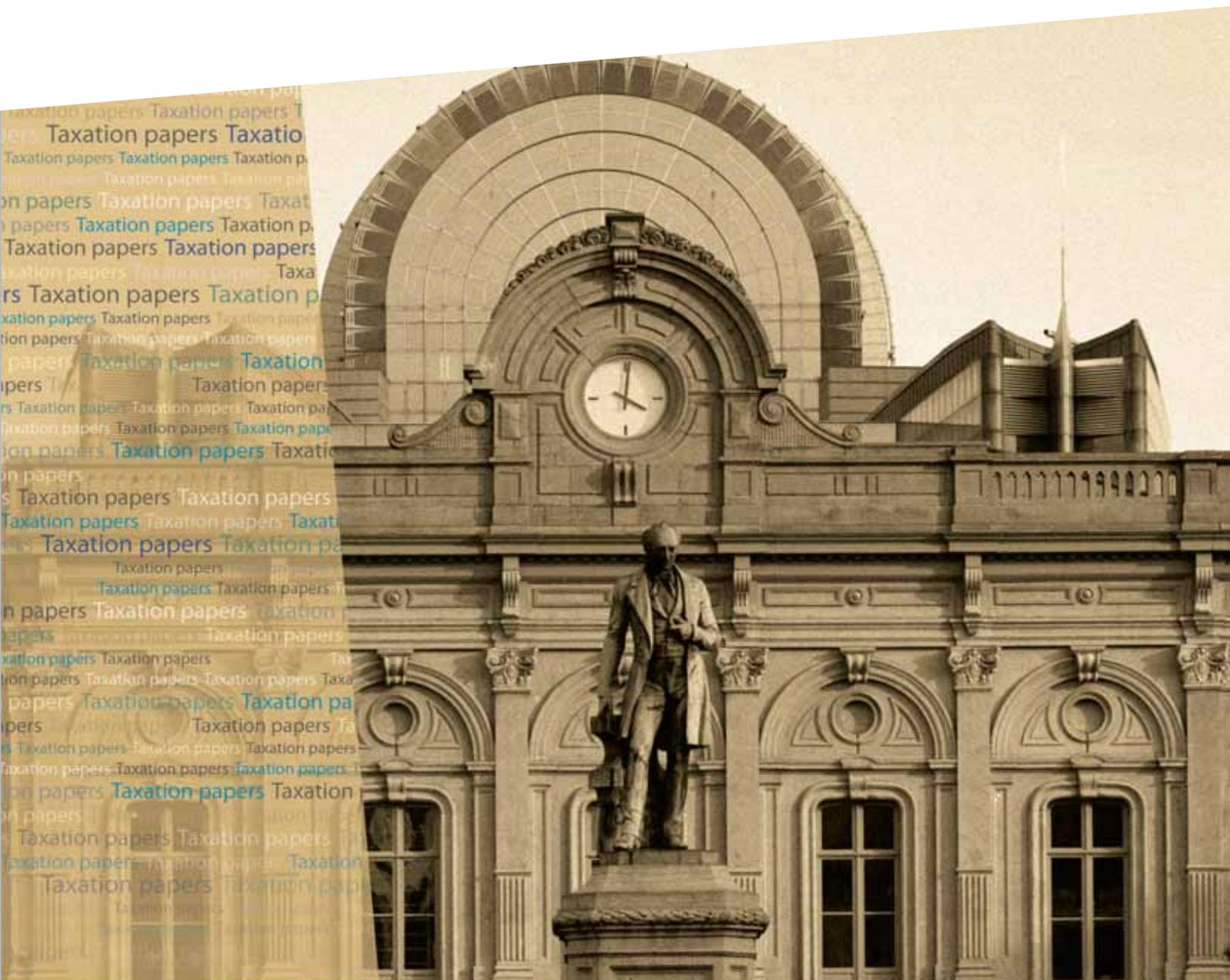




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The corporate income tax rate-revenue paradox: Evidence in the EU



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The corporate income tax rate-revenue paradox: Evidence in the EU

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Abstract:

In Europe, the decline in the corporate tax rates has not been reflected in the tax-to-GDP ratios. This paper explores to what extent the observed trend can be explained by changes in the effective tax burden on corporate income, in the share of total income accruing to the corporate sector and in total business income relative to GDP. We present an overview of the findings from previous literature, apply the methodology developed by Sørensen to decompose the most complete data available on the European level and make use of information collected from parallel studies on the effective tax burden and corporatization. The results suggest that corporatization is the driving factor for the trend observed in corporate tax revenues.

Key words: corporate taxation, tax revenues, incorporation, corporatization.

JEL classifications: H25

* Contact author: werner.vanborren@ec.europa.eu. The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors. They should not be attributed to the European Commission or the Polish Ministry of Finance. The authors thank Christopher Heady, Stefanie Knoth, Gaëtan Nicodème, Emanuela Tassa, Christian Valenduc and Florian Wöhlbier for useful comments and Jean-Pierre De Laet for his support of the project.

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1 Introduction

Between 1982 and 2004, the fall of corporate statutory rates observed in the majority of OECD countries did not give rise to a decrease of corporate income tax revenues relative to GDP¹. A similar trend can be observed in the European Union where, according to European Commission's² data for 1995-2005, the decrease in statutory rates has not been replicated in the changes of revenues from corporate income tax. Notably, in the EU-25, the average top statutory tax rate on corporate income dropped from 35.3% in 1995 to 25.3% in 2006. At the same time, the role of corporate income tax revenue grew considerably, the share of taxes on corporate income to GDP rising from 2.7% in 1995 to 3.3% in 2006. From the policy makers' perspective, it is important to understand the drivers behind the corporate income tax revenues and how they can influence the choice of the corporate tax rate, the definition of the corporate tax base, and the tax treatment of the parts of corporate income. It is generally acknowledged that while the list of factors that could potentially explain the corporate income rate-revenue paradox is long, the relative importance of all these factors is not known yet and should be further studied. In particular, data limitations and lack of specific analyses of the developments in the EU were pointed out as being partially the cause of the confusion.

This paper attempts to fill the information gap by providing an overview of the findings in economic literature as well as a more detailed picture of the recent

¹ Sørensen, P.B. (2006), *"Can capital income taxes survive? And should they?"*, CESifo Economic Studies, 53.2: 172-228.

² European Commission (2006), *"Taxation trends in the European Union"*.

developments in corporate taxation based on the data collected by the European Commission in the framework of the annual 'Taxation Trends in the European Union' publication. We base our analysis on the formula of decomposition of tax revenues to GDP proposed by Sørensen (2006). A new and innovative feature is the use of information on the decomposition of business income. The paper starts with an overview of the findings in previous literature. Then the methodology used for the analysis is set out (section 3). Finally, the developments at the EU level (section 4) and the country level (section 5) are described.

2 *Previous literature*

There exists a substantial body of literature on trends in corporate income tax revenues worldwide and a growing number of studies try to put forward explanations for the rate-revenue paradox in corporate taxation. While some of the literature focuses on providing an overview of the trends (Bond et al. (2000); Griffith and Klemm (2004)), a number of studies consider specific sources of variation of corporate tax revenues.

2.1. Systemic characteristics of the corporate tax system

A first factor considered in the literature relates to traits of the corporate tax system. Auerbach (2006b) points out a relatively stable ratio of US federal tax revenues from non-financial corporations to GDP. This probably masks a declining ratio of corporate profits of these corporations relative to GDP and an increasing average tax rate on these profits. He claims that the average corporate tax rate rose steadily between 1996 and 2003 in large part because of the importance of tax losses, reflecting the asymmetric treatment of gains and losses under the corporate income tax and caused by

a growing dispersion in profit outcomes among firms (i.e. many firms have losses even when the overall rate of profit is not low).

Creedy and Gemmell (2007) consider to what extent the observed volatility in the buoyancy of the corporate tax revenues in the UK in 1992-2004 could be determined by the fiscal drag properties of the tax system. Fiscal drag characterises progressive income taxes where, as the average income rises, the fixed or income-related allowances, and rising marginal tax rates result in a growing share of total income paid in income tax. In the analysed case, fiscal drag is describing the pattern of growth of corporate tax revenues relative to profits in an unchanged tax regime. Creedy and Gemmell show that deductions play an important role in determining the rate of growth of corporate tax revenues relative to profits. Moreover, in the case of small companies, tax rates and thresholds applied to net profits are shown to have an important impact on these companies' revenue elasticity of tax. They point out that since both corporate tax buoyancy and corporate tax revenue elasticity are volatile, the volatility of tax revenues could be inherent to the tax system itself. They also suggest that while in the long term, covering one or more full economic cycles, corporate income tax revenues and profits can be expected to grow at a roughly similar rate, provided that no discretionary changes take place, the short term corporation tax revenues trend can vary significantly depending on the economic situation. They conclude that in consequence, forecasting corporate tax revenues is especially difficult in severe economic downturns, when corporate losses are pronounced and temporary increases and decreases in the revenue elasticity can occur.

2.2. Corporatization and income shifting

An increase in the economic weight of the corporate sector is put forward by some studies as a second explanatory factor. Clausing (2006) conducts a systematic study of the role of several factors explaining the variation of the size of corporate income tax revenues relative to GDP among OECD countries in 1979-2002. The analysed factors include statutory tax rate, tax base, corporate profitability, the share of corporate sector in GDP, incentives to shift between the individual and corporate income tax bases, and international factors. Importantly, the analysis covers both countries that experienced an increase as well as those that witnessed a decline of the tax-to-GDP ratio. Clausing finds that the tax-to-GDP ratio is greater in countries with greater share of corporate sector in the economy and in countries with higher corporate profit rate, the latter effect being stronger. She also finds small but statistically significant effect of shifting income from the one earned under corporate form to the one earned under non-corporate form when the highest personal income tax rate is lower than the corporate income tax rate.

Sørensen (2006) argues that the rate-revenue paradox may be explained by increasing corporatization on one hand, itself caused by subsequent decline of certain sectors in which non-corporate organizational form dominates, and income shifting between personal and corporate income, and base broadening on the other hand. De Mooij and Nicodème (2007) argue that the simultaneous decline in corporate tax rates and rising tax-to-GDP ratios in Europe may to a large extent be explained by growing corporatization and income shifting from personal to corporate income tax. According

to their findings, since the early 1990s income shifting could have raised the share of corporate tax revenue in GDP by some 0.25 percentage points.

