

# **Capital income taxation in Europe**

**Trends and trade-offs**

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## Preface

European integration evolves. Markets become more integrated, businesses are increasingly operating internationally and capital mobility is growing. This process is accommodated by developments in European policy such as the creation of an internal market, centralisation of monetary policy, and coordination of economic policies by means of guidelines, information exchange and peer pressure. Economic policies not only accommodate but also respond to increasing market integration: competition policy has partly been moved to a central European level while individual governments increasingly compete with their institutions for internationally footloose capital.

CPB's unit on European Comparative Analysis conducts research projects on the interaction between market integration in Europe and the coordination of economic policies. In the underlying report, the focus is on tax policies. The main question is whether tax coordination should be the next step in the European integration process as a response to the increasing integration of markets. To answer this question, the authors bring together the economic literature on tax competition, an analysis of trends in capital income tax systems, and an overview of the European policy discussion on tax coordination. In this way, they provide a guide to the debate and aim to help policy makers in structuring their ideas and in clarifying the choices they face.

The study was conducted by Joeri Gorter and Ruud de Mooij, both from the European Comparative Analysis unit at CPB. They thank Lans Bovenberg for fruitful discussions during the course of this project. They also benefited from helpful comments on earlier drafts by Casper van Ewijk, George Gelauff and Jan Koeman. Kathy Schuitemaker was very helpful in finalizing the report.

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# 1 Introduction

To what extent does internationalisation of business trigger reforms in European capital income tax systems and vice versa? Would tax coordination among European countries be an appropriate response to internationalisation? And if it is, how should member states go about doing it? This study elaborates on these and other issues in the context of capital income taxation in the European Union.

It is by now a commonplace to state that capital markets integrate, especially in the European Union (EU). Indeed, portfolios become more international, cross border mergers are daily business, and never before has there been so much foreign direct investment. The creation of the internal market for financial services and the completion of EMU amplify this trend.

Capital market integration has important implications for capital income taxation. For instance, it raises compliance costs for both multinational corporations and governments: in the EU, the first now have to deal with fifteen distinct tax administrations and their complex interactions; the latter face the difficult task to monitor international capital income. Moreover, internationalisation increases the opportunities for profit shifting by multinationals, thereby threatening the budget in high-tax countries. And last but not least, capital market integration intensifies tax competition among governments: it prompts governments to set low effective tax rates in order to lure internationally mobile capital.

Capital market integration has thus not only provoked national tax reform, but has also kicked up dust in the EU policy debate on tax coordination. This debate is not new. Already in 1975, the European Commission (EC) proposed minimum and maximum corporate income tax rates in the EU. Member states brushed this proposal aside by arguing that harmonisation of tax rates is meaningless without a harmonisation of tax bases. In 1988, the EC launched a draft proposal for harmonisation of tax bases while a report by the Ruding Committee in 1992 on company taxes suggested steps towards harmonisation of both tax bases and tax rates. Again, these proposals did not gain approval. Recently, the EU laid down a code of conduct with respect to harmful tax practices. This approach has been more successful: in 1997, member states committed themselves to the code; in 1999 the Primarolo working group blacklisted a number of harmful tax practices, resulting in peer pressure among member states to discard these practices. Nevertheless, the code is non-binding and narrow in scope. This raises questions: should Europe go beyond the code? And if so, what would be a fruitful direction for tax coordination?

Pleas for tax coordination usually originate in inefficiencies associated with tax competition. In particular, the main tenet of tax competition theory is that it prompts governments to set inefficiently low tax rates on internationally mobile capital. The result of this fiscal externality would be either inefficiently low levels of public good provision, or inefficiently high tax rates on less mobile production factors such as labour. The central tenet of a different strand of literature

is, however, that tax competition is an effective means to discipline governments which have a natural tendency to set too high tax rates. Thus, a trade-off exists between the fiscal externality of tax competition and the alleviation of government failures: solving the first problem aggravates the second, and vice versa.

Where do we currently stand on this trade-off? The present state of tax coordination is minimal: it only entails a few directives and a non-binding code of conduct. This suggests that a (marginal) increase of tax coordination is likely to be a move towards the optimal mix of tax competition and tax coordination.

Still, it is by no means obvious *how* member states should go about coordinating their tax codes. This is due to another trade-off: coordination of tax codes puts a backstop on tax competition, but infringes upon the diversity in tax systems. This latter entails a cost because countries can no longer pursue the policies that best reflect the preference of their citizens. Less far reaching proposals for tax coordination respect tax diversity, but fail to alleviate most of the negative externalities associated with tax competition. There are, moreover, subtle trade-offs in the design of tax coordination related to the to the simplicity of taxation, to the incentives to compete for real investments, and to the scope for profit shifting. This study aims to clarify these trade-offs so that policy makers are better informed in making their decisions.

## 1.1 Main findings of the study

The study contains four main building blocks, presented in four chapters. First, it contains an European comparative analysis of the systems and levels of capital income taxation, primarily from a national point of view. Second, the study explores the tax treatment of international capital flows in Europe and the behavioural responses to these taxes. Third, we examine how governments respond to each other in a world of internationally mobile capital. Finally, the study contains an assessment of a number of proposals for tax coordination.

In chapter 2 we elaborate on the differences in capital income tax systems in the EU and their development during the last decade. We draw three conclusions from this analysis. First, capital tax rates in Europe have decreased: tax rates on interest, dividend, and retained profit have unambiguously declined, both due to lower statutory corporate tax rates and lower personal tax rates on capital income. Secondly, capital income tax systems have *not* converged. Indeed, we find that capital tax systems have become more dissimilar in their mix of taxation of interest, dividend, and retained profit. Thirdly, capital income taxation has become *less* neutral. This is because the undertaxation of interest relative to dividend and retained profit has not been resolved. In addition, the undertaxation of retained profit relative to dividend has become more pronounced.

Chapter 2 also analyses the development in effective tax rates in Europe. We stress that effective tax rates should be interpreted with care. The reason is that different calculation



methods exist, all with their own merits and demerits and all with different conclusions. Our conclusion is that the main use of effective tax rates lies not in cross-country comparison, but in inferring trends. In analysing these trends we find that, unlike the statutory tax rates, effective capital income tax rates have remained constant in Europe during the last decade. Indeed, the decrease in statutory rates has been accompanied by a broadening of tax bases.

In chapter 3 we focus on the taxation of international capital flows, primarily corporate income taxation. On the basis of recent literature, we conclude that effective corporate taxes have a significant impact on the international allocation of investments. Furthermore, cross-country differences in statutory tax rates are found to have important implications for the distribution of corporate profits across affiliates in various countries. This profit shifting intensifies in light of the internationalisation of business, the growing importance of intangible investments and the rise in intra-company trade.

In chapter 4 we elaborate on tax competition. Strategic tax setting behaviour by individual governments leads to several inefficiencies associated with fiscal spillovers. These reflect some kind of ‘market failure’ in the context of competition among governments and provide a case for tax coordination. This case, however, should be qualified. Tax competition can be welfare improving to the extent that it exerts a positive impact on the efficiency of government policies. Moreover, model simulations suggest that the welfare effects from tax coordination will be unequally distributed, both over countries and over interest groups within countries. For instance, large countries and poor residents tend to benefit more from tax coordination than small countries and rich residents, if the latter gain at all. This uneven distribution may impede the implementation of tax coordination. Consequently, the case for tax coordination is more subtle than a first glance at fiscal spillovers would suggest.

In chapter 5 we discuss several forms of tax coordination that go beyond the current state of affairs. All proposals infringe upon the sovereignty of member states. However, the way in which they do differs markedly. Proposals impact differently upon administrative and compliance cost, the fiscal spillovers associated with tax competition, and the distortionary impact of tax differentials for the international allocation of resources. The trade-offs in capital income taxation imply that if a proposal does well on one score, it tends to do worse on another. Therefore, it is impossible to proclaim a winning proposal.

Our analysis suggest that *tax base harmonisation* will typically improve neutrality and simplicity. However, it does not reduce the opportunities for profit shifting, unless formula apportionment is introduced. Formula apportionment and harmonisation of *statutory tax rates* eliminate profit shifting, but hardly improve upon simplicity. A *minimum effective tax rate*, to some extent, respects the fiscal sovereignty of member states, and reduces the possibilities for tax competition and profit shifting. This proposal increases, however, the administrative burden of taxation. A full *harmonisation of tax rates and bases* outperforms all other proposals on neutrality, fiscal spillovers, and simplicity. A European corporate income tax is most attractive in

these respects. It yields economies of scale in tax collection and it avoids the political, technical and economic problems associated with formula apportionment and separate accounting. However, one has to accept that 'one size fits all' infringes most upon diversity.

## 2 Capital income taxation in the EU

Countries differ substantially in the way and the level at which they tax capital income. These differences originate in historical developments in economic, legal and social structures, different political traditions, country size, the desirable size of the public sector, and the acceptability and feasibility of various taxes. This chapter sheds light on the differences in capital income taxation in the European Union. We explore also the developments in these taxes during the last decade.

### 2.1 Capital income tax systems

A glance at tax codes of EU countries reveals an array of distinct taxes: there are corporate income taxes, net worth taxes, corporate real estate taxes, payroll taxes, corporate social security contributions, withholding taxes on dividend, interest, and royalties, value added taxes, personal income taxes, wages taxes, capital gains taxes, net wealth taxes, personal real estate taxes, personal social security contributions, inheritance and gift taxes, and more. Which ones are capital income taxes? Moreover, countries operate split rate, dual and imputation systems in which corporate and personal income taxes interact. How does this impact upon capital income taxation? Clearly, a simplifying model is needed.

#### 2.1.1 A simplified framework

A convenient starting point is the system of national accounts (Sinn, 1987). Its basic relation is the identity 'net national product equals net national income'

$$f(K, L) - \delta K \equiv wL + rD + \Pi \quad (2.1)$$

where  $f(K, L)$  denotes gross national product,  $\delta$  the depreciation rate,  $K$  the capital stock,  $w$  the wage rate,  $L$  employment,  $r$  the interest rate,  $D$  the stock of outstanding debt, and  $\Pi$  profit. This profit comprises three elements: the normal return to capital (equal to the interest rate), a risk premium, and an economic rent. Profits can be decomposed into distributed profit (or dividend)  $\Pi^d$ , and retained profit  $\Pi - \Pi^d$ . The terms on the right hand side of identity (2.1) correspond, in addition to labour income  $wL$ , to the capital income categories interest  $rD$ , dividend  $\Pi^d$ , and retained profit  $\Pi - \Pi^d$ . Taxes on these capital income categories are capital income taxes.

Companies can be divided into incorporated and unincorporated businesses. The latter are usually taxed under the personal income tax. In this book, we concentrate on the taxation of

capital income generated by corporate businesses. In that case, the total tax burdens on interest, dividend, and retained profit equal

$$\tau_p rD \quad (2.2)$$

$$\tau_d \Pi^d + \tau_{pd} (1 - \tau_d) \Pi^d \quad (2.3)$$

and

$$\tau_r (\Pi - \Pi^d) + \tau_c (1 - \tau_r) (\Pi - \Pi^d) \quad (2.4)$$

where  $\tau_p$  denotes the personal income tax rate on interest,  $\tau_d$  the corporate and  $\tau_{pd}$  the personal tax rate on dividend,  $\tau_r$  the corporate income tax rate on retained profit, and  $\tau_c$  the personal income tax rate on capital gains. It may be noted that interest escapes corporate income taxation due to its deductibility from the corporate income tax base. There is, however, ‘economic double taxation’ of dividend and retained profit. The first terms of expressions (2.3) and (2.4) refer to the corporate, the second terms to the personal income tax burden. The economic double taxation of dividend is salient: it constitutes taxable corporate as well as taxable personal income. The economic double taxation of retained profit is more subtle: it constitutes taxable corporate income, and induces a proportionate appreciation of outstanding stocks. This appreciation is subsequently taxed through the personal capital gains tax (if applicable in a country).

### 2.1.2 Integration systems

Relief for economic double taxation is, perhaps because of its salience, focussed on dividend. Various ‘relief systems’ or ‘integration systems’ coexist. We sum them up with help of the tax rates defined above. Germany has a *split rate* system. It sets a relatively low corporate income tax rate on dividend, i.e.  $\tau_d < \tau_r$ <sup>1</sup>. France, Finland, Ireland, Italy, Spain and the UK have *imputation* systems. These countries impute a proportion  $\alpha$  of net dividend as a tax credit to individual shareholders. It seems more natural to impute a proportion of the corporate income tax on dividend (as done in Portugal and Denmark). This does, however, come down to the same thing. The effective personal income tax rate on dividend changes according to the equation  $\tau_{pd}' = \tau_{pd} + \tau_{pd}\alpha - \alpha$ . The first term on the right hand side corresponds to the personal income tax rate on dividend; the second term to the practice that the tax credit constitutes taxable

<sup>1</sup> Germany is about to discard the split rate tax system.

personal income; the third term to the tax credit itself. It may be noted that the inequality  $\tau'_{pd} \leq \tau_{pd}$  holds for all parameter configurations that make economic sense. Thus, imputation always leads to a reduction of total tax burden on dividend. This burden becomes

$$\tau_d \Pi^d + \tau'_{pd} (1 - \tau_d) \Pi^d \quad (2.5)$$

Austria, Belgium, Luxembourg, the Netherlands, and Sweden have a *classical* system. They do not set reduced tax rates on dividend, nor do they impute net dividend to individual shareholders. The Netherlands, however, replaced its personal income tax on interest and dividend by a net wealth tax in 2001 (see box).

Note that relief systems are not mutually exclusive. For instance, Germany combines the imputation system with the split rate system. Finland, among other countries, combines the imputation system with a *dual* tax system: it sets a relatively low personal income tax rate on dividend, i.e.  $\tau_{pd} < \tau_w$ , where  $\tau_w$  denotes the personal income tax rate on labour income.

Relief for double taxation of retained profit is less common. Nevertheless, some countries do set relatively low capital gains tax rates. Often a distinction is made between speculative and non speculative capital gains by tracking the number of years shares are being held by individual shareholders. A few countries completely exempt capital gains.

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#### **Dutch tax reform in 2001 and neutrality of capital income taxation**

In January 2001, the Netherlands have replaced the comprehensive personal income tax on interest and dividends by a schedular tax of 30% on a presumptive return of 4%. This tax boils down to a net wealth tax of 1.2%. Bovenberg and Ter Rele (1998) have explored the implications of this reform for the incentives to save and invest, using the methodology developed by King and Fullerton (1984).

Their results suggest that the reform has a number of implications for the neutrality of taxation. First, by lowering the marginal tax burden on capital at the personal level, it reduces the relative tax advantage of tax exempt institutional savings (like pension savings). Secondly, the reform causes less distortions in the choice between financing investment through retained earnings and new equity. This is because, unlike the previous tax system which leaves capital gains untaxed, the new system applies a uniform personal tax rate on interest, dividend and capital gains. By alleviating the tax-favoured treatment of capital gains, this also alleviates the favourable tax treatment of saving through funds that generate only capital gains. Finally, the reform intensifies the discrimination of debt finance over equity finance since it eliminates the tax advantage of capital gains at the personal level. Hence, it will probably aggravate the problem of thin capitalization.

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### 2.1.3 A characterization of tax systems

Now we have derived expressions for the tax burdens on interest, dividend, and retained profit, we are in the position to present our model of capital income taxation. By dividing the tax burdens (2.2), (2.3), and (2.4) by, respectively  $rD$ ,  $\Pi^d$ , and  $\Pi - \Pi^d$ , we arrive at a vector of three total tax rates on interest, dividend, and retained profit

$$[\tau_p, \tau_d^*, \tau_r^*] \quad (2.6)$$

where the equation  $\tau_d^* = \tau_d + \tau_{pd}' - \tau_d \tau_{pd}'$  corresponds to the total tax rate on dividend, and  $\tau_r^* = \tau_r + \tau_c - \tau_r \tau_c$  to the total tax rate on retained profit. The first terms on the right hand sides of the equations refer to corporate income taxation, the second to personal income taxation, and the third to the reduction of the personal income tax base due to integration relief. The rationale behind this model is that capital owners should not be interested in corporate and personal income tax rates separately, but rather in how they interplay to determine the total wide tax rate, that is, in the proportion of gross capital income that ends up in the treasury's coffers.<sup>2</sup>

Sinn (1987) provides a rigorous theoretical foundation for the model by demonstrating that within a dynamic general equilibrium framework only these rates directly impact upon the financing and investment behaviour of the representative capital owner. Admittedly, tax rates that directly apply to capital stock, such as net worth and net wealth tax rates, should also matter. They are, however, insignificant from the perspective of tax revenue (except for the Netherlands after 2001). We will come back to the impact of taxes on investment behaviour at the end of this chapter.

## 2.2 Developments of capital income taxation

What are the recent developments of EU capital income tax systems  $[\tau_p, \tau_d^*, \tau_r^*]$ ? Our international comparison comprises three questions: (1) have capital income tax rates decreased, (2) have capital income tax systems converged, and (3) is there a trend towards neutrality?

Table 2.1 lists the capital income tax systems of all EU countries for 1990 and 2000. Details from the tax codes of corporate and personal income tax rates that constitute the basic building blocks of the capital income tax systems have been relegated to the appendix to this chapter. Before discussing the figures in table 2.1, a few remarks are necessary. First, the figures refer to tax rates set by the central government, exclusive of local taxes. These local taxes are quite important in some countries, for instance in Germany (the Gewerbesteuer). Given the complexity

<sup>2</sup> Here, we focus on domestic investors who invest in domestic firms. For foreign investments, the distinction between corporate taxes (levied on a source basis) and personal taxes (levied on a residence basis) does matter (see chapter 3).

of local taxes and their interactions with federal corporate taxes, however, we decided to exclude them from our table. Secondly, table 2.1 ignores surtaxes. A surtax is a tax on corporate tax (rather than on corporate income) and is often imposed as a temporary measure. Thirdly, we do not take account of graduated tax structures but instead report the top marginal tax rate on corporate profits. Some countries, such as the UK, set a relatively low tax rate on small businesses. Finally, we take no account of the special corporate tax rates to different types of businesses. For instance, Ireland adopts a special 10% tax rate for income from manufacturing and companies in the financial centre of Dublin. The appendix does describe the various country-specific elements in corporate tax systems in Europe.

**Table 2.1 Total tax rate on dividend, retained profit, and interest, EU 1990/2000**

	interest ( $\tau_p$ )		dividend ( $\tau_d^*$ )		retained profits ( $\tau_r^*$ )	
	1990	2000	1990	2000	1990	2000
Austria	50	25	48	51	65	34
Belgium	25	55	56	73	41	39
Denmark	40	15	55	59	64	32
Finland	30	29	29	29	57	50
France	57	54	59	54	73	69
Germany	53	51	53	51	77	71
Great Britain	40	40	48	48	61	58
Greece	50	15	46	40	73	67
Ireland	56	24	46	59	77	39
Italy	50	27	58	46	68	65
Luxemburg	56	46	71	46	71	62
Netherlands	60	60	74	74	35	35
Portugal	40	40	58	48	43	39
Spain	56	40	74	45	74	61
Sweden	25	30	55	50	55	50
Mean	45.9	36.7	55.3	51.5	62.3	51.4
Standard deviation	11.8	14.5	11.8	11.5	13.6	14.1

Source: IBFD (2000)

Table 2.1 reveals that the total tax burden on interest ranges from a low of 25% (Belgium and Sweden) to a high of 60% (Netherlands) in 1990, and a low of 15% (Denmark and Greece) to a high of 60% (Netherlands) in 2000. The tax rate on dividend ranges from 29% (Finland) to 74% (The Netherlands) in 1990 and 2000. The width of the range is predominantly caused by differences in capital tax systems, not by differences in headline rates. In particular, Finland has a full imputation system, where all corporate income tax can be credited against personal income tax liability, whereas the Netherlands has a classical system, where no double taxation relief is given. The tax rate on retained profits ranges from 41% (Belgium) to 77% (Germany) in 1990, and from 32% (Denmark) to 71% (Germany) in 2000. The width of the range is predominantly caused by differences in tax bases, again not by differences in headline rates.

Belgium and Denmark exempt capital gains from personal income taxation, whereas Germany taxes them fully. It should, however, be noted that the Danish tax rate is somewhat biased since local tax rates, not included in table 2.1, constitute a relatively important part of the Danish tax system (see appendix).

### 2.2.1 Have tax rates declined?

From table 2.1 it is immediately apparent that tax rates have unambiguously decreased over the past decade: the mean tax rates on interest, dividend, and retained profit have changed from 46% to 37%, from 55% to 52%, and from 62% to 51%. The t-statistics of the tests for two population means with paired comparisons are -2.1, -1.2, and -3.4 for interest, dividend, and retained profit. Thus, the decrease is statistically significant for interest, and retained profit, albeit not for dividend. The mean tax rate on interest has decreased because Austria, Greece, and Ireland have replaced taxation of interest through the personal income tax by a final withholding tax with a significantly lower rate. But also the tax rates in Denmark, Italy and Spain fell by more than 10%-points. The mean tax rate on retained profit has decreased for the same reason, but even more because Austria, Denmark, and Ireland have expelled capital gains from the personal income tax base. In chapter 4 we will discuss what may have prompted these countries to do so. At this stage we merely stress that the first 'stylised fact' from the international comparison is a clear decrease in capital income tax rates. As becomes apparent from the appendix, this is due to both lower corporate income tax rates and lower personal income tax rates.

### 2.2.2 Have tax systems converged?

Table 2.1 shows an increase in the standard deviations of tax rates on retained profit and interest. This does not mean, however, that capital tax systems have diverged. The reason is that row observations are paired because they belong to the same country. It is conceivable that, even though the variation of capital taxes have increased, capital tax *systems* have converged. Thus, in order to verify whether EU integration in the last decade has induced convergence, a slightly more complicated analysis is necessary.

