

# **CAPITAL INCOME TAXATION UNDER CONVERGENCE AND EMU – A FRAMEWORK TO DISCUSS POLICY CHALLENGES IN A WORLD OF HIGH CAPITAL MOBILITY**

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## **1. Introduction**

Completion of the monetary union has given new impetus to the debate on tax coordination at the European level, particularly in the field of capital income taxation. Scope for coordinated action is given by the fear that excessive or harmful tax competition to attract foreign capital would reduce capital income taxes to politically and economically unsustainable levels, causing distortions in the internal market, tax revenue losses and an excessive tax burden transferred to labour income.

The aim of the paper is to assess whether, in accordance with the prescriptions of the basic model of tax competition, European countries have engaged in some form of tax competition with regard to more mobile factors over the past decades. In particular, the paper focuses on taxation of corporate income and it examines whether, in an environment of increased liberalisation of capital movement, corporate income taxation has declined significantly across countries. Based on several tax indicators, available from recent empirical studies and examined in the paper, no strong conclusion can be drawn regarding countries' practice in the area of tax competition. Although statutory tax rates on corporate income declined significantly from 1983 to 2001 in all EU countries, revenues from corporate income, as a share of GDP, have remained fairly stable over the past decades. Furthermore, corporate taxation, as measured by indicators of effective taxation (EATR and EMTR) have decreased by much less than statutory tax rates and converged somewhat across countries.

Recent studies have tried to resolve the apparent inconsistency between theory prescriptions and the practice adopted by countries by means of several arguments. This paper reviews and assesses these arguments against the background of the available empirical evidence. By doing so, the paper also aims at raising critical issues for policy making in the new environment of capital mobility.

The next section outlines the main theoretical prescriptions from the basic model of tax competition and highlights some departures from it. The third section provides an overview of tax reforms undertaken in most EU countries since the mid-Eighties, with particular references to corporate income taxation. Moving to

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specific aspects of tax systems, the fourth section focuses on the evolution of corporate tax rates over the period considered. To assess the combined effects of changes in tax rates and tax base determination on the tax burden of corporations, more complex indicators are needed. In order to do so, the fifth section outlines the methodology underlying various indicators for the effective tax rates (marginal and effective). Based on the concept of the user's cost of capital and the related measure of effective taxation, these indicators summarise the effects of changes of the overall tax regulation on firms' tax burden. The same section also highlights merits and shortcomings of the selected indicators. The sixth section presents the quantitative results from the elaboration of tax indicators and discusses these results against the main prescriptions of the theory of tax competition. In so doing, it reviews the main arguments set forth by recent studies to reconcile theory and practice. Section 7 discusses recent actions of the EU Council in the field of business tax coordination. The conclusive chapter raises issues of relevance for the current debate and highlights future avenues of work.

## **2. A basic model of tax competition**

The standard result of the literature on tax competition is that in a classical model of full capital mobility and small open countries, where governments want to maximise national welfare using tax instruments, countries have an incentive to reduce taxes on locally invested capital.<sup>1</sup> The intuitive explanation is that a small country cannot influence the world rate of return available to domestic investors. In this context, starting from an equilibrium for the world and domestic rate of return, any increase in the domestic capital tax rate would imply an increase in the new equilibrium domestic pre-tax rate of return and hence induce an outflow of capital. If factors of production, capital and labour are in fixed supply for the world and labour is immobile, the attempt to increase taxes on locally invested capital income (the mobile factor) would shift the incidence of the tax onto the immobile factor because of well known channels of marginal productivity, in a constant-returns-to-scale production function

In this setting, if countries compete to attract foreign capital, they have an incentive to reduce taxes on capital and keep them at a low level. This implies that in a Nash equilibrium, tax rates on capital income are set at a level below the Pareto efficient level and all countries could be better off if they would adopt a cooperative solution, enforcing higher tax rates (Hamada, 1966 and Razin and Sadka, 1991).

The basic result described above needs to be further qualified by specifying the tax principle applied in taxing cross-border investment, namely whether capital income is taxed according to the source-based or the residence-based principle of

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<sup>1</sup> For a survey of the literature and main issues on tax competition, see Devereux, Griffith and Klemm (2002), Gordon and Hines (2002) and Sorensen (2001).

taxation.<sup>2</sup> It is worth noting that, the result previously described of a too low and inefficient taxation of capital income is only obtained if corporate income is taxed according to the source-based principle. By contrast, if the residence principle applies, then the argument that higher domestic tax rates of capital taxation would drive up the domestic pre-tax return on capital and hence, drive away capital, does not hold any more (Gordon, 1986). In fact, under the residence principle, countries can tax exported capital. Hence the result that countries would compete to decrease capital income taxes to inefficiently low levels hinges on the difficulty of taxing “exported” capital (Bucovetsky and Wilson, 1991). This is the case when the source principle applies or when the residence principle is implemented imperfectly, due to the well known practical difficulties.

From the global efficiency point of view, a central result has been derived by Razin and Sadka (1991) from the international version of the production efficiency theorem of Diamond and Mirrlees (1971). It states that, if any pure profits can be fully taxed and there are no constraints in the set of taxes and transfers available to the government, the optimal set of taxes is the one which preserves production efficiency, that is the one which equates pre-tax returns to capital across countries. The implication is that the source principle is always inferior to the residence principle, as the latter is the only one which guarantees absence of distortions in individual investments and production choices. Furthermore, under the residence-based principle the non-cooperative or Nash competitive solution coincides with a cooperative solution.

The enforcement of the residence principle in taxing worldwide corporate income is not without a number of administrative and practical difficulties. In practice, because of these difficulties, most countries tax corporate income according to the source principle. The departure from the residence-based tax principle and the application of the source principle lies at the heart of the worries currently expressed within the EU. Along the lines of the prescription of the theoretical models, one would expect that countries have undertaken some form of tax competition and have adopted too low and inefficient tax rates, in order to compete on taxable bases.

