sample of 36 countries into three sub-samples according to average aggregate spending levels over 2004-08. The group of big spenders consists of countries with a mean expenditure-to-GDP-ratio above 48 per cent.[5] The small government group is made up of countries with average spending levels below 38 per cent of GDP, approximately the mean spending level minus one standard deviation.[6] The medium-spending group consists of countries with a mean expenditure share between 38 and 48 per cent over 2004-08.[7]

2.2.2 Productive vs. non-productive government spending

Preliminaries

The core of endogenous growth models with public spending is that not (only) the total volume of government expenditure is relevant for growth but its composition and, thus, the allocation between expenditure types which are growth enhancing (productive), growth depressing or neutral (non-productive) with respect to economic growth. From the viewpoint of these theories it is in particular the components of government spending that enter directly or as intermediate public inputs the production function of private enterprises which are expected to have a positive impact on a country's growth performance (Barro, 1990; Gemmell, Kneller and Sanz, 2011).

Although the theoretical concept is quite clear it is, however, not so obvious which types of government spending should be counted as productive. Empirical research supports a substantial positive impact of some spending components on growth, but there is still no agreement on which categories. In their survey of the relevant literature Bayraktar and Moreno-Dodson (2010) guess that "[o]ne possible explanation for the mixed results in the literature is sample selection. What we expect is that public spending can improve growth performance of countries only if they are able to use these expenditures productively". This means that the productivity of several public spending types, *i.e.*, their growth-promoting effects, depends critically on the institutional and economic environment of a country.

Another important point of the ongoing debate on productive and non-productive public expenditure is that one should take a more functional perspective. What matters is not the formal economic categorization of several spending types into consumption or investment spending per se, but for which function the money is used. Wages and salaries which are – by definition – a substantial part of government consumption can be employed for highly productive uses (e.g., educational issues) but also for unproductive purposes (e.g., salaries for outdated bureaucracies).

In Table 1 we report a categorization which is based on Gemmell, Kneller and Sanz (2011) with several adaptations and modifications based on European Commission (2002), Barrios and Schaechter (2008) and Bayraktar and Moreno-Dodson (2010). The assignments shown in Table 1

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[4] The correlation between primary spending and interest spending is only weakly positive (+0.27 in the sample over the years 2001-10).

[5] This group is composed of France, Sweden, Denmark, Austria, Hungary, Belgium, Finland and Italy.

[6] Korea, Switzerland, Australia, Lithuania, Estonia, Romania, Slovakia, Ireland, the USA, Latvia, Japan and Bulgaria all belong to the small-spender group.

[7] Greece, the Netherlands, Iceland, Germany, Portugal, the United Kingdom, Slovenia, Malta, Czech Republic, Poland, Cyprus, Norway, Canada, Spain, Luxembourg and New Zealand (listed from higher to lower shares).

Table 1

Components of Productive and Non-productive Government Spending

Expenditure Type (Theoretical)	Expenditure Type (SNA, COFOG)	Remarks on Productive Impact
Productive		
Core public services	General public administration	Basic services for organization of democracy and public administration
	Public order and safety	Includes spending on police, courts etc.
	Defense	Growth effects disputed, dependent on external threats (?)
Infrastructure spending	Public investment in Economic Affairs	Investment in transport and communication as well as other infrastructure services
	Housing and community services	Predominantly spending for local infrastructures (e.g., water supply)
	Environmental protection	Growth effects disputed
Merit goods/Externalities	Education	Increases productivity of labor, but could also be provided privately in principle
	Health	Increases productivity of labor, but could also be provided privately in principle
Non-productive		
Redistribution	Economic services	Sectoral subsidies, often with sclerotic effects, although some forms of horizontal subsidies (R&D-spending) are productive
	Social protection	Basic social protection may be productive if it improves labor market functions and reduces social tensions
Other	Recreation, culture, religion	Possible indirect positive impact on growth via health channel
Interest payments	Interest payments	Exclusively past-related spending

Source: WIFO compilation, based on Gemmell, Kneller and Sanz (2011). Supplemented by European Commission (2002), Semmler *et al.* (2007); Barrios and Schaechter (2008); Bayraktar and Moreno-Dodson (2010).

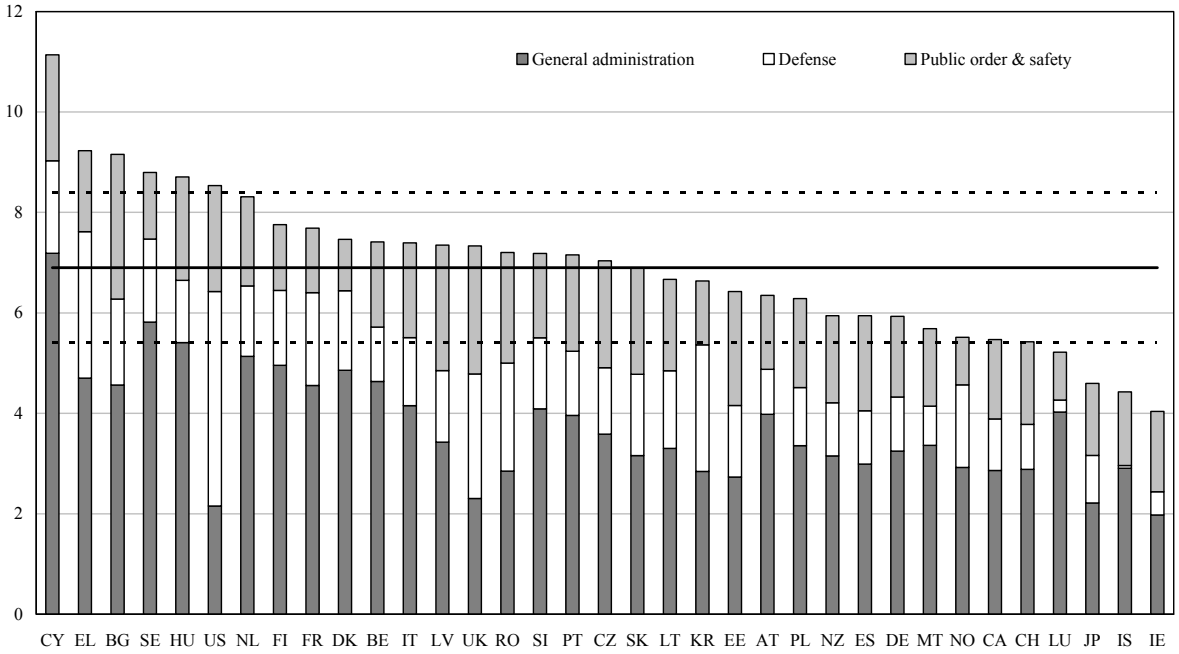
are based on results of macroeconomic research on the impact of fiscal policies. Microeconomic evidence may lead to partly different conclusions.

Core public services

Expenditures for core public services consist of spending for general administration, public order and safety, and defense. Their growth impact stems from the fact that a minimum of public administration services is required in all (democratic) systems, as well as institutions of enforcing law, order and public safety, probably also against external threats.

Figure 2

Government Spending on Core Public Services
(averages 2004-08; percent of GDP)



Source: EUROSTAT, OECD, and WIFO calculations.

Average expenditures on core public services in 35 countries amount to 6.9 per cent of GDP over the years 2004-08.[8] The smallest expenditure ratios (less than 5 per cent of GDP) are found in Ireland, Iceland and Japan; Cyprus, Greece, Belgium, Sweden, Hungary and the USA observe the highest spending on core services in relation to GDP (see Figure 2). In relation to total spending (over the years 2004-08), expenditure on core services on average equal 16.9 per cent, with a range between 9.8 per cent (Iceland) and 26.5 per cent of total spending in Cyprus.

Subtracting defense spending, Figure 3 illustrates no clear evidence that expenditure on general administration and public order and safety are characterized by economies of scale. Neglecting the obvious outlier Cyprus, a hump-shaped relation between population size (in logs) and core public service spending appears to exist, with smaller expenditure ratios in very small and very large countries.

A high quality physical infrastructure is a productivity-enhancing input in private production processes and thus a major driver of a country's growth performance (e.g., Aschauer, 1989; Romp and de Haan, 2007; Crafts, 2009; Egert, Kozluk and Sutherland, 2009). Public infrastructure capital includes utilities and devices for transport and communication, energy and water supply etc. Government spending for infrastructure purposes is frequently approximated by gross fixed investment in the government sector. However, such a statistical recording entails a number of difficult-to-solve problems (e.g., Alegre *et al.,* 2008).

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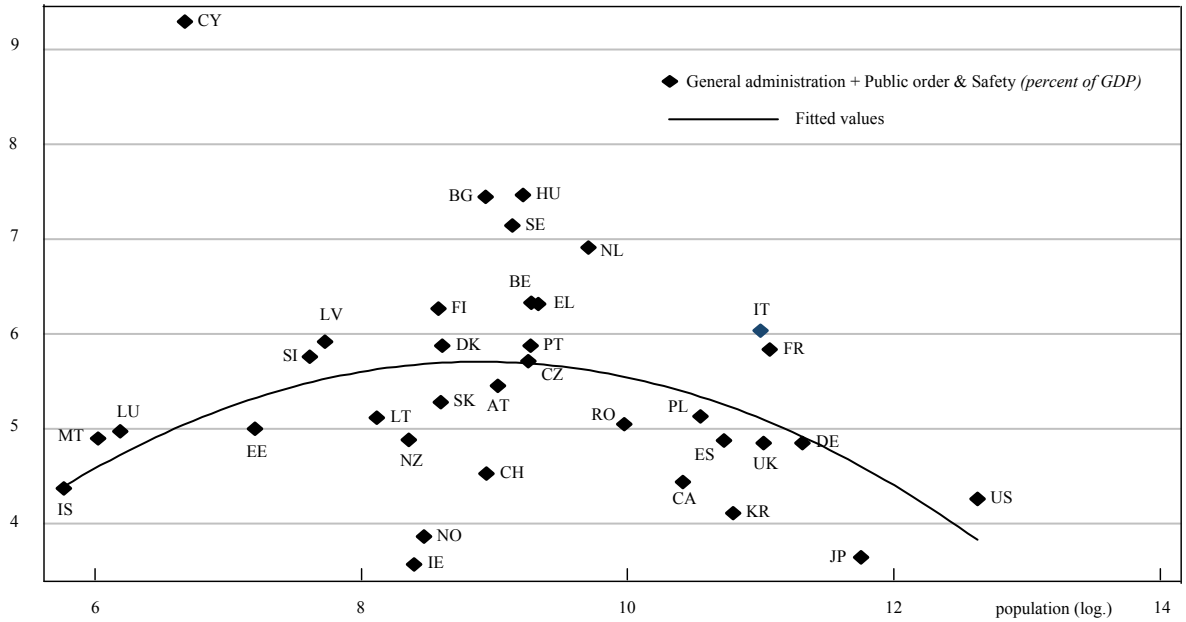
[8] Source: COFOG-databases of EUROSTAT and OECD. Interest spending that is allocated to COFOG-division 1 (General Public Administration) is deducted. For New Zealand, Canada, and Japan, data are only available until 2005/2006/2007. Hence, we calculated an average for shorter time periods. Data for Switzerland include only the years 2007 and 2008, as earlier data are unavailable. Data for Australia are not available.

Figure 3

Government Expenditure on General Administration, Public Order & Safety vs. Population Size
(averages 2004-08; percent of GDP)



Infrastructure spending

Hence, we decided to use a somewhat different classification: According to our definition, infrastructure spending encompasses total government expenditure (current *and* investment spending) in COFOG divisions 5 (Environmental protection) and 6 (Housing and community amenities) plus gross government investment in division 4 (Economic affairs). In our view, this classification captures best of what should be subsumed under the heading of infrastructure spending, which is not necessarily identical to investment expenditure.

Mean infrastructure spending defined along these lines is on average 2.8 per cent of GDP in the sample (averaged over 2004-08).[9] The range is between 1.4 per cent (Denmark) and 5.2 per cent (Czech Republic). The high spending group also includes Korea, Ireland, Japan, and Romania, whereas Austria, Switzerland, the USA, Finland and Belgium all belong to a group with low infrastructure spending (Figure 4). In relation to total government spending, infrastructure expenditure make up on average 7 per cent. Smallest shares of less than 3 per cent of total spending are observed in Denmark and Austria; the highest shares in Korea (16.1 per cent) and Ireland (12.1per cent).

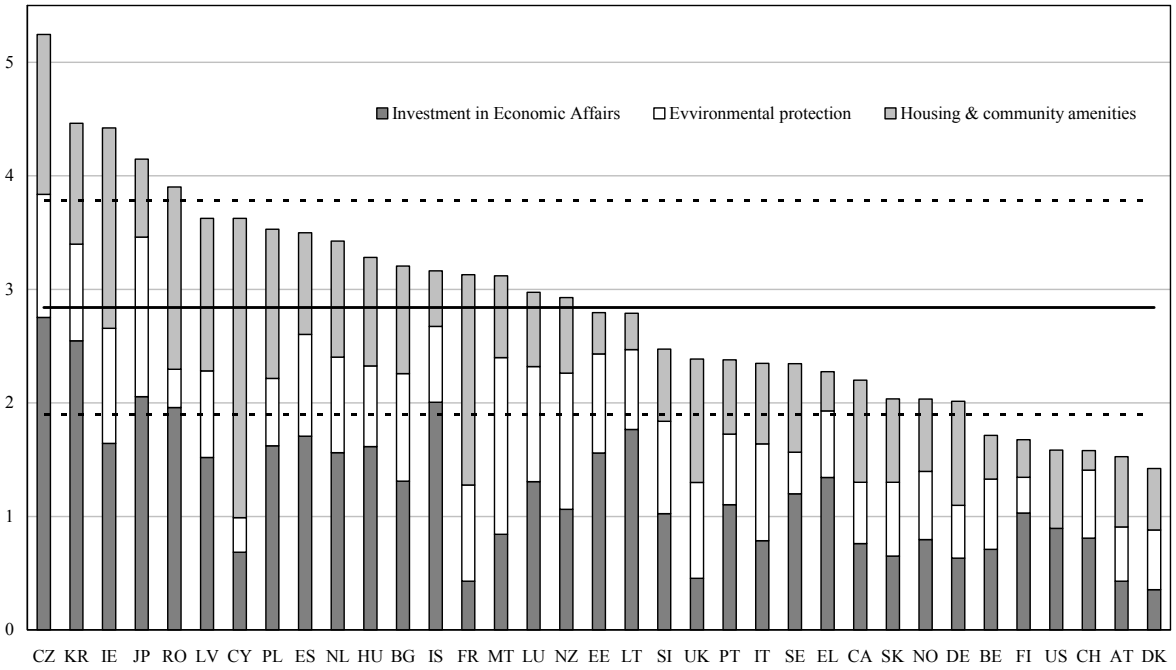
Figure 5 plots infrastructure investment levels over 2004-08 against real GDP per capita (in international US-Dollars (logs) in 2003.[10] A strong negative relation indicates that countries in a catching-up process tend to have higher infrastructure expenditures, whereas countries that already have a high GDP per capita, and presumably a higher quality public capital stock, observe smaller spending in relation to GDP. Smaller government spending on infrastructure may therefore

[9] With respect to data availability and gaps in the data, see footnote 10.