2.3. Corporate profitability and capital income

A third driver for the corporate income tax rate-revenue paradox referred to in the literature is the corporate profit level. Auerbach and Poterba (1987) and Douglas (1990) analyse the impact of tax and profit rates on the decline of the corporate income tax revenues in the U.S. (1959-1985) and Canada (1960-1985), respectively. The two studies indicate that the decline of the corporate income tax revenues is mainly due to the declining corporate profitability, without further addressing the reasons for the latter. Analysing the opposite trend, i.e. the increase of UK corporate tax revenues in 1980-2004 despite the reductions in corporate statutory tax rates, Devereux et al. (2004) point out that even during the recession in the early nineties and despite further falls of corporate tax revenue, the latter remained at higher levels than in the early eighties, when the statutory tax rates were considerably higher. Devereux et al. suggest that the main underlying causes for the increase of UK corporate tax revenues, are the widening of the corporate income tax base³, structural changes in the UK economy resulting in greater participation of the financial sector, and the increasing profitability of the latter around the year 2000⁴. However, they suggest that the primary reason for the strength of corporate tax revenues could be the rise of corporate profits in GDP.

³ The role of base-broadening tax reforms as an explanation for rising revenues in a sample of 16 OECD countries in 1982-2001 is also analysed by Devereux et al. (2002).

⁴ Direct evidence on profitability of the non-financial sector provided by Devereux et al. does not confirm that profitability could have an impact on the increasing corporate tax revenues.

Swiston et al. (2007) consider the role of personal and corporate income tax, capital gains and income distribution as factors explaining the vast majority of variations of tax revenue. They find that the 2004-2006 increase of the tax-to-GDP-ratio in the US is mainly due to growth of corporate profits and capital gains. These two determinants of tax revenue each contribute to a 40 percent increase in the tax-to-GDP-ratio. Swiston et al.'s analysis of time series adjusted for tax policy changes suggests that corporate income tax is the most volatile revenue component. They conclude that because of capital income volatility over the analysed business cycle, the observed surge in tax revenue buoyancy is a temporary phenomenon.

3 Methodology

To further consider trends in the corporate income tax revenues, we use the approach proposed by Sørensen (2006). The approach is based on a formula that decomposes the ratio of corporate income tax revenues to GDP and allows to analyse whether the trends in corporate income taxation are caused by a change in the effective tax burden on corporate income, a change in the share of total income accruing to the corporate sector or a change in total business income relative to GDP. According to the formula:

$$R/GDP = R/C * C/P * P/GDP$$

Where R is the total corporate tax revenue; C is the total corporate income; P is the total business income; R/C is the tax revenue relative to corporate income; C/P is the ratio of corporate income to business income; and P/GDP is the business income share of total GDP.

The values for both corporate income tax revenues and GDP are extracted from Eurostat databases. The values for C and P are directly extracted from the data on the implicit tax rates⁵ on corporate income and on capital and business income respectively. The denominator of the implicit tax rate on corporate income is used as a proxy measure of corporate income (C). From the denominator of the implicit tax rate on capital and business income, the data relative to income of corporations and active income of households is subtracted and used as a proxy measure of business income (P).

The main advantage of applying the implicit tax rate denominators is threefold: First, the formula allows using the same data to compare changes in all three indicators that may influence the rate-revenue paradox, i.e. the rate of incorporation, the share of total business income in GDP, and the tax revenue relative to corporate income. Second, using the implicit tax rate denominators allows decomposing corporate and business income. This in turn allows for the analysis of changes in the components of these two types of income, a methodology that has not been applied in previous studies. Third, the methodology used for the construction of implicit tax rates has been agreed with the Member States and implemented in a consistent way. One of the main advantages of the backward-looking implicit tax rate indicator is its comparability arising from the consistency and harmonised computation of ESA95 national accounts data.⁶

The use of our approach has several methodological limitations. The implicit tax rate indicator measures the average effective tax burden on an approximation of the

⁵ As calculated in European Commission (2006), *"Taxation trends in the European Union"*.

⁶ A comprehensive overview of ITR methodology has been presented in European Commission (2006); A comprehensive overview of ITR and other tax indicators is given in: OECD (2000) and European Commission (2004). Information on the data used in the analysis can be found Annex I.

potentially taxable base in the economy. This potential tax base is comparable across countries but does not measure the actual tax base defined in tax legislation. Consequently, the divergence between the denominator and the legislative tax base may cause additional variations. The Sørensen formula, and in particular the C/P ratio, does not allow to find out how much of the increasing role of the corporate sector is due to a change in structure and size and how much is related to a change in relative corporate profitability. That could be achieved by further decomposition of the C/P ratio. Finally, even after taking away passive income, i.e. not taking into account the entire denominator of ITR of capital and business income, P still does not allow for a full split of the income between individuals and corporations. In particular, unavailability of data that splits income for households and income of self-employed is the main drawback of working with data at the current level of data aggregation.

Several earlier studies had been based on a methodological approach similar to the one used in our analysis (Weichenrieder (2005), Sørensen (2006), De Mooij and Nicodème (2007) and used different data sources. For instance, Sørensen used OECD National Accounts data and De Mooij and Nicodème (2007) based their findings on data extracted from the Ameco database⁷. The data used in our study are taken from Eurostat and are based on the harmonised computation of ESA95 national accounts. The analysis also draws on the preliminary results obtained from the 'Study on effective tax

⁷ Sørensen applied the decomposition formula to 7 countries. Additionally, he analysed the net change of the corporate tax revenues relative to GDP in 1982 and in 2004 in 14 countries.

rates in an enlarged European Union'⁸ and the 'Questionnaire on corporatization'⁹. Recent changes in the ESA95 methodology (and mainly the inclusion of Financial intermediate services indirectly measured (FISIM) in the GDP) have resulted in important revisions of the relevant time series. However, some countries have not yet finished correcting the data. In comparison to previous studies, our analysis covers a shorter time span (1995-2004)¹⁰ but a larger group of countries (16 EU Member States)¹¹.

4 Developments at the EU level

At the EU level, corporate tax revenues remained relatively stable around the level of 3% relative to GDP over the period 1995-2004. On average, the effective tax burden¹² on corporate income in the EU has been gradually reduced from 32% in 1998 to 26% in 2004 and the corporate tax burdens across the EU seem to converge since the beginning of the century. The evolution is explained by a reduction in the statutory rates, which is only partly compensated by a broadening of the corporate tax base. The evolution of the corporate tax revenues relative to corporate income contrasts with the overall trend observed in national tax laws in the respective EU countries. The ratio of

⁸ European Commission (2005), *"A study to compute and analyse effective levels of company taxation within an enlarged European Union using a model approach based on the Devereux-Griffith methodology"*.

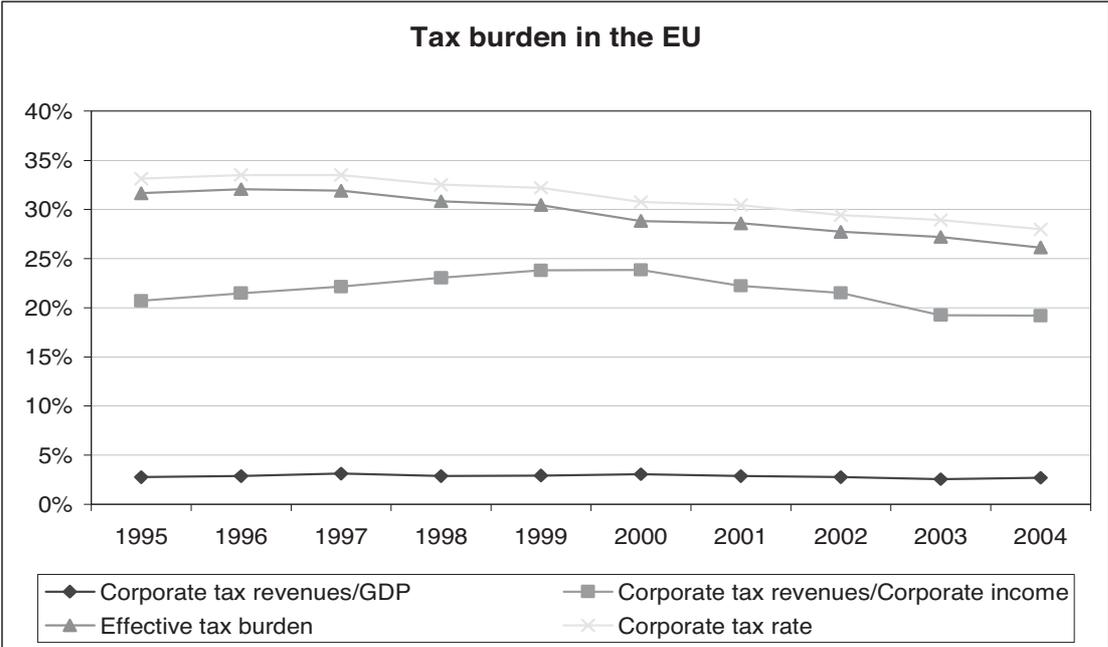
⁹ European Commission (2007), *"Questionnaire on corporatization"*.

¹⁰ As set out in Annex I, data limitations apply for Czech Republic, Estonia, Portugal, Slovakia and Sweden.

¹¹ Belgium - BE, the Czech Republic - CZ, Denmark -DK, Estonia - EE, Spain - ES, France - FR, Italy - IT, Lithuania - LT, the Netherlands - NL, Austria - AT, Poland - PL, Portugal - PT, Slovakia - SK, Finland- FI, Sweden - SE and the United Kingdom - UK.

¹² Information on the computation of the effective tax burden is presented in annex II.

corporate tax revenues to corporate income increased continuously from 21% to 24% between 1995 and 2001, in spite of a slight drop of the effective tax burden over the same period. After 2001 a similar trend to effective tax burden becomes noticeable, with roughly a similar 5 percentage point drop, to a level of 19% in 2004.