Departing from the assumption of perfect competition and considering the possibility of economic rents significantly modifies the conclusions regarding the efficiency property of the residence and source principles. For instance, if foreign investors earn pure profits and the source principle applies, the country hosting the investment can optimally choose to set a high tax rate on capital return, thus exporting abroad some of its tax burden. As a further example, the existence of

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<sup>2</sup> Under the source-based taxation principle, capital income is taxed only by the country where the investment is located, regardless of the residence of the investor. Hence, corporations would be subject to the tax rules of the country or jurisdiction where they are located. Instead, under the residence principle, if fully implemented, a country would tax worldwide capital income of its residents, regardless of their location. Hence, corporate income would be subject to the tax rules of the country of residence of stockholders (in the case of an individual company), either on an accrual basis or upon repatriation of profits.

agglomeration forces and related self-sustaining spatial concentration, might create location specific rents, which could then be taxed without distorting the location of capital (Baldwin and Krugman, 2001). However, when a firm's investment decision is based on a discrete choice model, as might be the case for a multinational selecting a location, not only the marginal units of the investment are mobile, but also the inframarginal units are mobile. Hence, taxing pure economic profits might distort the location of capital as well (Devereux *et al.*, 2002). Along these lines, the theory would prescribe that one would find a higher tax rate where most profitable investments are located or where larger agglomeration forces are to be found.

### **3. Tax reforms in the EU countries since the mid-Eighties**

In the second half of the 1980s, spurred by the new fiscal regulation introduced in the United Kingdom in 1984 and the Tax Reform Act which came into force in the United States in 1986, the governments of many countries committed themselves to reforming their direct tax systems. The reforms undertaken until the early Nineties generally aimed at ensuring a tax system which was simpler, more equitable and efficient. In the previous decades, a considerable erosion of the tax base resulted from large and to some extent discretionary tax allowances for personal and corporate income. Awareness of the disincentive effects of excessively high tax rates on the promotion of entrepreneurial activity then created a strong incentive for a less progressive tax system. Of equal importance was the greater importance acquired by sources of income, such as capital gains, traditionally not of primary concern but whose exclusion appeared highly prejudicial as regards to potential tax revenue. Therefore, in most countries tax reforms aimed at lower tax rates and a larger taxable base, so as to leave overall tax revenue unchanged. The reforms of the mid-Eighties generally had a neutral effect on tax revenue.

Concerning the taxation of corporate income, tax reforms have generally broadened the tax base and reduced tax rates. The reforms also ensured a more uniform taxation of the various productive activities, reducing differences of tax treatment, according to the type of capital good and sector of activities. Several additional provisions were also modified. The provision for carrying forward losses was modified to allow larger compensation over time of previous losses incurred by firms.

In the late Nineties, tax reforms were once again high on the agenda of the policy maker. As in the mid-Eighties, the reforms aimed at increasing the efficiency of the tax systems and simplifying the tax code. However, contrary to the reforms of the mid-Eighties, the reforms also aimed at reducing the tax burden on economies. Specific targets of the reforms, broadly shared by all countries, were (i) to promote employment and investment via lower marginal taxation and contribution rates, (ii) to increase tax neutrality with respect to savings and financing instruments, (iii) to improve the efficiency of tax administration, and (iv) to simplify tax codes. In addition, tax reforms were also deemed necessary from an international perspective,

as many EU countries have an average tax burden far in excess of the main industrialised countries outside the euro area. Relative to the initial tax plans announced, tax reforms have gained momentum in all euro area countries: future plans have been brought forward and, in some cases, the measures announced have been frontloaded.

The tax reforms are following a common pattern although they differ across countries in terms of their size and composition. Most euro area countries have introduced or plan to introduce significant corporate and personal income tax cuts. The latter will typically benefit all income groups, although many countries favour low-income earners. A number of countries explicitly state the objectives of alleviating poverty and unemployment traps, promoting “fairness” in the tax system and stimulating labour demand and supply. The objective of promoting employment is also behind the social security contribution cuts pursued in roughly half of the euro area countries. Most countries have also implemented or are planning corporate tax rate reductions. The related costs are partly being offset by broadening the tax base via less generous tax allowances for depreciation. A number of countries have reorganised and rationalised capital income taxation, aiming at a more neutral taxation of income from various sources (*i.e.* dividends, interest income and capital gains) in order to reduce distortions in investment and financing decisions. Some countries have also implemented tax measures to promote corporate reorganisation and restructuring. A number of countries have passed legislation or reinforced existing legislation favouring small and medium sized firms.

Over the period from 2000 to 2003 tax reforms will have reduced the total tax burden by more than 2 percentage points of GDP in EU countries. Although tax cuts differed in size and composition across countries, they were mainly concentrated in the area of personal income taxation. However, a number of countries have also implemented sizeable reductions in the corporate tax rates. In particular, Belgium, France, Germany, Ireland, Luxembourg, Italy and in Greece.

#### **4. The evolution of the statutory tax rates on corporate income**

The statutory tax rates on corporate income declined significantly from 1983 to 2001 in all EU countries. Notwithstanding the drastic simplification needed to produce a summary table of statutory tax rates for different countries, the direction towards a generalised reduction of tax rates is strongly supported by the data (see Table 1 and Figure 1). In the European Union average, corporate tax rates, as levied by central governments on retained earnings, declined by more than 12 percentage points, from 43.6 to 31 per cent, over the period considered. In the EU average, most of the total tax rates’ reductions took place in the Eighties.