[10] Data are from the Penn World Tables 7.0.

Figure 4

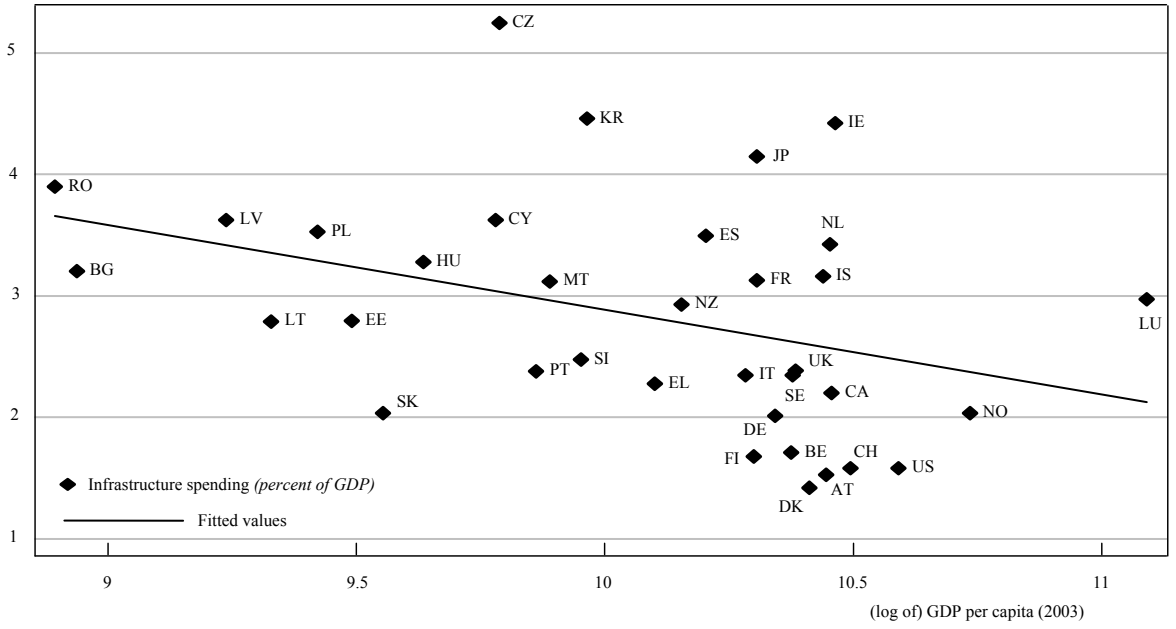
Government Spending on Infrastructure
(averages 2004-08; percent of GDP)



Source: EUROSTAT, OECD, and WIFO calculations.

Figure 5

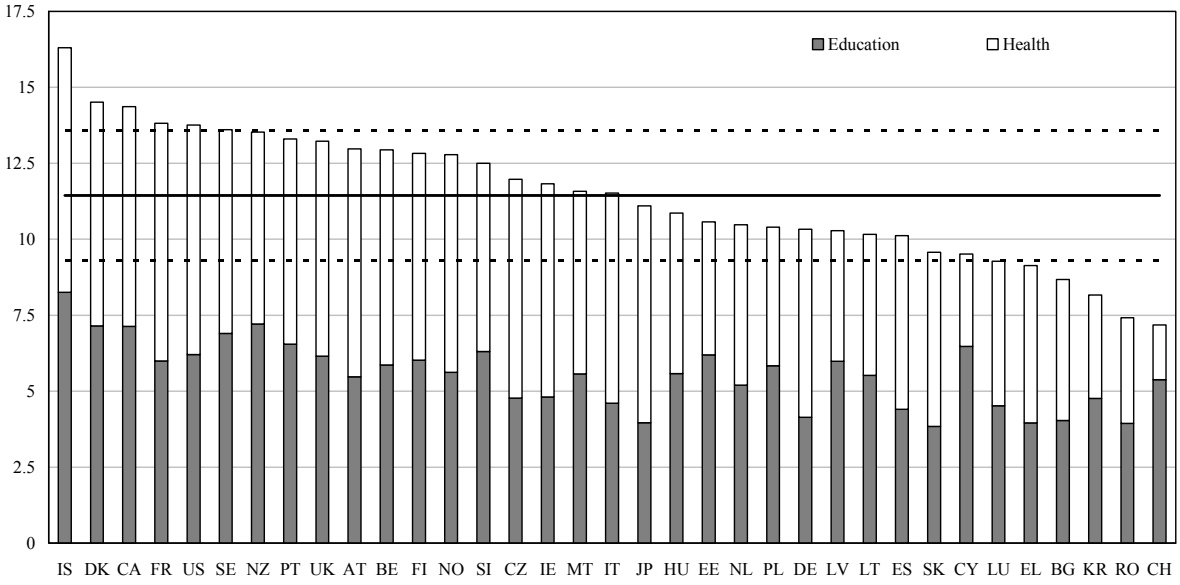
Government Spending on Infrastructure versus GDP per capita 2003



Source: Penn World Tables 7.0, EUROSTAT, OECD, and WIFO calculations.

Figure 6

Government Spending on Education and Health
(averages 2004-08, percent of GDP)



Source: EUROSTAT, OECD, and WIFO calculations.

also be a sign of diminishing returns to public capital (see also Kamps, 2006).[11] Empirical evidence for such a saturation effect is, however, not very strong (Välilä, Kozluk and Mehrotra, 2005), but some country data may be severely biased by off-budget investment that is accounted for as private sector spending.

Spending on merit goods/externalities: education and health

A substantial share of government expenditure of modern Welfare States is devoted to spending on merit goods. The two most prominent examples are education and health spending. With respect to the growth effects of both spending categories the impact of human capital investment is common wisdom now (e.g., Bassanini and Scarpetta, 2002; Baldacci *et al.*, 2008). If public spending on education and health care improve human capital then this should show up in a better growth performance. Especially for economies that operate at the technology frontier human capital investment through education and health care improvements are of crucial importance (e.g., Aghion, 2008).

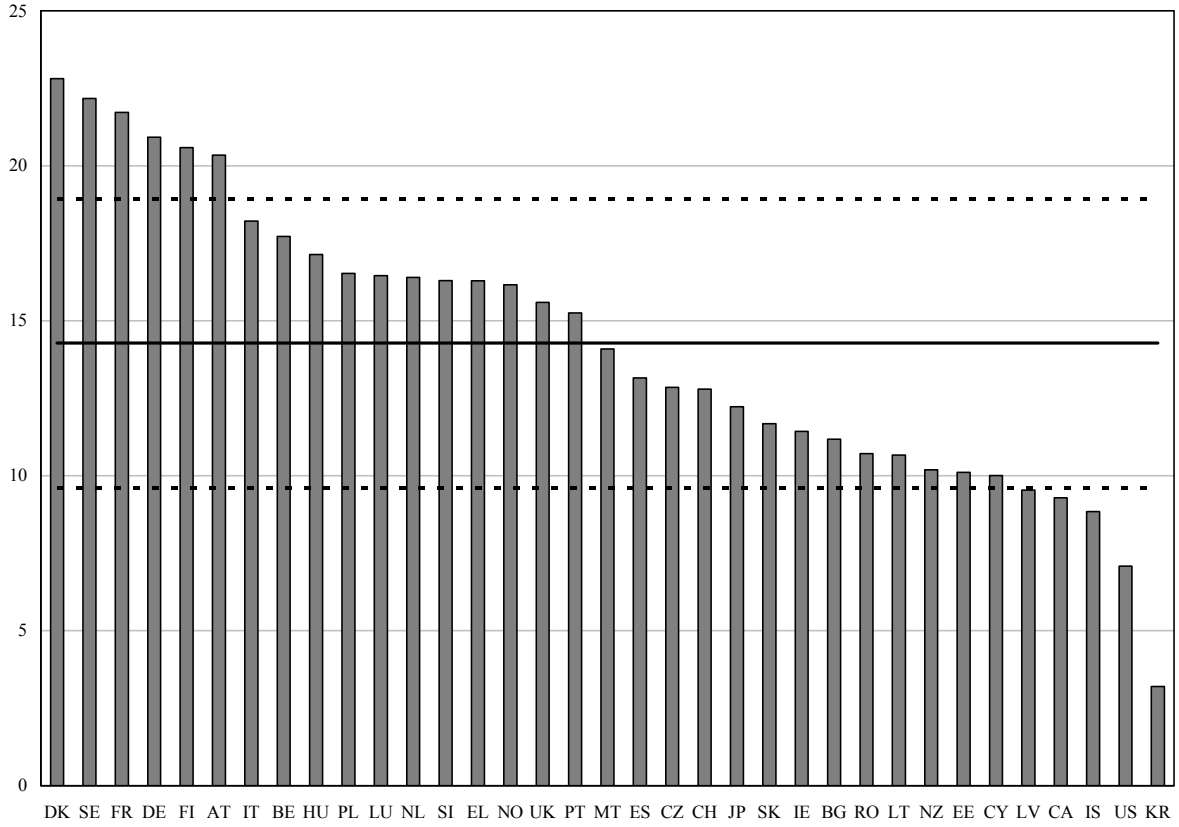
Redistributive spending

The impact of transfer payments on growth is theoretically ambiguous. On the one hand, redistributive spending may be long-run growth-enhancing if it helps to support and maintain social

[11] In some countries new modes of financing infrastructures by Public-Private-Partnerships or outsourcing may also have contributed to a decline in government investment figures. For an empirical analysis of economic and political factors affecting government investment spending in Europe, see Kappeler and Välilä (2008) or Pitlik (2010).

Figure 7

Government Spending on Social Protection
(averages 2004-08; percent of GDP)



Source: EUROSTAT, OECD, and WIFO calculations.

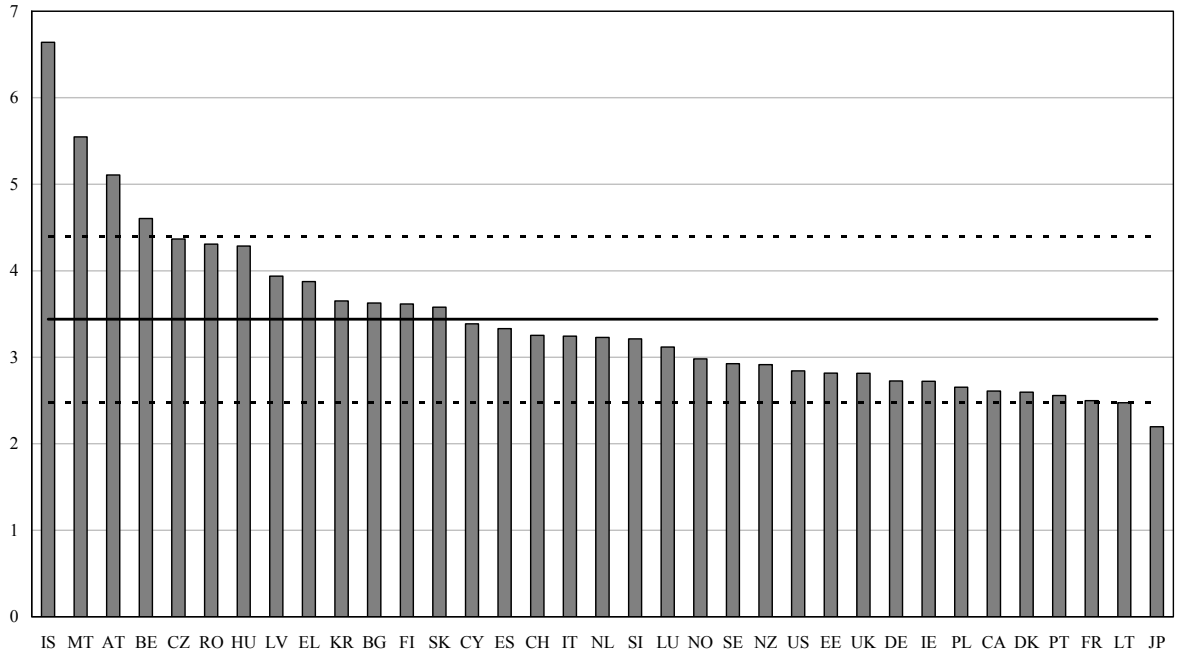
peace, correct labor market failures or enters as input in private production. Lindert (2004), for example, claims that social welfare spending is almost a "free lunch" without (net) growth deterring effects. Properly designed capital transfers to enterprises may also stimulate growth by promoting private investment. On the other hand, redistributive spending will inhibit growth as it generates disincentives for potential recipients, or stimulate socially unproductive rent seeking (e.g., Murphy, Shleifer and Vishny, 1991). Empirical evidence shows mixed results, although studies that find negative effects of government transfers on economic growth appear to dominate (see e.g., Romero-Ávila and Strauch, 2008, but see also Afonso and Furceri, 2010). Government spending that is predominantly redistributive is generally categorized as non-productive.

Figure 7 displays spending on social protection affairs. It includes cash benefits as well as transfers-in-kind and government services for social protection purposes.[12] Spending on these issues is 20 per cent of GDP or more in Denmark, Sweden, France, Germany, Finland and Austria, whereas Korea, the USA, Iceland, Canada and Latvia spend less than 10 per cent of GDP on social protection. Average government expenditure in the sample is 14.3 per cent of GDP.

[12] Note that this classification does not include health care spending as in the European System of integrated Social Protection Statistics (ESSPROS) categorization of social protection spending.

Figure 8

Government Spending on Economic Affairs
(infrastructure investment deducted; averages 2004-08; percent of GDP)



Source: EUROSTAT, OECD, and WIFO calculations.

A second type of redistributive spending takes the form of sectoral aid for private enterprises. Figure 8 illustrates that average government support over the years 2004-08 was by far highest in Iceland, amounting to almost 7 per cent of GDP. This is, however, due to Iceland's special aid during the banking crisis of 2008, which boosted spending from 3.7 per cent of GDP (2007) to 16.9 per cent.[13] Malta and Austria offer support slightly above 5 per cent of GDP. The average spending level in the sample is 3.4 per cent of GDP. Relatively little support is given by Japan, with slightly more than 2 per cent of GDP.