Systems of capital taxation can be represented by points in the three dimensional space spanned by the tax rates on dividend, retained profits, and interest. For example, the Dutch system of capital taxation can be represented by the point (60, 74, 35), where the coordinates refer to the Dutch total tax rates on interest, dividend, and retained profits. The set of EU systems is then a scatter of fifteen points. If the points are closely bunched around the scatter's centre of gravity then EU systems of capital taxation are alike; if the points are jumbled across space then EU systems of capital taxation are unlike. The mean distance from the centre of gravity measures the degree to which capital tax systems are alike. Hence, it is a *dissimilarity* indicator. If it decreases, capital tax systems converge; if it increases, capital tax systems diverge. It is easy to verify that its 1990 value is 18.9 and its 2000 value 20.8. The reason for this

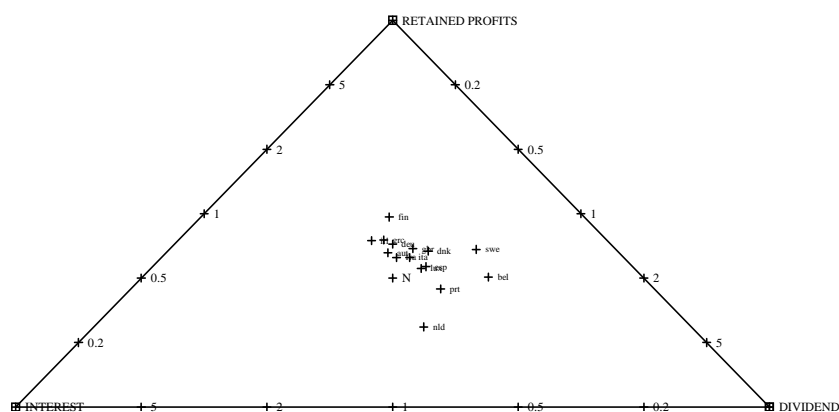


increment that the Austrian, Danish, and Greek capital tax systems have become more idiosyncratic. In short, the second ‘stylised fact’ from the international comparison is divergence of capital income tax systems.

### 2.2.3 Have systems become more neutral?

If tax rates on interest, dividend, and retained profit, differ, they alter the way in which investment is financed or the way in which savings are held. For example, the relative undertaxation of interest induces ‘thin capitalisation’ -financing by debt rather than equity- which may be costly if small yet efficient corporations have difficulties in issuing bonds in an imperfect capital market. We ask whether the relative tax rates on dividend, retained profit, and interest have converged, in other words, whether capital tax systems have become more neutral.

Figure 2.1 Tax triangle, 1990

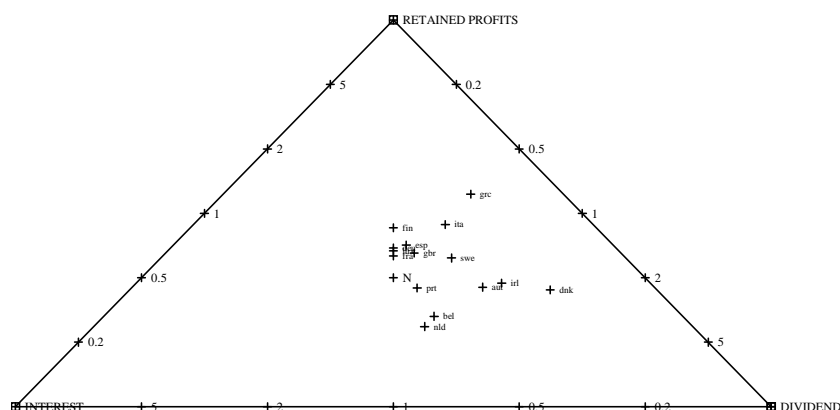


Figures 2.1 and 2.2 display the ‘tax neutrality triangles’ for 1990 and 2000.<sup>3</sup> A point in a triangle represents a capital income tax system. Its proportion of tax rates on interest and dividend can be read off the horizontal side by drawing a line emanating from the retained profit corner through that point. Similarly, its proportion of tax rates on dividend and retained profit can be read off the right hand side by drawing a line emanating from the interest corner through that point. Finally, its proportion of tax rates on retained profit and interest can be read off the left hand side by drawing a line from the dividend corner through that point. The points in the

<sup>3</sup> For details about the construction of this type of triangles see Leamer (1987).

middle, labelled  $N$ , represent a perfectly neutral tax system. The actual tax system are bunched around it. Of course, the closer an actual tax system is to  $N$ , the more neutral it is; the closer it is to a corner, the more it discriminates against the respective kind of capital income.

**Figure 2.2** Tax triangle, 2000



Most countries lie north of  $N$ , which implies that most countries overtax retained profit, both relative to interest and dividend. No country lies southwest of  $N$ , which implies that no country overtaxes interest. In general, the closer a country is to  $N$ , the more neutral is its tax system. Thus, the distance from  $N$  is an indicator of the non-neutrality of a capital tax system. Similarly, the mean distance from  $N$  is an indicator of the neutrality of the set of capital tax systems. Its 1990 value is 0.12 and its 2000 value is 0.15. The main reason for the increase is that Austria, Denmark, and Ireland, have joined Belgium, the Netherlands, and Portugal southeast of  $N$ . In other words, the incidence of overtaxation of dividend has increased. The third 'stylised fact' from the international comparison is a trend away from neutrality.

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## Merits and demerits of different effective tax rates

Effective tax rates (etr's) are rough proxy variables that summarize the interaction of various tax rules on an investment. They can be computed in several ways. Each method has its own merits and demerits; there is not a single preferred methodology (OECD, 2000c). The various methods differ in three important ways.

- **Forward looking versus backward looking methods**  
Forward looking etr's are usually based on tax codes. Their advantage is that they measure the impact of taxes on *new* investment projects. Instead, backward looking methods refer to *existing* capital. The etr's on existing and new capital differ because the mix of new investment can differ from that of existing assets. Moreover, the tax burden on existing capital can be distorted by the carryforward of losses or tax credits. Compared to the forward looking methods, the backward looking methods have the advantage that they take account of tax planning activities, complex tax provisions and discretionary administrative practices of tax authorities.
- **Average versus marginal tax rates**  
Marginal etr's measure the wedge between the pre- and post tax return on a marginal investment project that does not yield an economic rent. Hence, it measures the incentive effects of taxes on marginal investment and/or savings decisions. Average etr's measure the overall tax burden on a typical investment. This can be important for decisions regarding lumpy investment, investment in the presence of imperfect competition, or for locational decisions of firms. Further, the average etr's give an indication of the tax that bears on companies which may be important for distributional reasons.
- **Corporate versus capital income tax**  
Etr's can either refer to the tax burden on corporations or on the overall tax burden on capital income that is levied on the corporate and the personal level.

In this chapter, we distinguish four methods to compute etr's with the following properties and problems:

**Macro data:** Ratio of capital income tax and operating surplus based on macro data.

*Properties:* backward looking method; average etr; tax burden on capital income

*Problem:* consolidation of non-incorporated enterprises

**Micro data:** Ratio of corporate tax liabilities and pre-tax corporate income.

*Properties:* backward looking method; average etr; tax burden on corporation

*Problem:* consolidation of foreign subsidiaries; sensitive to differences in accounting principles

**King-Fullerton:** Wedge between the pre and post tax rate of return on a marginal investment.

*Properties:* forward looking method; marginal etr; tax burden on capital income

*Problem:* sensitive for assumptions regarding inflation, interest rate and investment behaviour

**Project-based:** Present value of corporate income tax liabilities on profits of a hypothetical investment divided by the present value amount of net profits.

*Properties:* forward looking method; average etr; tax burden on corporations

*Problem:* sensitive for assumptions regarding inflation, interest rate, company type

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## 2.3 Effective tax rates

So far, we have concentrated on capital income tax rates that can directly be constructed from the tax codes. However, differences between capital income tax *bases* also impact upon the behaviour of capital owners. In particular, international differences between depreciation allowances for machinery and buildings, valuation of inventories, general investment reliefs, the treatment of reserves and provisions, and the tax treatment of capital gains at the company level cause differences between the taxable corporate income of two otherwise equivalent corporations (see OECD, 1991 for a review). Similarly, international differences between the treatment of health insurance premiums, social security contributions, pension savings, and education expenses cause differences between the taxable personal income of two otherwise equivalent persons. Therefore, tax payments differ, even if tax rates would be the same. This calls for information about tax codes that supplements statutory tax rates. It is provided by so-called *effective* tax rates, which usually -but not always- refer to tax payment divided by a measure of taxable income. They capture the entire capital or corporate income tax system in one single number. Although in many instances this figure provides a highly desirable summary of the capital income tax system, it may not do justice to underlying aspects that are important economically.

Effective tax rates can be computed in alternative ways. Each method of computation has its merits and demerits and different effective tax rates measure different things. Hence, there is no such thing as *the* effective tax rate. The box reviews a number of methodologies to calculate the effective tax rates.

### 2.3.1 Effective tax rates on the basis of macro data

We first calculate time series of effective capital income tax rates according to the method of Mendoza *et al.* (1994). That is, we divide the sum of the corporate income tax and personal capital income tax by the total operating surplus of the economy. Thus, these effective capital income tax rates correspond to the total tax rates listed in table 2.1. To be precise, they correspond to the weighted mean of the total capital income tax rate that *actually* applies, where the weights are the proportions of dividend, retained profit, and interest in capital income. Table 2.2 lists the effective capital income tax rates. The OECD tax revenue statistics and national accounts allow calculation of these rates for only a subset of the EU countries up to 1997.

Table 2.2 reveals relatively high effective tax rates for the UK and Sweden and relatively low rates for Germany and France. Across time, the effective tax rates are fairly constant, although we observe a gradual decline for Sweden and Finland.

**Table 2.2** Mendoza effective tax rates

	1990	1991	1992	1993	1994	1995	1996	1997
Austria	.	.	.	.	.	.	.	.
Belgium	33	33	33	35	37	37	36	38
Denmark	.	.	.	.	.	.	.	.
Finland	45	58	53	34	32	32	37	.
France	26	26	25	26	25	26	28	30
Germany	.	27	28	28	25	25	24	23
Great Britain	55	54	45	43	42	47	47	.
Greece	.	.	.	.	.	.	.	.
Ireland	.	.	.	.	.	.	.	.
Italy	30	32	35	38	33	33	34	.
Luxemburg	.	.	.	.	.	.	.	.
Netherlands	31	33	32	35	29	28	31	.
Portugal	13	16	18	16	15	16	.	.
Spain	.	.	.	.	.	.	.	.
Sweden	73	68	54	53	50	41	53	.

Source: own calculations on the basis of OECD tax revenue statistics and national accounts.

Mendoza's method of calculating effective capital income tax rates is, although widely used, not undisputed. A fundamental problem is that tax revenue statistics do not attribute tax revenue to capital income per se, but to corporate and personal income. Similarly, national accounts do not list capital income per se, but operating surplus of corporate and unincorporated enterprises and property and entrepreneurial income of households. Therefore, the effective capital income tax rate -capital income tax divided by capital income- can only be calculated with some ingenuity in extracting the required information from the available data. For this reason, a number of authors have sought to refine Mendoza's method. For example, Volkerink and De Haan (1999) exploit additional data sources in calculating their effective capital income tax rates. Table 2.3 lists these rates.

Does it matter whether one uses 'Mendoza' or 'Volkerink' rates? The Mendoza rates tend to be higher. What is important, however, is that the differences between the rates vary across countries, but are virtually constant over time. To illustrate, the effective tax rates for Italy and the UK decline substantially more due to the Volkerink adjustment than the rate for the Netherlands. This implies that international comparisons at a particular point in time should be made with caution, but that trends can be inferred with confidence.

**Table 2.3** Volkerink effective tax rates

	1990	1991	1992	1993	1994	1995	1996
Austria	19	20	22	.	.	.	.
Belgium	.	.	.	.	.	.	.
Denmark	.	.	.	.	.	.	.
Finland	24	27	23	.	.	.	.
France	24	26	25	.	.	.	.
Germany	.	.	.	.	.	.	.
Great Britain	41	38	31	31	31	34	36
Greece	.	.	.	.	.	.	.
Ireland	.	.	.	.	.	.	.
Italy	20	21	25	27	23	23	24
Luxembourg	.	.	.	.	.	.	.
Netherlands	26	27	26	30	27	26	30
Portugal	.	.	.	.	.	.	.
Spain	.	.	.	.	.	.	.
Sweden	.	.	.	.	.	.	.

Source: Volkerink and De Haan (1999)

A salient feature of either the Mendoza or Volkerink rate is that they show no discernable decreasing trend. This appears to be at odds with the clear decreasing trend that we derived above. Both phenomena can, however, be reconciled by a broadening of the capital income tax base. The simultaneous reduction in rates and broadening of bases appears to be the quintessential 'stylised fact' of the recent developments in capital income taxation, and indeed of income taxation in general<sup>4</sup>.

### 2.3.2 Effective tax rates on the basis of micro data

An alternative method of calculating effective tax rates is based upon micro data from the financial accounts of individual firms (MARC, 1999). The corporate income tax paid by the firm is divided by its pre tax corporate income. The median ratio in a country is then the effective tax rate (the mean is too sensitive for outliers if there is a limited number of firms). Table 2.4 lists the median effective corporate income tax rates for all EU countries from 1990 to 1999. For Luxembourg, the small number of observations causes a rather large volatility in effective tax rates. We therefore do not report these figures.

<sup>4</sup> See for example recent studies by the EC (2000) and the OECD (2000a).

**Table 2.4**      **Worldscope effective tax rates**

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Austria	18	22	14	16	20	17	24	25	21	24
Belgium	17	16	22	23	23	24	23	22	21	17
Denmark	33	32	30	30	32	32	31	31	32	31
Finland	45	37	34	24	26	27	28	28	28	28
France	33	33	33	33	33	36	35	38	38	38
Germany	48	49	49	44	41	41	41	40	40	41
Great Britain	33	31	31	30	30	30	30	29	29	29
Greece	11	11	24	29	29	31	33	35	35	35
Ireland	20	22	19	20	17	22	21	21	24	22
Italy	38	41	47	50	44	46	45	43	44	40
Luxembourg <sup>a</sup>	.	.	.	.	.	.	.	.	.	.
Netherlands	31	32	32	31	31	31	32	31	31	30
Portugal	17	20	27	25	20	23	22	21	24	25
Spain	27	28	29	27	25	24	26	26	26	29
Sweden	31	32	30	19	28	27	28	28	28	28
Mean	28.7	29	30.2	27.7	28.4	29.3	30	29.8	30	29.8
Weighted mean <sup>b</sup>	35.5	36.1	37.3	35.7	34.1	35	35.1	34.8	34.9	34.6
Standard deviation	10.6	9.8	9.1	9	7.4	7.5	6.8	6.7	6.8	6.5

<sup>a</sup> We do not present figures for Luxembourg because of too few data.

<sup>b</sup> Country medians weighted by GDP.

Source: own calculations on the basis of the Worldscope database

The effective tax rates in table 2.4 are not directly comparable to those of tables 2.2 and 2.3. The reason is that they are *corporate* income tax rates, not *capital* income tax rates. Nevertheless, their trends sketch the same picture: they do not change much, and therefore confirm the stylised fact of a simultaneous reduction in rates and broadening of bases.

Table 2.4 paints a picture that small countries set relatively low effective tax rates, compared to large countries. More specifically, the five largest EU members, Germany, France, Italy, UK and Spain, have an effective tax rate that is, on average over the sample period, 11.2% higher than in the smaller member states (see chapter 4 for a further elaboration on this observation). This is also illustrated by the weighted mean of the effective tax rates in table 2.4 (where we use GDP as weights). Indeed, the weighted mean is, on average over the sample period, 6.1%-points higher than the unweighted mean.

Table 2.4. reveals also that the effective tax rates have converged across countries over the past decade. This is reflected in a gradually declining standard deviation from 10.6 in 1990 to 6.5 in 1999. This may seem at odds with the conclusion from the previous section that capital tax systems have diverged. There are two fundamental differences, however, between the approach of the previous section and the effective tax rates in this section. First, the effective tax rates refer to corporate taxes while the previous section deals with the entire system of capital

income taxation. Secondly, in contrast to table 2.1, the effective tax rates take account of differences in the tax base.

The effective tax rates on the basis of micro data suffer from the practice of consolidating the financial accounts of parents and their foreign controlled corporations. In particular, the Dutch effective tax rate is contaminated by German taxes because Philips consolidates the accounts of the Dutch parent with its German affiliates, subsidiaries, and branches, while the German effective tax rate is contaminated by Dutch taxes because Siemens consolidates the accounts of the German parent with its Dutch affiliates, subsidiaries, and branches. However, one can eliminate this contamination in several ways. Collins and Shackleford (1995) show that these adjustments hardly change the results. This is consistent with MARC (1999) who show that firm characteristics do not have a significant impact on the average tax rate of firms.

### 2.3.3 Marginal effective tax rates on the basis of tax codes

A third class of effective tax rates is calculated on the basis the tax code, not on the basis of tax data. King and Fullerton (1984) derive the 'marginal effective tax rate', the percentage wedge that a tax code drives between the pre and post tax required rates of return on marginal investment projects. In formula form, this is

$$\tau = \frac{p - r}{p} \quad (2.7)$$

where  $\tau$  stands for the marginal effective tax rate and  $p$  denotes the required pre-tax rate of return on a marginal investment (the user cost of capital) which is necessary to offer a post tax rate of return on capital of  $r$ . The term  $p-r$  is the marginal tax wedge that measures the difference between the pre-tax and post-tax returns on capital.

The King-Fullerton effective tax rate in (2.7) can explicitly take into account the fiscal details such as depreciation allowance, inventory valuation, investment incentives, and preferential savings provisions. Hence, the King-Fullerton tax rate intends to capture the main tenets of the tax code that impact upon investment decisions in a single number. In econometric analysis this ex-ante tax rate is to be preferred over the ex-post effective tax rate. This is because of possible simultaneity biases caused by two way causality between investment behaviour and tax revenue. However, one disadvantage of the King-Fullerton rate is that it is difficult to calculate and interpret, another that they are sensitive to minor changes in the assumptions underlying their calculation. For instance, the marginal effective tax rate is sensitive to the assumed interest rate or the inflation rate. Furthermore, it is derived under strong assumptions regarding optimal investment behaviour, perfect competition, a small open economy that cannot exert market power, infinitely divisible investment and decreasing returns to scale with respect to capital in production (OECD, 2000c). For these reasons, the absolute figures of the King-Fullerton rates



are not so informative. However, they can be informative to compare the tax burdens across countries and over time.

Table 2.5 lists the 'King-Fullerton' marginal effective tax rates as given by Chennells and Griffith (1997). Being the percentage wedge between the pre and post tax rates of return that are required by individual shareholders (rather than the corporate management), they comprise both corporate and the personal income taxation. From this perspective, they are more closely related to Mendoza and Volkerink effective tax rates than to the Worldscope effective tax rates. Their method of calculation is, however, fundamentally different.

	1990	1991	1992	1993	1994	1995	1996	1997
Austria	.	.	.	.	.	.	.	.
Belgium	.	.	.	.	.	.	.	24
Denmark	.	.	.	.	.	.	.	.
Finland	.	.	.	.	.	.	.	.
France	12	11	9	9	9	.	.	.
Germany	24	27	27	24	19	.	.	25
UK	17	16	16	12	17	.	.	21
Greece	.	.	.	.	.	.	.	.
Ireland	2	5	4	4	4	.	.	.
Italy	18	19	19	24	25	.	.	.
Luxemburg	.	.	.	.	.	.	.	.
Netherlands	.	.	.	.	.	.	.	20
Portugal	.	.	.	.	.	.	.	.
Spain	21	23	21	20	20	.	.	.
Sweden	.	.	.	.	.	.	.	.

Sources: Chennells and Griffith(1997); CPB (1997)

The marginal effective tax rates suggest that France and Ireland have relatively low rates, as compared to the other reported countries. Compared to the effective tax rates based macro and micro data, the King-Fullerton marginal effective tax rates appear to be rather low. However, their development over time paint a similar picture: their mean value remains constant. Thus, the rate reducing - base broadening trend is again supported.

### 2.3.4 Average effective tax rates from tax codes

Devereux and Griffith (1998a) adjust the King-Fullerton approach in order to calculate the 'average effective tax rate', i.e. the average percentage wedge on a range of *inframarginal* investment projects on which firms earn an economic rent. In the same tradition, Jacobs and Spengel (1999) use the 'European Tax Analyzer', a computer simulation program containing a lot of institutional detail, to calculate the wedge between the pre and post tax wealth of hypothetical firms. The latter methodology is usually referred to as 'project-based' analysis of

effective tax rates. Table 2.6 presents calculations for the average effective tax rate, as derived by Chennells and Griffith.

	1990	1991	1992	1993	1994
Austria	.	.	.	.	.
Belgium	.	.	.	.	.
Denmark	.	.	.	.	.
Finland	.	.	.	.	.
France	17	16	15	14	14
Germany					
Great Britain	18	17	17	17	18
Greece	.	.	.	.	.
Ireland	5	6	5	5	5
Italy	18	18	18	19	19
Luxemburg	.	.	.	.	.
Netherlands	.	.	.	.	.
Portugal	.	.	.	.	.
Spain	20	21	20	20	20
Sweden	.	.	.	.	.

Source: Chennells and Griffith(1997)

Table 2.6 reveals that the average effective tax rate based on tax codes is higher than the marginal effective tax rates from table 2.5. The reason is that many tax deductions apply to the cost of investment projects (which, for the marginal investment project, are equal to the rate of return) but are irrelevant for economic rent.