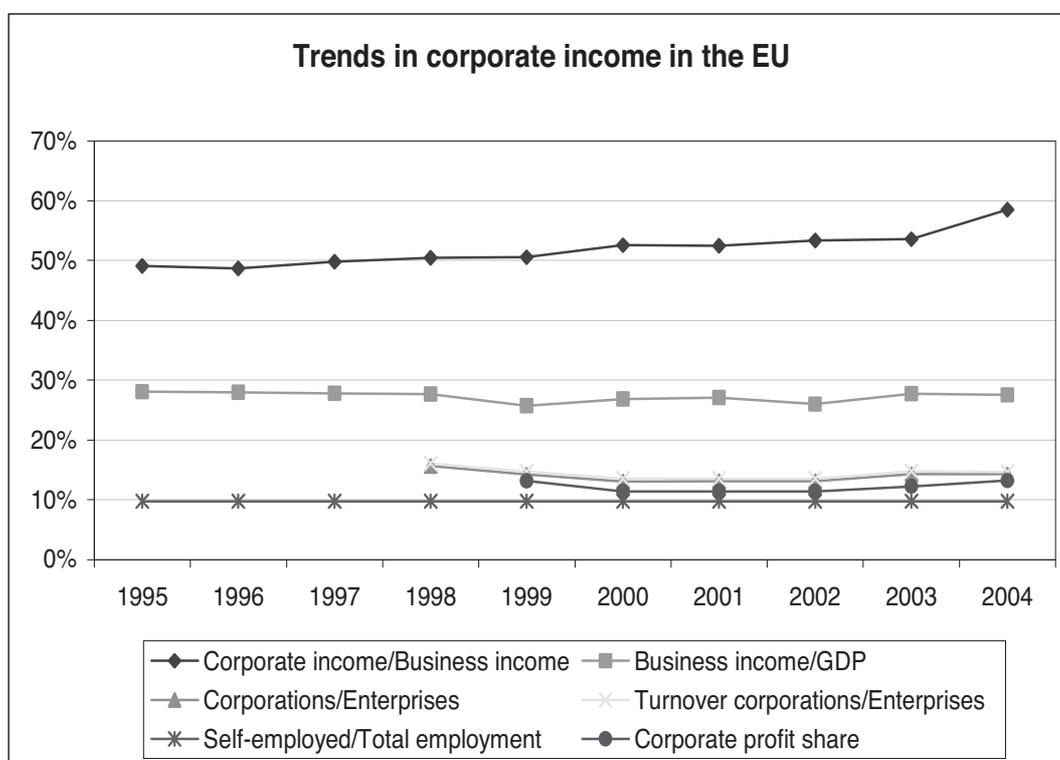


Source: European Commission

Corporate income relative to total business income increased steadily from 1995 to 2004. Overall, the rate of incorporation was 9 percentage points higher in 2004 than in 1995. The ratio of business income to GDP remained fairly stable over the period 1995-2004, in spite of a slight reduction between 1999 and 2002. Following a minor drop in the late 1990s, the rate of incorporation¹³ showed a slightly rising trend since

¹³ The rate of incorporation is defined by 2 indicators: (1) the number of corporations relative to the total number of enterprises and (2) the turnover of corporations relative to the turnover of all enterprises.

2000. The corporate profit share¹⁴ followed the same trend. The ratio of self-employed to total employed remained unchanged over the period 1995-2004.



Source: European Commission

Total business income relative to GDP remained relatively stable between 1995 and 2004, with a slight drop in 1999. After 1999, total business income relative to GDP rose steadily from 26% to 28%, the latter being the initial level between 1995 and 1998. The decomposition of the business income sheds light on the developments that took place at the EU level. While the corporate income held an increased share in business income, the growth rate of other components was lower than that of GDP¹⁵. Thus, the increase in business income relative to GDP is mainly due to an increase of corporate

¹⁴ The profit share of corporations is calculated as the ratio of gross operating surplus to gross value added of corporations.

¹⁵ The developments in net operating surplus and net mixed income of households have to be interpreted with caution as some Member States have not yet provided complete information on the separation between these items.

income, which was stronger than GDP. However, these figures hide important fluctuations at the country level, which are further analysed in the next section.

Table (1): Business income (P) and its components in 1995 and 2003 in selected EU countries¹

COMPONENTS OF P (ESA 95)		1995	2003	1995-2003
		SHARE in P (%)	SHARE in P (%)	CHANGE ² (%)
C	Corporate income	48,7	52,7	8,2
b2n (S.14-S.15) ³	Net operating surplus of households, self-employed and non-profit institutions	12,9	11,7	-9,3
b3n (S.14-S.15) ³	Net mixed income of self-employed	36,7	33,7	-8,2

¹ BE, CZ, DK, EE, ES, FR, IT, LT, NL, AT, PL, PT, SK, FI, SE, UK..

² Measured as share of the difference of last year and first year in the value for the first year.

³ Non-corporate business income = b2n (S.14-S.15) + b3n (S.14-S.15).

5 *Developments at the country level*

To shed light on the drivers behind the trend in corporate tax revenues relative to GDP at the country level, we look at the developments in each of the components of the Sørensen formula: the tax system (R/C), corporatization (C/P) and business income (P/GDP) for each country. Subsequently, we look at the overall picture in each of the countries to establish whether the change in corporate tax revenues relative to GDP can be attributed to one of these factors.¹⁶

Out of the sixteen countries contained in the data set, eleven countries experienced *increasing* corporate tax revenues relative to GDP (Austria, Belgium, the Czech Republic, Denmark, Finland, France, Italy, Poland, Portugal, Sweden and the UK). The remainder of the countries experienced *decreasing* corporate tax revenues relative to GDP (Estonia, Lithuania, the Netherlands, Spain and Slovakia).

¹⁶ More details on the trends at the country level described in this section can be found in annex III.

5.1. Corporate tax level (R/C)

The influence of the corporate tax system is evaluated by comparing the evolution of the ratio of corporate tax revenues to corporate income with the trend in the effective tax burden. The comparison provides an indication as whether there was a change in the tax rate or in the tax base over time.

Looking at these components, seven countries showed *increasing* corporate tax revenues relative to corporate income (Austria, Belgium, Denmark, France, Portugal, Spain and Sweden). Eight countries reported a *decrease* in corporate tax revenues relative to corporate income (the Czech Republic, Estonia, Italy, Lithuania, the Netherlands, Poland, Slovakia and the UK). Finland reported *stable* corporate tax revenues relative to corporate income.

For two countries the increase in corporate tax revenues relative to corporate income coincides with an increase in the effective corporate tax burden (Austria and France). In Spain, the increase in corporate tax revenues relative to corporate income coincides with an unchanged effective corporate tax burden. In Finland, constant corporate tax revenues relative to corporate income are accompanied by an increase in the effective tax burden. All eight countries reporting decreasing tax revenues relative to corporate income reported a fall in the effective tax rate (the Czech Republic, Estonia, Italy, Lithuania, the Netherlands, Poland, Slovakia and the UK).

For Austria, Poland and the UK, the evolution of the ratio of corporate tax revenues to corporate income is proportional with the trend observed for the effective tax burden. To some extent, this also applies to Finland: before the turn of the century corporate tax revenues relative to corporate income developed in line with the increase

in the effective tax burden and remained fairly stable in the later years as did the effective tax burden. Also Belgium, Denmark, Spain and Sweden experience an increase in corporate tax revenues to corporate income, although the effective tax burden decreased, except for Spain where it remained stable. France and Portugal are confronted with an increasing trend, although important reductions of the effective tax burden can be observed at the turn of the century. For Denmark, Sweden and Spain, the rise in the effective tax burden is significant, while in the case of Austria, Belgium and Finland the impact is rather small. The Czech Republic, Estonia, Lithuania, Poland, Slovakia, Italy and the UK experience important reductions in the level of corporate taxation. Also the Netherlands are confronted with an important reduction in the ratio corporate tax revenues to corporate income, although the effective tax burden did not change over the period observed.

For most countries, the direction of the changes in the effective tax burden corresponds to the direction of the changes in corporate tax revenues relative to corporate income. The same applies to the comparison of corporate tax revenues relative to corporate income with corporate tax revenues relative to GDP. However, for one third of the countries this reasoning does not apply. In addition, for the countries where this reasoning does apply, the size of the changes in corporate tax revenues relative to corporate income cannot explain the relatively moderate effect on the corporate tax revenues relative to GDP ratios.

Table (2): Corporate taxation in selected EU countries (1995-2004).

Country	BE	CZ	DK	EE	ES	FR	IT	LT
R/C	+	0	+	-	+	+	-	-
ETR ¹	-	-	-	-	0	+	-	-
Country	NL	AT	PL	PT	SK	FI	SE	UK
R/C	-	+	-	+	-	0	+	-
ETR	0	+	-	-	-	+	+	-

"+": increase "0": constant "-": decrease

¹ ETR : effective tax burden.

5.2. Corporatization (C/P)

The evolution of the ratio of corporate income to total business income is compared with other trends observed in corporatization, measured by corporate profit shares, the ratio of self-employed to total employment as well as the share of business activity performed under corporate form (incorporation), both in terms of number of corporations and their turnover¹⁷. The comparison provides some information on changes in the size of the corporate sector and corporate profitability over time.

Thirteen countries showed *increasing* corporate income relative to total business income (Austria, Belgium, the Czech Republic, Denmark, Estonia, Finland, France, Italy, Lithuania, the Netherlands, Poland, Sweden and the UK). For eight¹⁸ of these countries the increase in corporate income to total business income coincides with an increase in either the rate of incorporation (Austria, the Czech Republic, Denmark, Finland, France, and the Netherlands) or corporate profit share (Belgium and Poland).

¹⁷ The information on the rate of incorporation is taken from European Commission (2007), "Questionnaire on corporatization". Further details can be found in annex IV.

¹⁸ Note missing data on the rate of incorporation for Belgium, Spain, Poland, Portugal and the UK.

For three countries (Italy, Lithuania and Sweden) there is no clear trend in the rate of incorporation¹⁹ and for one country (Estonia), the rate of incorporation decreased.

Three countries reported a *decrease* in corporate income relative to total business income (Portugal, Slovakia and Spain). Two of these countries experience also a decrease in the rate of incorporation (Portugal, Spain), while one country reported an increase in the rate of incorporation (Slovakia).

The increase in corporate income relative to total business income was strong in Belgium, the Czech Republic, Denmark, Estonia, Finland, Italy, Lithuania, the Netherlands, Poland, Sweden and the UK. The decrease in corporate income relative to total business income was strong Slovakia. For Austria and Denmark, the evolution of the ratio corporate income to total business income is proportional with the development of the share of the corporate sector in terms of numbers and turnover. To a lesser extent, this also applies to Finland and Poland. For the Czech Republic, Denmark, France, Lithuania and Poland the rise in the share of the corporate sector is significant, while in the case of Austria, Belgium, Finland, Italy, the Netherlands, Slovakia and Sweden, this trend is rather weak. For Belgium, Denmark, Finland, France, Italy, Lithuania, Poland, Portugal, Slovakia and the UK the increasing corporatization is accompanied by a reduction in the ratio self-employed to total employment and for Belgium, Denmark, France, Lithuania and Slovakia by an increase in the corporate profit share. Lithuania experiences a significant increase in corporate profit share despite a reduction in the corporate share in terms of the number of corporations.

¹⁹ For Italy, the rate of incorporation increased in terms of number of corporations and decreased in terms of turnover of corporations, while for Lithuania and Sweden, it is the opposite.