2.2.3 The overall growth friendliness of government spending

So far, our investigations show that governments in our sample follow very different spending patterns. In particular, we observe clear differences considering the "budget mix" of productive and non-productive expenditure. Table 2 sheds some light on this. In order to investigate the "overall" growth friendliness of a country's spending patterns we simply calculate the share of productive expenditure types (according to our definitions) in total government spending. We use again averages over the years 2004-08 in order to reduce the impact of temporary fluctuations due to singular events. As the general productivity of defense spending is the most controversially debated topic, we differentiate between two definitions of productive expenditures, the first including, and the second excluding military spending. The countries are ranked in order of productive spending without defense.

[13] If the 2008 figure is not used for calculation of the mean, then the Iceland figures drop to 4.1 per cent of GDP.

Table 2

Total Spending and Productive Spending Shares
(averages 2004-08)

Country	Code	Total *(percent of GDP)*	Productive *(percent of total exp.)*	Productive (w/o defense) *(percent of total exp.)*
Korea	KR	27.9	69.1	60.1
New Zealand	NZ	38.9	60.0	57.2
Ireland	IE	36.3	56.0	54.7
Latvia	LV	36.8	57.7	53.8
Cyprus	CY	42.1	57.7	53.3
United States	US	36.8	64.9	53.3
Canada	CA	39.6	55.7	53.1
Iceland	IS	45.5	53.1	53.0
Lithuania	LT	34.5	56.9	52.4
Estonia	EE	35.1	56.4	52.4
Czech Republic	CZ	43.9	55.3	52.3
Japan	JP	36.9	53.8	51.2
Bulgaria	BG	38.0	55.3	50.8
Portugal	PT	44.8	51.0	48.1
Spain	ES	39.2	49.9	47.1
Slovenia	SI	44.5	49.8	46.6
Slovakia	SK	36.3	51.0	46.6
Romania	RO	35.5	52.1	46.0
United Kingdom	UK	44.5	51.6	46.0
Netherlands	NL	45.5	48.8	45.7
Norway	NO	41.9	48.5	44.5
Malta	MT	44.1	46.2	44.4
Poland	PL	43.1	46.9	44.3
Luxembourg	LU	39.1	44.6	44.0
Sweden	SE	52.7	47.0	43.9
Hungary	HU	49.9	45.7	43.3
France	FR	52.9	46.6	43.1
Finland	FI	49.2	45.3	42.3
Belgium	BE	49.8	44.4	42.2
Denmark	DK	52.3	44.7	41.7
Italy	IT	48.3	44.1	41.2
Switzerland	CH	33.8	44.0	41.2
Austria	AT	50.5	41.4	39.6
Greece	EL	46.2	44.7	38.4
Germany	DE	45.3	40.3	38.0

Source: WIFO calculations based on Eurostat and OECD.

Figure 9

Total Spending and Productive Spending Shares (Without Defense Spending) in Total Spending
(averages 2004-08, percent of GDP)

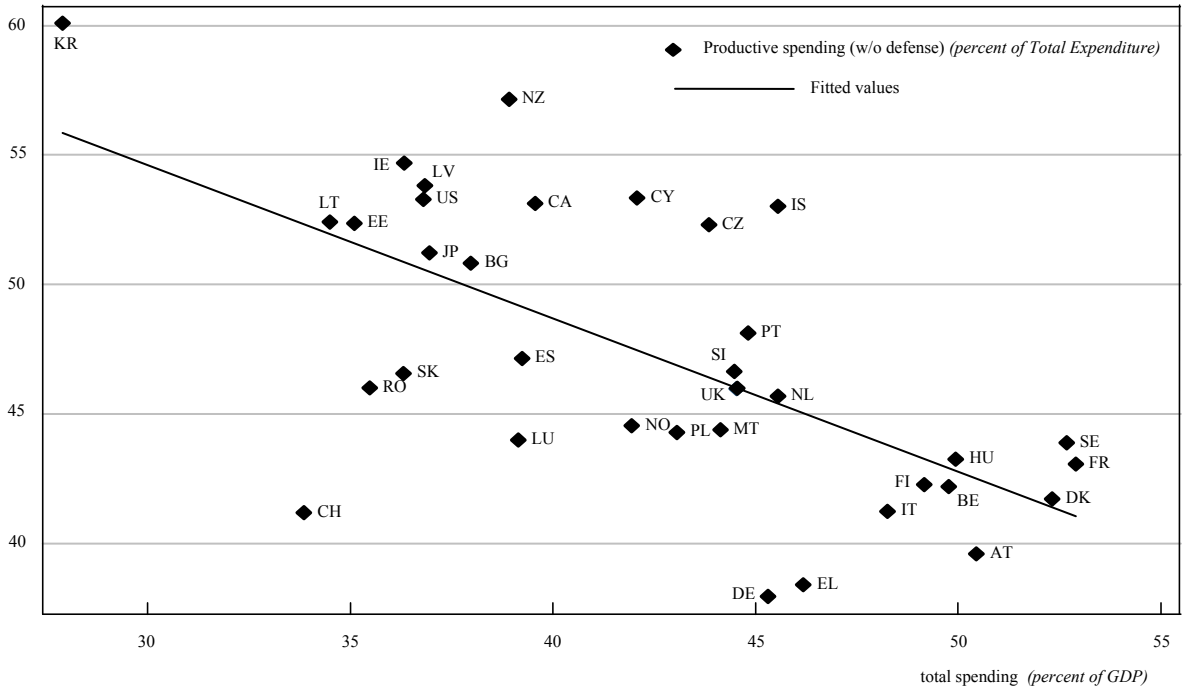


Figure 9 illustrates that there is in general a negative relation between total government spending and productive expenditure shares (without military spending).[14] This is an indication that expansion of government size is mainly due to non-productive spending items.

3 Taxation

The highest budget share of productive spending items is observed for Korea, according to both definitions. Almost 70 per cent of general government expenditure is allocated to productive uses if defense is included, and still more than 60 per cent if defense spending is counted as non-productive. New Zealand and Ireland follow, with a productive spending budget share of 57.2 per cent and 54.7 per cent, respectively. At the lower end of the ranking we find Germany, Greece and Austria with productive budget shares of slightly less than 40 per cent, if military expenditures are excluded. The largest change of productive spending shares when defense spending is included is observed for the USA (+11.6 percentage points), Korea (+9), Greece (+6.3) and Romania (+6.1).

Taxes are the most important revenue source for governments to finance their expenditures. Particularly with the advancement of endogenous growth models implying – in contrast to neoclassical growth theory – that tax policy is able to impact on the long-run growth level itself and not only on the growth rate during the transition of the economy to the steady-state growth rate, the

[14] Results are almost identical if defense spending is included.

relationship between taxes and economic growth has attracted increasing attention. Against the background of the significant increases of public deficits and debt many countries affected by the recent financial and economic crisis are experiencing, the growth friendliness of tax increases to consolidate public budgets currently is of particular interest and an important element of the policy recommendations of the supranational organisations (e.g., European Commission, 2010a, or OECD, 2010a).

3.1 Growth-friendly tax systems: Theoretical background

Physical and human capital, labor supply and technological progress are the crucial determinants of long-run economic growth. To the extent to which taxes influence these growth determinants, they impact on long-run growth. While taxes on capital may dampen savings of private households and firms' investments as well as their innovative activities, taxes on labor may decrease labor supply and demand and adversely affect incentives to invest in human capital. These distortionary effects and disincentives for economic activities of private households and firms may be aggravated by an increasing international integration of goods and factor markets, as a comparatively high tax burden may drive economic activities abroad or may be detrimental for a country's attractiveness for foreign investment or qualified labor (Afonso *et al.*, 2005, Handler *et al.*, 2005).

As, however, the existing theoretical models trying to depict the relationships between taxes and growth or growth-relevant factors, respectively, do not always yield clear-cut results,[15] an increasing number of econometric analyses attempt to tackle this complex question empirically. Therefore in the last three decades an ever-increasing number of empirical studies investigated the influence of taxation on economic growth.[16]

3.2 Growth-friendly tax systems: empirical results

Initially empirical analyses focused on the growth effects of the total level of taxation. However, they only partially support the theoretical expectation of a significant (negative) relationship between the total tax burden and economic growth: Endogeneity problems, the neglect of growth-enhancing expenditures financed by tax revenues, the disregard of taxation structures as well as statistic/conceptual problems in defining the tax ratio limit the explanatory power of the existing empirical studies (Arnold, 2008; Myles, 2009; European Commission, 2010A). The only safe conclusion that may be drawn from the existing empirical evidence is that a high tax ratio does not impact positively on growth (Afonso *et al.,* 2005).

Lately the potential growth impact of the tax structure has attracted more attention than the pure level of the tax burden. The starting point of this more recent empirical work is the assumption – also warranted by theoretical considerations – that different tax categories affect growth with differing intensity and via different channels. In the meantime, a rather large body of empirical analyses has emerged. Most authors focus on growth-relevant effects of specific taxes in a more or less isolated perspective, only few studies examine the growth implications of different tax categories in a comparative perspective.[17]

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[15] For example, it is not clear *ex ante* whether an increase of labor taxes increases or decreases labor supply, as it will have both an income and a substitution effect running in the opposite direction.

[16] For recent overviews over relevant empirical work see Schratzenstaller (2007), European Commission (2008) or Myles (2009).

[17] Mostly these studies analyse the growth effects of distortionary versus non-distortionary taxes, e.g., Bleaney, Gemmell and Kneller (2001) or Kneller, Bleaney and Gemmell (1999).

Of the latter, a rather recent study by a group of economists associated with the OECD (Johannson *et al.*, 2008) has achieved some prominence and gained considerable attention also among policy-makers. Based on a macroeconomic perspective, a hierarchy of individual taxes with respect to their growth friendliness is derived. Taxes on property have the least growth-dampening effect, followed by taxes on consumption (including environmental taxes in particular). In comparison, personal income taxes (including social security contributions and payroll taxes) are more harmful, and corporate income taxes are most detrimental to growth. This suggests that tax systems relying more on property and consumption taxes display more favourable growth properties than those strongly based on personal and corporate income taxes.

A crucial advantage and the innovative aspect of this approach is that it does not direct an isolated focus on the effects of single tax categories but on the effects of a (revenue-neutral) trade-off between them. However, that the macroeconomic tax structure is of limited use as an indicator for the effective tax burden on individual tax bases, because it does not account for the structure of the overall tax base. Moreover, marginal tax rates shaping incentives for economic decisions of private households and firms are neglected. Thus, an analysis of the tax structure of a given country also include macroeconomic effective tax rates reflecting the distribution of total tax revenues as well as microeconomic (marginal and average) tax rates influencing individual behaviour of private households and firm decisions. Moreover, a complementary look at studies examining growth-relevant effects of individual tax categories certainly is useful to gain deeper insights regarding the concrete channels via which individual tax categories may directly or indirectly impact on economic growth. Two aspects are of particular interests in this respect: namely, the influence of corporate income taxes on firm decisions and of labor taxes on labor supply.

While labor taxes can be assumed to influence various individual decisions shaping the quality and quantity of labor supply (employment in the shadow economy or in non-taxed sectors of the economy, investment in human capital, occupational choices, individual work effort and productivity, etc.), their effect on labor market participation and hours worked has been investigated most intensely and with the most robust results. These can be summarized as follows:[18]

- the influence of labor taxes differs for different demographic groups and educational levels due to differing wage elasticities of labor supply;
- for some groups – e.g., mothers with young children – labor taxes strongly impact on the decision about participation and hours worked;
- the participation decision is rather tax sensitive in the group of lone mothers and men with low qualifications;
- participation as well as hours worked of men in general and highly-qualified men in particular hardly react to labor tax variations.

Corporate income taxes influence firm behaviour in various respects. In a rather recent review of the rich empirical evidence, including a meta analysis of studies investigating the influence of taxation on international investment, de Mooij and Ederveen (2008) authors reach the conclusion that the largest tax-base elasticities can be found in empirical studies on profit shifting. Also marginal investment displays a significant elasticity with respect to EMTR, and even more so discrete location decisions.

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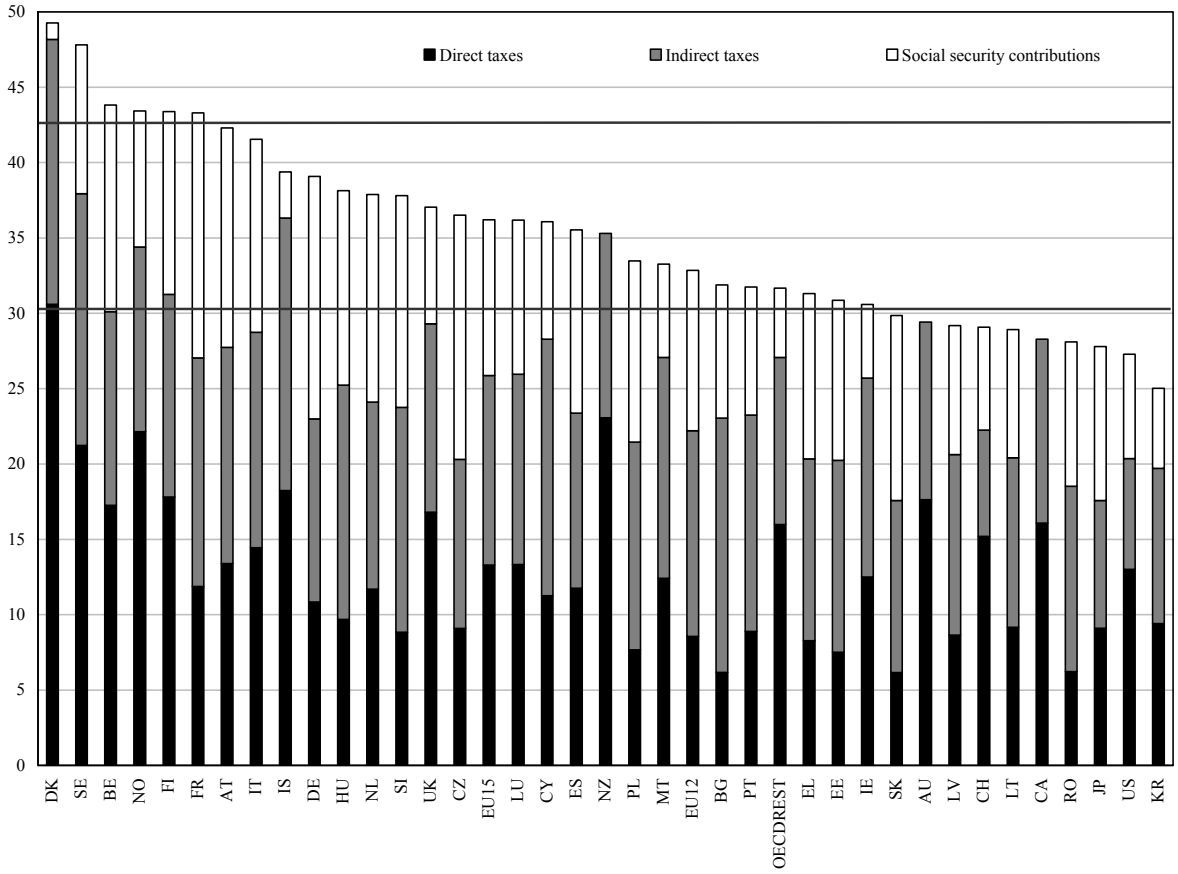
[18] For the following short summary see the extensive literature reviews by Meghir and Phillips (2008) or Task Force of the Monetary Policy Committee of the European System of Central Banks (2008).