Again, Ireland appears to be a low-tax country as compared to the other countries analysed. France is more in line with the other countries than with the marginal effective tax rate. The pattern over time suggests a stationary effective tax burden.

### **2.3.5      The interpretation of effective tax rates**

In arguments about tax competition one often refers to *the* effective tax rate. However, there are many different variants. Which one does one mean? The substantial differences between the values of the effective tax rates according to Mendoza *et al.*, and Volkerink and De Haan exemplifies that being vague is not innocuous, not in the least because these *differences* differ across countries. To bring this point home, consider table 2.7, which lists different effective tax rates of the three largest EU countries for 1994.

**Table 2.7**      **Effective tax rates, 1994 (rankings in parentheses)**

	King-Fullerton	Jacobs-Spengel	Mendoza	Worldscope
France	(3) 9	(1) 41	(2) 25	(2) 33
Germany	(1) 19	(2) 37	(2) 25	(1) 41
Great Britain	(2) 17	(3) 20	(1) 42	(3) 30

Sources: Tables 2.2, 2.4 and 2.5 and Jacobs and Spengel (1999).

It may be noted that the ranking of the countries changes radically. Germany tops the list according to the King-Fullerton effective tax rate, France according to the Jacobs-Spengel effective tax rates, and Great Britain according to the Mendoza effective tax rate. This does not necessarily mean that one effective tax rate is ‘false’ and another ‘true’. They simply measure different things. It does mean, however, that each rate on its own does not merit sweeping conclusions about tax systems.

Although differences between effective tax rates vary across countries, they appear to be fairly constant over time. This merits another important conclusion: international comparisons are precarious - we have said it before - whereas trends can be inferred with confidence.

## 2.4 The impact of capital income taxes on saving and investment

Governments motivate the use of capital income taxes on several grounds. Among them, horizontal and vertical equity play an important role. Moreover, governments may find it difficult to distinguish between labour and capital income, e.g. in case of self-employed and small corporate businesses. To avoid tax arbitrage, both incomes are usually taxed at more or less equivalent rates. However, the capital income tax system can have important implications for the capital market. This holds for both the statutory tax rates in  $[\tau_p, \tau_d^*, \tau_r^*]$ , and the determinants of the tax base, captured by the effective tax rates. In particular, capital income taxes change relative prices on capital markets, thereby affecting the size and composition of savings and investments.

### 2.4.1 Effect on savings

Let us start with the impact of capital income taxes on savings. Capital income taxes reduce the net rate of return on savings and thus tend to distort intertemporal decision making by private households. In particular, a lower net rate of return has a ‘substitution’ and an ‘income’ effect that work in opposite directions. On the one hand, a lower net rate of return increases the price of future relative to present consumption and induces substitution of the first by the latter. This adverse effect on savings is caused by the *marginal* (effective) tax rate on capital income. On the other hand, a lower net rate of return decreases life-time wealth by reducing the present value of future earnings and induces efforts towards smoothing of present and future consumption. This

effect, induced by the *average* (effective) tax burden on capital income, implies an increase of savings. Which effect dominates is an empirical issue. The evidence on the compensated elasticity of aggregate savings is inconclusive: some studies suggest that a higher net rate of return has no impact, while others find a mild positive impact, with elasticities ranging from 0.2 to 0.4.<sup>5</sup> The uncompensated elasticity of savings, however, is always negative. Hence, a lower marginal tax rate on savings at a given average tax will unambiguously increase savings.

Capital income tax rates also affect the composition of households' savings portfolios. The relative taxation of different types of capital income, rather than the absolute level of taxation, is of particular importance here. For instance, the preferential tax treatment for retirement savings and owner-occupied housing induces households to engage primarily in these types of saving. Also the non-neutral tax treatment of debt and equity and that of dividend and retained earnings tends to distort household investment portfolios.

#### 2.4.2 Effect on investments

Corporate income taxes are generally thought to distort investment behaviour by firms through several channels. First of all, a corporate income tax reduces the net rate of return on the marginal investment project, inducing firms to invest less than they would otherwise have done. However, interest is deductible from the corporate income tax base. Thus, corporate income taxes should leave the net rate of return on the marginal investment project untouched, provided that it is financed by debt. This leads proponents of the so-called 'optimistic' view to argue that corporate income taxes are immaterial for investment decisions. However, proponents of the 'traditional' and the 'new' view point out that, although debt financing appears most attractive, firms do in fact finance investment with equity.<sup>6</sup> Accordingly, they argue that corporate income taxes are *not* immaterial. Recent empirical literature supports these latter views. For instance, Hassett and Hubbard (1997) conclude on the basis of a review of empirical studies that there appears to be consensus that the elasticity of investment with respect to the user cost of capital is somewhere in the range between -0.5 and -1.

Not only the marginal tax but also the average tax burden on corporations may reduce the incentives to invest. In particular, a substantial number of firms is liquidity constrained due to capital market imperfections. This may be due to asymmetric information between creditors and firms regarding risky investment projects. A lower corporate income tax will relax liquidity

<sup>5</sup> The literature distinguishes a number of more subtle effects of these taxes on saving behaviour. See Boadway and Wildasin (1994) for a survey.

<sup>6</sup> The traditional view assumes that payment of dividend serves as a signal to shareholders that the firm is doing well. Hence, dividend payout has some 'intrinsic value' that compensates for the unfavourable tax treatment of dividend. Dividend taxes therefore increase the cost of equity finance and reduce investment. The new view assumes that mature firms finance marginal investments by retained earnings. Shareholders can thus not escape dividend taxes since these will be distributed either now or later if they are retained in the firm. Dividend taxes therefore get capitalized in share prices, but have no impact on investment.

constraints so that firms will find it easier to finance new investments. Empirical studies indeed provide evidence for the impact of net internal funds on investment (see e.g. Hubbard, 1997).

A third effect of corporate income taxes on investment is due to uncertainty. By taxing profits and allowing a deduction against other income for losses, the government shares in the risk of uncertain investments. Accordingly, corporate taxes may encourage investors to put more funds in risky businesses (Arrow and Lind, 1970). Note, however, that there are usually limitations on the magnitudes of the losses that can be offset. Moreover, to the extent that corporate taxes reduce wealth of the investor, they may also reduce the willingness to take risk. The overall effect thus remains ambiguous.

Capital income tax systems can also have effects on the source of finance of investments. Indeed, non-neutrality induces substitution towards the relatively tax-favoured way of finance. For instance, the preferential tax treatment of debt versus equity encourages firms to finance investments primarily by debt, a phenomenon that is referred to as ‘thin capitalization’. This erodes capital tax revenue, leads to less solvent, undercapitalized firms and discriminates against new firms that have more difficulty to obtain debt finance. In particular if small, innovative entrant firms find it relatively difficult to issue bonds, then these distortions aggravate their difficulty in financing their investments. This could be detrimental to economic growth. Furthermore, tax systems generally favour the financing of investments through retained earnings as compared to new equity. This may cause lock-in effects, with adverse implications for the flexibility of capital markets.

Finally, corporate taxes can affect the international allocation of savings and investments. We will discuss this extensively in chapter 3.

## 2.5 Conclusions

To recapitulate, we have examined the development of capital income taxation in the EU over the last ten years. On the basis of a simple model of capital income taxation we can draw three conclusions. First, capital taxes have decreased. There is an unambiguous downward trend in economy wide tax rates on interest, dividend, and retained profit. Secondly, capital income tax systems have *not* converged. On the contrary: capital tax systems have become more dissimilar in their mix of taxation of interest, dividend, and retained profit. Thirdly, capital income taxation has become *less* neutral. The undertaxation of interest relative to the taxation of both dividend and retained profit has not been resolved. The reason is that interest remains deductible from the corporate income tax base. In addition, some countries have scrapped capital gains taxes, leading to undertaxation of retained profit relative to dividend.

Unlike the statutory capital income tax rates, effective capital income tax rates, however measured, do not show a clear downward trend. The downward trend of statutory rates and the constancy of effective rates can, however, be reconciled by a broadening of the tax base. This

throws up the quintessential 'stylised fact' of the development of capital income taxation: there has been a simultaneous decrease of tax rates and broadening of the tax base. In passing, we have pointed out that effective tax rates should be interpreted with care. A large variety of calculation methods exist, each with its own advantages and disadvantages. Their power lies not in cross country comparison but in inferring trends.

According to economic theory, capital income taxes tend to reduce the level of savings and investments. Furthermore, they have a significant impact upon the *composition* of savings and investments. In the next chapter we address a third distortion associated with capital income taxes, namely how they impact upon the international allocation of savings and investment.

## Appendix

Table 2.8 lists the five basic capital income tax rates for each EU country in 1990. The first column lists the personal income tax rate on interest  $\tau_p$ . Most countries tax include dividend in personal income, implying that the personal income tax rate on interest is the personal income tax rate (Austria, Denmark, France, Germany, Greece, Great Britain, Ireland, Italy, Luxembourg, The Netherlands, Portugal, and Spain). It differs between individuals because of the progressivity of personal income taxation. We abstract from this complication by choosing the top personal income rate for each of these countries. The tax rates in the first column should therefore be interpreted as upper bounds. Some countries tax interest through a final withholding tax (Belgium and Finland). Since the final withholding tax rate is flat there exists no complication with respect to progressivity.

The second and third columns respectively list the corporate tax rate on dividend  $\tau_d$  and the personal income tax rates on dividend  $\tau_{pd}'$ . The corporate income tax rate on dividend is simply the headline corporate income tax rate, except under Germany's split rate tax system. The personal income tax rate on dividend incorporates double taxation relief. Some countries operate a dual tax system in which dividend is taxed at a zero or reduced personal income tax rate (Austria, Belgium, and Greece). Other countries impute part of net dividend to individual shareholders (Denmark, Finland, France, Germany, Ireland, Italy, Portugal, Spain, and the United Kingdom).

The fourth and fifth column respectively list the corporate income tax rate on retained profit  $\tau_r$  and personal capital gains tax rate  $\tau_c$ . The corporate income tax rate on retained profit is simply the headline corporate income tax rate. Most countries include capital gains in personal income, implying that the capital gains tax rate is the personal income tax rate (Austria, Denmark, Finland, France, Germany, Great Britain, Greece, Italy, Luxembourg, Spain, and Sweden). Other countries tax capital gains at a special or zero rate (Belgium, Ireland, The Netherlands, and Portugal). Wherever these rates depends on whether capital gains are speculative or not, we choose the rates that apply to speculative capital gains.

In the decade between 1990 and 2000 numerous capital income tax reforms have been implemented: countries have introduced and scrapped final withholding taxes on interest and dividend, have moved towards a classical system, a dual system, or an imputation system. Moreover, countries have excluded capital gains from personal income. How these reforms have materialised in the five basic capital income tax rates is apparent from table 2.9, which lists these rates for each EU country in 2000.

We put in a caveat: we abstract from surcharges and local taxes, and from differences between residents and non residents. Thus, the information in tables 2.8 and 2.9 is thus insufficient to capture the legal intricacies that lie at the heart of, for example, the Primarolo report (Council, 1999). It does, however, constitute a rough and ready summary of the most salient aspects of EU capital taxation.

**Table 2.8 Capital income tax rates, EU 1990**

	interest personal ( $\tau_p$ )	dividend corporate ( $\tau_d$ )	personal ( $\tau_{pd}$ )	retained profit corporate ( $\tau_r$ )	personal ( $\tau_c$ )
Austria	50	30	25 <sup>a</sup>	30	50
Belgium	25 <sup>b</sup>	41	25 <sup>b</sup>	41	0
Denmark	40	40	25 <sup>c</sup>	40	40
Finland	30 <sup>b</sup>	25	5 <sup>d</sup>	25	43
France	56.8	37	35.2 <sup>e</sup>	37	56.8
Germany	53	36 <sup>f</sup>	26.6 <sup>g</sup>	50	53
Great Britain	40	35	20 <sup>h</sup>	35	40
Greece	50 <sup>i</sup>	46	0 <sup>j</sup>	46 <sup>k</sup>	50
Ireland	56	43 <sup>l</sup>	5 <sup>m</sup>	43	60
Italy	50	36	34.4 <sup>n</sup>	36	50
Luxemburg	56	34	56	34	56
The Netherlands	60	35	60	35	0 <sup>o</sup>
Portugal	40	36.5 <sup>p</sup>	33.1 <sup>q</sup>	36.5	10
Spain	56	40	56.1 <sup>r</sup>	40	56
Sweden	25	40	25 <sup>s</sup>	40	25
Mean	45.85	36.97	28.76	37.9	39.32
Standard deviation	11.42	4.98	17.61	5.93	19.8

Source: IBFD (1990)

<sup>a</sup> Austria taxes dividend at a rate equal to 50% of the effective personal income tax rate.

<sup>b</sup> Final withholding tax.

<sup>c</sup> Denmark imputes  $\frac{1}{4}$  of net dividends as a tax credit to shareholders. This tax credit constitutes taxable personal income. Thus, given a statutory personal income tax rate (on dividends) of 40%, a personal income tax rate on dividends of  $(0.4(1+1/4)-1/4) \cdot 100 = 25\%$ .

<sup>d</sup> Finland imputes  $\frac{2}{3}$  of net dividends as a tax credit to shareholders, which yields, given a statutory personal income rate (on capital income) of 43%, a personal income tax rate on dividends of  $(0.43(1+2/3)-2/3) \cdot 100 = 5\%$ .

<sup>e</sup> France imputes  $\frac{1}{2}$  of net dividends as a tax credit to shareholders, which yields, given a statutory personal income tax rate of 56.8%, a personal income tax rate on dividends of  $(0.568(1+1/2)-1/2) \cdot 100 = 35.2\%$ .

<sup>f</sup> Refunds of corporate income taxes are such that the corporate income tax rate on dividend equals 36%.

<sup>g</sup> Germany imputes  $\frac{9}{16}$  of net dividends as a tax credit to shareholders, which yields, given a statutory personal income tax rate of 53%, a personal income tax rate on dividends of  $(0.53(1+9/16)-9/16) \cdot 100 = 26.6\%$ .

<sup>h</sup> The United Kingdom imputes  $\frac{25}{75}$  of net dividends as a tax credit to shareholders, which yields, given a statutory personal income tax rate of 40%, a personal income tax rate on dividends of  $(0.40(1+25/75)-25/75) \cdot 100 = 20\%$ .

<sup>i</sup> Greece exempts interest on government bonds from personal income taxation.

<sup>j</sup> Greece exempts dividend from personal income taxation.

<sup>k</sup> Greece taxes income of mining and manufacturing corporations at a reduced rate.

<sup>l</sup> Ireland taxes income of manufacturing corporations at a reduced rate.

<sup>m</sup> Ireland imputes  $\frac{28}{72}$  of net dividends as a tax credit to shareholders, which yields, given a statutory personal income tax rate of 56%, a personal income tax rate on dividends of  $(0.56(1+28/72)-28/72) \cdot 100 = 5\%$ .

<sup>n</sup> Italy imputes  $\frac{9}{16}$  of net dividends as a tax credit to shareholders, which yields, given a statutory personal income top rate of 50%, a personal income tax rate on dividends of  $(0.50(1+9/16)-9/16) \cdot 100 = 34.4\%$ .

<sup>o</sup> The Netherlands tax capital gains at a flat rate of 25% in case the underlying capital pertains to a substantial interest of at least 5% of a corporation.

<sup>p</sup> Portugal taxes income of agricultural corporations at a reduced rate.

<sup>q</sup> Portugal imputes 20% of the corporate tax paid on gross dividends to shareholders, which yields, given a statutory corporate income tax rate of 36.5% and a personal income tax rate of 40% a personal income tax rate on dividends of  $(0.40(1+0.20 \cdot (0.365/0.635)) - 0.20 \cdot (0.365/0.635)) \cdot 100 = 33.1\%$ .

<sup>r</sup> Spain imputes 10% of net dividends as a tax credit to shareholders, which yields, given a statutory personal income tax rate of 56%, a personal income tax rate on dividends of  $(0.56(1+0.10)-0.10) \cdot 100 = 51.6\%$ .

<sup>s</sup> The Swedish local personal income tax rate is 30%.



**Table 2.9 Capital income tax rates, EU 2000**

	interest personal ( $\tau_p$ )	dividend corporate ( $\tau_d$ )	personal ( $\tau_{pd}$ )	retained profit corporate ( $\tau_r$ )	personal ( $\tau_c$ )
Austria	25 <sup>a</sup>	34	25 <sup>a</sup>	34	0 <sup>b</sup>
Belgium	55	39	55	39	0
Denmark	15 <sup>c</sup>	32	40	32	0
Finland	29 <sup>a</sup>	29	0 <sup>d</sup>	29	29
France	54	33,33 <sup>e</sup>	31 <sup>f</sup>	33	54
Germany	51	30 <sup>g</sup>	30 <sup>h</sup>	40	51
Great Britain	40	30	25 <sup>i</sup>	30	40
Greece	15 <sup>a</sup>	40 <sup>j</sup>	0.5 <sup>k</sup>	40	45
Ireland	24 <sup>a</sup>	24	46	24	20
Italy	27 <sup>a</sup>	37 <sup>l</sup>	13,5 <sup>m</sup>	37	45
Luxembourg	46	30	23 <sup>n</sup>	30	46
Netherlands	60	35	60	35	0 <sup>o</sup>
Portugal	40	32 <sup>p</sup>	23,1 <sup>q</sup>	32	10
Spain	39.6	35 <sup>r</sup>	15,4 <sup>s</sup>	35	39.6
Sweden	30	28	30	28	30
Mean	36.7	32.6	27.8	33.2	27.3
Standard deviation	14	4.1	16.8	4.5	19.8

Source: IBFD (2000)

<sup>a</sup> Final withholding tax.<sup>b</sup> Austria taxes capital gains at 50% of the effective personal income tax if the underlying capital pertains to an interest of at least 10% of a corporation.<sup>c</sup> The mean Danish local personal income tax rate is 32%.<sup>d</sup> Finland imputes 29/71 of net dividend as a tax credit to shareholders, which yields, given a statutory personal income tax rate (on capital income) of 29%, a personal income tax rate on dividend of  $(0.29(1+29/71)-29/71) \cdot 100 = 0\%$ .<sup>e</sup> The French surtax on the corporate income tax liability is 10%.<sup>f</sup> France imputes 1/2 of the net dividend as a tax credit to the shareholders, which yields, given a statutory personal income tax rate of 54%, a personal income tax rate on dividends of  $(0.54(1+1/2)-1/2) \cdot 100 = 31\%$ .<sup>g</sup> Germany has a split corporate income tax rate: 30% on gross dividends, and 40% on retained profits.<sup>h</sup> Germany imputes 3/7 of net dividend as a tax credit to shareholders, which yields, given a statutory personal income tax rate of 51%, a personal income tax rate on dividends of  $(0.51(1+3/7)-3/7) \cdot 100 = 30\%$ .<sup>i</sup> The United Kingdom imputes 1/9 of net dividend as a tax credit to shareholders, which yields, given a statutory personal income tax rate (on dividends) of 32.5%, a personal income tax rate on dividends of  $(0.325(1+1/9)-1/9) \cdot 100 = 25\%$ .<sup>j</sup> The Greek tax rate for income of corporations listed at the Athens stock exchange is 35%.<sup>k</sup> Greece exempts dividend from personal income taxation.<sup>l</sup> Italy has a tax rate of 19% on an imputed return of 7% on the sum of retained profits since 1996. The tax is deductible from the corporate income tax base. Thus, the corporate income tax liability equals, given a statutory corporate income tax rate of 37%,  $0.37 \cdot [\text{gross dividend} + \text{retained profits} - 0.07 \cdot \sum \text{retained profits since 1996}] - 0.19 \cdot 0.07 \cdot \sum \text{sum of retained profits since 1996}$ .<sup>m</sup> Italy imputes 37/63 of net dividend as a tax credit to the shareholders, which yields, given a statutory corporate income tax rate of 45.5%, a personal income tax rate on dividends of  $(0.455(1+37/63)-37/63) \cdot 100 = 13.5\%$ .<sup>n</sup> Luxembourg exempts 50% of net dividend from personal income taxation. Thus, given the statutory personal income tax rate of 46%, the personal income tax rate on dividend is  $0.5 \cdot 46 = 23\%$ .<sup>o</sup> The Netherlands tax capital gains at a flat rate of 25% if the underlying capital pertains to an interest of at least 5% of a corporation.<sup>p</sup> The Portuguese local income tax rate is 10%.<sup>q</sup> Portugal imputes 60% of the corporate income tax paid on gross dividends as a tax credit to shareholders, which yields given a statutory corporate income tax rate of 32% and personal income rate of 40%, a personal income tax rate on dividends of  $(0.40(1+0.60 \cdot 32/68) - 0.60 \cdot 32/68) \cdot 100 = 23.1\%$ .<sup>r</sup> The Bask corporate income tax rate is 32%.<sup>s</sup> Spain imputes 40% of the net dividend as a tax credit to shareholders, which yields, given a statutory personal income tax rate of 39.6%, a personal income tax rate on dividend of  $(0.396(1+0.40)-0.40) \cdot 100 = 15.4\%$ . The local personal income tax rate is, in addition, 8.4%.