Estonia reports a modest reduction in the rate of incorporation and in the ratio of self-employment to total employed as well as a constant profit share, in spite of a significant reduction in the corporate share in terms of the number of corporations. The Czech Republic and Portugal are confronted with a modest decline in corporate profit share²⁰. Spain reported a declining ratio of self-employment to total employed as well as a constant profit share, in spite of a modest reduction of corporate income relative to total business income. The results for Sweden indicate that corporate income relative to total business income and the ratio of self-employed to total employed increased, while the level of corporatization remained stable.

TABLE (3): Corporatization in selected EU countries (1995-2004).

Country	BE	CZ	DK	EE	ES	FR	IT	LT
C/P	+	+	+	+	-	+	+	+
Corporations/Enterprises		+	+	-		+	+	-
Turnover Corporations/Enterprises		+	+	-		+	-	+
Corporate Profit share	+	-	0	0	0	0	0	+
Self-employed/Total employment	-	-	-	+	-		-	-
Country	NL	AT	PL	PT	SK	FI	SE	UK
C/P	+	+	+	-	-	+	+	+
Corporations/Enterprises	+	+			+	+	-	
Turnover Corporations/Enterprises	+	+			+	+	+	
Corporate Profit share	0	+	+	0	+	0		
Self-employed/Total employment	0	0	0	+	+	-	0	-

"+": increase "0": constant "-": decrease

Another way to look at corporatization is by analysing the evolution of the share of corporate income in total business income. In Austria, Belgium, the Czech Republic, Denmark, Estonia, Finland, Italy, Lithuania, the Netherlands and the UK, corporate

²⁰ Calculated as the ratio of gross operating surplus to gross value added of corporations.

income accounts for the bulk of the business income²¹. The growth of the corporate share in total business income was accompanied by a relative decline of the share of the non-corporate sector. In Austria, the Czech Republic, Estonia; Italy and Lithuania, the corporate share overtook the non-corporate share over the period observed. The Czech Republic, Estonia, the Netherlands and the UK experienced also an increase in business income from households and Italy reported an increase in mixed income. In France, Poland, Portugal, Spain, Slovakia and Sweden the share of non-corporate income accounts for the bulk of the business income. The growth of the share of non-corporate income in total business income was accompanied by a relative decline of the share of the corporate sector in Portugal, Spain, Slovakia and Sweden. In Slovakia and Sweden, the non-corporate share overtook the corporate share over the period observed. In France and Poland, the growth of the corporate share in total business income was accompanied by a relative decline of the share of the non-corporate sector.

In Austria, Belgium, the Czech Republic, Denmark, Estonia, Finland, Lithuania, the Netherlands, Poland and the UK, corporate income grew at a higher rate than GDP. The growth of corporate income was accompanied by a growth of non-corporate income at a rate slower than GDP in Belgium, Denmark, Lithuania and the Netherlands. In Austria, both corporate and non-corporate income grew faster than GDP, but growth in corporate income was stronger. The Czech Republic and the UK also reported an increase of income from households, which was stronger than GDP growth. In the case of Italy, Portugal Slovakia, Spain and Sweden, corporate income grew at a slower pace

²¹ In 1995, corporate income in Italy and Sweden represented respectively 40% and over 60% of total business income.

than GDP, while non-corporate income grew faster than GDP, except for Portugal. For France, corporate income grew at a faster rate than GDP. However, the growth of the income from households was somewhat higher than the growth of corporate income.

5.3. Evolution of total business income in the economy (P/GDP)

Six countries show increasing business income relative to GDP (Austria, the Czech Republic, Estonia, Finland, the Netherlands and Poland). Seven countries do report decreasing business income relative to GDP (Belgium, Italy, Lithuania, Portugal, Slovakia, Spain and Sweden). In three countries, business income relative to GDP remained fairly constant (Denmark, France and the UK).

Some interesting insights on the underlying trends can be derived from a comparison of the growth rates of total business income to GDP growth.²²

Of the countries experiencing an *increasing* share of total business income over the period observed, the Czech Republic and Poland report consistently higher growth rates than GDP since the turn of the century. Estonia, Finland, the Netherlands and Austria enjoy a particularly high growth rate in the first half of the period observed, while at the end of the period growth in total business income becomes weaker than GDP growth.. The Netherlands even record a negative growth rate for the last part of the period observed.

Of the countries experiencing a *decreasing* share of total business income over the period observed, Belgium, Italy, Portugal, Spain and Sweden report the growth rates of business income to be consistently lower than GDP. On the other hand, Lithuania and

²² Information on the growth rates of corporate tax revenues (R), corporate income (C), business income (P) and GDP at the country level can be found in annex V.

Slovakia display particularly high growth rates, exceeding GDP growth at the turn of the century. For the Netherlands and Sweden, negative growth rates are visible towards the end of the period. France and the UK moved from relatively high growth rates compared to GDP in the beginning of the period to negative growth rates at the end of the period, while Denmark recorded higher growth rates than GDP until the last part of the period observed. Overall the effects of the changes in the ratio of total business income relative to GDP are relatively modest, except for Estonia, Finland, Spain and Sweden

5.4. Overall assessment

Austria experiences a minor increase in all components: corporate tax revenues to corporate income, as well as the level of corporatization and total business income relative to GDP. In Slovakia, we observe a decrease in all components. The relative decrease in corporate tax revenues to corporate income and the level of corporatization are more important than the decrease in the share of total business income relative to GDP. Denmark and France experience an increase in corporate tax revenues relative to corporate income as well as in the level of corporatization, while total business income remains stable relative to GDP. In Denmark the increase in the level of corporatization is strong, compared to the situation in France. In France, after 1998, a slight increase of corporate income relative to business income and an increase in the rate of incorporation suggest a relative strengthening of the corporate sector.

In the Czech Republic, Estonia, the Netherlands and Poland, the level of corporatization and total business income as a share of GDP increases. In the Czech Republic, the Netherlands and Poland the impact of corporatization is more important than the developments in total business income, as opposed to Estonia, where both

effects are strong. All four countries experience a decline in corporate tax revenues relative to corporate income. In the Czech Republic this decline is less important than in the other countries. In Spain and Portugal, both the level of corporatization and total business income as a share of GDP decline. In Portugal, the decrease in the level of corporatization is strong, compared to the situation in Spain. In Spain, the decrease in the share of total business income relative to GDP is stronger than in Portugal. Both countries enjoy an increase in corporate tax revenues relative to corporate income. In Italy and Lithuania, a strong increase in the level of corporatization is accompanied by a reduction in both corporate tax revenues relative to corporate income and total business income as a share of GDP. In both countries the reduction in corporate tax revenues relative to corporate income is important. The decrease in the share of total business income in GDP is stronger for Italy than for Lithuania.

In Belgium and Sweden, both the level of corporatization and corporate tax revenues relative to corporate income increase, while the share of total business income relative to GDP decreases. In Sweden, the decline in the share of total business income relative to GDP is more important than in Belgium. In Finland, the level of corporatization as well as the share of total business income relative to GDP increase, while corporate tax revenues remain stable relative to corporate income. In the UK, corporatization increases, while the share of total business income relative to GDP remained stable and corporate tax revenues relative to corporate income decreases.

Table (4): Country overview of the trends in relevant economic and tax indicators (1995-2004).

Country	R/C	C/P	P/GDP
BE	+	+	-
CZ	-	+	+
DK	+	+	0
EE	-	+	+
ES	+	-	-
FR	+	+	0
IT	-	+	-
LT	-	+	-
NL	-	+	+
AT	+	+	+
PL	-	+	+
PT	+	-	-
SK	-	-	-
FI	0	+	+
SE	+	+	-
UK	-	+	0

"+": increase "0": constant "-": decrease

6 Conclusions

Although the corporate tax revenues to GDP ratio remained relatively stable over the analysed period for most of the countries analysed, changes in the underlying drivers can be observed. Interestingly, there is no single pattern in the EU, which indicates that there still exists a large economic divergence across EU Member States.

The results of our analysis indicate that corporatization is the driving factor for the trends observed in corporate tax revenues. Without the effect of corporatization, the revenue effects relative to GDP cannot be explained by the trend in corporate tax revenues to corporate income. These results partially confirm the findings of Sørensen

(2006) and De Mooij and Nicodème (2007).²³ The presented data also indicate that an overall slight rise in corporate income relative to GDP was accompanied by a strong fall in non-corporate business income. The decline in corporate tax revenues relative to corporate income in several countries may indicate that the impact of tax base broadening measures, in countries where such measures were introduced, might have not fully compensated for the decrease in statutory tax rates. Corporatization is more pronounced than the trends in tax burden and business income relative to GDP.

This is a first study presenting the most complete data of this type available for a large number of EU countries. The main drawback of the analysis is that the data are still characterised by a high level of aggregation.

Our analysis does not allow to assess the relative importance of the causes of corporatization, such as the share of economic activity performed under the corporate form, profitability of firms, and income shifting. Further research and desagregation of the data are necessary to draw conclusions on the role of the incentives to shift taxes between individual and corporate income, the importance of the developments in the financial sector, the influence of international factors, and structural changes in the economy.

²³ A summary comparison of results obtained by Sørensen (2006), De Mooij and Nicodème (2006) and this study is presented in Annex VI.

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Annex I: Definitions

S.14	Households (individuals, group of individuals as consumers, entrepreneurs producing market goods and financial and non-financial services); includes, among others, S.141 + S.142 (employers and own account workers)
S.15	Non-profit institutions serving households
ITR on corporate income	Denominator: net operating surplus of corporations + interests (d41), rents on land (d45), dividends (d42), insurance property income attributed to policy holders (d44) of non-financial and financial corporations (all paid minus received) + dividends received by general government and rest of the world + dividends received by S.14-S.15
ITR on capital income	Denominator: denominator of ITR on corporate income + denominator of ITR on capital and business income of households, the latter denominator includes: + interests (d41), rents on land (d45), dividends (d42), insurance property income attributed to policy holders (d44) (all paid minus received) + dividends (d42) received by general government and rest of the world + dividends (d42) received by S.14-S.15 + rents of private households, net operating surplus of non-profit institutions, net mixed income of self-employed + interests (d41) and rents on land (d45) of households and non-profit organisations (all paid minus received) + insurance property income attributed to policy holders (d44) received by households and non-profit organisations
Operating surplus	the surplus (or deficit) on production activities before account has been taken of the interest, rents or charges paid or received for the use of assets.
Net operating surplus	operating surplus minus consumption of fixed capital
Mixed income	the remuneration for the work carried out by the owner (or by members of his family) of an unincorporated enterprise. This is referred to as 'mixed income' since it cannot be distinguished from the entrepreneurial profit of the owner.

Annex II: Effective tax burden

The methodology used for the calculation of the effective tax burden is set out by Devereux and Griffith (1999, 2003), and has also been used in an earlier study by the European Commission in 2001 (Company Tax Study)²⁴. The effective tax burden considered in the analysis is the 'effective average tax rate' (EATR), which identifies the effect of taxation on discrete location choices. Corporation taxes are the only taxes taken into account.