Figure 10

Tax-to-GDP Ratios
(averages 2004-08, percent of GDP)



Sources: European Commission (2011), OECD (2010), *Revenue Statistics 2010*, and WIFO calculations. EU12: new members. OECD: sample countries which are not EU members.

3.3 Size and structure of taxation

As already indicated, there are different types of indicators that may be used to measure and evaluate the growth friendliness of tax systems. While the macroeconomic tax structure (*i.e.*, the shares of individual tax categories in total tax revenues or over GDP) can give a first impression concerning (potentially unfavourable) overall tax structures, macroeconomic effective tax rates are required to measure the distribution of the overall tax burden on the respective macroeconomic tax bases. Incentives influencing growth-relevant decisions by firms and individuals are affected by effective microeconomic tax rates.

3.3.1 Total tax burden and macroeconomic tax structure

Figure 10 shows the total tax burden (including social security contributions) in percent of GDP (the most common indicator for the overall tax level) for the sample of 36 countries as five-year averages for the period 2004 to 2008. We group – somewhat arbitrarily – the countries

regarded in high-tax countries (tax burden above 42 per cent of GDP),[19] in low-tax countries (tax burden below 30 per cent of GDP)[20] and in a group with a medium tax burden (between 30 per cent and 42 per cent of GDP).[21] The country-specific values cover a wide range, from 25 per cent of GDP in South Korea to 49.3 per cent of GDP in Denmark. The average tax level for the rest-OECD countries included in our sample amounts to 31.7 per cent of GDP, for the EU15 countries the average is 36.2 per cent and for the EU12 countries 32.8 per cent.

In a first rough categorization, total tax revenues can be grouped into three main categories: indirect taxes, direct taxes, and social security contributions. Related to GDP, direct taxes dominate on average for the rest-OECD countries in our sample, with 16 per cent; indirect taxes reach 11.1 per cent (see Figure 10). Social security contributions are of considerably smaller significance, with 4.6 per cent of GDP on average for the rest-OECD countries regarded. In the EU12 indirect taxes are clearly dominating on average, with 13.6 per cent of GDP, followed by social security contributions with 10.6 per cent and direct taxes with 8.6 per cent of GDP. In the EU15 the shares of the respective tax categories are comparatively balanced, with direct taxes reaching 13.3 per cent, indirect taxes 12.6 per cent, and social security contributions 10.3 per cent of GDP.

Figure 10 also shows that the shares of these main tax categories in GDP vary considerable between countries. Averaged over the period 2004 to 2008, direct taxes reach 6.2 per cent of GDP in (the flax tax countries) Bulgaria, Romania and the Slovak Republic on the low end, and 30.6 per cent of GDP in Denmark on the high end. Indirect taxes range from 7.1 per cent of GDP in Switzerland to 18.1 per cent in Iceland. While social security contributions make up for 1.1 per cent of GDP in Denmark only, they amount to 16.3 per cent of GDP in France.

3.3.2 Macroeconomic effective tax rates

Macroeconomic or implicit effective tax rates relating total revenues stemming from one tax category to the corresponding tax base and thus reflecting the effective tax burden on individual tax bases are calculated regularly by Eurostat for the EU27 countries plus Iceland and Norway. Eurostat calculates implicit effective tax rates for labor, energy, consumption, and on capital (which are divided further in implicit tax rates on capital and business income and on corporate income). Table 3 contains implicit tax rates for 2000 and 2008 in comparison. On average, implicit tax rates for all macroeconomic tax bases decreased in the EU15. In the EU12, on the other hand, only implicit tax rates on labor and corporate income decreased, while they increased on consumption, energy, and capital.

A closer look at developments in individual countries reveals that they are differently affected by these general trends: Firstly the extent to which tax burdens have changed during the last decade varies considerably across countries. Secondly, about one third of the EU countries regarded are moving against the general trends with regard to implicit tax burdens on labor, capital, and corporate income; in about one fourth of the EU countries analyzed here the implicit tax rate on energy and in half the EU countries the implicit consumption tax rate went down.

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[19] This corresponds approximately to the mean tax ratio plus one standard deviation (41.4 per cent); the resulting group of 8 high-tax countries includes Denmark, Sweden, Belgium, Norway, Finland, France, Austria, and Italy.

[20] This corresponds approximately to the mean tax ratio minus one standard deviation (29.1 per cent); the 10 low-tax countries are the Slovak Republic, Australia, Latvia, Switzerland, Lithuania, Canada, Romania, Japan, the United States and South Korea.

[21] This is the biggest group with 18 countries, consisting of Iceland, Germany, Hungary, the Netherlands, Slovenia, the United Kingdom, the Czech Republic, Luxembourg, Cyprus, Spain, New Zealand, Poland, Malta, Bulgaria, Portugal, Greece, Estonia, and Ireland.

Table 3

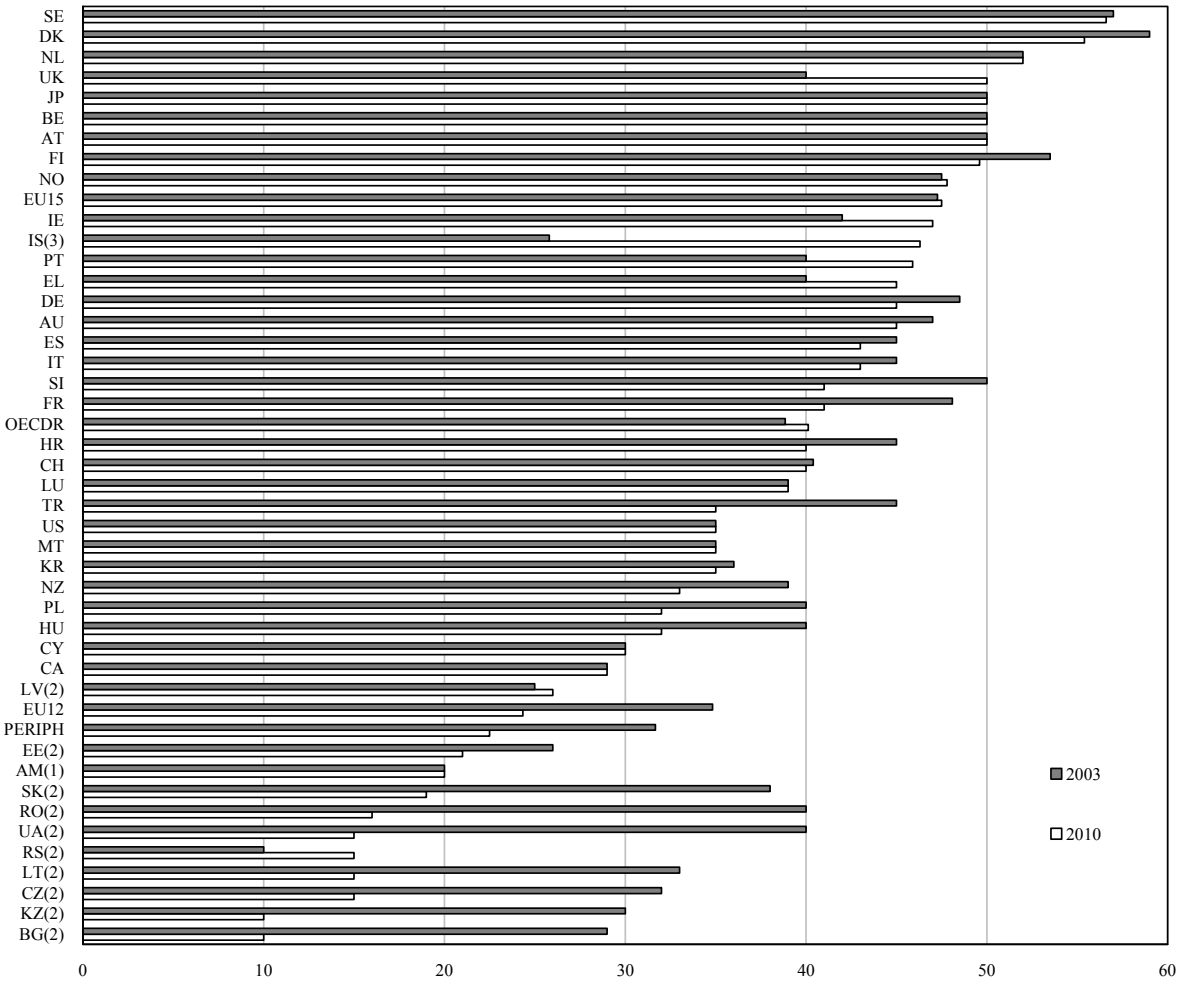
Implicit Tax Rates on Labor, Consumption, Energy, Capital, Corporate Income, EU 27, 2000-08

Country	Labor			Consumption			Energy[1]			Capital			Corporate Income		
	2000	2008	Δ 2000-08	2000	2008	Δ 2000-08	2000	2008[2]	Δ 2000-08	2000[3]	2008[4]	Δ 2000-08	2000[5]	2008[6]	Δ 2000-08
BE	43.6	42.6	–1.0	21.8	21.2	–0.6	92.4	97.1	4.7	29.6	32.7	3.1	24.4	21.4	–3.0
BG	38.7	27.6	–11.1	19.7	26.4	6.8	36.4	71.7	35.3	-	-	-	-	-	-
CZ	40.7	39.5	–1.2	19.4	21.1	1.7	55.2	127.1	71.9	20.9	21.5	0.6	26.2	25.7	–0.5
DK	41.0	36.4	–4.5	33.4	32.4	–1.0	300.8	267.8	–33.1	36.0	43.1	7.1	23.0	24.9	1.9
DE	40.7	39.2	–1.6	18.9	19.8	0.9	192.7	193.8	1.1	28.4	23.1	–5.3	-	-	-
EE	37.8	33.7	–4.1	19.5	20.9	1.5	32.2	71.5	39.3	6.0	10.7	4.8	4.1	8.3	4.3
IE	28.5	24.6	–3.9	25.7	22.9	–2.8	140.5	153.1	12.5	14.9	15.7	0.8	10.0	7.6	–2.4
EL	34.5	37.0	2.5	16.5	15.1	–1.4	117.3	102.0	–15.3	19.9	15.8	–4.1	29.0	18.6	–10.4
ES	28.7	30.5	1.9	15.7	14.1	–1.6	137.8	114.6	–23.2	29.8	32.8	3.0	30.7	34.0	3.3
FR	42.0	41.4	–0.6	20.9	19.1	–1.8	173.2	160.7	–12.5	38.3	38.8	0.4	29.6	29.1	–0.5
IT	42.2	42.8	0.6	17.9	16.4	–1.5	248.7	187.4	–61.3	29.5	35.3	5.8	19.2	31.5	12.3
CY	21.5	24.5	2.9	12.7	20.6	7.8	43.1	110.0	66.9	23.7	36.4	12.6	28.6	37.3	8.7
LV	36.7	28.2	–8.4	18.7	17.5	–1.2	48.3	48.4	0.1	11.2	16.3	5.1	8.6	15.2	6.6
LT	41.2	33.0	–8.2	18.0	17.5	–0.4	58.0	78.5	20.5	7.2	12.4	5.2	3.9	11.1	7.1
LU	29.9	31.5	1.6	23.0	27.1	4.1	164.3	173.3	9.0	-	-	-	-	-	-
HU	41.4	42.4	1.0	27.5	26.9	–0.6	79.7	98.0	18.3	17.1	19.2	2.0	28.7	19.9	–8.8
MT	20.6	20.2	–0.4	15.9	20.0	4.1	142.2	197.0	54.9	-	-	-	-	-	-
NL	34.5	35.4	0.9	23.8	26.7	2.9	154.4	189.8	35.3	20.8	17.2	–3.7	18.5	11.9	–6.6
AT	40.1	41.3	1.2	22.1	22.1	0.0	141.8	150.2	8.4	27.7	27.3	–0.3	27.1	26.1	–1.0
PL	33.6	32.8	–0.8	17.8	21.0	3.2	58.9	108.0	49.0	20.5	22.5	2.0	37.1	20.0	–17.1
PT	27.0	29.6	2.7	18.9	19.1	0.2	111.8	143.4	31.6	33.6	38.6	5.0	25.5	22.6	–2.9
RO	33.5	29.5	–4.0	17.0	17.7	0.7	58.2	26.2	–32.0	-	-	-	-	-	-
SI	37.7	35.7	–2.0	23.5	23.9	0.4	118.3	121.7	3.4	15.7	21.6	5.9	19.6	27.4	7.7
SK	36.3	33.5	–2.8	21.7	18.4	–3.3	42.4	84.6	42.2	22.9	16.7	–6.2	40.2	20.7	–19.4
FI	44.1	41.3	–2.7	28.5	26.0	–2.5	108.7	114.5	5.8	36.1	28.1	–7.9	30.4	19.3	–11.1
SE	46.0	42.1	–3.8	26.3	28.4	2.2	182.0	190.1	8.1	43.2	27.9	–15.3	41.0	23.2	–17.8
UK	25.3	26.1	0.7	18.9	17.6	–1.4	249.5	180.2	–69.3	44.7	45.9	1.2	31.0	22.2	–8.8
EU 15	36.5	36.1	–0.4	22.1	21.9	–0.3	167.7	161.2	–6.5	30.9	30.2	–0.7	26.1	22.5	–3.6
EU 12	35.0	31.7	–3.3	19.3	21.0	1.7	64.4	95.2	30.8	16.1	19.7	3.6	21.9	20.6	–1.3

[1] Energy taxes in Euro per tons of oil equivalent (TOE), base year: 2000; [2] Iceland 2006; Greece, France, Malta 2007; [3] Ireland 2002; [4] Greece 2006, Norway 2007; [5] Ireland 2002; [6] Greece, Portugal 2006.
Source: European Commission (2010b), and WIFO calculations.

Figure 11

Personal Income Tax Rate, 2003-10



Source: KPMG (2010). (1) Introduction of flat tax in 2011; (2) Flat tax; (3) Introduction of flat tax in 2007, abolished in 2010.