### 3 Internationalization and capital income taxation

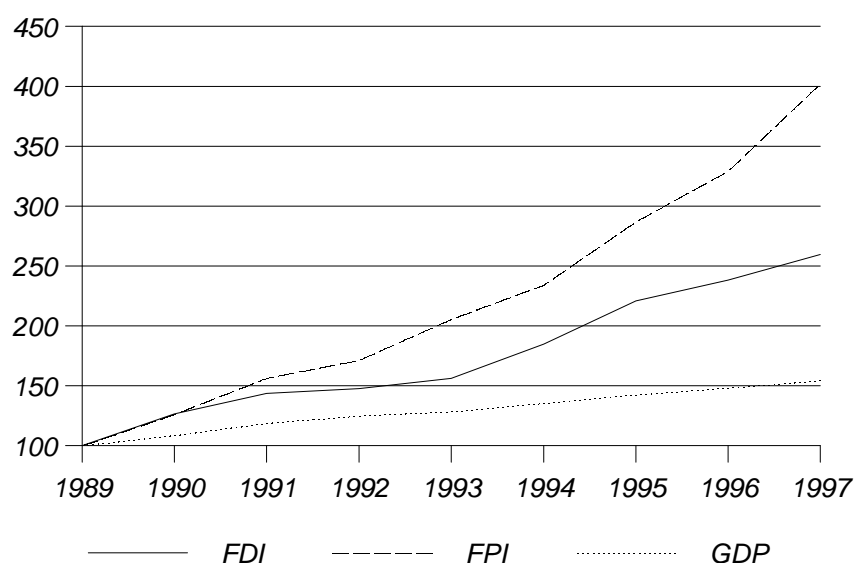
Chapter 2 elaborates on the national tax treatment of corporations and the capital income they generate; this chapter draws attention to the tax treatment of international capital flows. Due to internationalization, taxes on capital not only distort the decision to save or invest, but also the international allocation of investment and profits.

#### 3.1 International capital flows

Households can invest their savings in several manners: they can choose between debt and equity, and between domestic and foreign assets. Households' investment in foreign assets is usually called foreign portfolio investment (FPI). This FPI is often channelled through financial intermediaries such as mutual funds or pension funds. In statistical information on foreign capital flows, FPI is defined as foreign investments in cases where the investor controls less than some fixed proportion of the capital stock that is invested in. The IMF guidelines propose a proportion of 10%. Hence, FPI in statistics not only refers to private households investing in foreign equity, but also to multinational firms that hold small foreign stakes. In practice, statistical information on FPI largely coincides with individual investors undertaking foreign investment.

Households may also invest in multinational firms of which the parent company resides in the home country. These multinationals may use these funds to invest in foreign controlled corporations such as affiliates or subsidiaries. This is referred to as foreign direct investment (FDI). In statistics following the IMF guidelines, FDI is defined as foreign investments in which the firm that invests owns more than 10% of the stock that is invested in. FDI flows consist of two broad categories: (i) direct net transfers from the parent company to a foreign affiliate, either through equity or debt, and (ii) reinvested earnings by a foreign affiliate.

Foreign investment has expanded rapidly during the last decade. This is illustrated in figure 3.1 which plots the growth of FPI, FDI, and GDP between 1989-1997. It shows that FDI and FPI in EU-countries grew considerably faster than GDP. Especially the growth in FPI has been high during the last decades: whereas the share of FPI in total international capital flows was about one quarter during the 1970s, it raised to three-quarter of total foreign investments in the 1990's (Slemrod et al., 1996). These trends illustrate the increasing internationalization of capital flows. For the coming decade, this expansion is likely to continue. Lower information costs due to information- and communication technology, the completion of EMU, and the alleviation of technical barriers on the internal EU-market for financial services will all contribute to further internationalization and, especially, Europeanization of capital markets.

**Figure 3.1 Growth in international capital flows in the EU compared to GDP growth (1989 = 100)**

Source: IMF Financial Statistics.

Statistical information on FDI and FPI involves financial flows that do not necessarily correspond to the allocation of real investment. For instance, a firm that receives funds from a foreign household (i.e. FPI) may use it to finance a subsidiary in a third country. The link between FPI and real investment is thus broken. Also FDI flows do not necessarily involve real investment in property, plant and equipment (PPE). For instance, the change in ownership in case of foreign acquisitions is registered as FDI, while there is no real investment taking place. Indeed, the capital stock in the receiving country is not affected by this type of FDI. Estimates suggest that mergers and acquisitions account for more than 60% of all FDI in advanced countries (OECD, 2000b). The distinction between the observed financial capital flows and the underlying real investment is, however, important for economic analyses. Indeed, it is the allocation of real capital that determines economic growth, productivity and the global efficiency of capital allocation. But the financial flows are also relevant, e.g. for tax purposes, the income distribution and the amount of financial intermediation in a country. Unfortunately, the data generally do not allow for a distinction between financial and real investments.<sup>7</sup>

<sup>7</sup> US data report investments in property, plant and equipment, which constitutes a better proxy for real investment than FDI. In Europe, such data are generally not available.

## 3.2 Taxation of international capital

Foreign capital income is taxed either on the basis of the source principle or on the residence principle. Under the source principle, capital income is taxed in the country where the capital is invested in, i.e. where the income is generated, irrespective of where the owner of that capital resides. Under the residence principle, capital income is taxed in the country where the owner resides, irrespective of the country that is invested in. In practice, governments use both source-based taxes, such as corporate income taxes, and residence-based taxes on capital income, such as personal income taxes. This may give rise to international double taxation, which is discussed below.

### 3.2.1 Foreign portfolio investment

If households invest in foreign debt, the rate of return on this investment is generally not taxed in the source country as interest payments are typically exempt from corporate income taxes. Only if countries levy a withholding tax on interest paid to non-residents (such as Portugal and Greece) is interest taxed in the source country. Under the OECD Model Tax Convention, withholding taxes on foreign interest are capped at 10%. Most countries that levy withholding taxes on interest, however, exempt non-residents (such as Belgium and Austria). In the absence of withholding taxes, interest is only taxed on the basis of the residence principle. In that case, the tax system does not affect household decisions regarding the choice between domestic or foreign deposits.

Households investing in foreign equity are usually taxed twice. First, the return on equity is taxed by the corporate income tax in the host country. Second, dividend payments (or capital gains) are taxed again under the income tax in the domestic country on the basis of the residence principle. This international double taxation is similar to the economic double taxation of investment in domestic equity under the classical tax system. As imputation credits often do not apply to foreign investors, imputation systems typically discriminate between domestic and foreign investors.

### 3.2.2 Foreign direct investment

Also FDI by multinational firms runs the risk of international double taxation. In particular, a foreign subsidiary is subject to corporate income tax in the host country. But these profits of the subsidiary can be taxed again under the corporate income tax in the home country of the parent. As this international double taxation would strongly discourage international business activity, most countries avoid it by means of bilateral tax treaties based on the OECD Model tax convention. In the EU, the Parent-Subsidiary Directive ensures that countries either adopt a credit system or an exemption system to avoid international double taxation within the Union.

In the EU, Italy, Greece and the UK adopt tax credit systems. All other countries adopt the tax exemption system.

Under the exemption system, foreign income that is taxed in the host country is exempt from taxation in the home country of the parent. Hence, profits are only taxed in the country where the subsidiary is located. To illustrate, a Dutch firm that invests in a German subsidiary is subject to the German corporate income tax alone. Dividend payments to the Dutch parent company thus remain untaxed in the Netherlands. Countries that adopt the exemption system differ with respect to their application of these exemptions. In some countries, firms can claim tax exemptions only if they control a substantial share of a company and when a minimum of foreign corporate income tax is paid. Other countries impose less tight conditions on the ownership share or on the foreign tax paid.

Under a credit system, tax liabilities in the host country of the subsidiary are credited against taxes in the home country of the parent. For instance, the corporate income tax in Greece is 40% while Denmark adopts a rate of 32%. As Greece adopt the credit system, a Greek corporation that earns 100 euro in Denmark pays 32 euro corporate income tax in Denmark and an additional 8 euro in Greece. Would Greece have adopted the exemption system, the corporation would have been subject to the Danish corporate income tax alone. Governments generally limit the foreign tax credits that firms can claim. Indeed, if foreign tax payments exceed the tax liability in the home country of the parent company, there exists an excess foreign tax credit. In that case, firms are usually permitted to claim no more tax credit than the domestic tax liability, i.e. it is in effect exempt from taxation. If the tax liability in the home country of the parent exceeds the foreign tax payment, there is deficit tax credit. Tax credit countries differ with respect to the application of tax credits, e.g. whether excess foreign credits can be compensated by deficit tax credits elsewhere or whether compensation is allowed by carrying backward or forward the deficit foreign credit through time.

Countries that adopt foreign tax credits to avoid international double taxation generally also permit tax deferral. In particular, profits of foreign affiliates that are reinvested in that company are deferred until they are repatriated to the parent company through dividend payments. Only upon the date of repatriation, is the parent company subject to corporate income tax in the home country. This makes the impact of home country taxation less important for investors from tax credit countries.

### 3.2.3 Residence versus source taxes

There is an economic rationale for the prevalence of residence-based capital taxes over source-based capital taxes. The reason is that, in contrast to residence-based taxes, source-based taxes violate the condition for so-called *capital export neutrality*, which requires that an investor is taxed at the same effective rate of capital income taxation if it invests in alternative countries. Differences in source taxes cause an unlevel international playing field, thereby distorting the

international allocation of capital with an associated welfare cost. In particular, with different effective tax rates, people invest ‘too much’ in low tax countries and ‘too little’ in high tax countries. The reason is that arbitrage on the international capital market implies equality of *net* marginal returns to capital. Different tax rates thus causes differences in the *gross* marginal returns to capital: the gross marginal return to capital in the high tax country must be higher than in the low tax country. This implies that world production (and therefore world welfare) can be increased by relocating capital from the low tax to the high tax country.

Although residence-based taxes are compatible with capital export neutrality, they violate *capital import neutrality*, a condition for efficient allocation of capital over time. In particular, investors should face the same tax rate. If they don’t, then those facing low rates overinvest, while those facing high rates underinvest. To see this, one has to think of investment as an exchange of present for future consumption. From the perspective of an individual investor, it is optimal to invest until his marginal rate of substitution -the amount of present consumption that he is, at the margin, willing to give up for future consumption- equals the net marginal return to capital. If investors from different countries face different tax rates, they also face different net marginal returns to capital, and their marginal rates of substitution will differ. Basic microeconomics teaches us that everyone would be better off by mutually exchanging present and future consumption, i.e. by lending and loaning.

Among economists there is consensus that capital export neutrality is more important than capital import neutrality (see e.g. Keen, 1993; Sørensen, 1993). We list three reasons. First, capital export neutrality, guaranteeing production efficiency, is always desirable, even in a second best world where (intertemporal) consumption patterns are distorted by capital income taxation. In contrast, it may be wise to sacrifice capital import neutrality. In particular, if savings are highly elastic in one country and highly inelastic in another, then it would be optimal, from a world perspective, to apply a low tax rate to investors from the first, and a high tax rate to investors from the second country. Secondly, capital export neutrality is consistent with horizontal equity in the sense that two investors from the same country are taxed similarly, regardless of the division of investment over domestic and foreign projects. This is not necessarily true under a regime of capital import neutrality. A third reason for favouring capital export neutrality over capital import neutrality is empirical: the welfare loss associated with a violation of capital export neutrality is determined by the sensitivity of capital across space; the welfare loss of violating capital import neutrality depends on the sensitivity of saving across time, determined by the intertemporal elasticity of substitution. As empirical research suggests, distortions in the allocation of capital across space are large, relative to the intertemporal distortions. Hence, violating capital export neutrality is more distortive than violating capital import neutrality.

Although economic theory thus suggests that residence-based taxes are to be preferred, they are problematic in practice. To quote Slemrod (1995): “... whereas it is not *desirable* to tax capital

on a source basis (because they are highly distortionary), it is not administratively *feasible* to tax capital on a residence basis.” The underlying reason for this infeasibility of residence taxes is that fiscal authorities require all the information of their residents about foreign capital income. This can be problematic because governments generally cannot obtain information from foreign firms and foreign financial intermediaries on the amounts of capital income they paid to each domestic resident. Due to these information problems, households can be encouraged to hold foreign instead of domestic deposits, thereby evading taxes in the country of residence. There is ample anecdotal evidence suggesting that this tax evasion is important (Dehejia and Genschel, 1998). For instance, the flourishing financial sectors and huge assets held in countries with a bank secrecy -such as Luxemburg and Switzerland- suggests that households use these countries to evade residence-based taxes on capital. Also tax havens play an important role for tax evasion.<sup>8</sup>

To the extent that the shift of savings abroad involves (learning) costs, not all taxes will be evaded. But this seems especially relevant for small savers, not for those with substantial assets. Residence-based taxes would thus be equivalent to a tax on small savers, which seems less attractive on equity grounds.

A solution to the information problem is to improve international information exchange among tax administrations. A number of bilateral tax treaties between countries already try to reduce tax evasion by making agreements on information exchange. Also the EU has recently agreed upon information exchange regarding interest income paid to foreigners within the EU. This is an important step forward. But information exchange also faces a number of serious problems in practice (Tanzi, 1995). First of all, there are legal difficulties regarding the information that may be passed to the foreign tax authority. Second, technical difficulties cause problems with respect to the adequate supply of data, language, etc. Finally, there may be political constraints with respect to information exchange among tax administrations and its enforcement. Because of these problems, Tanzi notes that “... it seems naive to assume that enhanced exchange of information among countries is the instrument that will allow countries to cope with the exponential growth of foreign source incomes that accompanies the increasingly deeper integration of the worlds economies” (p. 84).

Because of these practical problems with the application of the residence principle, favouring a residence tax over a source tax appears to detach from reality. As Keen (1993) puts forward, this pushes the real world situation towards an effective source base. Hence, source-based capital taxes are likely to remain important in future tax systems. The rest of this study

<sup>8</sup> Tax havens are small jurisdictions with little production, a stable political climate, a low or zero tax on foreign capital income, lack of transparency, and lack of effective exchange of information usually due to strict bank secrecy laws. The OECD has identified 47 of such tax havens. In Europe, well-known examples are Andorra, Monaco and the Channel Islands.



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### Why do countries tax corporations

Given that countries want to tax capital income, why would they want to tax it at the corporate level? The economic literature lists the following reasons.

- Governments tax capital income because of horizontal and vertical equity. Indeed, tax systems are heavily influenced by the idea of a comprehensive income tax in which individuals are taxed on the sum of their income from labour and capital. These considerations would naturally result in residence-based taxes. However, administrative complications may render these taxes impossible. For instance, as long as fiscal authorities find it difficult to assign income from retained profits to individuals, a tax on the company level is justified for administrative reasons.
  - Governments tax corporations on the basis of the concept of entitlement. This reflects the view that the source country is entitled to share in the income created within its borders, including income that flows to foreign capital owners. This concept applies especially to location-specific rents that accrue to firms operating in the country. These rents may originate from natural resources, public infrastructure, agglomeration benefits, etc. They can be taxed by the government without causing an immediate capital flight out of the country. Although a pure profit tax would be more efficient to tax away these rents, it might be difficult for governments to distinguish between the normal return to capital and pure profit. Therefore, it may rely on a uniform corporate tax.
  - Governments can adopt the benefit principle of taxation. Economic theory suggests that, under a strict application of the benefit principle, taxes do not distort the allocation of capital. Intuitively, whereas taxes reduce the after-tax rate of return on capital, the benefits of public goods exactly compensate for this by raising the before-tax rate of return. A strict application of the benefit principle is impossible, however, because unincorporated businesses and firms that do not make profits benefit from the public goods financed out of corporate taxes. Nevertheless, the benefit principle usually provides an important motivation for corporate income taxes.
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concentrates on these source-based taxes on capital income, in particular corporate income taxes. The following box lists some more fundamental arguments why governments want to tax corporations.

### 3.3 Corporate income taxes and international capital allocation

At the time that capital markets are increasingly becoming international, capital tax systems remain very different across EU countries (see chapter 2). This induces numerous tax-induced responses by market participants. In this section, we discuss the empirical evidence on the impact of company taxes on investment behaviour of multinational enterprises. The next section elaborates on the impact on profit allocation.<sup>9</sup>

<sup>9</sup> We concentrate on these broader issues and do not discuss the numerous other ways in which firms respond to special tax incentives, such as investment tax credits, allowances for investments in research and development (R&D), special tax holidays, or the tax treatment of royalties. For a discussion of these tax incentives, see e.g. Hines (1996b).

### 3.3.1 Theory

Economic theory suggests that, when capital is perfectly mobile across borders, the after-tax rate of return to capital should be equal across countries in equilibrium, i.e.

$$f'(k_1) - t_1 = f'(k_2) - t_2 \quad (3.1)$$

where  $t_1$  and  $t_2$  denote source taxes in countries 1 and 2, while  $f'(k_1)$  and  $f'(k_2)$  stand for the marginal product of capital, equal to the before-tax rates of return to capital in countries 1 and 2, respectively. According to the arbitrage condition (3.1), differences in tax rates across countries 1 and 2 should be matched by differences in the before-tax rates of return. Since one generally assumes decreasing returns to scale with respect to capital in production, i.e.  $f'(k_1)$  and  $f'(k_2)$  are negative, equality in (3.1) is accomplished through changes in the capital stock. For instance, if the two countries start from an equal tax rate and country 1 increases its tax above that in country 2, equality in (3.1) can be maintained by a reallocation of real capital from country 1 to country 2. The speed with which the before-tax returns to capital in both countries respond to changes in the capital stock determines the sensitivity of international capital allocation to source-based taxes. Note that  $t_1$  and  $t_2$  should be interpreted as the marginal effective tax rates on capital. Indeed, not only the statutory rates but also parameters that influence the tax base determine the after-tax rates of return on real investment.

Expression (3.1) forms the basis for most empirical studies on the impact of taxes on the allocation of capital. Before we discuss this empirical evidence, three remarks should be made. First, (3.1) makes no distinction between financial capital and real capital. In theory, it is the adjustment in real capital that ensures equilibrium. The data, however, usually confound financial and real capital. The latter can therefore not be observed directly.

Second, (3.1) assumes that investment decisions are taken at the margin. Devereux and Griffith (1998a) argue, however, that investment decisions are often inframarginal. This implies that the average rate of return and, correspondingly, the average effective tax rate should feature in the equilibrium condition. Indeed, many empirical studies use the average effective tax rate to explore location decisions.<sup>10</sup>

A final remark to condition (3.1) is that countries with high taxes may indirectly compensate firms with investment incentives that are more difficult to measure. Examples are investment subsidies or spending on infrastructure. By making private capital more productive, these indirect measures raise the before-tax rate of return to capital. This suggests that the combination of taxes and public spending determines international investment decisions, rather than taxes alone.

<sup>10</sup> Rents make investment decisions responsive to the average tax rate. If these rents are location specific, however, they can be taxed away without causing capital flight. The new economic geography literature illustrates how industrial agglomeration create such rents (Haufler and Wooton, 1999; Kind et al., 2000).

### 3.3.2 Empirical evidence for the US

A number of studies have explored the impact of taxes on the location of FDI. Table 3.1 provides a summary of these studies. The first is a study by Devereux (1992) on behalf of the Ruding Committee. He provides a survey of the literature before 1992 on the impact of taxation on international investment flows. The report concludes that “at least for multinational enterprises, taxation does appear to have a significant impact on the location of real activities”.

In a recent survey of the literature, Hines (1999) suggests that time-series studies generally find a significant impact of taxes on US direct investment abroad. In particular, according to Hines, a value of  $-1.7$  for the semi-elasticity of FDI to tax rates is a reasonable consensus estimate from the literature, i.e. a 1%-point increase in the foreign tax rate reduces US investment in a country by 1.7%.<sup>11</sup> Hines also argues that the elasticity of retained earnings is probably somewhat higher than for direct transfers.

A number of other studies use cross-section data. Grubert and Mutti (1991) explore the sensitivity of US investors in 33 countries with respect to foreign average effective tax rates. They find a semi-elasticity of investment of  $-0.3$ . Using the same method, Hines and Rice (1994) find a higher semi-elasticity of  $-3.3$ . The difference in magnitudes of the Grubert-Mutti and Hines-Rice elasticity can be explained by the use of different data. First, Hines and Rice use data for more countries, including a number of tax havens. Second, the data used by Hines and Rice contain all nonbank companies while Grubert and Mutti concentrate on manufacturing firms alone. Capital flows to tax havens and by non-manufacturing firms may contain much more financial capital than the flows analysed by Grubert and Mutti. The difference in results therefore suggests that financial flows are typically more responsive to taxes than is real capital.

According to Altshuler et al. (1998), capital has become more responsive to taxes during the 1980's. In particular, they have data on average effective tax rates and investment in plant and equipment by US multinationals in manufacturing in 58 countries for 1984 and 1992. Altshuler et al. find a semi-elasticity of  $-1.5$  in 1984 but a much larger elasticity of  $-2.7$  for 1992. This suggests that capital has become more responsive to taxes during this decade.

One problem in the studies mentioned above is that they might not adequately control for omitted variables that are correlated with taxes and which potentially affect FDI. Hence, the estimates might be biased. Following the methodology of Slemrod (1990), Hines (1996a) addresses the omitted variable problem by using the distinction between investment from countries with a tax credit system and countries that adopt a tax exemption system. Investors from tax exempt countries are taxed only under the tax of the host country and should thus respond to high tax rates abroad. In contrast, high taxes on investors from tax credit countries are compensated by the foreign tax credit in the home country. Since all omitted variables affect investors from tax exempt and tax credit countries in the same way, one can control for these

<sup>11</sup> This corresponds to an elasticity of  $-0.6$  if the tax rate is set at 35%.

variables by estimating the elasticity of tax exempt countries, conditional on a zero elasticity for tax credit countries. Thus, Hines reports a fairly large elasticity of  $-10$ .