Average developments for the EU hide countries’ specific developments to some extent. In 1983, large EU countries (Germany, Spain, France, Italy, The Netherlands and the United Kingdom) recorded on average a much higher corporate income tax rate than the small EU countries, namely 46.3 against 41.8 per cent. The

Table 1

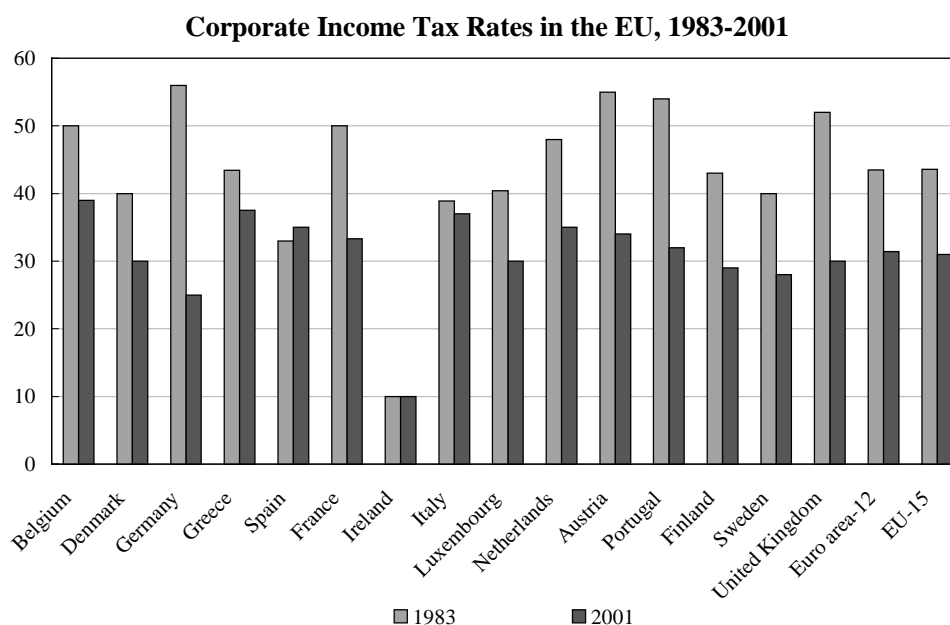
## Corporate Income Tax Rates - Central Government

	1983	1991	2001	1984-2001	1984-1991	1992-2001
Belgium	50	41	39	-11	-9	-2
Denmark	40	38	30	-10	-2	-8
Germany	56	52	25	-31	-4	-27
Greece	43.4	35	37.5	-5.9	-8.4	2.5
Spain	33	35	35	2	2	0
France	50	34	33.3	-16.7	-16	-0.7
Ireland	10	10	10	0	0	0
Italy	38.9	36	37	-1.9	-2.9	1
Luxembourg	40.4	34.3	30	-10.4	-6.1	-4.3
Netherlands	48	35	35	-13	-13	0
Austria	55	30	34	-21	-25	4
Portugal	54	36	32	-22	-18	-4
Finland	43	23	29	-14	-20	6
Sweden	40	30	28	-12	-10	-2
United Kingdom	52	33	30	-22	-19	-3
Euro area-12 average	43.5	33.4	31.4	-12	-10	-2
EU-15 average	43.6	33.5	31.0	-13	-10	-3
EU-15 standard deviation	11.5	9.0	7.0	-5	-3	-2
Small countries	41.8	30.8	29.9	-12	-11	-1
Big countries	46.3	37.5	32.6	-14	-9	-5
Core countries	49.2	38.5	33.2	-16	-11	-5
Periphery countries	39.9	30.1	29.5	-10	-10	-1

Note: Tax rate on corporate retained earnings.

Sources: National sources and Ministry of Finances, Commission (2001), Devereux (2002), Cnossen (2002), Backer and McKenzie (1999).

difference in tax rates between the two groups widened in 1991, with small countries reducing their tax rates at a faster pace. In 1991 the average tax rate of the small countries group had fallen to 30.8 per cent, below the average tax rate for the large countries group and the EU average. By contrast, large countries appear to have distributed rate cuts more gradually over time. Therefore, in 2001 the distance between the average tax rates in the two groups decreased significantly. However, the large countries group still recorded on average a somewhat higher tax rate than the small countries group, namely, 32.6 against 29.9 per cent. Therefore, compared with the large countries group, the small countries group appears to have maintained lower tax rates throughout the period considered and to have adopted further tax cuts well ahead of time. Similar conclusions are reached when distinguishing countries between core countries, which are those which benefit from the agglomeration economies associated with a well established centre, and periphery countries, which

**Figure 1**

do not benefit from it. The classification produces a slightly different grouping of countries, compared with the previous criterion based on size, with Belgium, Germany France, Italy, The Netherlands and the United Kingdom included in the core economies. In each of the years considered, core economies recorded a higher average tax rate than the periphery economy. Furthermore, tax rates declined in the core economies more gradually over time than in the other countries and, at the end of the period considered, the distance between the average tax rates in the two groups had diminished significantly.

In the same years, the largest tax cuts have taken place in countries with the highest tax rates in the mid-Eighties (see Figure 2). This has also implied some convergence of tax rates across countries (see Figure 3). Moreover, the standard deviation of tax rates across countries declined significantly over time (from 12 to 7). Between 1983 and 2001, tax rates in the various countries have converged to a significantly lower EU average.

## 5. Marginal and average effective tax rates: the methodology

Statutory tax rates alone do not allow a satisfactory comparison of different tax systems. Several tax provisions, in particular those affecting the definition of the taxable base, concur to modify the tax burden on corporations. Therefore, corporate taxation is better assessed on the basis of the “effective tax rate” approach. Such a