3.3.2 Microeconomic tax rates

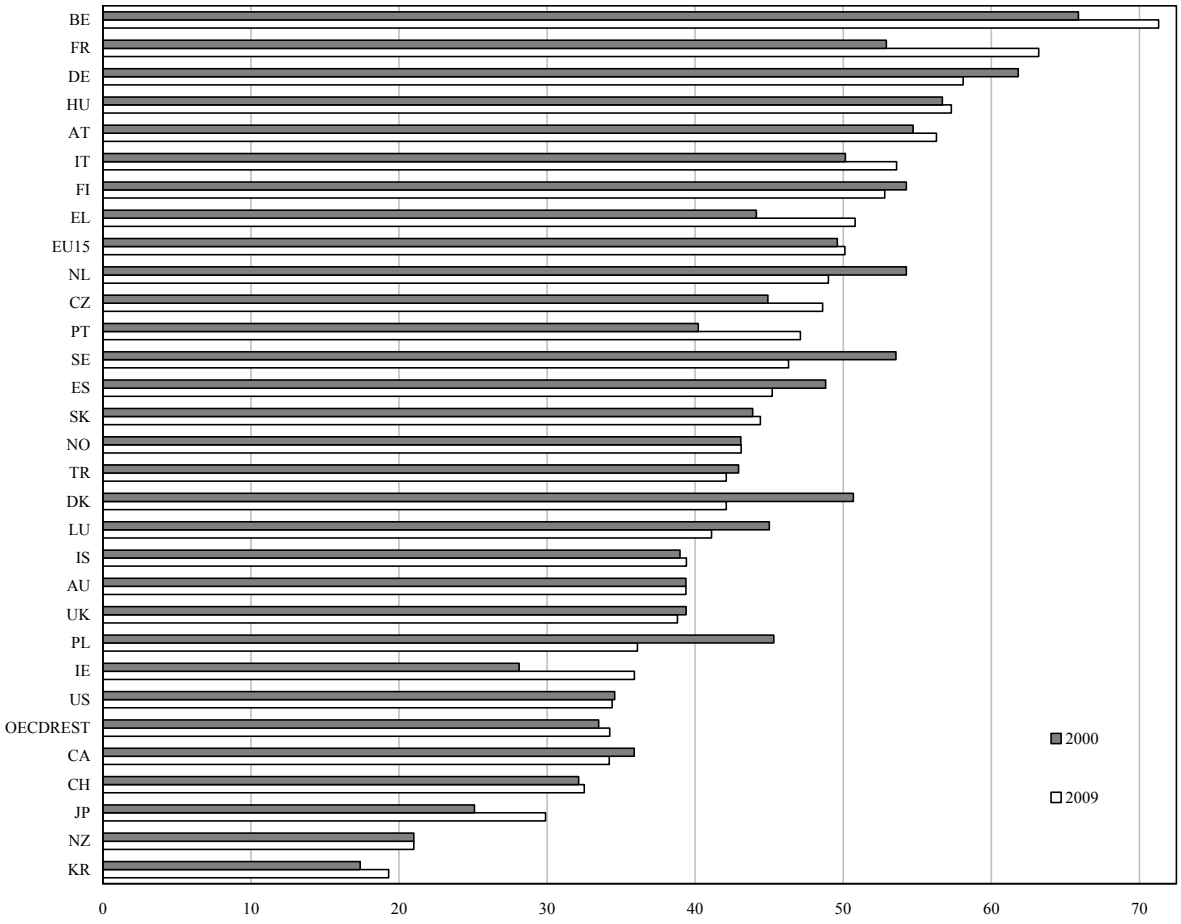
Evaluations of the effects of taxes on labor supply and investment need to be based on microeconomic tax rates. Ideally, these should be forward looking, as the tax burden of the past is of limited relevance for future decisions of economic agents about, for example, investment or labor supply.

3.3.2.1 Microeconomic tax rates on labor

We start with a look at top income tax rates for our sample of 36 countries, which we enrich by 6 peripheral European countries (Croatia, Ukraine, Kazakhstan, Armenia, Republic of Serbia, Turkey). Between 2003 and 2010, a clear downward trend of personal income tax rates can be observed for the EU12 and the peripheral European countries, where the average top income tax rate went down from 34.8 per cent in 2003 to 24.3 per cent in 2010 and from 31.7 to 22.5 per cent,

Figure 12

Marginal Tax Wedge, 67 per cent of Gross Labor Income, 2000-09



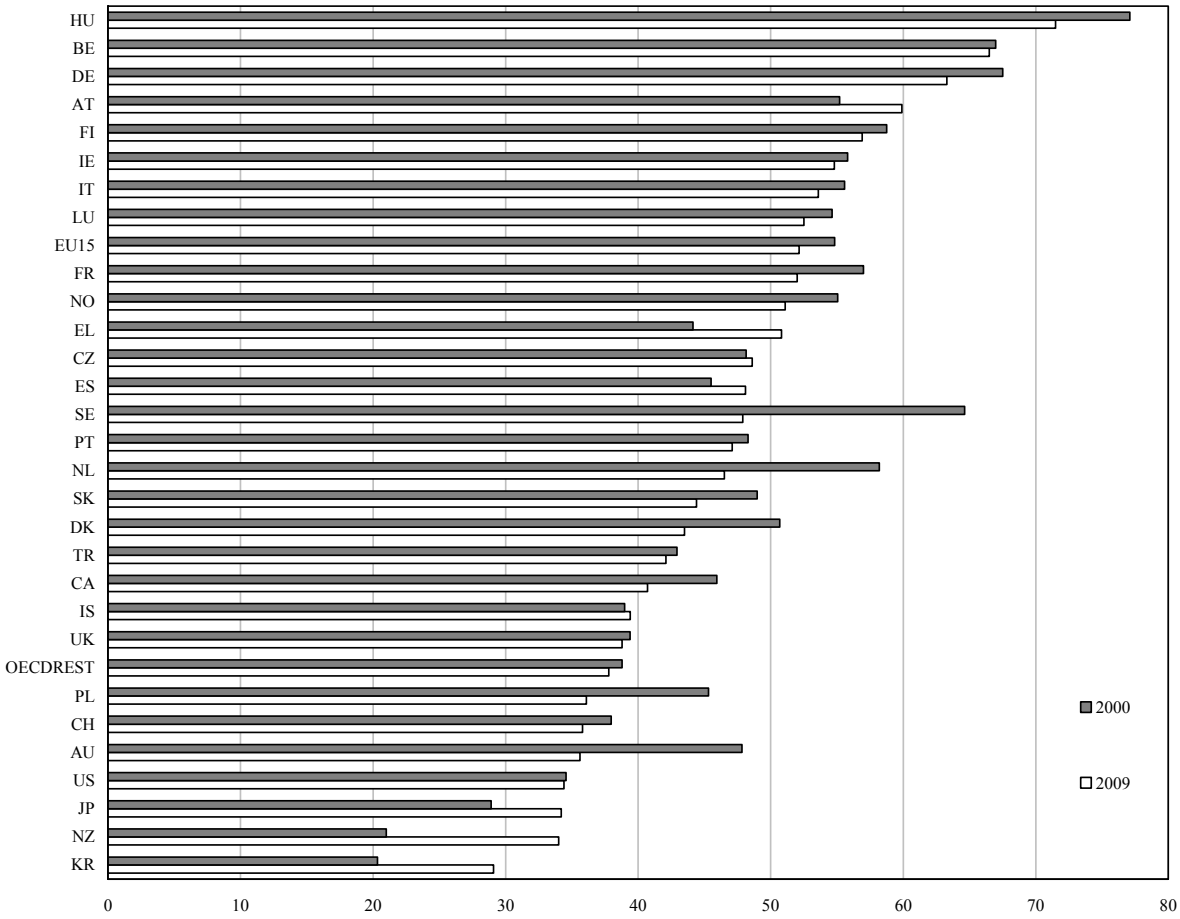
Source: OECD (2011).

respectively. In the EU15 countries, on the other hand, top income tax rates stagnated on average, amounting to 47.5 per cent in 2010. In the rest-OECD countries analyzed here the average top income tax rate increased from 38.9 to 40.1 per cent.

To assess the incentive effects of personal income taxation with regard to labor supply, a focus on top personal income tax rates is far too narrow, however. Firstly, tax sensitivity of labor supply of workers in the top income groups – as the results of the overwhelming majority of empirical studies reported above show – is rather limited; tax elasticity is much higher in lower income groups. Secondly, marginal tax rates are important for decisions about the numbers of hours worked; the participation decision, however, is influenced by average tax rates which also take into account the rules to determine the tax base. Thirdly, to identify the incentive effects of taxation for labor supply all relevant taxes need to be considered: As can be seen in the macroeconomic data above, the majority of countries do not only levy wage taxes, but also social security contributions on labor incomes. Thus, to derive a more complete picture of the possible incentive effects of labor taxation, effective marginal as well as average microeconomic tax rates for different income groups with different tax rate elasticities of labor supply must be determined, which include personal income taxes as well as social security contributions.

Figure 13

Marginal Tax Wedge, 100 per cent of Gross Labor Income, 2000-09



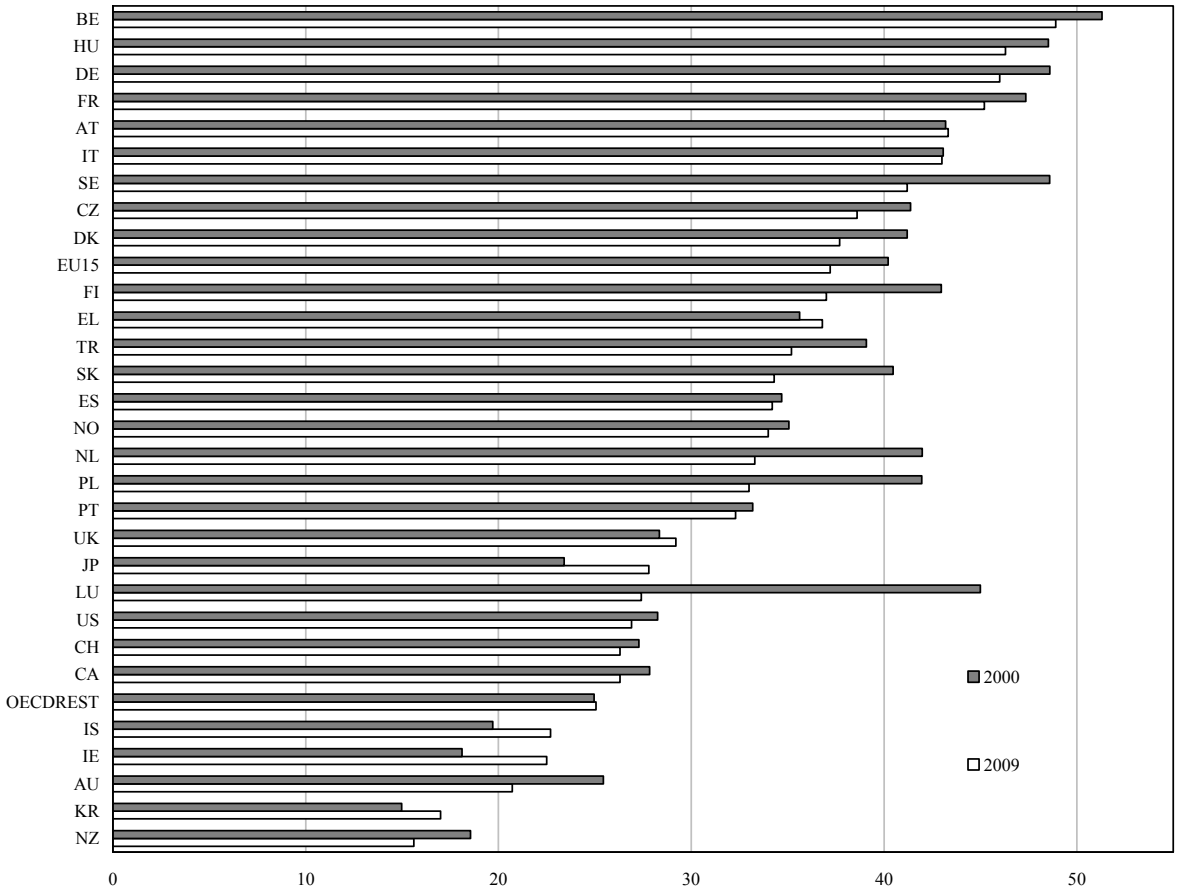
Source: OECD (2011).

Effective marginal and average tax wedges including personal income taxes and social security contributions are calculated regularly by the OECD. For sake of complexity reduction, we choose from the considerable selection of family constellations and income sizes the OECD offers two simple cases: a single earner with 67 per cent of an income (as representative for a rather low income group), and a single earner with an average income. In Figures 12 to 15, marginal and average tax wedges (resulting from wage tax and social security contributions minus cash benefits), respectively, are presented in comparison for the years 2000 and 2009.

For low income earners, in the EU15 the marginal tax wedge slightly rose on average between 2000 and 2009, to a rather high level of 50.1 per cent: Thus it approached the marginal tax rate for an average earner, who faced a marginal tax wedge of 52.1 per cent in 2009 (compared to 54.8 per cent in 2000). The marginal tax wedge for low incomes was lowest in South Korea (19.3 per cent) and highest in Belgium (71.3 per cent). Average incomes were burdened with the lowest marginal tax wedge in South Korea (29.1 per cent) and with the highest marginal tax wedge in Hungary (71.5 per cent). The average tax wedge for the EU15 went down by about 3 percentage points both for low incomes (to 37.2 per cent) and average incomes (to 41.6 per cent). The average tax wedge for low and for average incomes was lowest in New Zealand (15.6 and 18.4 per cent,

Figure 14

Average Tax Wedge, 67 per cent of Gross Labor Income, 2000-09



Source: OECD (2011).