The effective tax rate (ETR) is a forward-looking indicator defined as the proportionate difference of the net present value of a profitable investment project in the absence of tax and the net present value of the same investment in the presence of tax. The impact of taxation depends on a number of features of the tax system, including the statutory tax rate, capital allowances, wealth taxes paid by the company, as well as possibly the treatment at the corporate level of dividends paid by the company. The ETR considers corporate taxation on domestic investments only.

It is important to note that the effective tax rate (ETR) approximates the tax base by considering the capital allowances for investment in a number of typical assets. The measure does not aim to take into account all aspects of the tax base. In particular, the treatment of losses is not captured in the calculations.

The measure presented here should also be distinguished from backward-looking approaches, as derived from published data on tax payments, either from company

²⁴ The Institute for Fiscal Studies, Working Paper Series No. W98/16 (1998), 'The taxation of discrete investment choices' (Michael P. Devereux/Rachel Griffith)

accounting records or from tax receipts. The latter offer the advantage that they are based on real-life data, but are subject to a number of limitations when analysing investment decisions: time lags in information and a lack of framework to distinguish between economic effects and tax effects, and the absence of a time perspective.

Effective tax rates are available for all countries considered over the period 1995-2004.

Effective corporate tax burden on investment (1995-2004)

ETR (%)	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
BE	35	35	35	35	35	35	35	35	30	30
CZ	33	32	32	26	25	24	24	24	24	25
DK	30	30	30	30	28	28	27	27	27	27
EE	22	22	22	22	22	20	20	20	20	20
ES	37	37	37	37	37	37	37	37	37	37
FR	33	36	36	40	38	37	36	35	35	35
IT	48	48	48	37	37	36	36	34	33	32
LT	23	23	23	23	23	19	19	13	13	13
NL	32	32	32	32	32	32	32	32	32	32
AT	29	30	30	30	30	30	31	31	31	31
PL	36	36	34	32	31	27	25	25	24	17
PT	35	35	35	34	34	32	32	30	29	25
SK	37	37	37	37	37	26	26	22	22	17
FI	23	26	26	26	26	27	27	27	27	27
SE	24	24	24	24	24	24	23	23	23	23
UK	31	31	31	30	29	29	29	29	29	29
Average ¹	32	32	32	31	30	29	29	28	27	26

Source: European Commission (2005), 'A study to compute and analyse effective levels of company taxation within an enlarged European Union using a model approach based on the Devereux-Griffith methodology'

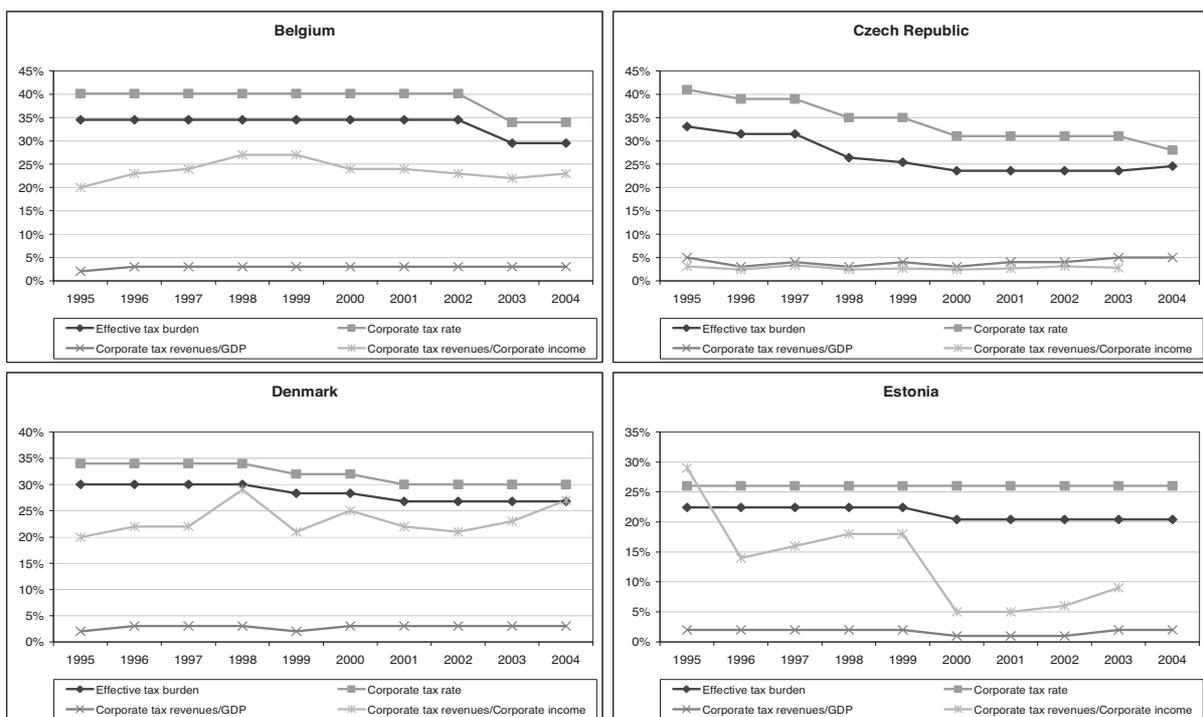
1. Only countries in the table.

Annex III: The Sørensen approach

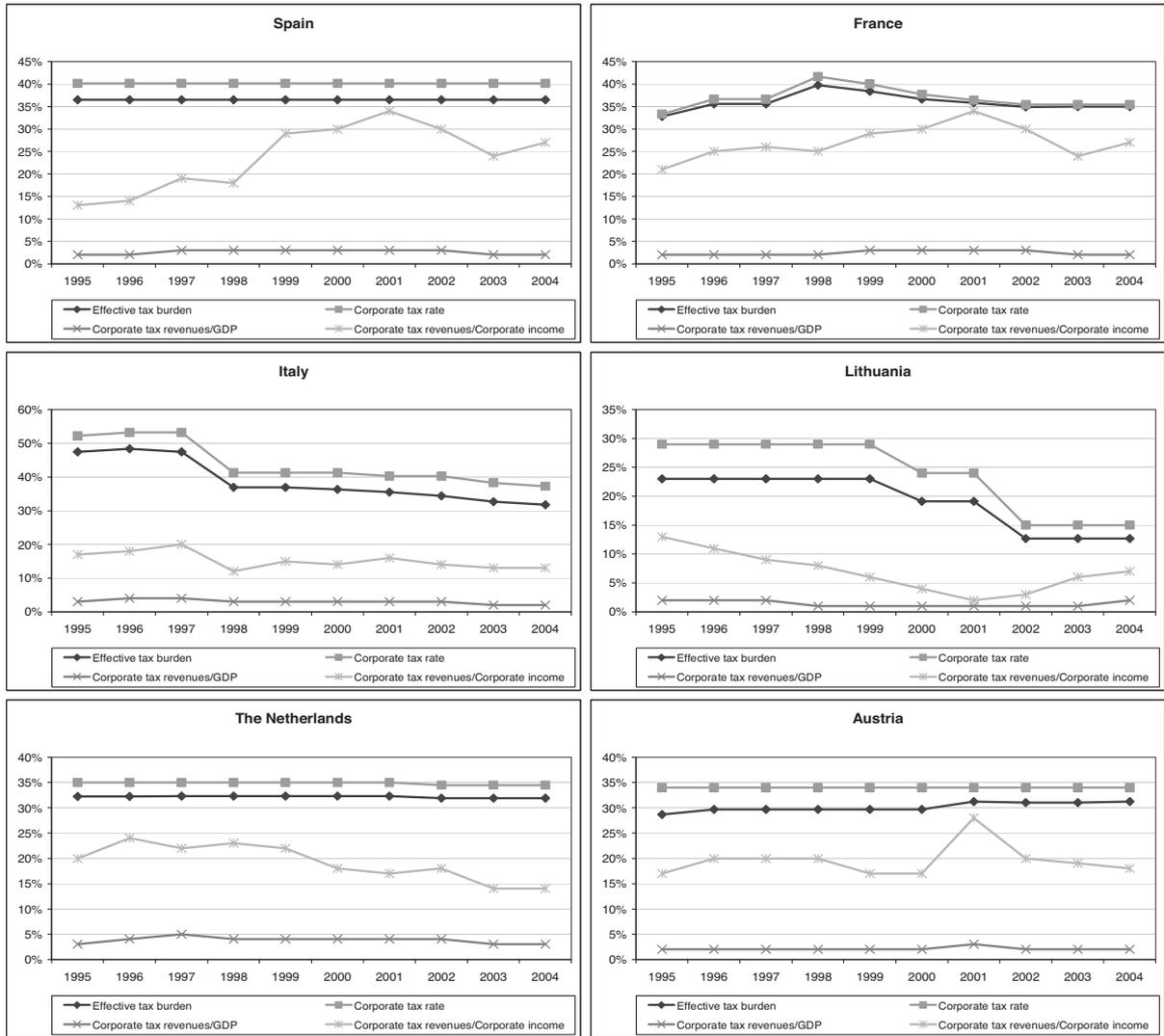
The ratios R/GDP, R/C, C/P and P/GDP were computed for 16 countries contributing to around 70% of EU-25 GDP (68% in 1995 and 73% in 2003). For R, the data cover the time span 1995-2004 except for Portugal and Slovakia where the last available year is 2003. For C and P, the data cover the time span 1995-2004 except for the Czech Republic, Estonia, Portugal and Slovakia where the last available year is 2003, and for Sweden where the last available year is 2002.

The corporate profit shares were calculated for 14 countries. For Belgium, the Czech Republic, Denmark, France, Italy, Lithuania, the Netherlands, Austria, Poland, Slovakia and Finland, the data cover the time span 1999-2004. For Spain, the data cover the time span 2000-2004, for Portugal 2000-2003 and for Estonia 2000-2002. For Sweden and the UK, the data were not available.