Figure 2

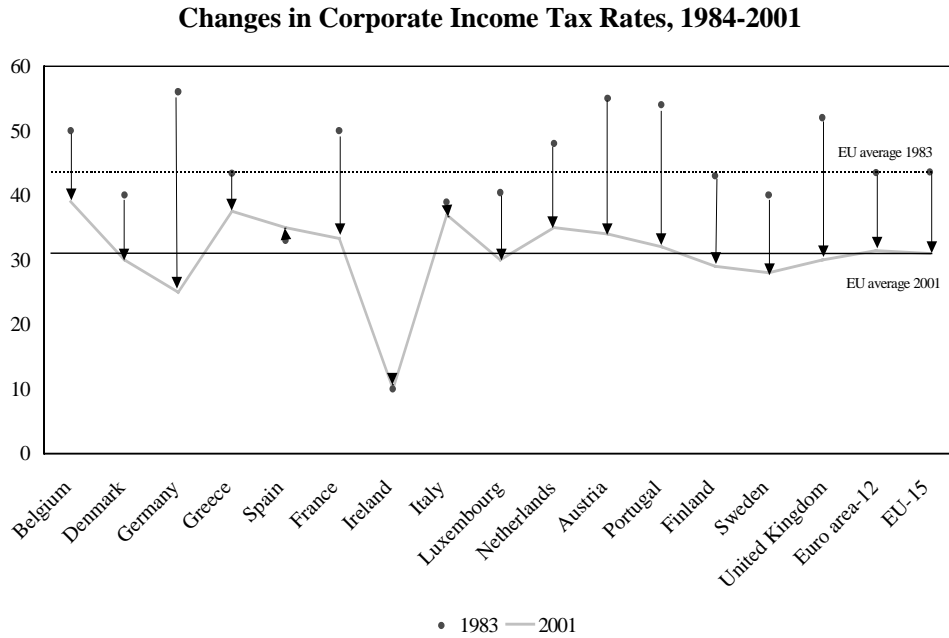
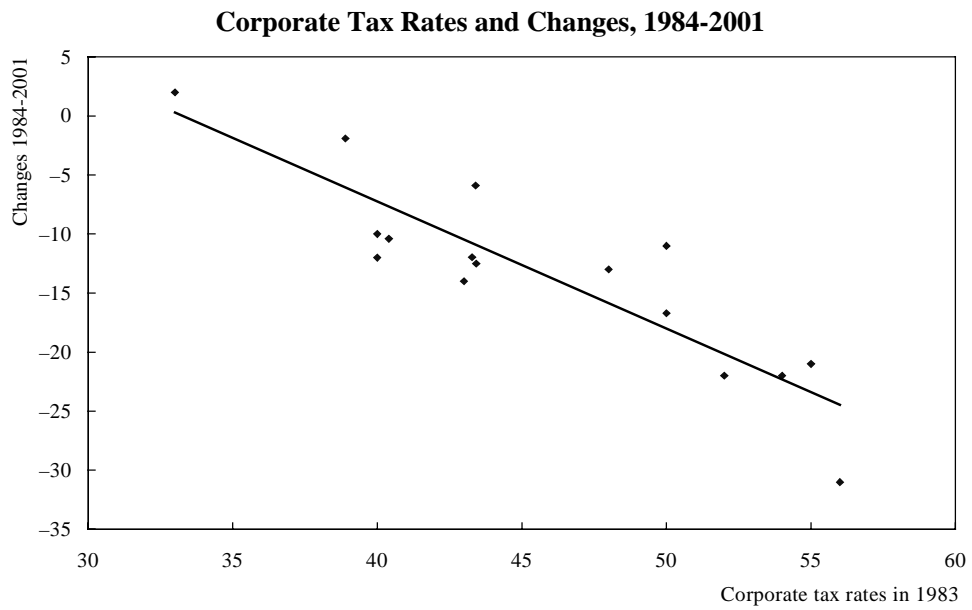


Figure 3





methodology summarises in one concise statistical measure all elements relating to corporate taxation and which describe the tax system in detail, namely, the tax base determination, tax rates, tax depreciation and other general tax provisions. This makes possible temporal and spatial comparisons of different tax systems across countries and their evolution over time.

The elaboration of the effective rates of taxation is based on the concept of the user's cost of capital, and related methodology. The theoretical foundations of the user's cost of capital and successive applications to the problem of capital income taxation have been developed by a vast literature.<sup>3</sup> The user's cost of capital indicates the gross rate of return on investment which is sufficient to remunerate the financing cost (internal and external), as well as the economic depreciation of capital goods, and other losses or gains related to prices and tax costs (depreciation and corporate and personal taxation). There is no unique user's cost of capital measure, as there are as many specific costs of capital as specific projects of investment. Therefore, the user's cost of capital is elaborated separately for specific sources of financing (retained earnings, equity issue and debt), specific capital goods (machinery, non-residential buildings and inventory) and type of investors (individual and institutional investors). The tax wedge is given by the difference between the user's cost of capital (net of the economic depreciation) gross and net of taxation. Effective tax rates are then obtained by taking the ratio of the tax wedge on the user's cost of capital, gross of taxation.

The user's cost of capital approach and the related measure of marginal effective tax have prevailed in the assessment of tax distortions on firms' savings and investment decisions. Following this approach, the distortional effects of taxes on firms' investment and financing decisions are assessed in a forward-looking way in a perfectly competitive market. Hence, effective tax rates are calculated as marginal tax rates and the effects of tax regulations on company financing and investment behaviour is assessed for the marginal investment. The marginal investment is the additional investment, which represents the new investment decision of the firm, where firms invest until the marginal cost is equal to the marginal revenue and there are no extra profits.

The validity of the effective marginal rates then stays with the validity of the underlying neo-classical investment paradigm. Furthermore, a satisfactory construction of the indicators hinges on the availability of data to produce forward-looking indicators. These aspects have been criticised and the recent empirical literature has proposed alternative indicators (see Table 2).

A different indicator has been proposed based on the consideration that marginal tax rates do not capture the effects of taxes when the decision process of a firm is described by a model of discrete choice of investment. An example of discrete choice is given by the case when firms, in particular multinational firms,

<sup>3</sup> In particular, Auerbach (1979), King and Fullerton (1984) and Jorgenson and Landau (1993).