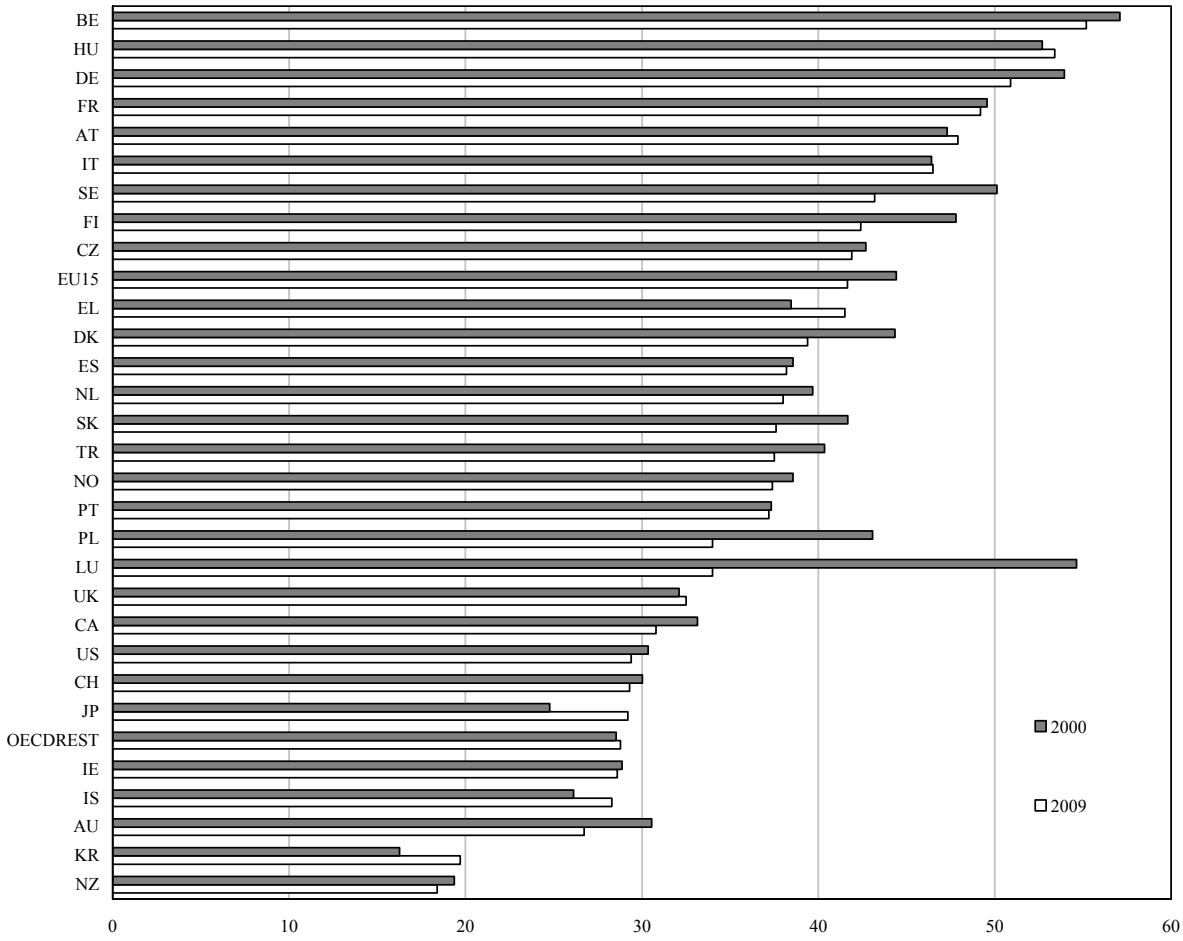
respectively). Low as well as average incomes faced the highest average tax wedge in Belgium (48.9 and 55.2 per cent, respectively). Interestingly, during the past decade the marginal tax wedge for low incomes went down in only about half the countries regarded, while the marginal tax wedge for average incomes as well as the average tax wedges for low and average incomes went down in a clear majority of countries.

3.3.2.2 Microeconomic corporate income tax rates

As mentioned above, a number of recent empirical studies corroborate the theoretical expectation that firm decisions – also in an international context – are influenced by corporate taxation. Hereby statutory corporate income tax rates as well as effective marginal (EMTR) and average (EATR) tax rates are relevant. Figure 16 shows that in our sample of 36 countries plus 10 peripheral European countries statutory corporate income tax rates fell markedly between 1995 and 2010. Only one country (Finland) slightly increased its corporate income tax rate, in 6 other countries (among them the 3 peripheral countries Montenegro, Armenia, and Belarus, but also Malta, Norway, and the United States) it remained constant. Again, the most marked reduction took place in the EU12 countries, where the average corporate income tax rate went down from 31.8 to

Figure 15

Average Tax Wedge, 100 per cent of Gross Labor Income, 2000-09



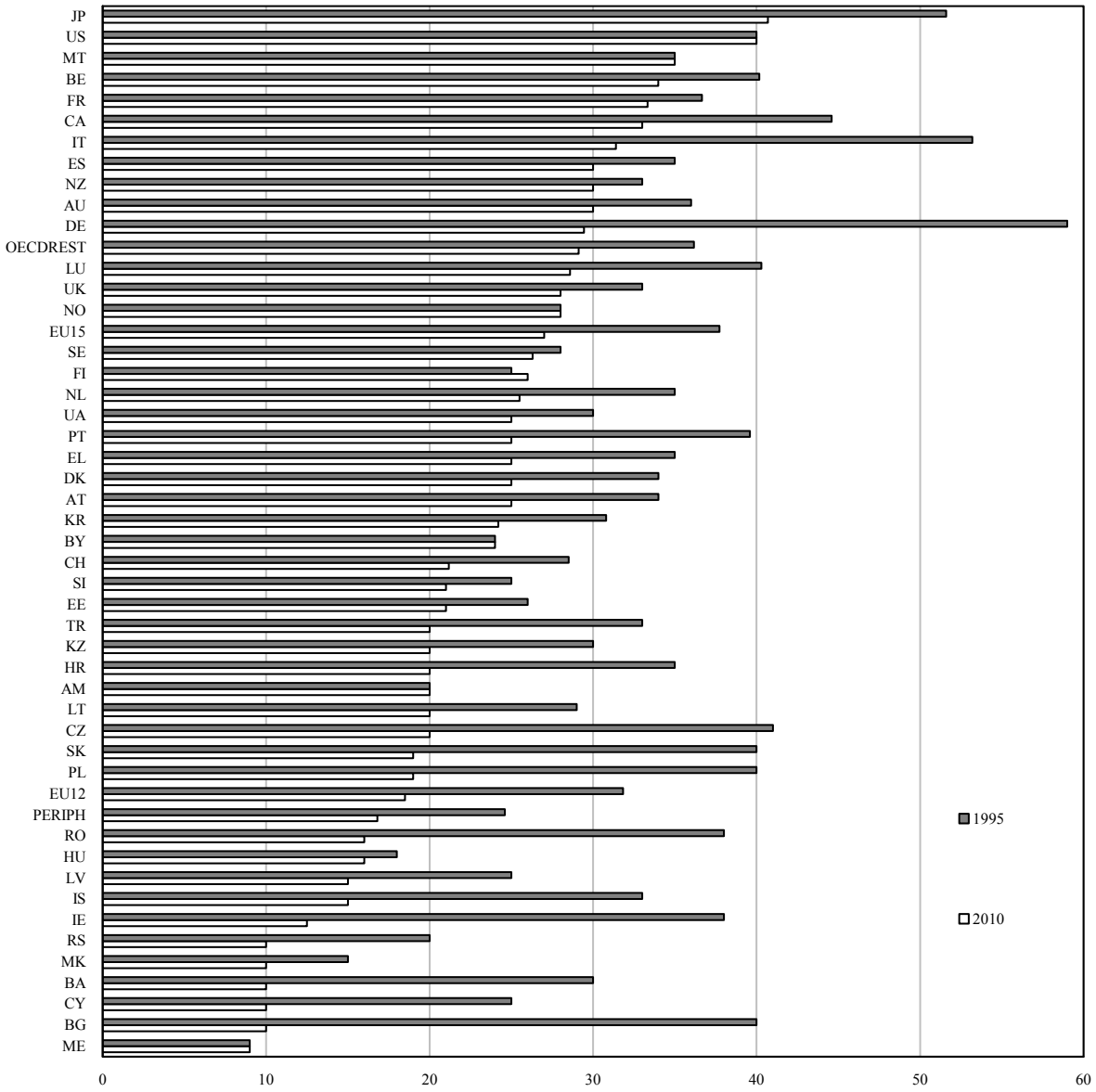
Source: OECD (2011).

18.5 per cent. But also the fall in the EU15 countries (from an average of 37.7 per cent in 1995 to 27 per cent in 2010) as well as in the European peripheral countries (from 24.6 to 16.8 per cent) is considerable. Less pronounced is the upward trend in the group of rest-OECD countries included in our sample; here the average statutory corporate income tax rate fell from 36.2 to 29.1 per cent. The distance between the high-tax and the low-tax countries narrowed down since the mid-Nineties, and while in 1995 3 countries in our sample of 46 countries had a corporate income tax rate of over 50 per cent, 2010 only 2 countries remained in which the corporate income tax rate reached about 40 per cent; it was below this threshold in all other countries.

Table 4 contains EMTR and EATR for all 27 EU countries plus 5 developed OECD countries as well as 3 European periphery countries for 2009 compared to 1998. On average EMTR and EATR were reduced in the rest-OECD countries, from 24.1 to 22 per cent and from 27.4 to 25.9 per cent, respectively. In the EU15, EMTR fell from 23.6 to 19 per cent, in the EU12 from 20.4 to 11.9 per cent. EATR went down from 30.7 to 25.1 per cent in the EU15 and from 27.4 to 17 per cent in the EU12. In this sample of 35 countries, EATR went up in 3 countries only and EMTR increased in 5 countries only; constant EATR and EMTR, respectively, can be observed in 2 identical countries.

Figure 16

Corporate Income Tax Rates, 1995-2010



Sources: KPMG (2010), and WIFO calculations. Earliest data 1995, except for Korea: 1997, Croatia, Kazakhstan, Macedonia: 1999, Serbia: 2002.

3.4 Conclusions

Table 5 gives an overview of the ranks of the countries regarded here (as far as available) with respect to the indicators presented above, whereby higher values of the tax burden indicators imply higher ranks. Of particular interest appears the relationship between the total tax burden on the one hand and the individual tax burden indicators on the other hand. However, a more detailed analysis of the relationships between the individual tax burden indicators goes beyond the scope of the study.

Table 4

Effective Average (EATR) and Marginal Corporate (EMTR) Tax Rates, 1998-2009

Country	EATR			EMTR		
	1998	2009	Δ 1998-2009	1998	2009	Δ 1998-2009
Austria	29.7	22.7	–7.0	20.2	17.4	–2.8
Belgium	34.5	24.7	–9.8	22.7	–5.1	–27.8
Bulgaria	32.0	8.8	–23.2	21.2	5.5	–15.7
Canada(1)	37.1	32.9	–4.2	38.6	32.8	–5.8
Cyprus	27.5	10.6	–16.9	24.4	9.5	–14.9
Czech Republic	26.4	17.5	–8.9	23.0	11.2	–11.8
Denmark	30.0	22.5	–7.5	21.5	16.7	–4.8
Estonia	22.4	16.5	–5.9	13.4	3.6	–9.8
Finland	25.9	23.6	–2.3	21.5	18.1	–3.4
France	39.8	34.6	–5.2	36.8	34.9	–1.9
Germany	41.2	28.0	–13.2	37.9	21.7	–16.2
Greece	30.4	21.8	–8.6	20.5	14.1	–6.4
Hungary	19.0	19.5	0.5	18.7	15.5	–3.2
Ireland	9.4	14.4	5.0	7.8	13.3	5.5
Italy	32.0	27.4	–4.6	9.7	20.8	11.1
Japan(1)	41.7	41.3	–0.4	42.8	41.9	–0.9
Latvia	22.7	13.8	–8.9	17.5	10.8	–6.7
Lithuania	23.0	16.8	–6.2	6.7	8.3	1.6
Luxembourg	32.6	25.0	–7.6	22.4	16.5	–5.9
Malta	32.2	32.2	0.0	26.9	26.9	0.0
Netherlands	32.3	23.7	–8.6	27.2	19.6	–7.6
Norway(1)	26.4	26.5	0.1	23.1	23.3	0.2
Poland	32.4	17.5	–14.9	25.3	13.7	–11.6
Portugal	33.4	23.7	–9.7	25.5	17.1	–8.4
Romania	34.0	14.8	–19.2	26.0	11.9	–14.1
Slovakia	36.7	16.8	–19.9	30.8	11.3	–19.5
Slovenia	20.9	19.1	–1.8	10.5	14.5	4.0
Spain	36.5	32.8	–3.7	35.4	33.4	–2.0
Sweden	23.8	23.2	–0.6	17.9	17.4	–0.5
Switzerland(1)	18.8	18.7	–0.1	12.5	12.4	–0.1
United Kingdom	29.7	28.3	–1.4	27.3	28.9	1.6
United States(1)	38.3	37.4	–0.9	35.9	35.1	–0.8
Croatia(1)	16.5	16.5	0.0	6.9	6.9	0.0
Macedonia(1)	13.3	7.9	–5.4	8.8	1.9	–6.9
Turkey(1)	26.8	17.9	–8.9	19.6	12.6	–7.0
EU 15	30.7	25.1	–5.7	23.6	19.0	–4.6
EU 12	27.4	17.0	–10.4	20.4	11.9	–8.5
OECD rest	27.4	25.9	–1.6	24.1	22.0	–2.0

(1) Earliest data: 2005.
Source: European Commission (2010b), and WIFO calculations.

Table 5

Country-specific Ranks with Respect to Tax Burden Indicators

Country	Total Tax Burden	Share of Growth-dampening Taxes	Top Personal Income Tax Rate [1]	Marginal Tax Wedge 100%	Average Tax Wedge 100%	Corporate Income Tax Rate	EMTR	EATR
Australia	28	13	13	24	26	8		
Austria	7	4	4	4	5	18	13	17
Belgium	3	7	5	2	1	4	32	12
Bulgaria	22	36	36	n.a.	n.a.	35	30	32
Canada	32	11	29	19	20	6	5	4
Cyprus	17	34	28	n.a.	n.a.	36	28	31
Czech Republic	15	9	34	12	9	26	26	23
Denmark	1	16	2	18	11	19	16	18
Estonia	25	25	31	n.a.	n.a.	24	31	27
Finland	5	10	8	5	8	16	12	15
France	6	14	18	9	4	5	3	3
Germany	10	8	14	3	3	11	9	8
Greece	24	22	15	11	10	20	20	19
Hungary	11	26	26	1	2	30	18	20
Iceland	9	33	11	20	25	32		
Ireland	26	31	10	6	24	34	22	29
Italy	8	15	16	7	6	7	10	9
Japan	34	1	6	26	23	1	1	1
Korea	36	35	22	28	27	22	n.a.	n.a.
Latvia	29	24	30	n.a.	n.a.	33	27	30
Lithuania	31	21	35	n.a.	n.a.	27	29	25
Luxembourg	16	19	21	8	17	12	17	11
Malta	21	32	23	n.a.	n.a.	3	7	6
Netherlands	12	17	3	16	13	17	11	13
New Zealand	19	20	25	27	28	9	na	na
Norway	4	5	9	10	15	13	8	10
Poland	20	29	27	22	18	28	21	24
Portugal	23	28	12	15	16	21	15	14
Romania	33	30	33	n.a.	n.a.	31	24	28
Slovakia	27	23	32	17	14	29	25	26
Slovenia	13	18	19	n.a.	n.a.	25	19	21
Spain	18	12	17	13	12	10	4	5
Sweden	2	3	1	14	7	15	14	16
Switzerland	30	6	20	23	22	23	23	22
United Kingdom	14	27	7	21	19	14	6	7
United States	35	2	24	25	21	2	2	2

[1] Out of a sample of 28 countries.
Source: WIFO.