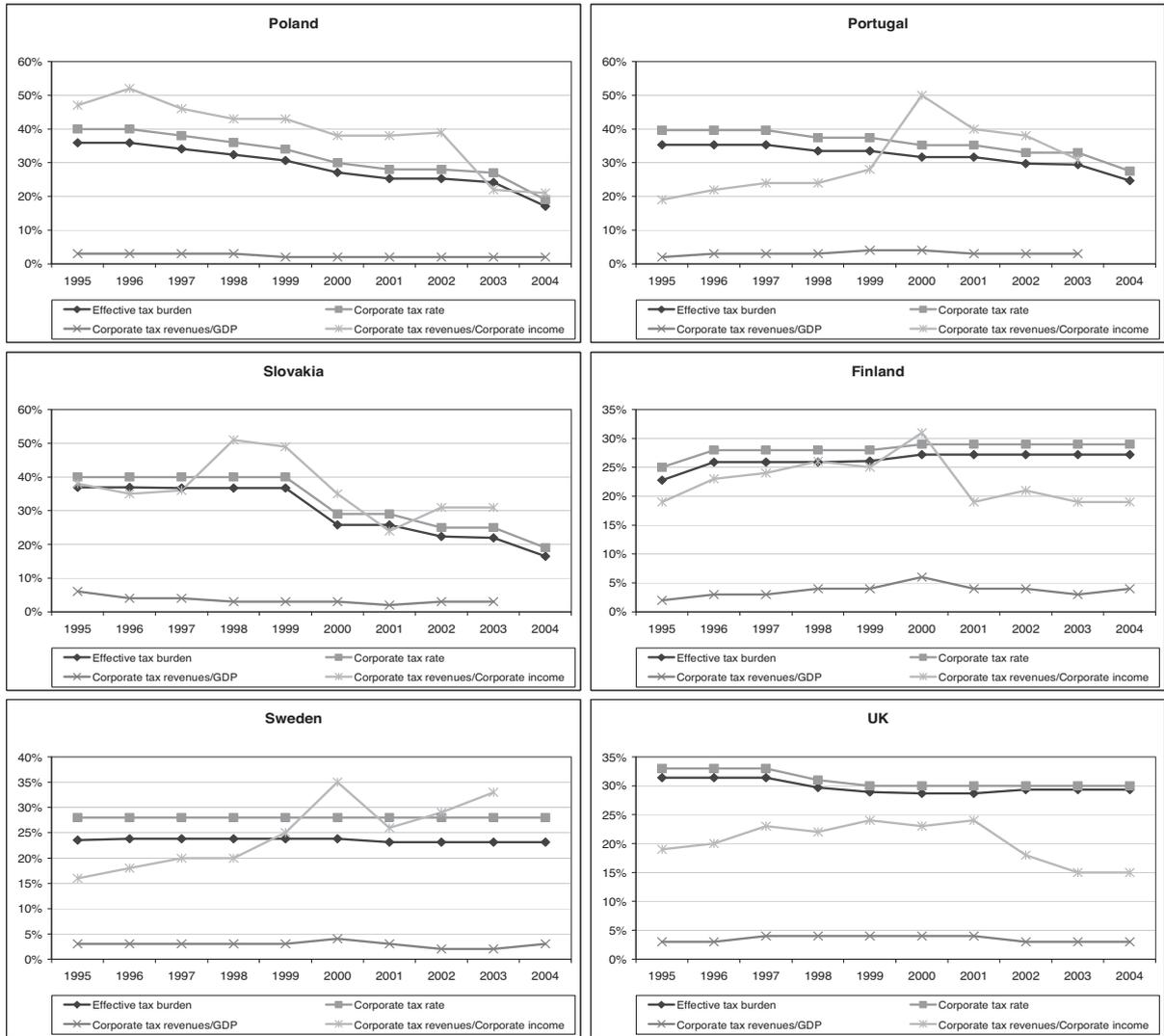
Corporate tax levels (1995-2004)



Source: European Commission (2006), 'Taxation trends in the European Union'

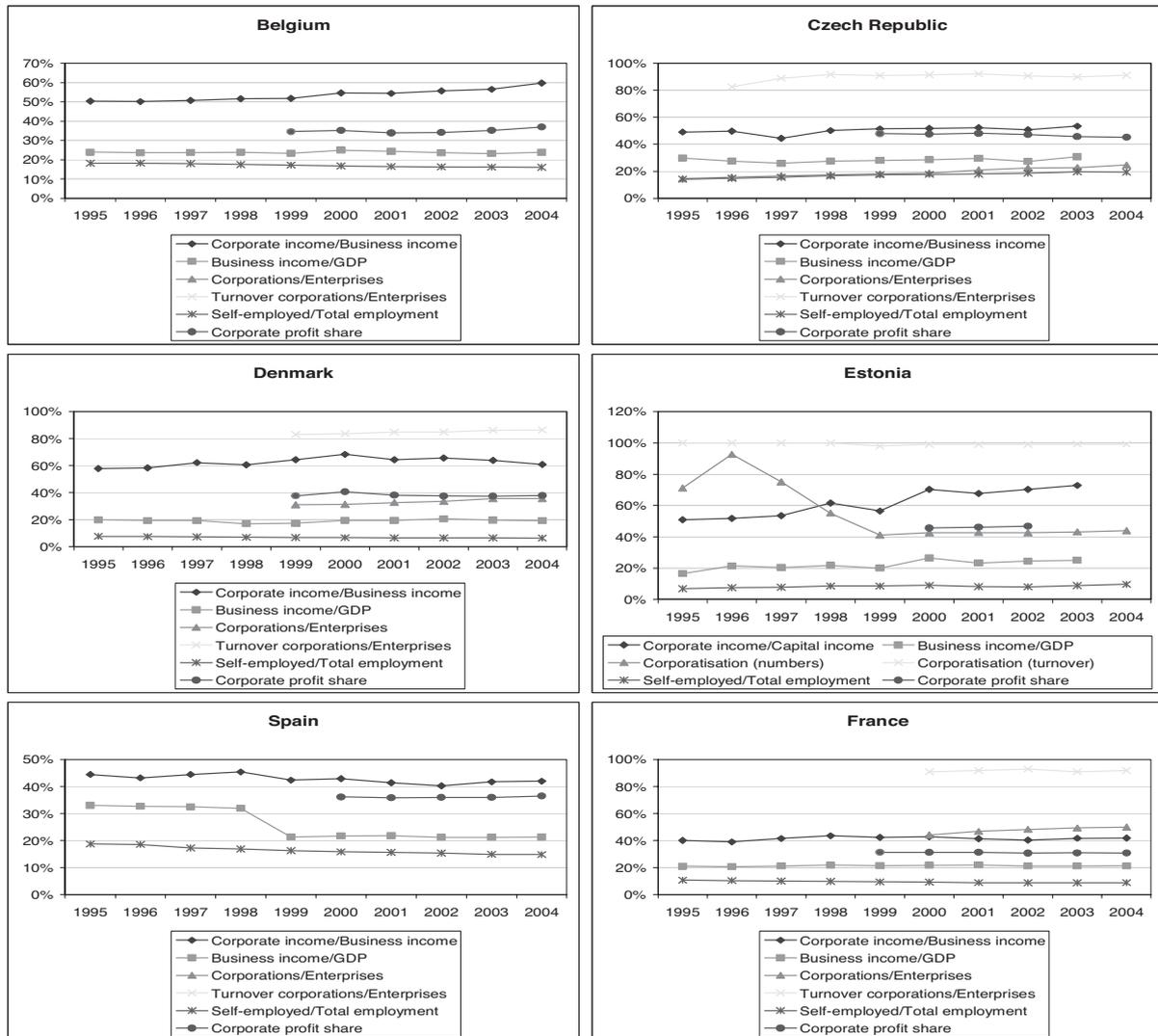


Source: European Commission (2006), 'Taxation trends in the European Union'

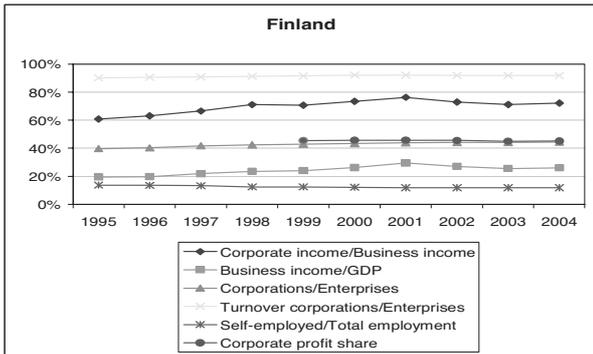
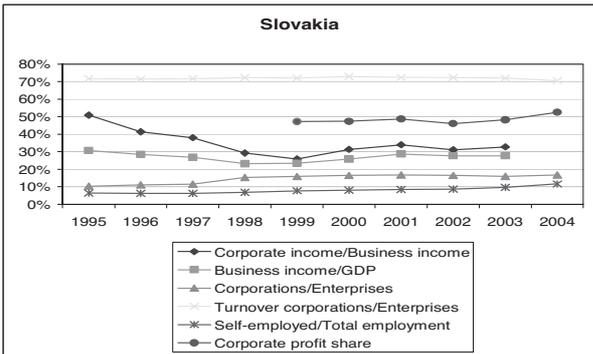
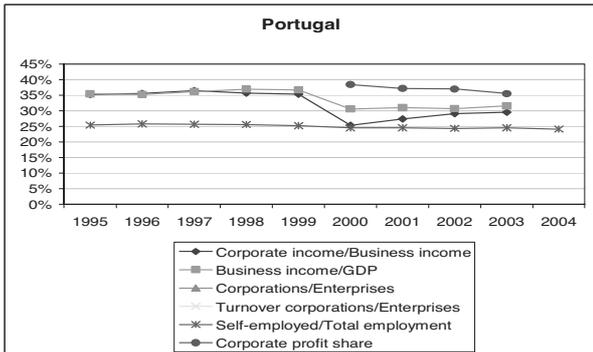
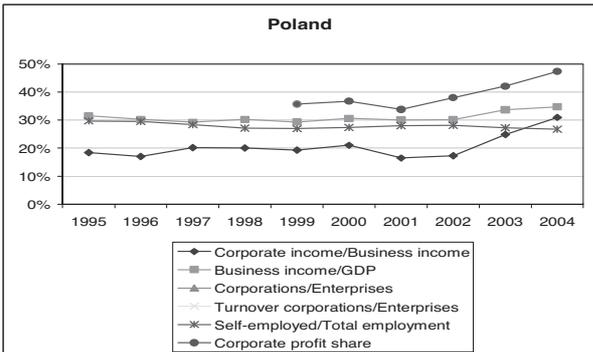
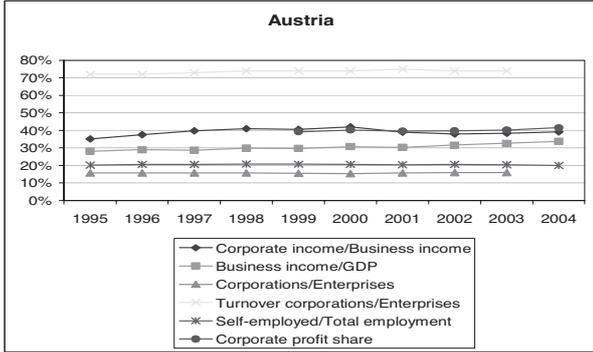
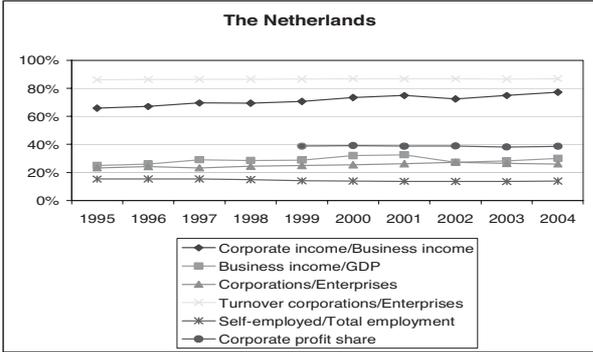
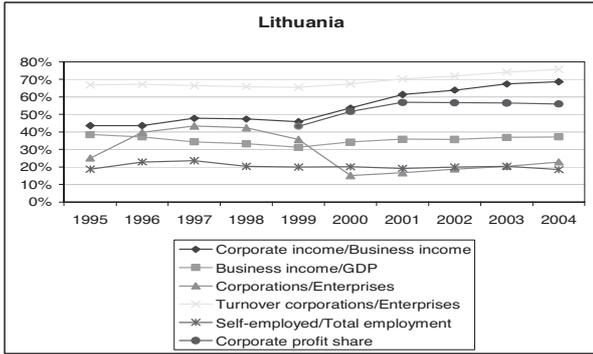
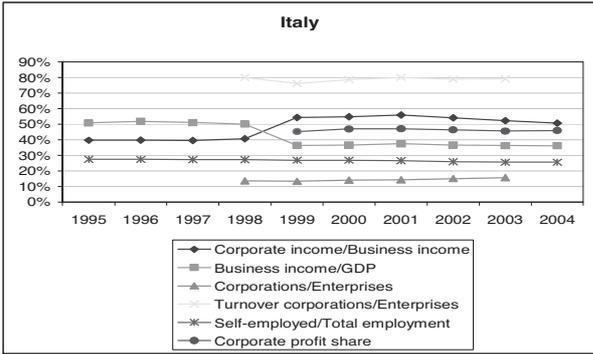