**Table 2**  
**Effective Marginal and Average Tax Rates: an Overview of Available Indicators**

<b>Model</b>	<b>Indicator</b>	<b>Ex ante/ ex post</b>	<b>Revenue- / legislation-based</b>	<b>Performance / Information</b>	<b>Disadvantages</b>
Devereux	EMTR	<i>Ex ante</i>	Legislation-based	Neo-classical model of investment/ forward looking / shows specific tax effects	Demanding estimates Sensitive to assumptions
Devereux	EATR	<i>Ex ante</i>	Legislation-based	Discrete investment choice / forward looking	Demanding estimates Sensitive to assumptions
Mendoza	EATR	<i>Ex post</i>	Revenue based / macro data	Backward looking / less demanding calculation / embodies tax planning	Difficulty to estimate the true economic profit / aggregate / does not isolate specific tax characteristic
Martinez-Mongay	EATR	<i>Ex post</i>	Revenue based / macro data	Backward looking / less demanding calculation / embodies tax planning	Difficulty to estimate the true economic profit / aggregate / does not isolate specific tax characteristic
Oecd	EATR	<i>Ex post</i>	Revenue based / macro data	Backward looking / less demanding calculation / embodies tax planning	Difficulty to estimate the true economic profit / aggregate measure / does not isolate specific tax characteristic / affected by economic fluctuations
Eurostat	EATR	<i>Ex post</i>	Revenue based / macro data	Backward looking / less demanding calculation / embodies tax planning	Difficulty to estimate the true economic profit / inclusion of capital income paid to households/ aggregate measure / does not isolate specific tax characteristic
Bach	EATR	<i>Ex post</i>	Revenue based / micro data	Backward looking / sectoral performance / calculation less demanding / improved consistency of numerator and denominator / embodies tax planning	Does not isolate specific tax characteristic / affected by economic fluctuations

have to select a location to establish their investment (Devereux *et al.*, 2002). When the decision taken by the firm is whether or not to locate an establishment in a given location, both marginal and intramarginal units of investment are mobile across location. In other words, in a discrete-choice model of investment all units of investment are critical to the investor's decision making. The advantage of adopting average effective corporate tax rates, rather than marginal effective tax rates, is that they capture the impact of tax on both marginal and intramarginal investment. Therefore, average taxes will be a better predictor than marginal taxes depending on the model underlying a firm's investment decision. Moreover, since the proposed indicator is calculated on the basis of the tax legislation, it maintains the characteristic of a forward-looking indicator. By the same token, the calculation of average effective tax rates is also sensitive, as in the case of marginal rates, to the assumption made on interest rates, inflation, pre-tax rate of return and maturity of the firm. Hence the same criticisms apply regarding the difficulty of calculating satisfactory indicators.

Given the difficulty in constructing forward-looking indicators taking as a starting point the set of tax regulations in individual countries and the limited data availability, an alternative approach aims at producing *ex post* effective average tax rates (Mendoza, Razin and Tesar, 1994). The methodology consists of calculating effective tax rates as the ratio between tax revenues from specific sources (labour, capital and income) and the corresponding tax bases obtained from national accounts. In the case of capital income, the tax base is determined by a measure of aggregate business surplus.

Further effective average tax indicators have thereafter been calculated based on a revised methodology, particularly concerning the treatment of capital income and of self-employed income (Martinez-Mongay, 2000; Carey and Tchilinguirian, 2000). With some difference in the methodology adopted, *ex post* average effective taxes have also been elaborated as "implicit tax rates". In particular Dg-Taxud, in co-operation with Eurostat, publishes "implicit tax rates" on labour consumption and other production factors (European Commission, 1997 and 2000).

Since average tax rates are calculated by taking the ratio of the actual tax revenues to some economic measure of profits, their informational content is richer than a simple statutory tax rate, in that it reflects both changes in the rates and in the tax base. Furthermore, as backward-looking indicators, they also reflect tax strategies undertaken by firms to minimise tax payments. Hence, to some extent they embody the firms' behavioural response to tax schedule changes.

However, *ex post* average tax rates from national accounts data are usually calculated by including in the total tax revenue not only corporate tax revenue, but also taxes paid on capital income by suppliers of capital. Therefore, tax revenue includes corporate taxes and taxes on interest, dividends and royalties as well as property taxes and taxes on financial transactions. Hence, to ensure consistency with the numerator, the denominator has to include domestic value added accruing to suppliers. Two main problems arise for a correct and consistent calculation of these ratios, namely, the estimation of personal income tax rates on capital income and the

imputation of self-employed income to capital and labour. Different studies have adopted alternative solutions. However, notwithstanding methodologically relevant differences, the correlation of alternative indicators across time for a given country and across countries is quite high.

A major conceptual difficulty with these indicators stems from the estimate of tax bases and profits according to economic criteria. Depreciation allowances should in principle reflect the true economic depreciation, and not tax allowances, as is in fact the case in the applied approach. In addition, in using aggregate data the measure of the denominator (economic profits) is also affected by a firm's maturity, possible losses carried forward, previous investment experience and related depreciation schedules. This implies that, ideally, profits need to be adjusted to take into account non-profitable firms and the build-up over time of various tax credits and tax allowances. As suggested by some studies, if the tax base merely reflects the tax legislation, the resulting indicator is the statutory tax rates and departures from it are due to measurement errors. Furthermore, profits and taxes are affected by the economic environment and show a rather cyclical evolution. For all these reasons, backward-looking tax indicators have only a limited use in singling out tax policy changes.

Some of these problems can be solved by using detailed micro data (Nicodème, 2001). For a given sample of firms, it would then be possible to calculate average effective tax rates making a consistent use of numerator (tax debt) and denominator (economic profits). However, even in this case economic growth and fluctuations affect the values of the indicator and hence do not allow the singling out of the specific effect of tax rule changes.

## **6. Quantitative indicators for marginal and average effective tax rates**

With regard to forward-looking indicators, over the period 1982-2001 marginal effective tax indicators declined significantly in almost all EU countries and in the European Union average (Table 3). In particular, the marginal effective tax rates in the average of 11 EU countries declined by some 11 percentage points, from 32.6 to 21.9 per cent. Results are slightly different when distinguishing between large countries (Germany, Spain, France, Italy and The Netherlands) and the small ones. Effective marginal taxes were higher in the large countries than in the small ones, and declined in small countries to a larger extent than in the large ones. The information provided by the indicators seems to go in the same direction as the theory prescriptions, with small countries adopting lower tax rates.