**Table 3.10 Summary of studies estimating the impact of taxes on FDI**

Reference	Type of study	Semi-elasticity of FDI <sup>a</sup>
Devereux (1992)	Survey of the literature	Significant negative effect of taxes on foreign investment
Hines (1999)	Consensus estimate based on times series models for US investment abroad	$-1.7$ (elasticity of retained earnings exceeds that of transfers)
Grubert and Mutti (1991)	US outward investment into 33 countries in 1982	$-0.3$
Hines and Rice (1994)	US outward investment into 73 countries in 1982	$-3.3$
Altshuler et al. (1998)	US outward investment in 58 countries in 1984 and 1992	$-1.5$ in 1984 $-2.7$ in 1992
Devereux and Freeman (1995)	Panel of bilateral outward FDI in 7 OECD countries 1984-89	$-0.4$
Devereux and Griffith (1998b)	Panel of US multinationals investing in EU countries	$-0.4$ for UK and $-1.7$ for France and Germany for probability of choosing location in that country
Broekman and van Vliet (2000)	Panel of aggregate FDI inflows in EU countries	between $-1.4$ and $-2.2$
Gorter and Parikh (2000)	Panel of bilateral outward FDI in 8 EU countries 1995-96	$-4.3$

<sup>a</sup> Percentage change in FDI in response to an absolute change in the tax rate.

### 3.3.3 Evidence for Europe

Unlike for the US, studies on the impact of corporate income taxes on foreign investment in Europe are more scarce. According to Hines (1999), this is mainly due to data limitations, especially for property, plant and equipment. The question is whether the elasticities found for the US carry over to the EU-economy. A recent study by Broekman en Van Vliet (2000), relying on FDI data, suggest that they do. They estimate the impact of average effective tax rates in EU-countries on aggregate inward FDI in these countries in the period between 1989 and 1998. Their estimates range between  $-1.4$  and  $-2.2$ , which is comparable with the Hines' consensus estimate of  $-1.7$ .

Devereux and Freeman (1995) use data on bilateral FDI flows between 1984-89 for five EU countries: Germany, France, UK, Italy and the Netherlands. Together with data for the US and Japan, Devereux and Freeman estimate the tax elasticity of FDI in two alternative forms. In particular, they assume that multinational firms follow a two-stage decision making proces. First, they determine the allocation of investment between domestic and total outward FDI. At

this stage, Devereux and Freeman find that taxes are unimportant: the tax elasticity is not significant. At the second stage, multinational firms determine how total outward FDI is allocated across alternative locations. At this second stage, Devereux and Freeman find that taxes do matter. In particular, the estimated coefficient of Devereux and Freeman suggest a semi-elasticity of  $-0.4$ .

Devereux and Griffith (1998b) confirm these findings by exploiting a panel of US multinationals. They find that European taxes do not affect the total amount of outward FDI by US investors as a share of total investment. However, tax differentials across EU countries do matter for the allocation of US investment abroad across EU states. Indeed, a higher average effective tax rate in the UK, Germany or France significantly reduces the probability of a multinational to locate in that country. Hence, the average effective tax rate is important for the choice of American multinationals between locations in Europe, but not for the choice whether to invest in Europe or not.

A recent study by Gorter and Parikh (2000) uses data for bilateral FDI in 1995-96 for eight countries in the EU. The authors follow Hines (1996b) in controlling for omitted variables by using the distinction between tax credit countries and tax exempt countries. For taxes, they use the (average) effective tax rates presented in table 2.4, i.e. based on the median effective tax rate on corporations in EU countries. The UK is the only tax credit country for which the elasticity is assumed to be zero. Gorter and Parikh find that the semi-elasticity of FDI within the EU is  $-4.3$  on average. This is somewhat higher than most of the elasticities found in studies for the US. One interpretation of the relatively high elasticity may be that capital is relatively mobile within the European Union, as compared to that between the EU and the US. Indeed, economic integration in Europe has eliminated the technical and informational barriers to cross-border investments that may still be present for investors from countries outside the EU. This is also in line with the conclusions from Devereux and Freeman (1995) and Devereux and Griffith (1998) which suggest that the investment location within Europe is more sensitive to taxes than whether an investment takes place in Europe or not.

Table 3.2 reports the Gorter-Parikh elasticities for different EU countries. In this table, an elasticity of  $-6.6$  for the Netherlands means that, if some European country increases its effective tax rate by 1%-point, Dutch investors reduce their investments in that country by 6.6%. Table 3.2 reveals that the tax elasticity for Portugal is an outlier. Only for Denmark, taxes have no significant effect on FDI. For all other countries, the impact of taxes on FDI is significantly negative and somewhere around the average of  $-4.3$ . Note that the zero elasticity of the UK is part of the estimation procedure, which imposes a zero elasticity for countries with a tax credit system.

**Table 3.11 The Gorter-Parikh elasticities**

Country	Semi-elasticity (t-value)
Portgal	-14.3 (8.2)
Netherlands	- 6.6 (3,8)
France	- 4.6 (3.7)
Finland	- 4.3 (3.4)
Germany	- 2.3 (2.2)
Austria	- 1.0 (2.4)
Denmark	- 1.5 (1.4)
United Kindomg	zero

Source: Gorter and Parikh (2000)

The various elasticities from Table 3.2. can be used to calculate the overall impact of a reduction in the effective tax rate on inward FDI from other EU countries. This exercise is presented in for the Netherlands in the next box. In particular, it illustrates the impact of a reduction in the Dutch corporate income tax on inward FDI and, consequently, on the Dutch tax base. This gives us some feeling for the size of the Gorter-Parikh elasticity. The lower part of the Box notes the various caveats that are associated with this computation.

### 3.3.4 Caveats

We may conclude that tax differentials have a significant impact on the location of FDI. It is tricky, however, to interpret gross FDI inflows as a proxy for its contribution to gross capital formation in a country. First, FDI confound several things such as real investment in property plant and equipment, mergers and acquisitions, and increases in investor equity. These different components do not have the same implications for gross capital formation in a country. For instance, mergers and acquisitions are just a change of ownership which does not contribute much to capital formation. The same holds true for financial capital that is not accompanied by real capital, the so-called passive FDI.

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### Effects of a reduction in the Dutch corporate income tax from 35% to 30%

Suppose the Dutch government decides to reduce the corporate income tax from 35% to 30%. At a given tax base and starting from the effective tax rate in 1999 of 30% (see table 2.4), this would imply a reduction in the effective tax rate by  $(30/35) \times 5\% = 4.3\%$ . Total revenue of the Dutch corporate income tax in 1999 equals 15.5 billion euro. By reducing the tax rate from 35% to 30%, the direct loss in tax revenue equals  $(5/35) \times 15.5 = 2.2$  billion euro. But how large is the ex-post budgetary cost?

A reduction in the effective tax rate by 4.3%-points raises the total amount of inward FDI in the Netherlands. This is calculated by using the Gorter-Parikh elasticities for Europe, where we assume the average elasticity of  $-4.3$  for countries that are not part of their study. For inward FDI from outside Europe, we take the Hines consensus estimate of  $-1.7$ . Some straightforward calculations suggest that the 4.3% reduction in the average effective tax rate raises total inward FDI by 18.9 billion euro. Between 1990 and 1999, the average return on invested capital of 265 Dutch companies in the *Worldscope* database was 9.9%. Using this figure, one can verify that the increase of inward FDI would imply a rise in Dutch profits of  $18.9 \times 0.099 = 1.87$  billion euro. This reflects the broadening of the tax base. Taxed at a marginal rate of 30%, this yields a public revenue of 0.56 billion euro. Hence, the ex-post budgetary cost for the government is equal to  $2.2 - 0.56 = 1.64$  billion euro, i.e. approximately 25% is earned back through the broadening of the tax base.

When interpreting the above calculations, one should keep in mind several caveats. In particular, the calculations ignore:

- financial decisions by multinational firms such as profit allocation and their interactions with real investment decisions.
- general equilibrium effects on prices, wages, unemployment, etc.
- effects on domestic investment

Hence, the calculation should be seen as an illustration of the Gorter-Parikh elasticity, not as an assessment of the overall impact of lower corporate income taxes on the government budget.

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Secondly, taxes may also have a different impact on the different components of FDI. Indeed, Swenson (2001) explores the implications of corporate effective taxes on the distinguished components of FDI in the US between 1984 and 1992, namely, new plants, plant expansions and mergers and acquisitions. She finds that investment in new plant and plant expansion respond significantly negative to taxes, with elasticities of  $-0.11$  and  $-0.07$ , respectively. In contrast, the impact on mergers and acquisitions is significantly positive, with an elasticity of  $0.06$ . This latter effect might be explained by the relatively tax-favoured treatment of US-owned firms, relative to domestically owned firms, in some high-tax countries. Swenson does not find a significant impact of taxes on purely financial components of FDI, such as increases in investor equity. The next Box suggests, however, that tax systems at large may have important implications for passive FDI.

The evidence on the responsiveness of FDI to taxes is thus not equivalent to the impact of taxes on gross capital formation. In particular, the tax effect of real capital is probably different

from the empirical estimates in table 3.1 since other components of FDI respond differently to taxes.

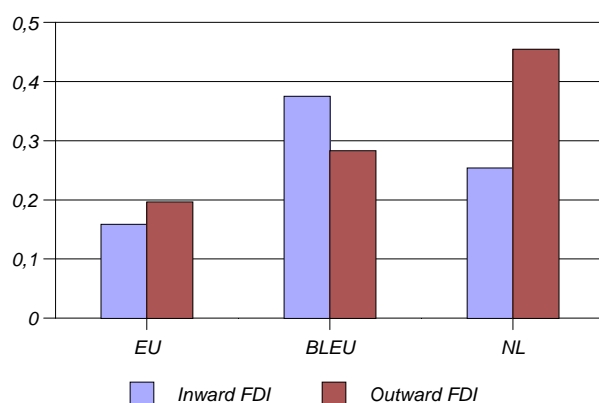
### Passive foreign direct investment

Passive FDI generally takes place through financial holding companies that receive the majority of their income from holding securities and portfolio capital. Some countries have created attractive tax regimes for these type of companies. For instance, financial holdings in Belgium and Luxemburg could qualify during the 1990s for a reduced tax burden. The Netherlands also created an attractive environment for these companies. As a result, the number of financial holding companies in the Netherlands rose between 1990 and 1999 from 6000 to more than 9000 (DNB, 2000).

These attractive regimes for holding companies have attracted substantial amounts of (passive) FDI. Indeed, the chart below shows the cumulative inward and outward FDI between 1990-1998 as a percentage of GDP in 1998. It reveals that inward FDI in the Benelux countries was substantially higher than in the rest of the EU.

It is sometimes argued that financial investments are attractive for countries since these financial flows will finally end up in real investments. However, passive investments are usually reinvested in third countries. Hence, a large gross inflow of FDI may be accompanied by a large gross outflow, without an impact on capital formation or employment. Indeed, the chart reveals that the large inflow of FDI in the Netherlands is accompanied by an even larger outflow. Moreover, some figures suggest that FDI creates relatively few jobs in the Benelux countries. To illustrate, for every \$100.000 assets invested by US multinationals in German and French affiliates, there were almost three people employed in 1998. For Belgium and the Netherlands, this is less than one employee (BEA, 2000)

### Cumulative inward (left) and outward (right) FDI 1990-98 as a ratio of GDP in 1998 in the EU, Belgium-Luxemburg, and the Netherlands



Source: OECD (2000b), IMF Financial Statistics (2000) and own calculations.



### 3.4 Effects of corporate income taxes on profit allocation

Distortions in the allocation of real investments are important for welfare since they involve the efficient allocation of capital across countries. But taxes can also affect the international allocation of profits of multinational firms, without relocating the underlying capital that generates these profits. In particular, the division of income of a multinational among countries in Europe traditionally relies on separate accounting. This means that all permanent establishments within a country determine their profits through accounts that terminate at the border. However, various parts of a multinational in different countries are usually closely connected. This complicates separate accounting, for instance when assigning shared costs and returns. Moreover, it allows for several discretionary routes through which companies can shift income across their affiliates in different countries. The most important routes among these are thin capitalization and transfer pricing (see below).

The incentives for multinational firms to shift their income from one country to another are determined by two parameters. The first is the difference between statutory tax rates which generally apply to marginal changes in profits. Second, the incentives for income shifting depend on whether countries adopt the exemption system or the credit system. In case of the exemption system, there is always an incentive for income shifting as long as tax rates differ. In case of a tax credit system, the tax benefits from income shifting depend on the possibilities for deferring home-country tax and the application of excess foreign tax credits. In case of excess foreign credit, there is an incentive for foreign subsidiaries to either reinvest profits in foreign operations or simply defer taxes by not paying out dividends to the parent.

Because profit shifting does not change the allocation of real capital, it seems less distortionary from a welfare point of view. Indeed, by shifting paper profits, a multinational only shifts its tax liabilities from one country to another. This is primarily a distributional issue. Profit shifting, however, may also have real effects as firms may take a joint decision about real investment and income allocation. In particular, profit shifting can partly offset the distorting impact of taxes on real investment decisions because high taxes are less of a disincentive to the extent that income can be shifted out of a country. Profit shifting may also create distortions in real investments. For instance, multinational firms may set up a financing, insurance or service entity in low-tax countries, just to enable the corporation to route income through affiliates in those countries. Moreover, profit shifting may frustrate the benefit principle of taxation. In fact, firms can benefit from a high supply of public goods in countries that levy high tax rates, but at the same time escape this tax burden by means of profit shifting to low-tax countries (Leeftink, 1999). Finally, profit shifting crowds out human resources that could otherwise be used more productively.

### 3.4.1 Thin capitalization

Multinational firms can finance their foreign affiliates in different ways. To understand the tax implications of these different types of finance, assume a parent company in country 1 that invests in a subsidiary in country 2. The parent company can choose between debt finance and equity finance. In case of debt finance, the interest is tax deductible for the subsidiary in the host country at rate  $t_2$ . The interest payment from the subsidiary to the parent is taxed in the country where the parent resides through the corporate income tax, i.e. at rate  $t_1$ . In case of equity finance, the return on capital in the subsidiary is taxed by the corporate income tax in the country where the subsidiary is located, i.e. at a rate  $t_2$ . If the parent company is located in a country that adopts the tax exemption system, the repatriated dividend is not taxed in the home country of the parent. Hence, firms in tax exemption countries will prefer debt finance for subsidiaries located in countries with high statutory tax rates and prefer equity finance for subsidiaries located in countries with low statutory tax rates. If the parent company resides in a country that adopts the tax credit system, repatriated dividends are taxed by the corporate income tax in the home country of the parent, while the foreign tax is credited. Hence, parent companies in tax credit countries will be indifferent between debt finance and equity finance, although deferral and limited access to foreign tax credits may also give an advantage to debt finance in high-tax countries.

A simple look at the data suggests that use of intra-company loans to finance foreign subsidiaries in high-tax countries is an important phenomenon. For instance, Weichenrieder (1996) shows that in the early 1990s more than three quarter of German inward FDI consist of loans while German investments abroad consists primarily of equity. This reflects the high-tax status of Germany in Europe. Also recent econometric evidence supports these incentive effects of taxes on the source of finance. Grubert (1998) exploits data for foreign subsidiaries of US firms and finds a positive correlation between the statutory tax rate and the amount of interest payments by a subsidiary. The reverse holds for dividend payments. Note that the opportunities for multinationals to reduce their tax bill through leveraging is limited due to thin-capitalization rules which limit the allowable debt/equity ratios.

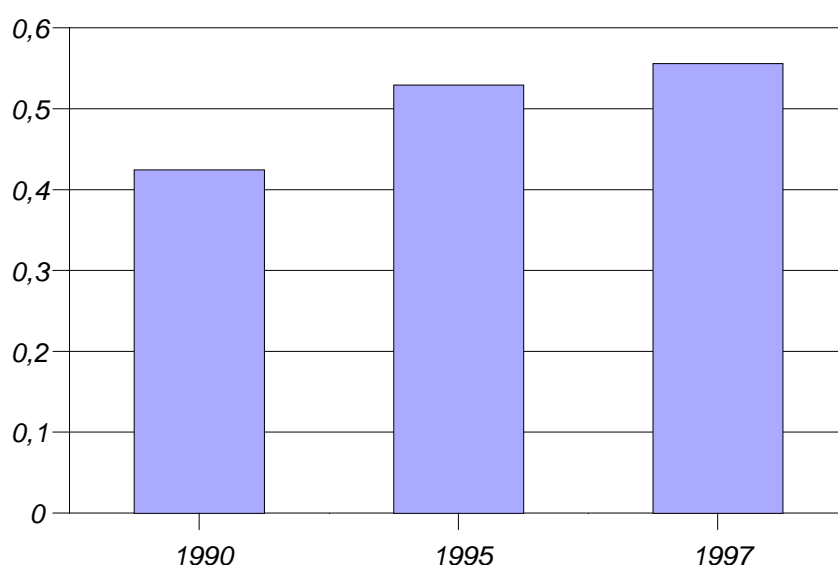
### 3.4.2 Transfer pricing

Under separate accounting, transactions between entities of a company in different countries should be traded at transfer prices. A way to shift paper profits within a multinational firm is by manipulating these prices. Indeed, it is attractive for multinationals to charge an artificially low price for goods that are transferred from high-tax countries to low-tax countries. This low price would increase profitability of the affiliate in the low-tax country while it decreases profitability of the affiliate in the high-tax country. Thus, the multinational would reduce its overall tax liabilities.

Today, intra company trade is quantitatively important. To illustrate, 30% of all Dutch industrial production is controlled by foreign parents, while this share is 15% in the service sector. Three quarters of the imports by these foreign controlled firms involves intra company trade, e.g. imports from the parent company or from another foreign affiliate. In aggregate, intra-company import by foreign controlled firms amounts to 146 billion guilders in 1996, which is around 40% of total Dutch imports (CBS, 1999). These figures suggest that there is indeed substantial scope for profit shifting through the manipulation of transfer prices.

Following the OECD Transfer Pricing Guidelines, however, most governments have introduced the arms-length principle to determine transfer prices. This implies that transfer prices should be set equal to the prices that would apply to market transactions between unrelated parties. But for a number of goods and services, there is no such outside market. Indeed, the uniqueness of many intangibles, such as brand names and intellectual property rights makes it impossible to determine arms-length prices. Due to asymmetric information, firms thus have some freedom to manipulate these transfer prices, thereby reducing their overall tax liability. This problem is likely to become more important in light of the growing importance of intangible investments and intangible products (see figure 3.2).

**Figure 3.2** Average ratio intangible/tangible investment in six EU countries (Aus, Bel, Fr, NL, UK, Sw)



Source: CBS, 2000.

Empirical studies on transfer pricing primarily rely on indirect methods to estimate the extent to which profit shifting occurs. For instance, some studies estimate the correlation between profitability rates of foreign affiliates of US multinationals and statutory tax rates in different host countries, thereby using aggregate data. Thus, Grubert and Mutti (1991) find that an

increase in the tax rate by 1%-point reduces profitability by 0.26%. Hines and Rice (1994) find a much higher elasticity of 2.3%. These findings are interpreted as indirect evidence for profit shifting through aggressive transfer pricing. According to Hines and Rice, tax havens play an important role for this type of tax avoidance: their calculations suggest that some tax havens maximize total corporate tax revenue (i.e. the top of the Laffer curve) at a rate between 5 and 8%.

An alternative way to explore transfer pricing is by using firm-level data. Harris (1993) compares the tax liabilities of companies with a foreign affiliate in a low-tax country and those with an affiliate in a high-tax country. The idea is that multinationals with low-tax affiliates may reduce the tax liabilities through transfer pricing in the home country of the parent, while those with a high-tax subsidiary are more likely to use transfer pricing to increase the domestic tax liabilities. Harris (1993) find that firms with low-tax affiliates indeed have substantial lower domestic tax liabilities in the US, while those with high-tax affiliates have a higher US tax bill.

Using firm-level data for 370 US multinationals, Rousslang (1997) compares the profitability of the foreign affiliates with the average profitability of firms. He also finds empirical support for income shifting, although he reports moderate effects: profit shifting represents less than 4% of the world-wide income of the firms under consideration.

Clausing (1998) exploits intra-firm trade data of US multinationals to test the hypothesis of manipulation of transfer prices. She finds that taxes have a significant impact on intra-firm trade balances. In particular, a 10% point lower tax rate in the country of the affiliate results in a 4.4% reduction in the trade balance between the parent company and the affiliate. This is consistent with the hypothesis that US sales to affiliates in low-tax countries are underpriced while US purchases from these affiliates are overpriced.

EU-evidence on profit shifting is rather scarce. One study by Demircuc-Kunt and Huizinga (1999) shows that, in a number of European countries, banks with foreign owners have lower tax liabilities than banks that are domestically owned. This may be interpreted as indirect evidence for tax avoidance. Bartelsman and Beetsma (2000) analyse the correlation between the complement of the labour-income share per sector (as a proxy for corporate profits) and statutory corporate income taxes. A positive correlation is interpreted as indirect evidence for profit shifting. Based on their estimates, the authors conclude that profit shifting is an important phenomenon in the OECD.<sup>12</sup>

Summing up, the scarce econometric evidence for Europe suggests that profit shifting is an important phenomenon. In addition, multinationals openly admit that tax planning is becoming

<sup>12</sup> A problem with this and other aggregate studies is, however, that the estimates may simply reflect systematic differences in the characteristics of firms that invest in low-tax countries, rather than profit shifting. Studies using firm-level data have more scope to control for this heterogeneity among firms, but such studies are currently not available for Europe due to a lack of adequate data.

an increasingly important aspect of the firm strategy.<sup>13</sup> A final piece of indirect evidence is the flourishing tax consulting industry in the EU.

### 3.5 Conclusions

To the extent that capital markets become more integrated, tax differences may cause more severe behavioural responses which change the international allocation of capital and profits. Indeed, this chapter shows that corporate taxes have a significant impact on the international allocation of investments. In particular, both US evidence and recent evidence for the EU suggest that foreign direct investment is sensitive to differentials in the effective tax burden on corporations with semi-elasticities ranging between  $-0.4$  and  $-4.0$ .