Source: European Commission (2006), 'Taxation trends in the European Union'

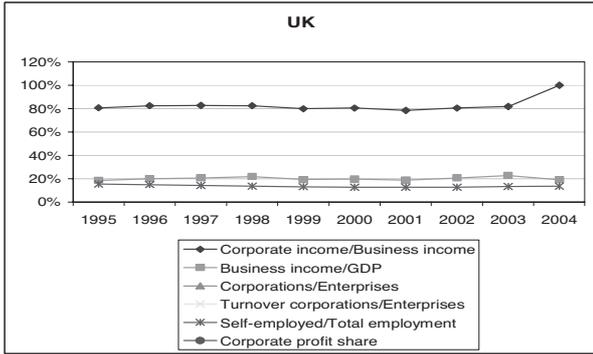
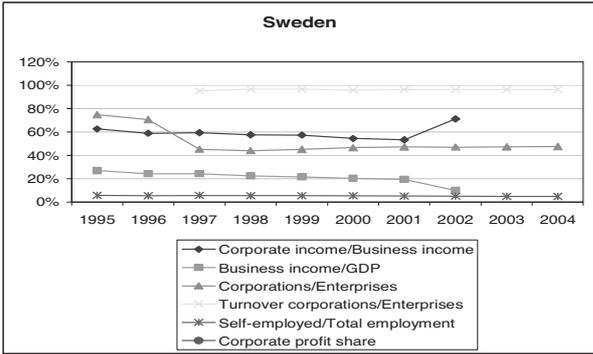
Trends in corporate income (C) and in business income (P) (1995-2004)



Source: European Commission (2006), 'Taxation trends in the European Union'

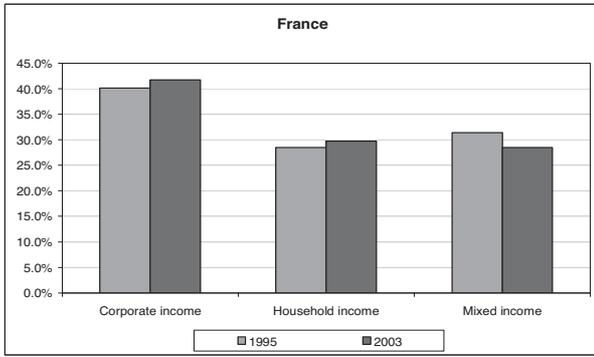
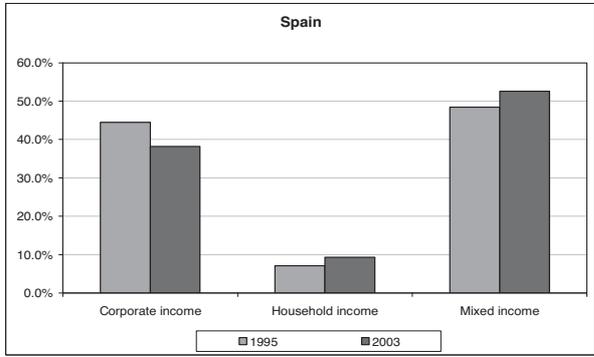
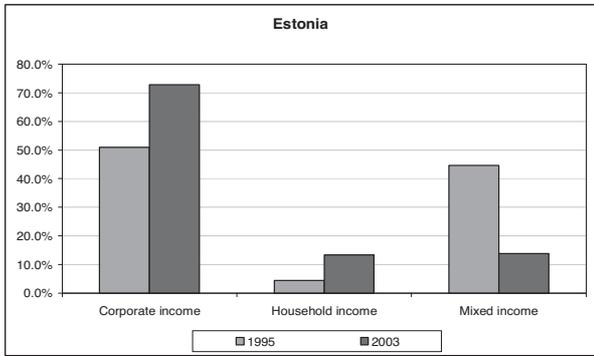
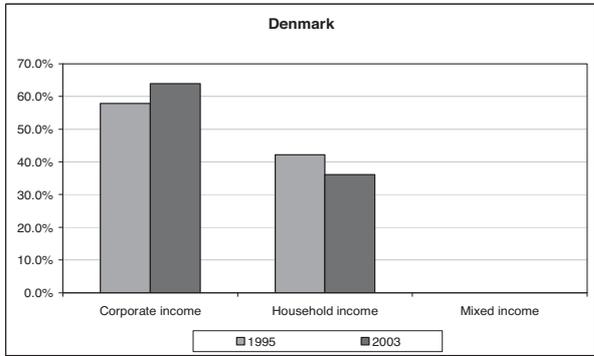
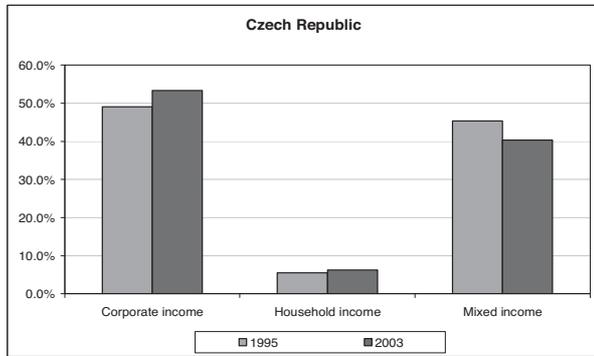
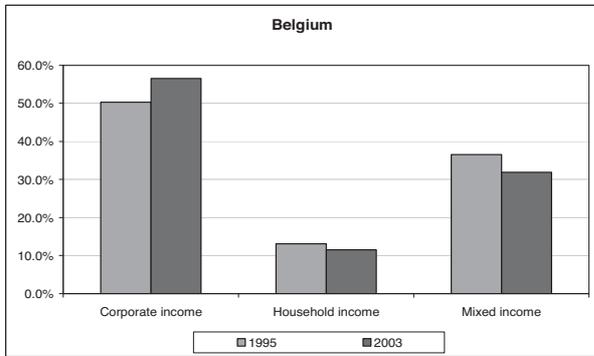


Source: European Commission (2006), 'Taxation trends in the European Union'

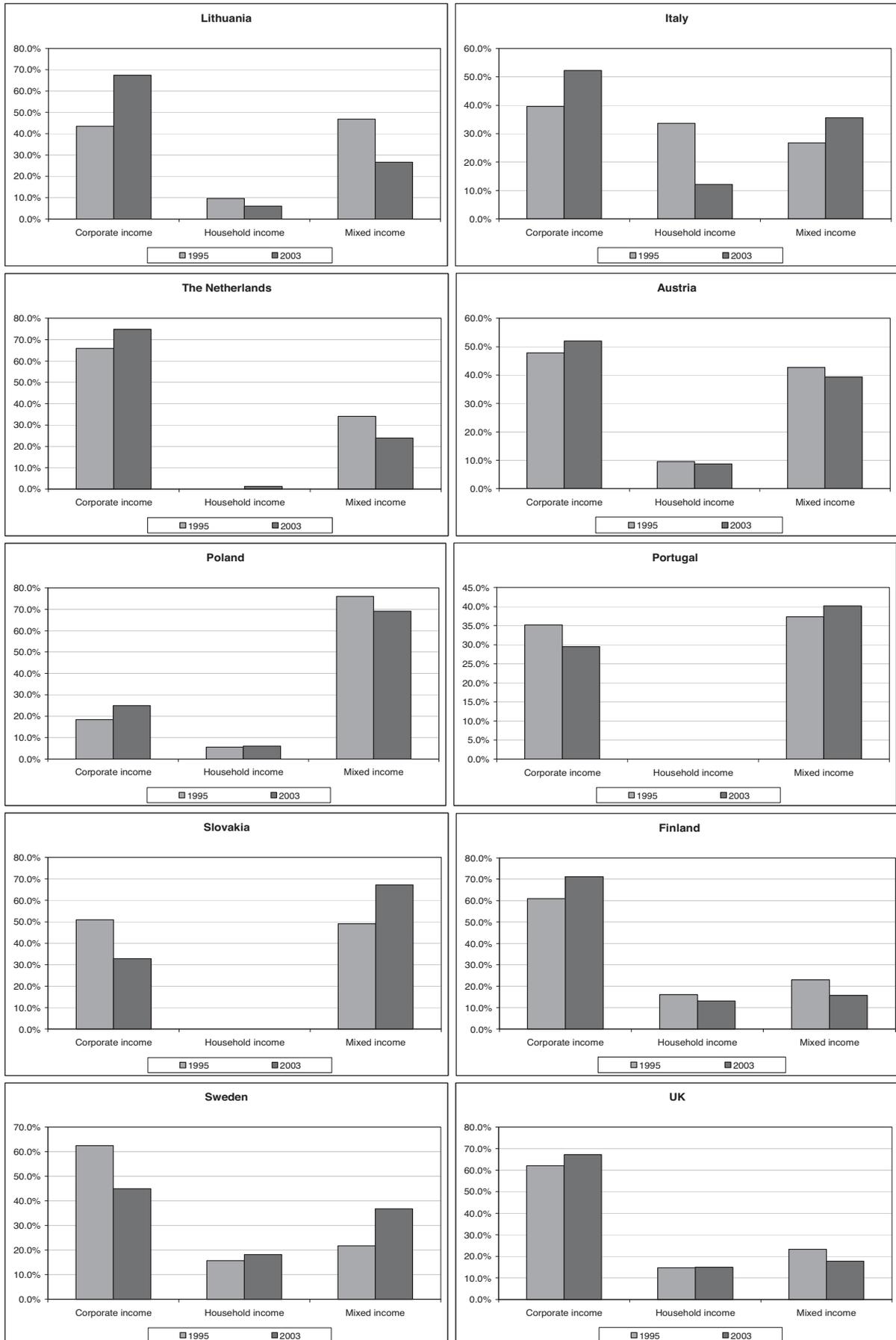


Source: European Commission (2006), 'Taxation trends in the European Union'

Business income (P) and its components in 1995 and 2003.