As clarified in the methodological section, marginal tax rates are a suitable indicator for potential tax competition should the neo-classical model of investment hold. However, marginal effective tax rates are of little help in assessing tax distortions in the presence of pure economic profits (rent) or when a firm's investment decision follows a discrete model. In these cases, average tax rates are a better indicator of tax distortions. Ideally, one would like to see a significant

Table 3

**Marginal and Average Effective Tax Rates**  
(forward-looking indicators)

	Effective marginal tax rates			Effective average tax rates		
	1982	2001	1983-2001	1982	2001	1983-2001
Belgium	30.0	25.0	-5.0	39.0	32.0	-7.0
Germany	47.0	28.0	-19.0	58.0	32.0	-26.0
Greece	33.0	28.0	-5.0	39.5	32.5	-7.0
Spain	23.0	29.5	6.5	29.0	32.5	3.5
France	25.3	20.3	-5.0	40.5	30.0	-10.5
Ireland	-	-	-	0.3	0.4	0.1
Italy	18.5	9.5	-9.0	30.0	29.0	-1.0
Netherlands	35.3	24.5	-10.8	41.0	30.0	-11.0
Austria	25.0	17.5	-7.5	50.0	28.5	-21.5
Portugal	48.0	20.0	-28.0	51.0	29.0	-22.0
Finland	42.5	20.0	-22.5	52.0	22.5	-29.5
Sweden	43.0	15.5	-27.5	52.0	21.5	-30.5
United Kingdom	-	-	-	38.0	28.0	-10.0
Countries weighted average	32.6	21.9	-10.7	43.8	30.3	-13.6
Large countries	29.8	22.4	-7.5	39.7	30.7	-9.0
Small countries	29.8	18.4	-11.3	38.6	24.2	-14.5

Notes: Investment in plant and machinery, financed by equity or retained earnings. Real discount rate 10%; inflation rate 3.5%; depreciation rate 12.25%. Marginal tax rates: no economic rents. Average tax rates: real rate of economic profits 10%. EATR and EMTR coincide for marginal investment when the pre-tax rate of profits is equal to the cost of capital.

Source: Devereux *et al.* (2002) and our calculations.

difference between the two indicators and from this to infer information about countries' practices regarding tax policy. This is not so much the case, although there are aspects which are worth noting.

Average effective tax rates declined from 1982 to 2001 by some 13.6 percentage points on average in the EU countries considered. This is a bit more than the decline in the marginal tax indicator, suggesting that, in modifying tax rules, the tax legislators might have paid more attention to reducing the average tax burden than the marginal one.

More interestingly, large countries recorded on average a much smaller decline of average effective rates, compared to small ones. If one believes that larger countries also benefit from larger location-specific rents, a logical conclusion can be

that in those countries agglomeration forces and locational rents have sheltered taxation from competition (Baldwin and Krugman, 2000).

In a recent study, Devereux (Devereux *et al.*, 2002) produced evidence that the decline of average tax rates has been larger for higher profitability investment. As noted by Devereux, when calculating these rates for major OECD countries, including Japan and the United States, marginal rates barely declined over the period considered. By contrast, average tax rates declined significantly in line with statutory tax rates. Should this difference be noticeable and confirmed by further research, one could infer that tax reforms are consistent with a model of competition where countries try to attract more profitable projects and firms take discretionary investment decisions.

However, one would still need to explain why reductions of statutory tax rates largely outweigh reductions of marginal and average effective rates. To find an explanation, one must again depart from the prescription of the traditional model. In particular, if multinationals operate income shifting between jurisdictions (for instance by using transfer prices) to exploit local low tax rates, then one might expect that countries might compete for allocation of taxable bases by reducing statutory tax rates (Haufler and Schjelderup, 2000).

Moving to backward-looking indicators, several studies have calculated the effective average tax rates. The remainder of this section only surveys those for which observations over a period of time are also available. The OECD elaborates effective tax rates based on the methodology originally developed by a number of studies (Lucas, 1990; Frenkel *et al.*, 1991, Mendoza *et al.*, 1993), as well as on a slightly revised methodology (see Table 4a). The main revision regards the treatment of self-employed income which, contrary to the original methodology, is only partly attributed to the category of capital income. However, in both cases, capital income category also includes households' capital income.

The data shows that over the period considered, average tax rates calculated on the net operating surplus have declined somewhat according to both methodologies. The decline has been larger for the OECD revised methodology (almost 7 percentage points) than in the case of the original methodology (some 3 percentage points), possibly due to the different treatment of capital income. Effective tax rates can also be based on the gross operating surplus (see Table 4b). In this case, the indicators hardly show any decline over the period considered, possibly due to the choice of tax base. However, the indicator does not signal different patterns for small and large countries.

A complete time series for average effective tax rates based on a comparable methodology is also available, based on net and gross operating surpluses (Martinez-Mongay, 2000). As shown in Figure 4, both indicators indicate only a slight reduction of effective tax rates over the period considered. Effective tax rates based on the net operating surplus decline somewhat over the period considered and remain rather stable as a ratio to gross operating surplus. This is not surprising to some extent as these indicators are *ex post* indicators or equilibrium indicators and

**Table 4****Average Effective Tax Rates***Part a): Net Operating Surplus*

	Mendoza methodology			OECD revised methodology		
	1980-85	1986-90	1991-97	1980-85	1986-90	1991-97
Germany	29.6	26.5	25.1	47.6	39.4	36.4
France	28.7	26.3	26.8	53.3	41.5	41.4
Italy	24.3	27.8	33.1	36	38.9	49.6
United Kingdom	67.8	61.2	48.2	95.5	90.2	68.6
Austria	21.4	21.9	23.4	35.4	34.2	34.4
Belgium	37.8	35	35.7	52.4	44.5	47
Denmark	-	54	48.3	-	90.1	67.7
Finland	30.3	37.6	39.9	35.6	46.4	56.5
Greece	-	15	16.1	-	38.9	39.4
The Netherlands	27.7	27.9	29.2	39.2	38.8	40.7
Portugal	-	11.2	16.7	-	-	-
Spain	13.5	19.9	21.5	24	31.4	31.9
Sweden	46.6	62.4	52.7	56.6	80.2	63.5
EU - Weighted average	35.2	34.0	32.1	53.7	50.8	47.0
EU - Standard deviation	15.2	16.7	12.2	19.7	22.0	13.1