Another elastic component to company taxation is the distribution of corporate profits across affiliates in various countries. Studies for the US find indirect evidence for this phenomenon. Also in Europe, income shifting seems important, although the magnitude of the problem is difficult to determine. The internationalisation of businesses, the growing importance of intangibles and intra-company trade, and developments in the Internet will probably make it increasingly difficult for tax authorities to monitor the use of transfer pricing, thus leaving more scope for profit shifting.

<sup>13</sup> See for instance <http://www.cfoeurope.com>.



## 4 Tax competition

The previous chapter discusses how firms respond to differences in capital income taxation; this chapter discusses how governments respond to each other's tax setting behaviour. In particular, internationally footloose business activity underlies international spillovers of taxation, which we call 'fiscal externalities'. They trigger strategic tax competition, and provide a case for tax coordination. The gains from tax coordination should, however, be weighed against positive effects of tax competition.

### 4.1 Fiscal externalities

#### 4.1.1 Underprovision of public goods

The archetypical tax competition model is instigated by the seminal work of Zodrow and Mieszkowski (1986).<sup>14</sup> We outline the main assumptions underlying its results, and give the intuition behind the idea of fiscal externalities. We won't prove lemmas or theorems or discuss the full array of variables in order to keep the mathematics to a minimum. Later in this chapter, we discuss some qualifications to the Zodrow-Mieszkowski framework.

Consider a world of two countries inhabited by residents who each supply one unit of labour to their home labour market, and  $k^*$  units of capital to the world capital market. Both countries produce a single good -which can be thought of as national product- by employing labour and capital according to the production function

$$f(k_i), \quad i = 1, 2 \quad (4.1)$$

that maps  $k_i$ , the per capita capital stock employed in country  $i$ , to  $f(k_i)$ , per capita production. We make no assumptions with respect to production technology, except the common ones that the marginal capital productivity  $f'(k_i)$  is positive, and the change in marginal capital productivity  $f''(k_i)$  is negative (decreasing returns to scale).

We are primarily interested in how tax policies determine the allocation of capital, and above all, how tax policy in one country affects that of other countries. We will come to these issues shortly. For the time being, suffice it to note that the allocation of capital obeys the identity

$$s_1 k_1 + s_2 k_2 = k^* \quad (4.2)$$

<sup>14</sup> The original idea stems from Oates (1972), but he does not formalize the argument.

where  $s_1$  and  $s_2$  denote the relative sizes of the countries in terms of population (the weighting with the population rates is necessary since the capital labour ratio is expressed at the level of an individual resident rather than the level of the country as a whole).

The good can be consumed in two ways: as  $x_i$ , a private good, or as  $g_i$ , a public good. The private good is (implicitly) distributed through the market. The public good must, however, be provided by the government. To this end it raises revenue by applying a tax rate  $\tau_i$  to  $k_i$ . Hence, the tax base is the capital stock employed within the country's borders, i.e. the tax is a 'source tax'. Had the tax base been  $k^*$ , the capital stock owned by residents at home or abroad, then the tax would have been a 'residence tax'. In chapter 3 we argued that, although residence based taxes are to be preferred from a theoretical perspective, source based taxes are the rule due to problems of monitoring foreign source capital income. Hence, the model's tax structure is a reasonable representation of reality.

Residents value both private and public consumption. Their preferences are summarised by the utility function

$$u(x_i, g_i), \quad i = 1, 2 \quad (4.3)$$

which has the usual properties  $u_{x_i}, u_{g_i} > 0$ ,  $u_{x_i x_i}, u_{g_i g_i} < 0$ . It is the government's task to choose the tax rate such that residents enjoy an optimal mix of private and public consumption. Formally, it should choose a tax rate such that

$$\frac{\partial x_i}{\partial \tau_i} + m(x_i, g_i) \frac{\partial g_i}{\partial \tau_i} = 0, \quad i = 1, 2 \quad (4.4)$$

This condition for optimal fiscal policy can be understood as follows: There is an objective trade-off between private and public consumption: public consumption inevitably goes at the cost of private consumption, the marginal rate of transformation. There is, however, also a subjective trade-off: public consumption is valued in terms of private consumption according to  $m(x_i, g_i)$ , the marginal rate of substitution. Condition (4.4) says that these trade-offs must be 'in balance', i.e. the marginal rate of transformation must equal the marginal rate of substitution. If this condition does not hold, public consumption is either too cheap or too expensive, and residents would be better off if the government respectively set a higher or lower tax rate. Solving condition (4.4) for the tax rate  $\tau_i$  yields a function that defines the optimal tax rate  $\tau_i$  given the tax rate  $\tau_j$  of the other government. This 'best-response' function underlines the strategic interdependence of the governments: they cannot afford to make fiscal policy disregarding the



fiscal policy of their opponent. This crucial element of tax competition is the consequence of the international nature of the capital market.

It can be demonstrated that, if the capital market is perfectly competitive, the gross return to capital equals the marginal capital productivity, and the net return  $r$  equals the marginal productivity less the tax rate. Assuming that capital is perfectly mobile, the residents of both countries supply their capital wherever the net return is highest. Hence, the market equilibrium condition is

$$r = f'(k_1) - \tau_1 = f'(k_2) - \tau_2 \quad (4.5)$$

This ‘capital arbitrage condition’ already featured in chapter 3. There we explained the corresponding equilibrium is stable: self-interested behaviour of individual investors drives the international allocation of capital towards a state in which equation (4.5) holds true.

If both governments are to choose their optimal tax rate given the tax rate of the other government, then neither government has an incentive to change its fiscal policy -they find themselves in a Nash equilibrium. It corresponds to the intersection of the best response curves defined by condition (4.4).

**Figure 4.1** Best response functions of two countries competing for mobile capital

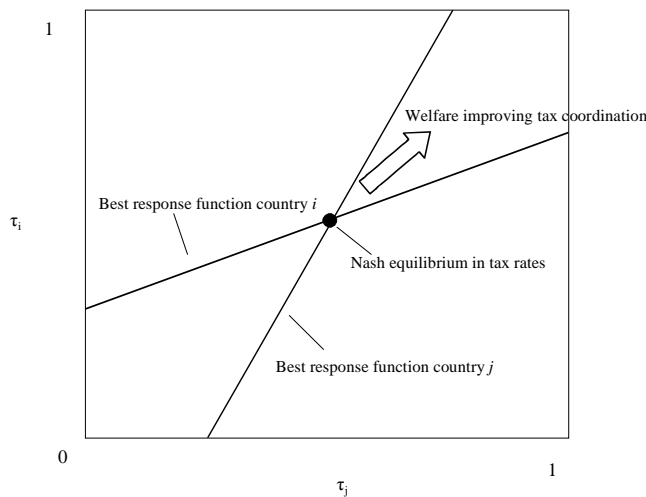


Figure 4.1 sketches the ‘best response functions’ of country  $i$  and country  $j$  graphically, that is, the optimal tax rates *given the tax rate of the other country*. Note that the optimal tax is non-zero for a zero tax rate of the opponent (the functions do not start in the origin). Moreover, the

optimal tax rate increases in the tax rate of the opponent (the functions are upward sloping). The only point where both countries simultaneously behave optimally is the intersection of the best response functions. This is the Nash equilibrium.

It can be demonstrated that the tax game that governments play against each other resembles a standard prisoner's dilemma. Thus, in the Nash equilibrium, the level of  $u(x_i, g_i)$  is lower than it would have been had the governments set their tax rates cooperatively. It is for this reason that supra-national bodies such as the European Commission favour tax coordination. The intuition behind this result revolves around capital flight.

The resident's budget constraint implies that private consumption equals the sum of their labour and capital income. The first is simply the difference between the national product and the remuneration of the suppliers of capital; the second the product of the net rate of return and the capital stock

$$x_i = f(k_i) - f'(k_i)k_i + rk^*, \quad i = 1, 2 \quad (4.6)$$

Public consumption equals the product of the tax rate and the tax base

$$g_i = \tau_i k_j, \quad i = 1, 2 \quad (4.7)$$

How does an increase in one country's tax rate impact upon private consumption of *the other* country? Differentiating (4.6) with respect to  $\tau_j$  yields the answer:

$$\frac{\partial x_i}{\partial \tau_j} = -f''(k_i) \frac{\partial k_i}{\partial \tau_j} + \frac{\partial r}{\partial \tau_j} k^*, \quad i = 1, 2, \quad i \neq j \quad (4.8)$$

The first term on the right hand side of equation (4.8) says that wages will increase in country  $i$ . The intuition is that the tax increase induces capital flight from country  $j$  to country  $i$ . Consequently, labour in country  $i$  will have more capital to work with, and becomes more productive. Private consumption in country  $i$  increases on this account. The second term says that the net return to capital decreases. As long as individual countries have a negligible impact on world interest rates, however, this second term is zero. Therefore, private consumption in country  $i$  increases if country  $j$  raises its tax rate.

We can perform a similar exercise for public consumption. Differentiating (4.7) with respect to  $\tau_j$  yields:

$$\frac{\partial g_i}{\partial \tau_j} = t_i \frac{\partial k_i}{\partial \tau_j}, \quad i = 1, 2, \quad i \neq j \quad (4.9)$$

Expression (4.9) reveals that tax revenue in country  $i$  increases due to a broadening of the tax base. Thus, public consumption also increases.

In short, an increase of the tax rate in country  $j$  increases both private and public consumption in country  $i$ . Thus, taxation involves an unambiguous positive externality. Since the government of neither country takes this externality into account while making its fiscal policy, they set their tax rates lower than it would otherwise have done. This implies that public good consumption is also lower than it would otherwise have been, and that residents of both countries would be better off if their governments would increase their tax rates in unison. In figure 4.1, this is indicated by the arrow labelled 'welfare increasing tax coordination'.

Zodrow and Mieszkowski initiated a vast literature that extends and generalises their original idea.<sup>15</sup> Hoyt (1991), for instance, shows that there is a positive relationship between the number of competing regions and the magnitude of the fiscal externality. This suggests that downward pressure on tax rates will increase with the advent of EU enlargement.

Others have emphasised that tax competition can be especially harmful for poor households since it increases the costs of income redistribution from the rich to the poor (Huber, 1999). The intuition behind this result is that high wage earners tend to own relatively much capital. Consequently, tax competition frustrates income redistribution. Tax coordination eases the efficiency-equity trade-off.

#### 4.1.2 Pecuniary externalities

Bucovetski (1991) qualifies the Zodrow-Mieszkowski result in case  $s_1 \neq s_2$ , i.e. if countries differ in size. Then, the large country has an incentive to set its tax rate differently from the small country. Intuitively, the large country possesses market power -- or monopsony power -- on the international capital market: it can influence the world interest rate by its tax policy. For instance, a higher tax in the large country reduces the demand for capital in that country, which has a non-negligible impact on world capital demand. Accordingly, the world interest rate declines. This benefits welfare in the large country if it is a net importer of capital (as in the Bucovetski model). Similarly, if the large country is a net capital exporter, it can improve welfare of its residents by reducing its tax rate in order to raise the world interest rate.

The welfare gain in the large country typically comes at the expense of other countries. For instance, if the large country is a capital importer, the lower interest rate induced by its high tax rate would hurt capital owners abroad. As the large country does not take into account the

<sup>15</sup> For a survey of the tax competition literature, see Wilson (1999)

adverse welfare effects on foreigners, it involves an externality: the so-called *pecuniary externality*. Note that the impact of the pecuniary externality on the tax rate can be opposite from the fiscal externality. Indeed, the pecuniary externality may either alleviate or exacerbate the underprovision of public goods by yielding either a too high or a too low tax rate on capital.

The pecuniary externality may not only refer to large countries. Gordon and Varian (1989) argue that also small countries can have market power on international capital markets, even though they cannot influence the world rate of return to capital. In particular, if the rate of return is uncertain and return patterns cannot be duplicated in other countries, investors may gain from internationally diversifying their portfolio's. In that case, all countries have some market power which provides incentives to impose taxes on the source basis.

With respect to small and large countries, there can be other differences as well. Kanbur and Keen (1996) show that small countries may actually gain from tax competition, relative to tax coordination. In particular, if the small country sets a lower tax rate than the large country, it attracts so much capital *relative to its size* that its residents are better off under a regime of tax competition than under a regime of tax coordination. For the large country, the opposite holds: a lower tax rate attracts so little capital relative to its size so that it is hardly rewarding for large countries to cut their taxes. This can explain why small countries, such as Ireland and Luxembourg, set relatively low tax rates compared to large countries. Moreover, it explains why small countries are usually reluctant to sign EU tax treaties, while large, high tax countries such as Germany and Italy generally press for them.

#### 4.1.3 Tax exportation externalities

Countries usually both import and export capital. Indeed, gross capital flows are substantially larger than net flows. With increased capital market integration, this cross-ownership of capital tends to become more and more important. If the domestic capital stock is to a large extent foreign-owned, the corporate income tax becomes an effective tool to tax foreign investors. Governments thus face an incentive to 'beggars their neighbour' by taxing foreign-owned businesses in their country, which pays for public goods of benefit to the residents in the country. This phenomenon is generally referred to as 'tax exportation'.

Tax exportation constitutes another fiscal externality. In particular, taxes on foreign-owned capital reduce the earnings received by foreign investors or, to the extent that these taxes are credited against foreign taxes, the tax revenue in foreign countries. This causes adverse welfare effects in other countries which is not taken into account when individual countries determine their tax rates non-cooperatively. The tax exportation externality provides an incentive for governments to set too high tax rates on capital. Just as the pecuniary externality, it may alleviate the underprovision of public goods.

Tax exportation is possible only if capital cannot fully escape the tax burden by moving abroad, i.e. if capital is not perfectly mobile internationally. This implies that tax exportation is probably more important in the short run than in the long run.

#### 4.1.4 Asymmetric information

A fourth international spillover effect can arise on the micro level and has to do with asymmetric information between firms and the government. Suppose that a multinational firm wants to invest somewhere in Europe. In contrast to the multinational, the fiscal authorities of the various EU countries do not know the sensitivity of the investment project to tax rates. This information asymmetry is important in the negotiations between the fiscal authorities and the investor about the discretionary tax treatment of the firm. In particular, the firm can exploit its information advantage to obtain a better tax deal with competing governments. Osmundsen et al. (1999) indeed show that the firm can realize a profit due to its information advantage regarding the mobility of its investment. If the various governments would coordinate their actions, the firm would have less power to exploit this information advantage.

### 4.2 Some qualifications

Economic theory thus gives at least four reasons why tax competition among jurisdictions fails. It must be noted, however, that these failures of tax competition depend on a number of important assumptions. These include:

- (1) capital is mobile internationally;
- (2) labour is immobile internationally;
- (3) tax revenue must (at least partly) be generated by source taxes on capital income;
- (4) public goods comprise only public consumption goods or transfers;
- (5) governments are benevolent maximisers of social welfare;
- (6) governments are credible.

Violation of these assumptions relaxes the market failures associated with tax competition. We discuss them in turn.

#### 4.2.1 Degree of capital-market integration

The empirical evidence on the degree of capital mobility is inconclusive. On the one hand, a number of empirical studies suggest that capital is rather immobile internationally. For instance, Feldstein and Horioka (1980) show that domestic savings and investments are almost perfectly correlated, which hints at a lack of capital market integration. In addition, interest-rate differentials and evidence on home biases of asset portfolios suggest that capital markets are not yet perfectly integrated. On the other hand, in chapter 3 we reviewed a number of empirical studies that point at a significant impact of taxation on the international allocation of capital. In

any event, the EU internal market and the EMU progress, and capital will probably become more mobile in the foreseeable future. Compared to the EU internal market, however, global capital markets tend to be somewhat less integrated.

Mobility may differ between various types of capital and between the short run and the long run. In particular, financial capital tends to be more mobile than real capital. Indeed, the latter is usually fixed in the short run. In the long run, the distinction between financial and real capital gets blurred. Hence, Zodrow and Mieszkowski's underprovision of public goods should be interpreted as a long run phenomenon, whereas inefficiently high rates due to tax exportation is more important in the short run.

#### **4.2.2 Household mobility**

The Maastricht treaty of the EU introduced the subsidiarity principle, suggesting that government functions should be centralised only if they cannot be fulfilled satisfactorily by the individual member states. Hence, the EU tends to favour decentralisation over centralisation. Economists generally support decentralisation. One important benefit, so they argue, is that local governments have better information about local preferences. In particular, by voting for local governments, residents reveal their preferences for the supply of local public goods. Accordingly, the mix of taxes and expenditures set by the local government will better reflect the preferences of residents in the region than in case of central governments. Indeed, central governments typically fail to differentiate across regions and supply the same amount of public goods to all regions. This yields efficiency losses to most regions, especially for those with exceptional preferences.

Tiebout (1956) suggests an alternative way to reveal household preferences for local public goods, namely 'voting by feet.' In particular, mobile households will choose the region in which the tax-expenditure mix best reflects their preferences. Tiebout suggests that interjurisdictional competition results in some sort of market solution for an efficient mix of taxes and public expenditures in all regions.

Wellisch (2000) demonstrates that the necessary assumptions for Tiebout's hypothesis to hold are quite restrictive. Interjurisdictional competition fails if households are immobile, and if there are interregional externalities. In that case, central intervention can be welfare enhancing. Since, household mobility across EU member states is almost zero, the latter case seems the most relevant for the EU. This is the starting point of this chapter where we discuss the various 'market failures' associated with tax competition between countries.

#### **4.2.3 Second-best taxation**

If capital is perfectly mobile then the incidence of a capital income tax in small open economies falls upon immobile factors such as labour. Hence, both capital and labour income taxes are borne by labour alone. Since the capital income tax discourages investment, small open

economies should refrain from raising revenue in this inefficient instrument to raise revenue (Gordon, 1986).

Zodrow and Mieszkowski consider no tax instruments other than those on capital income. Would the government have access to other, more efficient tax instruments, then fiscal externalities from capital taxes might disappear from the model. Bucovetsky and Wilson (1991), however, show that fiscal externalities remain important in this case. In particular, countries find it optimal to set low tax rates on labour in order to raise domestic labour supply. This boosts the marginal productivity of capital and thus attracts mobile capital from neighbouring countries. Hence, the fiscal externality is now reflected in too low labour taxes.

In practice, we do observe source taxes on capital in small open economies. One reason is that more efficient tax instruments are politically not acceptable to the public. The English poll tax riots are a case in point. Therefore, governments have to rely on other, less efficient taxes, including source taxes on capital (see also chapter 3).

#### **4.2.4 Public consumption versus public inputs**

The formalized framework in this chapter does not distinguish different kinds of public goods. Yet, recreational payments or social services differ fundamentally from infrastructure or education: the first kind does not increase the marginal productivity of capital, whereas the second kind does. Hence, the provision of public inputs compensates the adverse effects of capital taxes on foreign investment.

Keen and Marchand (1997) show, however, that tax competition will typically cause a distortion in the composition of public spending. In particular, the supply of public consumption will be too small relative to the supply of public inputs. Accordingly, a reallocation of public goods from public inputs to public consumption in all countries would yield an efficiency gain. This issue raises an important point, namely, that tax competition is harmful for public goods such as recreation and social services but not for others such as education and infrastructure. In fact, the latter may be overprovided because governments may compete with the supply of these public inputs (such as airports, railways, etc) in order to attract particular types of businesses.

#### **4.2.5 Benevolent maximiser of social welfare**

The tax competition literature starts from the assumption that governments are benevolent maximisers of social welfare, thereby taking into account the preferences of their residents. The public choice literature, in contrast, has a radically different perception of how the policy making process works. In particular, Brennan and Buchanan (1980) suggest that governments generally lack accountability, especially higher levels of government. Therefore, there is room for policy makers to pursue their own personal goals, rather than serving the interest of the public. The personal interest of policy makers will typically result in too high public expenditures. Indeed,

public choice economists often assume a Leviathan-type government that is an untrustworthy revenue maximiser. Accordingly, governments have the tendency to set tax rates that are too high from a social point of view. In that case, tax competition will serve the valuable task of taming the Leviathan. In particular, it forces governments to reduce taxes, which improves the conditions for an efficient mix of taxes and public expenditures (McLure, 1986).

Edwards and Keen (1996) try to reconcile the two opposing views on governments. They develop a model of tax competition where the government is characterized by properties of both the benevolent maximiser of social welfare and the Leviathan revenue maximiser. Hence, the cost of tax competition related to fiscal externalities should be weighed in the Edwards-Keen model against the gains of tax competition associated with the disciplining impact on the Leviathan. Edwards and Keen thus derive an explicit condition regarding government behaviour the under which tax competition harms social welfare. In particular, welfare increases only if the fraction of government spending that represents 'pure waste' exceeds the responsiveness of capital to taxes. Hence, if capital is very elastic, tax competition is unlikely to be beneficial since this requires a very high fraction of the Leviathan-component of public spending.

In practice, it is very hard to find evidence in support of the Leviathan hypothesis. In the wake of Oates (1985), many authors have sought to pin down the Leviathan government empirically, but have for the most part failed. It is therefore difficult to apply the Edwards-Keen result to the real world. One may also question whether forgoing tax competition is the appropriate means to tame the Leviathan. Would more direct instruments to improve the accountability of governments not be better? In the absence of first-best instruments, however, tax competition may a welcome second-best means to discipline bureaucrats and alleviate government failures. The challenge is, therefore, to find a balance between tax competition and tax coordination.

#### 4.2.6 Credibility of government

Another type of government failure has to do with time inconsistency. Investors have to make a decision how much to invest in a particular country. These investments often require set-up costs, investments in human capital of local employees, or research and development. These costs are sunk after they have been made. The company will aim to finance these costs by making quasi-rents on their investments in later periods. But governments may have an incentive to tax away these quasi-rents since the investments cannot be relocated easily. This creates a hold-up problem since the government cannot credibly pre-commit to companies that it will not tax them in later periods. Firms will therefore underinvest in the country.