4 Regulation

4.1 The regulatory framework and economic growth

A further dimension of government size is the intensity of regulation. Governments provide the framework for market transactions by setting the rules for voluntary exchange and market entry (and sometimes also: exit). Government regulations impose restrictions on individual market participants' actions and thereby limit the range of opportunities. On the one hand, a minimum set of regulations is a pre-condition for the functioning of markets and competition so that they can unfold their productivity enhancing power. A good regulatory framework reduces transaction costs on goods and factor markets and thus contributes to growth. Moreover, regulations may also improve the allocation of resources by channeling economic behavior of market participants in order to correct market failures from asymmetric information, externalities or natural monopoly markets. On the other hand, overly rigid regulatory systems can be an obstacle to economic growth if the set of implemented rules impedes welfare-enhancing voluntary transactions. Regulatory restraints can be so strict that they prevent an economy to respond quickly to technological change and to allocate scarce resources to their most productive uses.

While too little regulation is bad for growth because the necessary framework for competitive markets is not provided, too much regulation can be bad for growth if it restricts competition (by entry limitations) and voluntary exchange. A lack of competition in markets can thwart incentives for productivity improvements and therefore lead to reduced innovation dynamics through barriers to entrepreneurship (Aghion *et al.*, 2001, Cincera and Galgau, 2005). Severe regulations place an additional burden on economic activities and thus reduce the rate of return from investment in physical or human capital. As such, the burdens from regulation are similar to burdens of taxation. Structural policies and regulations which influence the working properties of markets can therefore contribute to cost differences in goods and factor markets. In case of excessive entry regulations, a liberalization or de-regulation can improve allocative efficiency by reducing monopoly rents and bringing prices in line with marginal costs. Also, enhanced competition will raise the productive efficiency of an economy by changing incentives for businesses. Moreover, a more open economy with reduced entry restrictions is also more attractive to foreign trade and investment (Nicodème and Sauner Leroy, 2007; Djankov, 2009). Finally, regulation also can serve as a means for state enforced re-distribution towards organized special interest groups. Achieving regulatory protection from competition is therefore a goal in socially unproductive rent seeking (Posner, 1975).

Seen from this view, the theoretical problems regarding the choice of an "optimal degree of regulation" are not too different from the questions with respect to the optimal fiscal size of government.[22]

Empirical evidence on the growth effects of the regulatory framework almost always points to the advantages of less heavily regulated markets. A number of empirical papers find that a more market-friendly regulatory environment is conducive to economic growth performance, and that too strict regulatory policies and lack of competition in markets are at the heart of a disappointing growth performance, specifically in some OECD nations (e.g., Dutz and Hayri, 1999; Griffith, Harrison and Simpson, 2006; Nicodème and Sauner Leroy, 2007). Nicoletti and Scarpetta (2003) find that productivity growth is boosted by reforms that promote private corporate governance and competition, and claim that "… entry-limiting regulation may hinder the adoption of technologies, possibly by reducing competitive pressures, technology spillovers, or the entry of new high-tech

[22] Wright (2004) even develops a similar theoretically hump-shaped relation between regulation intensity and growth performance as in Figure 1 of this paper.

firms". Alesina *et al.* (2005) report that a more competitive environment is good for growth as it stimulates private business investment. Fernandes (2008) finds a positive impact of de-regulation on productivity in the services sector in transition economies. Djankov, McLiesh and Ramalho (2006) use data from the World Bank's Doing Business reports as objective measures of business regulations in 135 countries. They find that countries with less regulation grow faster. Dawson (2006) reports a significant negative relationship between a broad measure of economic regulation and growth. Similar results are found when measures of credit market and business regulations are used.

Although it is still an ongoing debate, the vast majority of theoretical models and empirical papers conclude that trade is good for growth (e.g., Grossman and Helpman, 1991; but see also Rodriguez and Rodrik, 2001). The international division of labor is generally supposed to be a major driver for world-wide development. Restrictions on international trade – tariffs, quotas, hidden administrative regulations etc. – are therefore suspected to be growth depressing. What is more controversial among economists is whether freedom of international capital movements is unequivocally good for growth (e.g., Klein, 2005; Edwards, 2007). Even before the recent Financial Crisis a number of economists advocated capital controls as a means to protect local producers and financial markets at a developmental stage (e.g., Stiglitz, 2002).

The most heavily disputed regulations are concerned with labor market issues. On the one hand, market imperfections like asymmetric information and distribution of market power between employers and employees require some protection for workers through labor market legislation (Beetsma and Debrun, 2003). On the other hand, restrictive regulation of labor markets can easily cause sclerotic labor markets that are an obstacle to efficient allocation and growth. Empirical evidence on the growth effects of restrictive labor market regulations is scarce. Most empirical studies are rather concerned with employment effects. Rigid labor market institutions are frequently seen as a fundamental cause for high and persistent unemployment in a number of European countries (e.g., Blanchard and Wolfers, 2000). Though empirical evidence is somewhat scarce, at least some empirical studies indicate that growth in industrial countries – especially in the European economies – could be enhanced by lower de facto labor market regulation (Calderon and Chong, 2005).

4.2 Regulatory policies

In this sub-section we provide an overview of the degree of regulation in OECD and EU27 economies, as well as in a number of countries in the European periphery. Yet, whereas fiscal size can in principle be measured – though only imperfectly and involved with a lot of problems – the quality of regulations governing markets is even more difficult to gauge, as it is not the mere number of laws that is decisive. Instead of introducing a vast number of different indicators and measurement systems for regulatory policies in this sub-section, we employ the most comprehensive composite Economic Freedom of the World-index from the Fraser Institute, which is based on data from various international sources. We take the data from the most recent edition of the Economic Freedom of the World-report (Gwartney and Lawson, 2010) which provides data for the degree of regulation of certain markets and businesses up to 2008. We concentrate on the following dimensions of the *efw*-index:

- the regulation of international trade and capital flows,
- the regulation of domestic credit markets,
- the regulation of business in general, and
- the regulation of labor markets.

Table 6 displays the results for 2008.

Table 6

Intensity of Market Regulations According to Economic Freedom of the World Sub-indices, 2008

Country	Code	International Trade and Capital	Domestic Credit	Domestic Business	Domestic Labor	Summary*
New Zealand	NZ	7.9	10.0	7.8	8.5	8.6
Denmark	DK	7.7	9.5	7.4	7.5	8.0
Canada	CA	7.1	9.5	7.1	8.3	8.0
Ireland	IE	8.2	9.0	6.9	7.6	7.9
Australia	AU	6.7	9.5	6.7	8.5	7.9
United Kingdom	UK	7.6	9.0	6.7	8.0	7.8
United States	US	7.6	7.7	6.7	9.2	7.8
Slovakia	SK	8.1	10.0	5.3	7.7	7.8
Netherlands	NL	8.3	9.5	6.4	6.7	7.7
Estonia	EE	8.0	10.0	7.3	5.6	7.7
Switzerland	CH	6.8	9.0	7.0	7.9	7.7
Belgium	BE	8.0	9.4	6.3	6.9	7.7
Czech Republic	CZ	7.8	9.3	5.6	7.7	7.6
Iceland	IS	5.7	9.3	7.7	7.7	7.6
Bulgaria	BG	7.6	9.5	5.4	7.7	7.6
Hungary	HU	8.1	8.8	6.0	7.1	7.5
Luxembourg	LU	8.1	9.5	7.0	5.3	7.5
Austria	AT	7.6	9.4	6.8	5.9	7.4
Latvia	LV	7.3	9.2	6.1	7.1	7.4
Sweden	SE	7.7	9.5	7.1	5.1	7.4
Japan	JP	6.1	8.9	6.1	8.2	7.3
Finland	FI	7.4	9.8	6.9	5.1	7.3
France	FR	7.3	9.2	6.2	5.6	7.1
Malta	MT	7.1	9.4	4.6	7.0	7.0
Cyprus	CY	7.1	9.5	6.1	5.3	7.0
Lithuania	LT	7.5	9.2	5.7	5.6	7.0
Slovenia	SI	7.3	9.0	6.0	5.4	6.9
Romania	RO	7.4	7.5	5.9	6.7	6.9
Norway	NO	6.5	9.3	6.6	4.9	6.8
Spain	ES	7.0	9.3	5.8	5.1	6.8
Poland	PL	7.1	8.7	4.9	6.5	6.8
Italy	IT	7.1	7.9	5.4	6.3	6.7
Korea	KR	7.1	9.3	6.1	4.0	6.6
Germany	DE	7.7	8.2	6.6	3.9	6.6
Portugal	PT	7.2	7.6	5.9	5.2	6.5
Greece	EL	6.4	7.6	5.7	4.4	6.0
sample mean		7.4	9.1	6.3	6.5	7.3
Georgia	GE	7.7	8.7	7.5	7.3	7.8
Montenegro	ME	7.2	9.6	5.3	7.9	7.5
Kyrgyzstan	KG	7.4	9.2	6.4	6.2	7.3
Croatia	HR	6.5	9.4	5.1	6.3	6.8
Armenia	AM	6.6	9.0	5.3	6.1	6.8
Bosnia and Herzegovina	BA	6.2	8.9	5.2	6.7	6.8
Albania	AL	6.3	8.1	6.1	5.8	6.6
Serbia	RS	6.7	8.7	4.8	5.7	6.5
Turkey	TR	6.4	7.5	6.3	4.4	6.2
Ukraine	UA	6.5	8.1	3.7	6.3	6.2
sample mean		7.2	8.6	6.1	5.7	6.9

* Simple average of the four regulation sub-indices, WIFO calculations.
Source: Gwartney and Lawson (2010).

International trade and capital flows

Also as a consequence of integration of international goods and capital markets through various international treaties, the countries in the sample observe a high level of trade and capital markets liberalization in 2008. On a 0-to-10-point-scale, average regulation index level is 7.4, lying in a range between 8.3 (Netherlands) and 5.7 (Iceland) (see Table 6). Trade and international capital movements are also reasonably liberalized in the 10 countries of the European periphery for which data are available. On average, the liberalization level is 7.2 points, with Georgia (7.7) having a regulatory regime that provides liberties comparable to Sweden or the USA.

Credit market regulations

This sub-index measures the extent to which the banking industry is dominated by private firms and whether foreign banks are permitted to compete in the market. It also indicates the extent to which credit is supplied to the private sector and whether controls on interest rates interfere with the market in credit. The average liberalization level of domestic credit markets in 2008 was 9.1, only a few countries (Portugal, Greece, Romania, Italy, and the USA) observed a liberalization level that is slightly less than 8 points on the scale.

Business regulations

The index of private business regulation identifies the extent to which regulatory policies and bureaucratic procedures restrain entry and reduce competition. In order to score high in this sub-index, governments must allow predominantly markets to determine prices and refrain from regulatory activities that retard entry into business and increase the cost of production. On average, the countries in the OECD/EU27 sample arrive at a liberalization level of 6.3, which is far lower than the international trade regulations level. While New Zealand and Iceland observe the highest level of de-regulation of product markets, especially Malta and Poland appear to have still a high potential to liberalize and, thus, enhance competition on domestic markets. According to the results of most empirical studies, this would boost growth in these countries. OECD (2005b), hence, expected a substantial increase of GDP per capita growth in the EU15 if competition-restraining regulations were abandoned.

Labor market regulations

The least regulated labor markets according to the *efw*-index can be found in the Anglo-Saxon Welfare States (USA, Australia, New Zealand, Canada, UK) as well as in Japan. Continental Europe, especially Germany in 2008, is lagging behind.[23] Greece, Spain, and Portugal also faced more rigid labor market regulations.

Summary index

Taking the simple mean of these four regulation-indices, New Zealand is the least regulated country in the sample, while Greece is the most heavily regulated. The countries in the European Periphery observe somewhat more economic regulation than the ones of the developed countries sample. Yet, the differences in 2008 are not very pronounced.

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[23] In the meantime Germany put in place a number of labor market reforms which will probably improve its score of the labor market regulation index.

Figure 17 shows a positive relationship between the level of GDP per capita and the state of market liberalization in 2008, taking also into account countries from the European Periphery sample. A simple bi-variate cross-country regression indicates that the interrelation between both variables is statistically significant at a 1 per cent level of confidence.

Figure 18 illustrates development of the summary regulation index over time in four country groups. While markets are already highly liberalized in EU15 and further OECD countries, the EU12 and the European Periphery observed a liberalization of regulatory policies over time. Until 2008 the differences between the country groups have been substantially reduced.

5 Interplay between expenditures, taxation and regulation

5.1 The role of policy complementarities

Having analyzed separately the spending, taxation and regulation patterns of the countries in our sample, the focus of this section will be placed on the interplay of the respective policies. Although often neglected in theoretical as well as empirical investigations, complementarities between policies can play an important in role for the growth friendliness of entire policy packages. As reforms are mutually interdependent, a country's economic policy package needs coherence, or, "economic complementarities", "… in a sense that the effectiveness of one policy depends on the implementation of other policies" (Orszag and Snower, 1998). Neglecting such interdependencies between policies can result in a wrong assessment of the economic effects of single policy measures (Aziz and Wescott, 1997).

The role of the interaction between certain economic policies in promoting growth has only recently received significant attention in the empirical growth literature. Aziz and Wescott (1997) consider measures for international openness, macro stability and size of government in a sample of 76 developing countries, and report that – analyzed separately – virtually none of these policies is significant in boosting growth over a 10 year period from 1985-95. Introducing a concept of complementarities between these different policies, they find that countries which have high quality of policies in all three measures (or at least only one "medium quality policy") have a significantly higher probability to observe higher growth.

Chang, Kaltani and Loayza (2009) find that the growth-promoting effect of trade openness depends on complementary reforms which help a country take advantage of international competition. Their estimates show that trade openness can reduce or increase growth, depending on the status of the complementary reforms in the areas educational investment, financial depth, inflation stabilization, public infrastructure quality, governance, labor-market flexibility, ease of firm entry, and ease of firm exit. This clearly indicates that the growth effects of an increase in international trade openness depend positively on the progress made in other policy areas. Bokaky and Freund (2004) also find that increased trade does not stimulate growth in economies with substantial regulatory interventions, it may even reduce growth in countries with excessive government regulation. In a similar vein, Gwartney, Holcombe and Lawson (2006) find countries with a higher overall institutional quality to experience a higher productivity of investment. More specifically, private investment is much more responsive to cross-country differences in economic freedom than are rates of government investment.