*Part b) Gross Operating Surplus*

	Mendoza methodology			OECD revised methodology		
	1980-85	1986-90	1991-97	1980-85	1986-90	1991-97
Germany	17.1	16.2	15.5	22.9	21.1	19.9
France	17.1	16.8	17	24.3	22.9	23
Italy	17.9	20.8	24.4	21.7	24.7	31
United Kingdom	39.4	38.4	31.9	46.4	47.1	38.4
Austria	13.7	14	14.7	18.9	18.8	18.9
Belgium	27.5	26.1	26.3	32.5	29.9	30.8
Denmark	-	26.5	25.8	-	32.3	29.1
Finland	17.4	20.4	20.6	14.8	18.4	19.6
Greece	-	12.2	13.3	-	23.5	26.8
The Netherlands	18.9	19.4	20.3	22.5	23.4	24.7
Portugal	-	10	11.4	-	-	-
Spain	9.8	14.9	16	12.6	19.7	20.6
Sweden	25.4	32.7	29.2	25.5	35.3	30.5
EU - Weighted average	21.5	21.9	21.1	26.8	27.2	26.2
EU - Standard deviation	8.4	8.3	6.5	9.6	8.4	6.0

Note: Average includes available countries.

Source: OECD (2000) and our calculations.

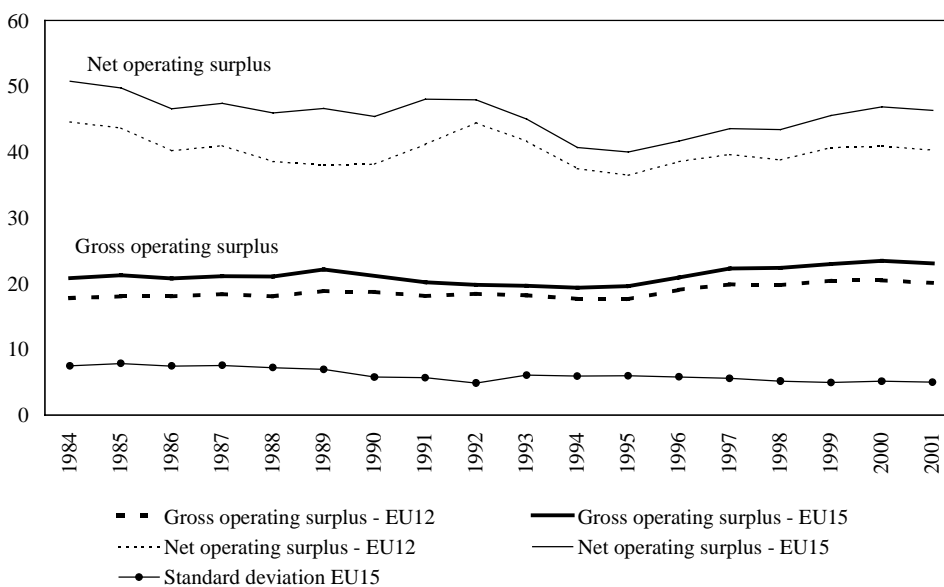
are the result of tax planning activities. However, following tax reforms implemented in the late Nineties, the chosen indicators indicate a reduction of the effective tax rate particularly towards the end of the period for the average of the euro area. Furthermore, a distinction between small and large countries highlights that tax reductions have been larger in the smaller countries.

Over the period considered, effective tax rates have converged across countries, particularly in the case of the euro area, as indicated by a declining value of the standard deviation and by the coefficient of dispersion. The coefficient of dispersion fell from some 35 per cent in the mid-Eighties to 20 per cent in the EU, but a similar decline was recorded also including the US and Japan in the sample.

As clarified in the methodological section, the indicators are also affected by the underpinning economic environment, with higher tax debt paid by companies in times of growth. Furthermore, the net operating surplus is a more erratic statistic than the gross operating surplus and a less comparable one across countries because of the treatment of depreciation. As pointed out in this section, the correlation of the two indicators within a country and across time is high. In addition, the correlation across countries, for short- and long-run changes is high. However, for the EU and euro area aggregates the correlation of the two indicators across time is much smaller, suggesting an area which deserves further exploration.

**Figure 4**

**Average Effective Tax Rates  
Gross and Net Operating Surplus**





Micro data from firms has been elaborated from the Bach databases (Nicodeme, 2001) for the years 1990-1999. Regarding the manufacturing industry, the study shows that on average in the two sub-periods 1990-94 and 1995-99, the tax indicators, taken as ratio of gross operating surplus, maintain a stable value. The estimates also show that effective tax rates increased after 1997 following cyclical developments at the time when statutory tax rates would be reduced in the EU.

**Table 5**

**Average Effective Tax Rates, *Ex Post* Indicators, 1990-1999**

	1990-1994	1995-1999	Change
Belgium	10.6	13.3	2.7
Denmark	15	18.3	3.3
Germany	20.2	21.8	1.6
Spain	12.3	15.5	3.2
France	11	13.5	2.5
Italy	17.7	20.6	2.9
The Netherlands	15.9	19.1	3.2
Austria	9.8	12.1	2.3
Portugal	11.8	15	3.2
Finland	7.1	10.4	3.3
Sweden	9.4	10.7	1.3
Countries average	12.8	15.5	2.7

Source: Nicodème G. (2001), "Computing effective corporate tax rates: comparisons and results", Economic Paper, No. 153, June.