Tax competition and the threat of a bad reputation can relax the time-inconsistency problem. This is because investors realize that governments who are disciplined by tax competition have less freedom to tax away quasi rents. Indeed, such a tax will be costly due to adverse reputation



effects which cause a reduction in future investments. Accordingly, tax competition increases the credibility of governments and, therefore, raises investments by firms.

Note that also current practices aim to alleviate the hold-up problem. In particular, tax administrations use advance pricing agreements and advance tax rulings in which they provide a commitment to firms regarding the future application of transfer prices or tax exemptions. This commitment encourages firms to invest in a country.

## 4.3 Evidence on tax competition

A natural question that arises is whether the theory on tax competition is relevant in practice? This section provides some evidence as the present situation is characterized by a virtual lack of tax coordination.

### 4.3.1 Is there a tax race to the bottom?

Chapter 2 shows that statutory corporate income tax rates have declined during the last decade. Indeed, the appendix to chapter 2 suggests that, on average over the 15 EU member states, the statutory corporate income tax fell from around 38% in 1990 to 33% in 2000. A number of EU countries have proposed further cuts in statutory rates in the near future. For instance, Denmark has reduced its rate in 2001 from 32% to 30%. In Germany, the corporate tax on retained profits will be cut from 40% to 25% and that on distributed profits from 30% to 25%. In France and Italy, the corporate tax rate is expected to fall by 3.6%-points and 13%-points, respectively. Ireland intends to lower its rate from 24% in 2000 to 12,5% in 2003 (see also the next box).

Chapter 2 shows that effective tax rates on corporations in Europe have, in contrast to statutory tax rates, not declined. This holds true, irrespective of the measure of the effective tax rate. In fact, table 2.4 shows that the mean effective tax rate has increased by 1.1%-points between 1990 and 1999. Note, however, that this is for a large part attributable to the increase of the Greek tax rate from 11% in 1990 to 35% in 1999.

In short, statutory tax rates have decreased, but effective tax rates have remained constant. How can this be reconciled with tax competition theory? As we explained in chapter 3, differences in statutory tax rates determine the incentives for profit shifting. The decrease of statutory tax rates points at the relative mobility of paper profits. Differences in effective tax rates determine the incentives for the location of real capital. The constancy of effective tax rates thus points at the relative immobility of real capital. There is, however, another reason why effective tax rates remain constant. On the one hand, capital market integration causes downward pressure on effective tax rates through the fiscal externality. On the other hand, it increases

cross-ownership of capital, thereby increasing the incentive for tax exportation<sup>16</sup>. The constancy of effective tax rates reveals that the incentive to decrease tax rates through the fiscal externality, and the incentive to increase tax rates through tax exportation cancel out. Simulations with a CGE model by Thalmann et al. (1996) confirm this observation.

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### The case of Ireland

For the first time in history Ireland has experienced net immigration. Undoubtedly, one of the main reasons is that Ireland has developed rapidly. Some facts: between 1987 and 1997 GDP has grown at more than double the rate of the US, while employment has increased by almost one fourth (Barry 1999). There is a wide array of explanations for Ireland's favourable development. Krugman (1997) points at a reduction of transport costs, which pulled Ireland out of the geographical periphery. Honohan (1998) points at the flair and adaptability of Ireland's labour force, which are apt cultural institutions for the booming computer-related services. Finally, Sachs (1997) points at the role of foreign direct investment as the motor of economic development. Indeed, half of Ireland's manufacturing employment is now in foreign controlled corporations, especially from the US. Tax incentives such as a special 10% corporation tax rate for manufacturing companies, exemption from local and capital gains taxes, as well as generous depreciation allowances have played an important role in attracting this foreign direct investment. Ireland will, moreover, press on with building an attractive fiscal climate for foreign direct investment. It is committed to reduce its corporate tax rate on all companies to 12.5% in 2003.

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#### 4.3.2 Do small countries have lower tax rates than large countries?

Tax competition theory suggests that small countries set lower tax rates than large countries. Kanbur and Keen (1993) explain why: small countries attract more capital relative to their own size by reducing their tax rate. Thus, lower tax rates by small countries constitutes indirect evidence for tax competition.

The difference between statutory tax rates of small and large countries are modest (see the appendix of chapter 2). In particular, for the big five EU member states (France, Germany, UK, Italy and Spain), the statutory tax rate on retained profit is, on average, 3% higher than for the small member states (Austria, Belgium, Denmark, Finland, Greece, Ireland, Luxembourg, Netherlands, Portugal, Sweden). To be precise, the averages are 35% and 32%, respectively in 2000. For distributed profits, the difference is even smaller due to the lower tax rate on distributed profits in the German split rate system.

The difference in effective tax rates between large and small countries is more pronounced. Table 2.4 shows that, calculated over the years between 1990 and 1999, the mean effective tax rate of small countries is 24.6%, while the mean effective tax rate of large countries is no less

<sup>16</sup> To illustrate, Statistics from De Nederlandsche Bank (2000) reveal that foreign ownership of capital in the Netherlands has doubled from approximately 400 billion euro in 1994 to 800 billion euro in 1998. Today, approximately 30% of all capital in the Netherlands is foreign owned.

than 35.8%. The difference between small and large countries has declined, however, over the last ten years from 10.8% in 1990 to 8.5% in 1999.

An alternative explanation for the observed difference between the tax rates of small and large countries is the lack of international loss compensation. This makes locating business activity in large countries relatively attractive. This puts large countries at an advantage in attracting investments from multinational firms since the loss of an affiliate can be offset against profits elsewhere in the large country, not against profits in a small neighbouring country. For this reason, large countries can set higher taxes than small countries without immediately losing capital.

#### **4.3.3 Strategic interactions**

Zodrow-Mieszkowski-type models yield best response functions where the optimal tax rate of one jurisdiction depends on the tax rates of by neighbouring jurisdictions. Figure (4.1) shows two of these functions. A number of scholars have estimated the slope parameter. Brückner and Saavedra (1999) show that property taxes on businesses set by municipalities in the state of Massachusetts significantly responds to the tax rates of neighbouring municipalities. Similarly, Büttner (2000) finds evidence for significant reactions of local governments in setting their business taxes in municipalities of Baden-Württemberg. Indeed, tax competition among local jurisdictions is present.

We are unaware of a similar research on strategic interactions for EU member states. It is, nevertheless, likely that strategic interaction is present. First, governments typically justify tax-rate reductions on the basis of developments in neighbouring countries. Secondly, convergence of effective tax rates (see table 2.4) is suggestive of tax competition.

#### **4.3.4 Preferential tax regimes**

When deriving evidence on tax competition from aggregate variables (such as effective tax rates), one important critique is that this does not do justice to the specific forms in which tax competition works. In particular, the aggregate figures hide preferential tax regimes which can be seen as forms of tax competition. For instance, countries have introduced special regimes to attract investment in specific geographical areas or activities (Ireland, Spain, Greece) or created special holding-company schemes which allow international capital income to flow through these companies with low taxation (Benelux, Denmark, France). Other tax regimes lack transparency or suffer from a lax enforcement of tax rules. Tax competition manifests itself through this type of practices which both the OECD and the EU have labelled 'harmful tax practices'.

## 4.4 Measuring the gains of tax coordination

We have seen that tax competition theory as well as empirical evidence provide a case for tax coordination. Countries underprovide public goods because tax competition prompts them to set tax rates that are too low from a communitarian perspective. Pecuniary externalities make things worse by distorting the international allocation of capital. Moreover, statutory tax rates have declined significantly, harmful tax practices abound in various EU member states, and casual observation as well as econometric research suggest that governments do strategically respond to each others tax setting behaviour.

The case for tax coordination must, however, not be overstated. There is a range of considerations that qualify the theoretical results. For one thing, if governments are less benevolent than is usually assumed, then the impact of tax coordination on welfare becomes ambiguous. For another, if capital is immobile, tax coordination constitutes an unnecessary infringement upon the sovereignty of individual countries. Even if capital is mobile, tax competition is not as bad as it seems, because tax exportation mitigates -or even counterbalances- the pressure on tax rates. Indeed, effective tax rates have remained constant during the last decade.

Welfare analysis confirms this balanced conclusion: there is a positive impact; it is, however, relatively small due to the opposing effects. Fuente and Gardner (1990), and Sørensen (2000) are run computer simulations with applied general equilibrium models that capture the interdependence of the main variables featuring in the discussion on tax competition and tax coordination. In essence, their models are extensions of the archetypical tax competition model outlined above. Both models take account of the regional character of the EU, which operates in a global economically integrated environment. Key parameters in the models have been calibrated on the basis of common sense, crude data, and empirical studies. The models focus on the allocation of real capital and thus ignore the impact of taxes on profit allocation. Moreover, the models consider only the static long-term effects of the reallocation of capital, and do not capture the transitory or short-term effects of tax harmonization. In Sørensen's model, however, part of the capital stock is assumed fixed, an assumption that is probably more important in the short run. The quantitative estimates in the two studies should not be taken too literally. They do, however, shed light on the comparative welfare gains of different forms of tax harmonisation and on the key assumptions that drive the results.

Table 4.1 summarises the results reported by Fuente and Gardner (1990) and Sørensen (2000). Fuente and Gardner conclude that complete harmonization of EU tax rates increases EU output by 2.1%. The main reason behind this result is that Fuente and Gardner assume that the EU will harmonise the tax rate at a relatively low level. This would lead to a net inflow of capital from the rest of the world. Accordingly, the welfare gain experienced by the EU comes at the expense of welfare losses in the US and Japan. It should be noted that this form of tax

coordination is peculiar in the light of tax competition theory, which, as we have seen, emphasises that tax coordination should alleviate the problem of *under* rather than *overtaxation*. In this respect, Fuente and Gardner emphasise that the main point is that the level around which the effective corporate tax rates are harmonized are crucial for the magnitude and even the sign of the gains from tax harmonization.

They also conclude that the gains from tax coordination accrue particularly to the large countries in the EU. Indeed, the five largest EU countries (France, Germany, Italy, UK and Spain) experience a welfare gain of 2.2%, on average. Some smaller countries, such as Luxembourg and Ireland, even lose under a regime of tax coordination, relative to tax competition. On average, the welfare gain for the seven smaller EU countries (Belgium, Denmark, Greece, Ireland, Luxembourg, the Netherlands and Portugal) is a modest 0.4%.

Sørensen estimates the welfare gain from tax harmonisation with the TAXCOM model at 0.15% of GDP. This figure is much smaller than found by Fuente and Gardner. One important reason is that, whereas the effective tax rate in Fuente and Gardner declines under a regime of tax harmonisation, the tax rate rises in the TAXCOM model. Accordingly, tax harmonisation in TAXCOM causes an outflow of capital from Europe to the rest of the world. Despite of this outflow of capital, Sørensen reports a welfare gain. This is due to the positive welfare implications of a more equitable income distribution. In particular, the increase in the corporate income tax rate in all EU countries by around 5%-points on average, allows for higher transfers to the poor and thus a more equitable income distribution. More specifically, the gains from tax harmonisation accrue to residents who are relatively worse off: the poorest quintile of the residents of the representative country will profit as much as 7.6% whereas the richest quintile loses 1.9%.

Another source of welfare improvement in Sørensen's model is that, by acting cooperatively, the EU is better able to exploit its market power on world capital markets. Indeed, by raising the tax burden on capital, it shifts the economic burden of government interference to suppliers of capital from the US and Japan who receive a lower return on their capital. Without cooperation, the EU does not exploit this opportunity.

Sørensen investigates the sensitivity of his results to changes a number of assumptions in his TAXCOM model. First, his simulations suggest that if *all* countries harmonize then the gain from tax coordination increases to 0.94%, i.e. more than six times the welfare gain under European tax coordination. The reason is capital no longer flies to the rest of the world.

**Table 4.12 The welfare gains from EU tax harmonization in % of GDP**

	Fuente and Gardner (1990)	Sørensen (2000)
Overall effect	2.1	0.15
- small countries	0.4	
- large countries	2.2	
Sensitivity analysis		
Global tax harmonization	–	0.94
Interest elasticity of saving is zero	–	0.43
Preference for redistribution is doubled	–	0.58
Capital mobility between the EU and the rest of the world is imperfect	–	0.48

Table 4.1 also presents sensitivity analysis with respect to some crucial parameters in the model. First, it matters whether one assumes that aggregate savings respond to changes in the after-tax return to capital. In particular, the benchmark simulation assumes an interest elasticity of saving of  $-0.4$ . Hence, as tax harmonization is associated with a higher tax rate in the EU, it reduces savings, thereby causing a decline in welfare. If the interest elasticity of savings would be zero, this adverse welfare effect disappears and the welfare gain of European tax coordination shoots up from 0.15% to 0.43%.

Second, it matters whether or not the government has a strong preference for redistribution. If the preference for income equality among households doubles compared to the benchmark simulation, then the welfare gain of regional tax coordination increases to 0.58%.

Finally, the benchmark simulation assumes that there are two types of capital: mobile and immobile capital. Mobile capital can move freely across both European borders and between the EU and other regions in the world. If this latter assumption is relaxed and the substitution elasticity between capital from inside and outside the EU is set at 4 rather than infinity, Sørensen finds that the welfare gain from EU tax harmonisation triples to 0.48%.

In short, model simulations suggest that the gain of EU-tax coordination is between virtually zero and 2% of GDP. These welfare gains are, however, unequally distributed. First, large and high-tax countries typically gain more than small and low-tax countries. Second, the gains from tax coordination are likely to be unequally distributed over poor and rich residents within countries. For instance, in the TAXCOM model, the poor gain while the rich are worse off. This unequal distribution of the welfare effects of tax harmonization constitutes an important impediment to its implementation.

## 4.5 Conclusions

Tax competition theory suggests that countries underprovide public goods because the threat of capital flight prompts them to set tax rates that are too low from a communitarian perspective. In addition, differences between countries cause differences in equilibrium tax rates, and thus an inefficient international allocation of capital. Empirical evidence supports tax competition theory: statutory tax rates have steadily declined and preferential tax regimes abound in various EU member states.

There are, however, a number of qualifications. Tax competition disciplines inefficient governments, capital immobility removes the need for tax coordination, and tax exportation mitigates the downward pressure on tax rates. Moreover, empirical evidence suggests that tax competition for real capital is absent: effective tax rates have remained constant during the last decade.

Whether tax coordination is desirable depends on the trade-off between its costs and benefits, relative to the current situation which is characterized by very little coordination. Simulations with applied general equilibrium models suggest that a move towards tax coordination, on balance, leads to a welfare gain. It is, however, small, somewhere between 0-2% of national income. Moreover, the welfare effects are unevenly distributed: large, high-tax countries and poor households are the winners; small, low-tax countries and wealthy households the losers. Political agreement on tax coordination is for this reason unlikely without side payments.

In short, theory and evidence do not yield a general case for tax coordination. The case for tax coordination is more subtle since fiscal externalities manifest themselves in particular areas, not in others, while tax competition also has some virtues in the presence of an imperfect political system. Moreover, the assessment of tax coordination should not focus solely on fiscal externalities: there are additional costs and benefits. On the one hand, tax coordination infringes upon the sovereignty of individual countries. Any restriction on their fiscal discretion implies that countries can no longer tailor their tax systems to the preferences of their residents. On the other hand, harmonisation of rules implies that the European tax maze will become simpler, and therefore cheaper to operate. The assessment of tax coordination on the basis of a more comprehensive set of criteria is the topic of the next chapter.





## 5 Assessing proposals for tax harmonisation

The previous chapter points out that the question is not so much *whether* countries should coordinate company taxes in Europe, but rather *how* they should do it. This chapter assesses the most important proposals on the basis of four criteria.

### 5.1 Current forms of tax coordination

Some form of tax coordination already exists: there are bilateral tax treaties for information exchange, transfer prices, and the avoidance of international double taxation; furthermore, there are multilateral agreements such as the OECD Model Tax Convention and Transfer Pricing Guidelines, and the EU directives on mergers, foreign source profits, interest and royalties, as well as an arbitration convention.

More recently, the EU agreed upon a code of conduct with respect to harmful tax practices. This code intends to curb marginal administrative practices conspicuously intended to attract particular kinds of business activity. More specifically, the code defines harmful tax practices as measures that (1) “affect, or may affect, in a significant way the location of business activity in the Community”, and (2) “provide for a significantly lower effective level of taxation, including zero taxation, than those levels which generally apply in the Member State in question”. The code adds that “Member States commit themselves not to introduce new harmful tax practices, and to re-examining their established practices” (European Commission, 1998).

The EU has, in order to promote peer pressure, established a code of conduct working group. This group, chaired by the British paymaster general Dawn Primarolo, has blacklisted 66 harmful tax practices (Council of the European Union, 1999). Territories such as the Isle of Man and Gibraltar account for 26 practices. Of the regular member states, the Netherlands appears to be the culprit, since it accounts for ten of the remaining forty. This is, however, mainly due to the codification of its advance ruling system.

The code of conduct is a non binding form of tax coordination: it relies upon peer pressure among member states to provide the incentive for scrapping tax practices that are the ‘odd one out’ in a tax code. There are signs that this peer pressure is successful. The Netherlands, for example, take the edge of their advance ruling system, while Ireland scraps the reduced corporate income tax rate for manufacturing companies. However, the Netherlands contemplate to reduce their corporate income tax rate, while Ireland is committed to reduce hers. Accordingly, the code of conduct may intensify, rather than relax, tax competition.

This raises the question whether harmful tax practices are indeed more harmful than tax competition per se. The answer is ambiguous. Diaw and Gorter (2001) formally demonstrate that the code does not necessarily alleviate undertaxation. On the one hand, it induces

governments to scrap harmful tax practices; on the other, it prompts them to compete with the general tax rate. The conclusion is that only under mild tax competition is the code likely to be successful. Intuitively, only then the loss of tax revenue due to a decrease of the general tax rate - which is necessary for compliance to the code- is relatively small.

The question remains whether further reaching proposals are desirable? One could in particular think of tax *harmonisation*, which differs from tax coordination in that it necessarily makes tax systems more similar across countries. The next section discusses a number of proposals in this direction.

## 5.2 Proposals for tax harmonisation

It is infeasible to discuss the comprehensive array of tax harmonisation proposals. To keep this chapter conveniently arranged, we stick to a small number of archetypical ones. These are non-utopian, that is, it must be conceivable that they will be implemented in the foreseeable future. Furthermore, they focus on primarily international aspects of taxation. They can be ordered under three headings: harmonisation of tax bases, harmonisation of tax rates, and harmonisation of both. We relegate more fundamental proposals to a box.

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### Fundamental tax reform

In discussions on tax harmonization in the EU, economists suggest alternative systems of capital income taxation, such as the allowance for corporate equity (ACE), the cash-flow tax, and the comprehensive business income tax (CBIT) (see Cnossen (1996) for a discussion). These proposals are of interest since economic theory provides a strong rationale for them.

The ACE, put forward by the IFS Capital Taxes Group (1991), boils down to a deduction on corporate profits equal to the shareholders funds, multiplied by an appropriate nominal interest rate to be determined by the government. As this tax deduction approximates the normal return to capital, the ACE approximates a tax on pure profits. This is attractive for economic reasons since it does not distort marginal investment decisions.

The cash-flow tax, discussed for instance in Sinn (1987), allows immediate expensing of investments, while scrapping the deductibility of interest payments. Since the present value of cash-flow equals the present value of pure profits, the cash flow tax is, like the ACE, a tax on pure profits.

The CBIT, proposed by the US Department of the Treasury in 1992, taxes all capital income at the company level. Hence, interest is no longer deductible from corporate profits. Accordingly, the CBIT does not favour debt finance over equity finance so that thin capitalization becomes irrelevant.

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### 5.2.1 Harmonisation of tax bases

Multinational companies in the EU are burdened with the ins and outs of 15 distinct tax codes. Harmonisation of the tax base -often called *common base taxation*- would make the EU tax maze a lot simpler. Although this is true for multinational corporations, it makes no sense for

purely national corporations. Therefore, some have suggested to adopt such a harmonised tax base for multinational corporations alone. Moreover, a proposal by the European employers organization UNICE leaves the choice between a harmonised EU-tax base and the application of national tax rules up to the multinational corporation (UNICE, 2000).

A major political obstacle to the harmonisation of tax bases is that any conceivable common base will oppose vested interests in some member states. Unsurprisingly, therefore, a draft proposal for harmonisation of the tax base by the European Commission (1988) never got beyond its initial stages.

Yet, there is a way out. If Germany accepts that taxable corporate income of Philips Germany is calculated according to the Dutch tax code, and if the Netherlands accept that taxable corporate income of Siemens Netherlands is calculated according to the German tax code, then both Philips and Siemens are subject to only one tax code (albeit each to a different one), even though neither Germany nor the Netherlands have to make administrative changes. This system of mutual recognition -often called *home state taxation*- thus evades the political obstacle mentioned above.

Common base and home state taxation may be complemented by *formula apportionment*. This approach is an alternative to separate accounting with transfer prices. Under separate accounting, the profits of each business entity of a multinational group are cut off at the border (the 'water's edge'). Hence, the accounts of related business entities within the country can be consolidated, but accounts with related business entities outside the country must be separated. In contrast to this, formula apportionment assigns the sum of profits of all business entities that comprise a multinational firm (the 'unitary combination') to the source countries on the basis of a simple formula. The elements in the formula should reflect the factors that determine the source of profits. Obvious candidates for the formula are workforce, capital layout, and sales. Under formula apportionment with base sharing, countries can apply their own national tax rates to the assigned share of profits. Formula apportionment is used in mature federations such as the US and Canada.