Figure 17

Intensity of Market Regulations and GDP per capita, 2008

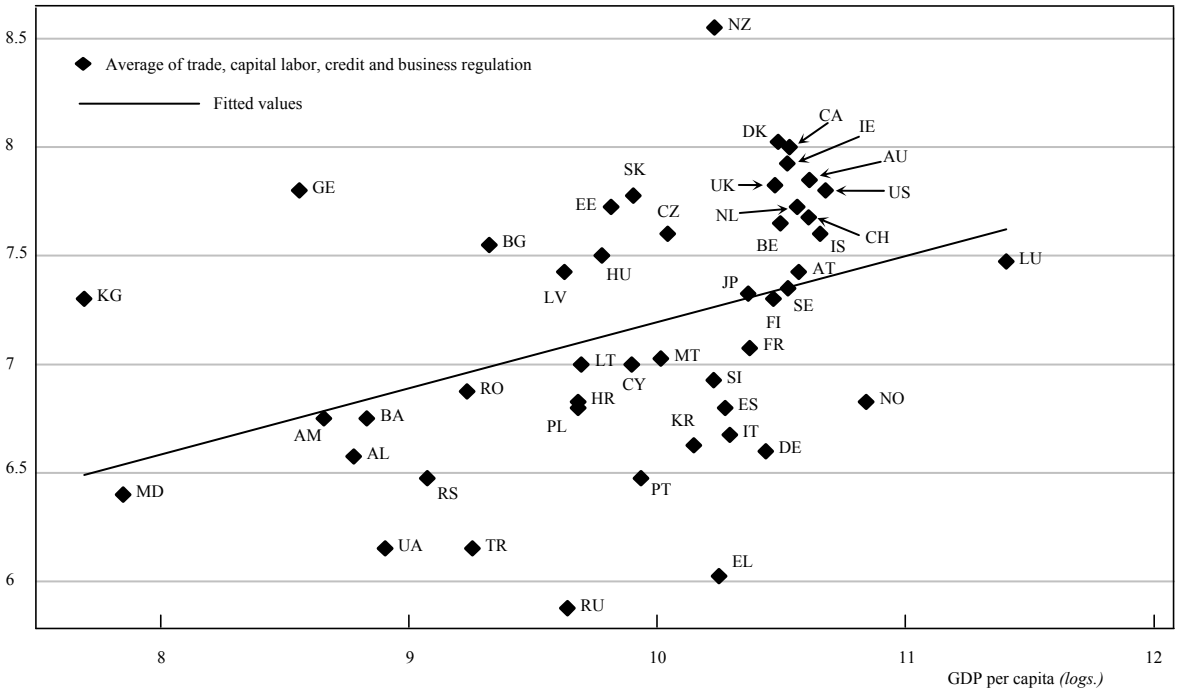
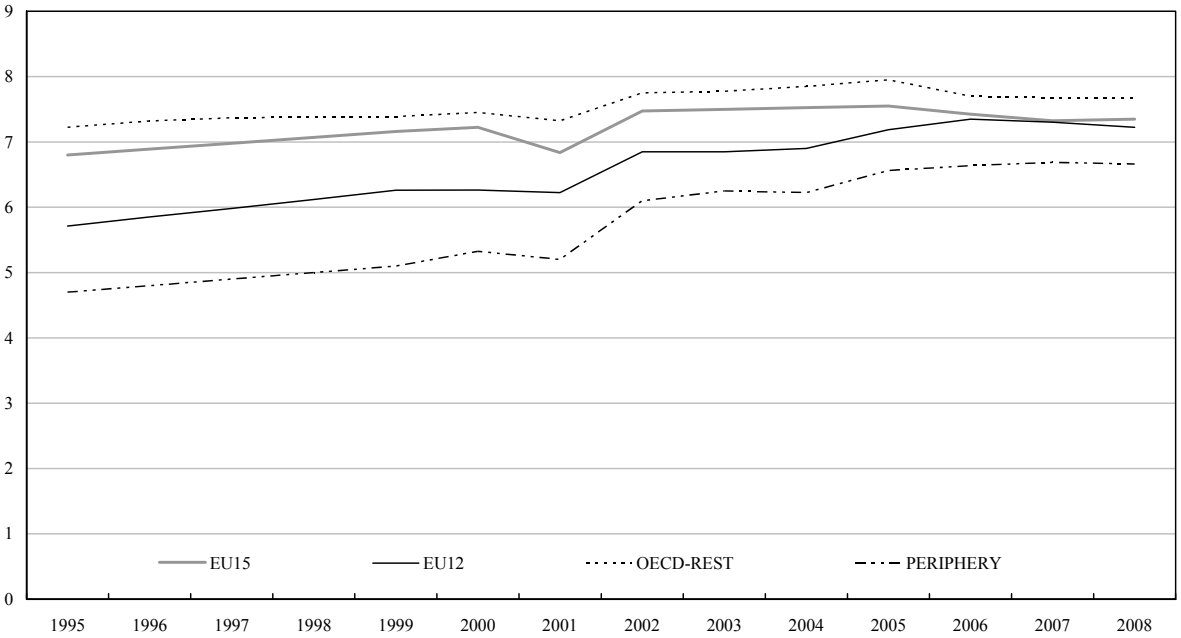


Figure 18

Median Economic Liberalization Levels in Groups of EU15, EU12 and Further OECD Countries, 1995-2008

(according to summary regulation index)



Source: WIFO calculations,based on Gwartney and Lawson (2010). Median values for the years 1996-99 derived from interpolated data.

Most recently, Braga de Macedo, Oliveira Martins and Rocha (2010) assess the possible impact of complementarities over six broad policy areas cross-country estimates in a sample of 130 countries over a time span of 13 years (1994-2006). The policy areas included are: i) trade openness, ii) business regulations, iii) freedom of capital movement, iv) openness of the domestic banking and financial system, v) property rights protection and vi) infrastructure quality. These major areas therefore resemble to some extent the policies that are considered to be growth enhancing in the present paper. Policy complementarities are captured by the standard deviation of the six aforementioned individual policy indicators, which have been standardized on a 0-100scale.[24] The authors find evidence that the variables having the strongest explanatory power are the average change of policies towards more economic liberalization and the time-averaged standard deviation of individual policy indicators, even after the inclusion of several controls. They conclude that "[t]his implies that countries where policy complementarities can unfold to a greater extent grow faster. Achieving a higher level of policy complementarity has therefore a permanent effect on growth rates". Turning to panel techniques, the introduction of (country) fixed-effects destroys the significance of the complementarities measure, indicating that the effect is driven mainly by the cross-section variance. In a simple random-effects framework, the positive impact of more coherent policies remains. Braga de Macedo, Oliveira Martins and Rocha (2010) therefore confirm the findings of a previous paper on transition economies, where the authors used different measures for complementarities (Braga de Macedo and Oliveira Martins, 2008).

In contrast to these economic complementarities between policy areas, political policy complementarities arise when the ability to gain political consent for one policy depends on the implementation of others (Orszag and Snower, 1998). This somehow parallels the famous argument of Rodrik (1998) who claims that many countries have increased social security spending and social regulation in order to compensate for higher risks due to globalization and market deregulation. On the other hand, Bergh and Karlson (2010) report evidence that high-tax countries might use a liberalization of trade as a substitute for excessive overall government size. Their results support the idea that countries with big government can use economic openness to mitigate the negative growth effects of high taxes and expenditures.

5.2 Some empirical facts

In this sub-section we will aim to investigate the existence (or absence) of complementarities between public expenditures, taxation and regulation in our sample. Note, first, that there is no single measure for complementarities, and, second, that we do not have an exact notion of the "optimal" level of productive spending or regulations. We therefore calculate a simple standardized index of the relative growth friendliness of a country's policy package as well as for the coherence/dispersion of the respective policy package, taking into account the real world range and distribution of the data in our sample. The construction of the indices assumes linearity, *i.e.*, possible non-linear relations between policy variables and economic outcomes are not reflected in the indices.

The first index is an index of the average growth friendliness of a country's policy mix, consisting of indicators for spending, taxation and regulation policies. It is constructed by measuring the growth friendliness of 13 policy indicators (see box) in relation to other countries in the sample. The resulting index is standardized on a 0-100 scale, where higher values reflect higher (average) growth friendliness.

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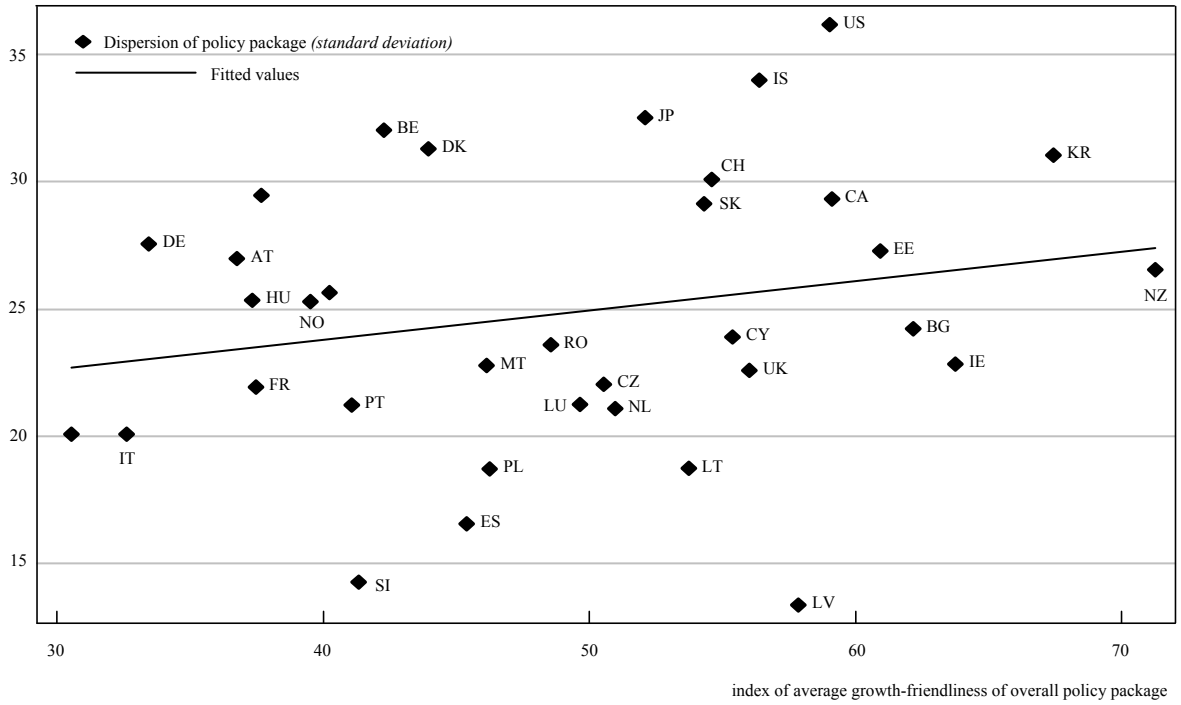
[24] Instead of employing the Fraser Institutes measures the authors use instead the Economic Freedom index of Wall Street Journal and Heritage Foundation.

Figure 19

Policy Dispersion and Average Growth Friendliness, 2008



The second index is simply calculated as the standard deviation of the growth-friendliness index of these 13 policies. Higher values indicate more dispersion and a less coherent overall policy package. Table 7 indicates the respective values for 2008.

The average index is led by New Zealand, followed by Korea, Ireland and Bulgaria. At the bottom of the 2008 ranking we find Austria, Germany, Italy and Greece. With respect to the policy dispersion measure, the most coherent policy mix can be found in Latvia, Slovenia and Spain, while the USA, Iceland, and Japan observe the highest standard deviation of our set of 13 policy indicators. Both measures are not strongly correlated, though. Figure 19 shows that average growth friendliness and policy dispersion are not strongly connected. If anything, there is a slightly positive relation between the two variables. Simple correlation tests also reveal no significant between both indicators.

6 Summary and outlook

Are fiscal and regulation policies in Europe in line with the recommendations from the new growth literature? The present study provides an overview of the growth friendliness of fiscal and regulatory structures in a sample of developed OECD countries and EU members (EU15 and EU12). Peripheral European (transition) countries are also included, whenever respective data are available.

Based on several measures capturing the expenditure and the tax side of the budgets, as well as regulatory policies, the size and the structure of public sectors differ markedly across countries. Our analysis of regulatory regimes is based on indicators for the liberalization of international trade and capital movements, as well as domestic credit markets, labor markets and business regulations.

Table 7

Growth-friendliness Index and Policy Dispersion Index, 2008

S-code	Country	Growth Friendliness	Dispersion
NZ	New Zealand	71.3	26.6
KR	Korea	67.4	31.0
IE	Ireland	63.8	22.8
BG	Bulgaria	62.2	24.2
EE	Estonia	60.9	27.3
CA	Canada	59.1	29.3
US	United States	59.0	36.2
LV	Latvia	57.9	13.4
IS	Iceland	56.4	34.0
UK	United Kingdom	56.0	22.6
CY	Cyprus	55.4	23.9
CH	Switzerland	54.6	30.1
SK	Slovakia	54.3	29.1
LT	Lithuania	53.7	18.7
JP	Japan	52.1	32.5
NL	Netherlands	51.0	21.1
CZ	Czech Republic	50.5	22.0
LU	Luxembourg	49.6	21.2
RO	Romania	48.5	23.6
PL	Poland	46.3	18.7
MT	Malta	46.1	22.8
ES	Spain	45.4	16.5
DK	Denmark	44.0	31.3
BE	Belgium	42.3	32.0
SI	Slovenia	41.3	14.3
PT	Portugal	41.1	21.2
FI	Finland	40.2	25.7
NO	Norway	39.5	25.3
SE	Sweden	37.7	29.5
FR	France	37.5	21.9
HU	Hungary	37.3	25.3
AT	Austria	36.8	27.0
DE	Germany	33.5	27.5
IT	Italy	32.6	20.1
EL	Greece	30.5	20.1

Source: WIFO calculations.

On average, New Zealand is the least regulated country in the sample, while Greece is the most heavily regulated. Countries of the European periphery observe a bit more strict economic regulation than those of the developed countries sample. Yet, the differences have become smaller over time and in 2008 they are not very pronounced any more.

Using a standardized index of the relative growth friendliness of a country's policy package as well as for the coherence/dispersion of the respective policy mix of spending, tax and regulation policies, in 2008 the most coherent policy mix can be found in Latvia, Slovenia and Spain. The USA, Iceland, and Japan observe the least coherent policy package, as measured by the standard deviation of our set of 13 policy indicators. Average growth friendliness of public policy and the level of policy dispersion are not strongly related.

Future work will have to take a closer look at the economic and political determinants of these substantial differences in size and composition of government spending, structure and volume of taxation and the regulatory regimes. Are productive and growth-friendly spending, tax and regulation structures driven by demographic change or by income development? Empirical analyses suggest that population aging is linked to higher social expenditures (e.g., Sanz and Velazquez, 2007), but what about the economic determinants of productive spending (e.g., Shelton, 2007; Pitlik, 2009)?

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