The study clearly highlights that major differences between tax rates depend on sector of activity and firm size. This again points to an area of interest for further investigation. In particular, differences across sectors might indicate different degrees of competition, different financial structures of firms and different profitability of sectors. Size is also relevant in that lower tax rates paid by larger companies might indicate a stronger potential for tax planning.

## 7. The code of conduct for business taxation

A major argument for tax coordination is raised by the tax avoidance practice which multinational corporations can implement via a number of cross border transactions to reallocate profits in low tax jurisdictions. A typical example of tax avoidance is the transfer pricing of intermediate inputs that are traded exclusively between the parent company and its subsidiary. A second important mechanism is profit shifting, including the distribution of overhead costs and the payment of interest and royalties within interconnected parts of the firm. As suggested by some of the literature reviewed, the larger decline of statutory tax rates compared with effective tax rates could signal that countries compete on the allocation of taxable bases by reducing statutory tax rates. Furthermore, the merely moderate decline of backward-looking effective rates could also be an indication that strategic tax engineering has been under way from the outset.

Moreover, in the context of the international mobility of capital, enforcement of the existing domestic tax rules adds a new dimension to tax competition given the complexity of corporate tax laws and the variety of possible forms of ownership and legal organisation of a corporation. In addition, the adoption of special ad hoc tax regulations, with discriminatory practices and tax regulations applied by some countries to attract foreign capital, ultimately leads to harmful tax competition. In attracting foreign capital, countries may compete, not only by fixing their tax rates, but also by determining the taxable bases and even by adopting ad hoc tax regulations. The result would be a less transparent tax system with discriminatory tax practices and regulations, such as tax breaks for non-residential firms.

Both observations seem to offer some grounds for some form of tax coordination. However, the origin of the problem largely appears to be in the practices of multinational corporations and the discriminatory nature of tax breaks available in “tax havens” as well as in countries’ ad hoc regulations. In this respect initiatives to reduce “unfair tax competition” and avoid harmful tax practices have been primarily geared towards preventing discriminatory tax preferences for foreigners that are not available to resident taxpayers. To prevent harmful competition, EU countries have given high priority to the fight against tax discrimination (particularly between domestic and cross-border investment) and harmful tax practices.

To this extent, in 1997 the EU Council adopted a resolution on a Code of Conduct for business taxation, with the scope of assessing tax measures considered harmful or discriminatory and improving system transparency and exchanges of information among tax administrations. The report was completed in 1999 (Primarolo Report) and out of the more than 2000 measures examined, identified 66 harmful measures such as discriminatory taxation and special regimes. The report addresses distortionary tax breaks, particularly advantages granted to non-residents, other advantages shielded from the domestic tax base and relaxed rules of profit determination for activities in the case of cross border transactions (multinational

groups). However, the rollback of these measures was postponed from 2003 to 2005 and further to 2010.

It should also be noted that the code is not legally binding as countries have expressed a voluntary commitment to abide by it. Furthermore, the code of conduct needs to be extended to third countries to be more effective.

## 8. Conclusions

The aim of the paper was to assess whether, in accordance with the prescriptions of the basic model of tax competition, in an environment of high capital mobility countries have engaged in some form of tax competition and in particular, whether corporate income taxation has declined significantly across countries. The paper also reviewed some of the arguments set forth to resolve the apparent inconsistency between theory prescriptions and the practice adopted by countries.

Based on several tax indicators available from recent empirical studies and examined in the paper, no strong conclusion can be drawn regarding countries' practice in the area of tax competition. Although statutory tax rates on corporate income declined significantly from 1983 to 2001 in all EU countries, revenues from corporate income as a share of GDP have remained fairly stable over the past decades. Furthermore, corporate taxation as measured by indicators of effective taxation (EATR and EMTR, both forward-looking and backward-looking) has decreased by much less than statutory tax rates and converged somewhat across countries.

With reference to forward-looking effective tax indicators, large countries recorded on average a smaller decline of effective average tax rates compared to small countries. If large countries are those who benefit most from location-specific rents, a possible conclusion is that in those countries' agglomeration forces and locational rents have sheltered taxation from competition (Baldwin and Krugman, 2000). Furthermore, in a recent study Devereux (Devereux *et al.* 2002) produced evidence that effective average tax rates have declined more than effective marginal tax rates and that the reduction of effective average tax rates has been larger for higher profitability investment. Therefore, tax reforms appear to be consistent with a model of imperfect competition where, in the presence of pure economic profits, firms take discretionary investment decisions regarding their location and countries try to attract more profitable projects by reducing effective average tax. Both studies point at areas which deserve further investigation in future work.

To explain why reductions of statutory tax rates have largely outweighed reductions of marginal and average effective rates, one must again depart from the prescription of the traditional model. In particular, if multinationals operate income shifting between jurisdictions (for instance by using transfer prices) to exploit local low tax rates, then one might expect that countries might compete for allocation of taxable bases by reducing statutory tax rates (Haufler and Schjelderup, 2000).

With reference to backward-looking effective tax indicators based on aggregate data, one would notice a much smaller decline over time when compared with forward-looking indicators. A possible explanation is that since they are ex-post indicators, they embody the result of tax planning activities and tax engineering performed by corporations. Furthermore, backward-looking indicators based on firms' micro data highlights that major differences between tax rates depend on sectors of activity and firm size. In particular, differences across sectors might indicate different degrees of competition, different financial structures of firms and different profitability of sectors. Size is also relevant in that lower tax rates paid by larger companies might indicate a stronger potential for tax planning. This confirms that tax engineering might have a relevant impact on corporations' tax burden.

The above conclusion supports the need for some form of tax co-ordination in order to prevent harmful competition. Against this background, the EU Council adopted a resolution on a Code of Conduct for business taxation with the scope of assessing tax measures considered harmful or discriminatory and improving system transparency and exchanges of information among tax administrations. However, the rollback of these measures was postponed from 2003 to 2005 and further to 2010.

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