Source: European Commission (2006), 'Taxation trends in the European Union'



Source: European Commission (2006), 'Taxation trends in the European Union'

Annex IV: The questionnaire on corporatization

Data were collected for 11 countries on the basis of an ad-hoc survey. Belgium, Spain, Poland, Portugal and the UK had not replied to the questionnaire. Except for Austria, Italy, Denmark and France, data were obtained for the time span 1995-2004.

Country	Number of corporations as a percentage of total enterprises [*]			Turnover of corporations as percentage of total turnover of enterprises [*]		
	1996	2005	Change	1996	2005	change
CZ	15,59	23,50	7,91	82,50	92,30	9,80
DK	31,05	35,58	4,53	83,00	86,30	3,30
EE	71,22	43,87	-27,35	100	99,20	-0,80
FR	44,19	49,92	5,73	91,00	92,00	1,00
IT	13,78	15,61	+1,83	81,33	79,13	-2,20
LT	39,73	22,90	-16,83	67,20	75,80	8,60
NL	24,17	25,83	1,66	86,30	87,20	0,90
AT	15,70	15,92	0,22	72,00	74,00	2,00
SK	10,98	17,13	6,15	71,40	71,70	0,30
FI	40,25	44,38	4,13	90,69	91,69	1,00
SE	70,59	47,57	-23,02	95,10	96,30	1,20

Source: European Commission (2007), 'Questionnaire on corporatization'.

^{*} The period considered for Estonia, Lithuania and Sweden was 1996-2004, for Austria and Italy 1996-2003. For Denmark, the period considered was 1999-2004, for France 2000-2004.

Annex V: Average nominal growth rates of corporate income (C), business income (P), corporate tax revenues (R) and GDP

		1996-1998	1999-2001	2002-2004
BE	C	2.47%	7.11%	6.26%
	P	-0.02%	3.42%	0.94%
	R	14.89%	1.67%	4.75%
	GDP	1.61%	4.34%	4.61%
CZ	C	9.08%	11.85%	20.88%
	P	8.83%	8.78%	17.15%
	R	-0.25%	15.50%	26.72%
	GDP	9.54%	7.72%	13.00%
DK	C	0.45%	12.69%	0.19%
	P	5.35%	8.32%	3.12%
	R	12.95%	5.52%	3.76%
	GDP	3.70%	4.93%	4.36%
EE	C	41.52%	25.87%	16.80%
	P	32.15%	16.73%	13.78%
	R	24.22%	-24.32%	43.05%
	GDP	20.04%	11.86%	15.66%
GR	C	0.52%	10.92%	17.50%
	P	3.28%	4.45%	9.42%
	R	14.11%	15.19%	-0.60%
	GDP	6.69%	6.90%	10.22%
ES	C	5.06%	-3.55%	7.55%
	P	4.18%	3.20%	5.43%
	R	17.75%	13.22%	14.09%
	GDP	5.57%	8.23%	10.12%
FR	C	7.30%	2.90%	3.42%
	P	6.39%	3.90%	-1.39%
	R	13.03%	14.23%	0.39%
	GDP	3.11%	4.39%	4.82%
IT	C	8.60%	5.72%	2.24%
	P	6.30%	-3.78%	0.63%
	R	2.88%	16.42%	1.97%
	GDP	8.20%	4.73%	5.29%
LT	C	24.17%	26.60%	27.92%
	P	19.57%	15.61%	16.33%

	R	7.57%	-16.39%	69.95%
	GDP	26.59%	11.06%	13.74%
NL	C	10.66%	15.52%	5.25%
	P	18.00%	9.60%	-2.14%
	R	15.94%	5.24%	-2.45%
	GDP	3.94%	7.56%	5.51%
AT	C	8.96%	3.23%	4.90%
	P	5.20%	4.59%	1.89%
	R	15.65%	18.43%	7.33%
	GDP	1.43%	4.16%	3.88%
PL	C	15.18%	5.90%	25.02%
	P	10.95%	11.76%	4.35%
	R	11.37%	0.78%	2.29%
	GDP	13.01%	11.61%	3.52%
PT	C	8.80%	-4.62%	16.84%
	P	4.54%	0.80%	3.24%
	R	17.79%	10.13%	-3.00%
	GDP	6.71%	6.93%	5.44%
SK	C	-16.13%	22.85%	21.76%
	P	2.69%	12.35%	14.79%
	R	-8.08%	-5.74%	9.66%
	GDP	9.91%	5.91%	15.32%
FI	C	18.09%	17.84%	4.33%
	P	12.51%	14.92%	3.37%
	R	29.67%	9.21%	-10.76%
	GDP	5.26%	6.32%	4.77%
SE	C	-3.42%	-3.90%	-17.94%
	P	2.44%	-1.08%	-12.57%
	R	5.78%	9.16%	1.47%
	GDP	5.28%	3.76%	2.45%
UK	C	20.87%	1.96%	10.14%
	P	27.19%	3.38%	-6.52%
	R	28.16%	4.04%	-3.33%
	GDP	13.83%	8.10%	3.63%

Source: European Commission (2006), 'Taxation trends in the European Union'

Annex VI: Comparison with previous studies

	R/GDP			C/P			P/GDP			R/C		
	Sørensen ¹	De Mooij and Nicodème ²	Current study ³	Sørensen ¹	De Mooij and Nicodème ²	Current study ³	Sørensen ¹	De Mooij and Nicodème ²	Current study ³	Sørensen ¹	De Mooij and Nicodème ²	Current study ³
TIME SPAN	82-04	80-04 ⁴	95-04 ⁵	81-02 ⁶	80-04 ⁷	95-04 ⁸	81-02 ⁶	Various ⁹	95-04 ⁸	81-02 ⁶	80-04 ¹⁰	95-04 ⁸
	CHANGE ¹¹			CHANGE ¹²			CHANGE ¹²			CHANGE ¹²		
EU	N/A	N/A	-	N/A	N/A	+	N/A	+	-	N/A	-	-
BE	+	+	+	+	+	+	-	stable	-	+	stable	+
CZ	N/A	N/A	+	N/A	N/A	+	N/A	N/A	+	N/A	N/A	-
DE	-	+	N/A	N/A	+	N/A	N/A	stable	N/A	N/A	stable	N/A
DK	+	+	+	+	+	+	+	stable	+	+	stable	+
GR	+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
EE	N/A	N/A	-	N/A	N/A	+	N/A	N/A	+	N/A	N/A	-
ES	+	+	-	N/A	-	-	N/A	stable	-	N/A	+	+
IE	+	N/A	N/A	N/A	N/A	N/A	N/A	stable	N/A	N/A	N/A	N/A
FR	+	+	+	+	+	+	+	+	+	-	stable	+
IT	-	+	+	0 (?)	-	+	0 (?)	stable	-	+	stable	-
LT	N/A	N/A	-	N/A	N/A	+	N/A	N/A	-	N/A	N/A	-
LU	-	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NL	+	+	-	+	+	+	0 (?)	stable	+	+	stable	-
AT	+	+	+	N/A	+	+	N/A	+	+	N/A	stable	+
PL	N/A	-	+	N/A	-	+	N/A	stable	+	N/A	stable	-
PT	N/A	N/A	+	N/A	N/A	-	N/A	N/A	-	N/A	-	+
SK	N/A	N/A	-									
FI	+	+	+	+	+	+	+	+	+	+	+	+
SE	+	+	+	N/A	+	+	-	stable	-	N/A	stable	-
UK	-	+	+	-	?	-	0 (?)	stable	+	-	-	+

Source: Sørensen (2006), De Mooij and Nicodème (2007) and own calculations.

- (1) Sørensen (2006), primary data source: OECD; profit is the operating surplus defined as profit gross of interest and depreciation
- (2) De Mooij and Nicodème (2007), primary data source: AMECO database based on Eurostat data; C is the total gross operating profits of corporations, P is the total gross operating profit in the economy.
- (3) Data source: denominators on ITR on corporate and capital income (the *Structures*) based on Eurostat data.
- (4) Except for PL 1995-2004.
- (5) Except for SK where the last available year is 2003.
- (6) Except for BE 1986-2002; DK 1981-2001; UK 1988-2003.
- (7) Except for UK 1987-2004; SE 1994-2004; ES, PL, AT 1995-2004; BE 1985-2004.
- (8) Except for CZ, DK, EE, PT, UK where the last available year is 2003.
- (9) Except for DE, PL 1991-2004, and EU 25 average 1995-2003.
- (10) Except for DE 1991-2004, Nicodème EU 25 average 1995-2003.
- (11) For Sørensen, last available year to first available year as seen in the graphs presented in the paper; for De Mooij and Nicodème (2007), last available year to first available year as seen in the graphs presented in the paper; for the current study, last year available to first year available, and EU average computed for 20 countries: BE, CZ, DK, EE, GR, ES, FR, IE, IT, LV, LT, LU, NL, AT, PL, PT, SK, FI, SE, UK.
- (11) For Sørensen, last available year to first available year as seen in the graphs presented in the paper (three-year moving averages); for De Mooij and Nicodème (2007), presumably last year to first available year as commented by the authors in the paper (own interpretation of the graphs presented in their paper in case of C/P for PL, SE and UK, in case of P/GDP for EU 25 average and in case of R/C for EU 25 average); for the current study, last year available to first year available, and EU average computed for 16 countries: BE, CZ, DK, GR, EE, ES, FR, IT, LT, NL, AT, PL, PT, SK, FI, UK.

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