### 5.2.2 Harmonisation of tax rates

Profit shifting is driven by differences in statutory corporate income tax rates. The reason is that depreciation allowances and other tax deductions depend on the capital outlay, not on corporate income per se. Thus, *harmonisation of corporate income tax rates* curbs tax competition, even without an accompanying harmonisation of tax bases. Harmonisation of statutory rates is, however, a political nonstarter. Therefore, proposals typically refer to *minimum* tax rates. Indeed, the European Commission has tried twice to agree on a minimum statutory rate in the EU: in 1975 it proposed a range between 45 and 55%; in 1992 it suggested a minimum corporate income tax rate of 30%. Individual member states brushed both proposals aside: they were unwilling to give up the power to set their tax rate independently.

An alternative to harmonisation of statutory tax rates is harmonisation of effective tax rates. The *minimum asset tax* goes a long way towards this (Van Wijnbergen and Estache, 1999). It is a “simple broad based tax, with no or few tax preferences”. Its most straightforward implementation is to require corporations to compute their tax liability according to the minimum asset tax as well as to the normal tax code, and let them pay whichever is highest (hence the adjective *minimum*). An obvious choice for a broad base is a simplified definition of corporate income. Some tax experts argue, however, that assets constitute a more reliable base (hence the adjective *asset*).

In short, the minimum asset tax is a minimum effective tax rate: corporations cannot reduce their corporate income tax bill to zero by exploiting tax preferences or shifting paper profits to foreign subsidiaries; if the ratio of the corporate tax bill and the tax base falls below the minimum asset tax rate, then the latter applies. Its main objective is to provide a backstop for corporate income tax revenue. A computer simulation with real world data lead Van Wijnbergen en Estache (1999) to conclude that the minimum asset tax indeed does well on this score. Brasil and Mexico, among other countries, operate variants of the minimum asset tax.

### 5.2.3 Harmonisation of tax bases and rates

It goes without saying that harmonisation of tax bases and harmonisation of tax rates can be combined. We focus on two prominent combinations: *revenue sharing* and the *European corporate income tax*.

Revenue sharing is a variant of formula apportionment. It differs slightly from base sharing: not the taxable corporate income *per se*, but the corporate income tax *revenue* is apportioned according to a certain formula. This boils down to the system of formula apportionment described above complemented by harmonisation of tax rates. It remains true that under either system, the corporate tax base must be determined by either common base taxation or home state taxation. The reason is that member states should in one way or another agree upon the size of the cake before they can divide it.

From revenue sharing it is only one step towards a European corporate income tax. Under such a system, the authority to tax corporate income is transferred from the individual member states to the European Union. The revenue could then replace the individual member states’ contributions to the Union.

The European corporate income tax finds support among prominent Europeans such Belgian prime minister Guy Verhofstadt. It merits special attention because it is the extreme form of tax harmonisation, and is therefore politically orthogonal to the present situation which is characterized by a virtual lack of coordination.

### 5.2.4 Summing up proposals for tax harmonisation

From the set of proposals for tax harmonisation outlined above, we will not discuss all marginal variations and suggestions. Instead, we focus on the following proposals that merely refer to archetypical directions for tax harmonisation:

- common base taxation;
- common base taxation combined with formula apportionment;
- home state taxation combined with formula apportionment;
- harmonisation of statutory tax rates;
- minimum asset tax;
- formula apportionment with revenue sharing;
- European corporate income tax.

## 5.3 Criteria for the assessment of proposals

Four arguments recurrently crop up in the tax harmonisation debate: *neutrality*, the tax induced distortion of international resource allocation; *externality*, the negative international spillover of national tax policy; *simplicity*, the administrative and compliance costs; and *diversity*, the degree to which national tax policy can provide for idiosyncratic national preferences with respect to, for example, the mix of private and public goods.

### 5.3.1 Neutrality

Neutrality usually refers to the overall distortionary impact of capital tax systems on the international resource allocation. This entails capital export neutrality, which requires residence based taxation, or convergence of effective source-based tax rates.

Residence based taxation is difficult. Credits for taxes on foreign source profits would be a step in the right direction. Nevertheless, excess credits and deferral of profit distribution would maintain effective source based taxation (Tanzi and Bovenberg, 1990). Thus, neutrality boils down to convergence of effective tax rates. We operationalise the neutrality criterion by assessing the impact of proposals on the variation of effective tax rates. Hence, if tax harmonisation reduces this variation, it is said to improve neutrality.

### 5.3.2 Externality

The second criterion refers to the various international spillovers discussed in the previous chapter. These ‘market failures’ in the context of competition among governments originate in strategic behaviour of governments. If tax harmonisation constitutes a binding restriction on the freedom of governments to pursue this strategic behaviour, then the adverse welfare effects of these externalities can be mitigated.

Externalities materialise in two forms: tax competition for paper profits, which puts downward pressure on statutory tax rates; and externalities regarding real capital, which puts downward pressure on effective tax rates. We treat these two forms of externalities separately. This is, however, not to say that they are unrelated, on the contrary. Alleviating one externality often exacerbates the other. For instance, if coordination restricts the freedom of governments to compete with tax rates, governments may intensify tax competition with their tax bases. When assessing the merits and demerits of the various proposals, we take these considerations into account.

As explained in the previous chapter, some degree of tax competition may be beneficial for European welfare since it helps to alleviate government failures. Therefore, one should strike a balance between tax coordination and tax competition. As the current situation is one of a virtual lack of tax coordination, we assume that the EU has not yet reached this balance. Hence, we assign a positive value to proposals that reduce the degree of tax competition. As chapter 4 reveals, this is probably more important for paper profits than it is for real capital.

### 5.3.3 **Simplicity**

Firms and governments face substantial administrative and compliance costs of corporate income taxation. To illustrate, under separate accounting, multinationals have discretion over the international allocation of joint costs such as research expenditures, advertising, and general management. Tax authorities attempt to gain a foothold by applying the arms length principle. The result is a cat and mouse game between multinationals and tax authorities: the first engage in expensive tax planning in order to let paper profits precipitate in low tax countries without breaking the transfer pricing rules; the latter engage in expensive monitoring of multinationals' accounting behaviour in order to enforce these rules and to receive a fair share of the tax base.

The cost of compliance are also high for businesses who face a complex set of tax rules and regulations that vary country by country. For instance, countries adopt different accounting principles, use different definitions of income and expenses, and adopt different methods to determine transfer prices.

These administrative and compliance costs tend to increase in the internationalisation of business activity and the further development of the internal market. Furthermore, developments such as internet and electronic commerce seem to complicate matters even further (McLure, 2000).

### 5.3.4 **Diversity**

The subsidiarity principle in the EU stems from the idea that preserving the integrity of sovereign states will best safeguard the welfare of European citizens. Only in the presence of international spillovers can coordination or harmonisation be desirable. In the context of tax policy, this implies that we should seek for tax coordination that allows for as much tax diversity

as possible. As Cnossen (1990) puts it “... tax diversity takes account of differences in preferences for one tax over another in the various member states which reflect differences in economic and social structures, different perceptions on the role of taxation, difference in the acceptability and feasibility of various taxes and, perhaps more fundamentally, differences in preferences for public sector size among the member states.” Moreover, diversity allows ‘real world experiments’ with tax systems, which helps to adopt better practices. For these reasons, the US, Canada, and Switzerland, among other federations, allow for substantial differences among local tax systems.

Diversity refers to distinct elements of taxation, including the level of tax rates, the definition of tax bases, and tax administration. Diversity in tax rates and tax bases implies an unlevel playing field that distorts the international allocation of resources, allows for strategic behaviour of individual governments, and induces high administrative and compliance costs. Hence, it is at odds with the neutrality, externality, as well as the simplicity criteria. In a sense, these reflect the cost of tax diversity. An appropriate application of the subsidiarity principle would seek the optimal trade-off between these costs and the benefits of tax diversity. We illustrate these and other trade-offs in the next section.

## 5.4 The tax harmonisation policy matrix

In this section we confront the seven proposals for tax harmonisation with the four criteria. The externality criterion is decomposed into tax competition for paper profits and real capital. Thus, the heart of our assessment is a tax harmonisation policy matrix (see table 5.1) with seven rows, each representing a proposal, and five columns, each representing a criterion. An element of the matrix represents whether a proposal is likely to improve the tax system according to a particular criterion.

The scoring itself merits clarification. First, all scores pertain to impacts *relative* to a benchmark, which is dubbed *laissez faire*. This refers to the present situation, characterized by a virtual lack of tax harmonisation. A zero score in the matrix signifies that a proposal has no significant impact on a particular criterion, relative to the benchmark; a plus signifies that there is an argument for a positive impact; a minus for a negative impact. Note that the strength of the impact is undefined. In explaining the scores of the matrix, we will make some attempts to provide a ranking of proposals on the various criteria, where possible.

**Table 5.13 The tax harmonisation policy matrix**

Proposals	Criteria				
	Neutrality	Externality Profits	Externality Real	Simplicity	Diversity
Laissez faire (benchmark)	0	0	0	0	0
CB	+	0	+	+	-
CB-FA	+	+	+/-	+/-	-
HST-FA	+	+	+/-	+/-	-
STR	+	+	+/-	0	-
MAT	+	+	+	-	0
FA-RS	+	+	+	+/-	-
EU-CIT	+	+	+	+	-

CB = common base taxation; CB-FA = common base taxation combined with formula apportionment; HST-FA = home state taxation combined with formula apportionment; STR = harmonisation of statutory tax rates; MAT = minimum asset tax; FA-RS = formula apportionment combined with revenue sharing; EU-CIT = European corporate income tax

#### 5.4.1 Neutrality

Which proposals have a positive impact on neutrality? In other words, which proposals aid convergence of effective tax rates? The second column of Table 5.1 lists our scores.

Some believe that laissez faire will automatically induce convergence of effective tax rates: just as price differentials are arbitrated away under perfect competition, tax rate differential are arbitrated away under tax competition, so goes the argument. This belief is, however, not based on mainstream tax competition theory. Indeed, Bucovetsky's (1991) asymmetric outcome discussed in chapter 4 falsifies the belief that capital market integration induces a 'spontaneous' convergence of capital income tax systems. Also different preferences or production technologies will induce countries to set different tax rates (DePater and Myers, 1994). In any event, since laissez faire is the benchmark, it scores zero by assumption.

A glance down the second column of table 5.1 reveals that all harmonisation proposals have a positive impact upon neutrality. For some proposals this is not obvious. For instance, common base taxation may increase the variation of effective tax rates because high statutory tax rates tend to come with narrow bases and vice versa (see appendix).

In order to make an educated guess we ran simulations, measuring the impact of all proposals on the variation of effective tax rates. Its results -presented in the appendix to this chapter- show that variations decrease and thus that neutrality improves in all cases. More specifically, neutrality improves most if tax bases and tax rates are both harmonised, as this eliminates all variation in effective tax rates. Of the other proposals, harmonisation of tax bases improves neutrality more than harmonisation of tax rates. The reason is that tax bases currently vary more among countries than statutory tax rates. However, also a minimum effective tax rate



and the harmonisation of statutory rates mildly improve the neutrality of capital income taxation.

#### **5.4.2 Externality: the incentive to compete for paper profits**

The third column of table 5.1 lists the scores for the externality with respect to paper profits. This incentive should materialise in a reduction of statutory tax rates.

Common base taxation leaves the incentive to reduce statutory tax rates intact. In contrast, formula apportionment makes profit shifting futile, which should annul the incentive (Mintz, 1998 and 1999). Multinationals retain, however, some discretion in manipulating their tax bill. They can, for example, boost labour costs in any country by ascribing the burden of general management to it. Accordingly, profit shifting is replaced by ‘formula shifting’. Although formula apportionment thus does not annul, it will significantly diminish the incentive to compete with statutory tax rates to attract paper profits.

The minimum asset tax puts a lower bound on statutory tax rates. Thus, also this proposal does not annul, but diminishes the incentive to reduce statutory tax rates. Harmonisation of statutory tax rates, either or not combined with a harmonisation of tax bases, score best on the account of the first externality.

#### **5.4.3 Externality: the incentive to compete for real capital**

The fourth column of table 5.1 refers to the second externality: the incentive or possibility of governments to compete for real capital. This incentive should materialise in a change in effective tax rates, either by adjusting the tax base or by changing the statutory tax rate.

Common base taxation restricts all practices that affect the tax base focussed on attracting particular kinds of business activity. It remains, however, possible to compete for real capital by setting low statutory tax rates across the board. Thus, common base taxation mildly diminishes the incentive.

The impact of common base taxation combined with formula apportionment is ambiguous. On the one hand -like common base taxation per se- it eliminates the opportunities to compete for real capital through specific tax incentives in the tax base. On the other hand, it makes tax competition in tax rates fiercer. This is because real investment decisions will be more responsive to differences in effective tax rates now formula apportionment has made profit shifting futile.

The same trade-off between the first and second externality applies to harmonisation of statutory tax rates and home state taxation combined with formula apportionment: governments have less instruments to pursue tax competition, but real investment decisions become more responsive to differences in effective tax rates.

Home state taxation introduces an additional form of tax competition. Since multinationals can reduce their tax bill by relocating their statutory headquarter to the member state with the

narrowest tax base, countries have an incentive to narrow their base, provided that there are positive spillovers associated with hosting headquarters. Hence, home state taxation is likely to intensify competition with tax bases.

The minimum asset tax, revenue sharing, and the European corporate income tax break the trade-off between the first and second externality. The minimum asset tax puts a lower bound on both statutory and effective tax rates; revenue sharing and the European corporate income tax rigorously rule out tax competition for both paper profits and real capital.

#### 5.4.4 **Simplicity**

The fifth column of table 5.1 lists whether proposals contribute to simplicity. Harmonisation of statutory tax rates does not constitute a significant simplification. The minimum asset tax even complicates matters due to the calculation of effective tax rates and retrospective tax collection.

Common base taxation is designed to alleviate the variation in the tax rules across countries and, therefore, to reduce the administrative tax burden for multinationals. For the same reason, common base taxation and home state taxation with formula apportionment improve simplicity for companies. Taxation becomes, however, troublesome for tax administrations under formula apportionment (McLure and Weiner, 2000). In order to receive an appropriate share of the profits, countries rely on the appropriate enforcement and administration of fiscal authorities in other countries. This calls for close cooperation between tax administrations. Moreover, calculation of the variables in the formula is bound to be plagued by data problems. Finally, formula apportionment raises technical problems such as defining which of the separately incorporated affiliates should be included in a unitary business, and the treatment of different accounting principles.

The European corporate income tax bypasses the complications of formula apportionment. Moreover, there are scale effects in tax collection, e.g. due to uniformity of interpretation and avoidance of duplication. This renders the European corporate income tax the most attractive proposal in terms of simplicity.

#### 5.4.5 **Diversity**

Unless a proposal has no impact upon government behaviour whatsoever, it must score negatively on the diversity criterion. This is illustrated in the final column of table 5.1. There is, however, a great deal of variation in the degree to which proposals infringe upon the freedom of governments to choose tax systems.

Of all proposals, the minimum asset tax respects sovereignty most. It restricts neither the diversity in tax bases nor the diversity in tax rates. It does put a lower bound on the effective tax burden on companies. This is, however, not more severe than tax competition per se. Indeed, under *laissez faire*, governments are restricted by tax competition: they must consider the strategic response of other countries when deciding upon their own tax policy.

Common base taxation infringes upon national sovereignty. Tax incentives have evolved under pressure of different interest groups in different countries. Therefore, any conceivable common base will oppose vested interests somewhere.

The same holds true for harmonisation of statutory tax rates. They primarily determine tax revenue, which is at the heart of fiscal sovereignty. This is not to argue that the tax base is immaterial, on the contrary. Idiosyncrasies of taxation are embedded in the array of tax incentives that determine the base. Table A1 in the appendix to this chapter illustrates this point: it shows that the variation of tax bases is higher than that of statutory tax rates.

Home state taxation merits special attention. At first glance, it appears to be compatible with subsidiarity since it requires no changes to national tax systems, just mutual recognition. This compatibility is, however, spurious. Subsidiaries of foreign parents are taxed according to the base of the country that hosts the parent. Thus, member states effectively force their tax systems upon each other without allowing each other to take part in deciding upon tax policy. Furthermore, countries may be forced to engage in fiercer tax competition with respect to the tax base in order to prevent headquarters from leaving the country. Thus, the surprising conclusion must be that home state taxation is worse than common base taxation as far as diversity is concerned.

Unsurprisingly, revenue sharing and the European corporate income tax most radically infringe upon the sovereignty of member states. Under revenue sharing the responsibility for tax administration remains with the member states; under the European corporate income tax, this responsibility is shifted towards a centralised body.

## 5.5 Conclusion: assessing the cost of tax diversity

It is difficult to proclaim a winning proposal. For one thing, ranking the proposals according to each criterion is not always possible. For another, even if it would be possible, there would be no proposal scoring best on all criteria. This is due to the many trade-offs in taxation.

The three proposals for *tax base harmonisation* -common base taxation and two variants of formula apportionment- improve neutrality and simplicity, but come at a cost of tax diversity. Moreover, a decrease of the incentive or possibility to compete for paper profits almost inevitably implies an increase in the incentive to compete for real capital, and vice versa. Indeed, formula apportionment only reduces the first externality, while common base taxation reduces only the second.

The combination of common base taxation and formula apportionment outperforms the combination of home state taxation and formula apportionment on the diversity criterion. In particular, mutual recognition implies that foreign tax authorities decide upon the tax base of hosted subsidiaries. Hence, each country is at the mercy of the countries hosting parent companies. This implies that home state taxation is, as far as sovereignty is concerned, a wolf in

sheep's clothing. Moreover, it introduces a new form of tax competition: reducing tax bases in order to attract parent companies.

Formula apportionment suffers from additional problems (see e.g. McLure and Weiner, 2000). It converts the corporate income tax to an effective tax on the arguments in the formula - usually labour, capital outlay, and sales- thereby distorting their allocation. Moreover, the formula is necessarily arbitrary, implying arduous political negotiations about exactly which formula should apply. Obviously, member states that produce labour-intensively wish a heavy weight for workforce; member states that produce capital-intensively wish a heavy weight for capital layout. Anand and Sansing (2000) somewhat ironically refer to these negotiations as 'the weighting game'.

Harmonisation of *statutory tax rates* bypasses some of these problems. It scores positively on neutrality and the externality with respect to paper profits. However, it does not improve simplicity, diversity, nor does it break the trade-off between the two types of externality.

Among the proposals that respect diversity, solely the *minimum effective tax rate* improves upon both the incentive to compete for paper profits and the incentive to compete for real capital. For this reason, the minimum asset tax deserves more attention in the tax harmonisation debate. Note, however, that it does increase the administrative burden of taxation.

Full *harmonisation of tax rates and bases* outperforms all other proposals on neutrality, externality, and simplicity. The shoe pinches, however, on the diversity criterion. These proposals imply a 'one size fits all' taxation, sidelining national tax authorities. Most member states are unwilling to accept this, which makes the prospect for political approval bleak.

Comparing revenue sharing and the European corporate income tax, we conclude that the latter outperforms the first. A uniform centralized tax administration yields economies of scale in tax collection. Moreover, the European corporate income tax avoids political, technical and economic problems associated with formula apportionment. A European corporate income tax may also be a more natural source of finance for the EU budget than the current sources. After all, the benefit principle suggests that the EU should tax multinationals who take advantage of the internal market.

In short, there is a clear trade-off between diversity and all other criteria: improving simplicity, for example, inevitably infringes upon the sovereignty of member states. Moreover, there is a clear trade-off between the two types of externality: decreasing governments' incentive or possibility to compete for paper profits makes businesses more footloose, thereby increasing governments' incentive to compete for real capital. A third trade-off is between the complexity of corporate taxes for companies and tax administrations: formula apportionment makes things much simpler for multinational corporations but involves a plethora of complications for tax administrations. Salient conclusions about individual proposals are that home state taxation -

contrary to what one would expect- does poorly on the diversity criterion, and that the minimum asset tax is the only non-far-reaching proposal that breaks the externality trade-off.

## Appendix

To make an educated guess on the impact of the proposals for tax harmonisation on neutrality, we did some simple calculations. These are reported in table 5.2. The first two columns of the table list the statutory and effective corporate income tax rates of the member states in 1999. The effective rates are derived as the mean effective tax rate of the corporations in the Worldscope data base, calculated for each country (they are comparable to those derived from table 2.4 where the median effective tax rates are reported). In table A1, the standard deviation of the statutory and effective tax rates are, respectively 3.96 and 6.7. Dividing these standard deviations by their respective mean values, we arrive at variation coefficients of 0.12 and 0.23, respectively. The variation coefficient for the effective tax rate will be used to assess the neutrality implications of the various proposals.

The third column of table A1 presents the ratio of the effective tax rate and the statutory tax rate. This provides an indicative measure for the broadness of the tax base in each country. Accordingly, we call it the tax base indicator. The mean value of the tax base indicator is equal to 0.87. This suggests that, on average, effective tax rates are lower than statutory tax rates in Europe. The tax base indicator varies considerably across countries, from a low 0.52 for Belgium to a high 1.11 for France. Although the indicator is probably an imperfect measure for the broadness of the tax base in general, it does give a rough indication of the large differences across EU-countries.<sup>17</sup>

We explore the neutrality implications of various proposals in the next five columns of table A1. In particular, in the fourth and fifth columns, we assume that under common base taxation and the combination of common base taxation and formula apportionment, the tax base is harmonised so that the tax base indicator for each country is equal to the European mean of 0.87. Under this assumption, we calculate a new set of effective tax rates by taking the product of this common tax base indicator and the statutory tax rate for each country (which is assumed not to change). The new set of effective tax rates reveals that both proposals yield the same mean value for the effective tax rate in Europe as in 1999. However, the variation coefficient drops to 0.12 which is equal to the variation coefficient of the statutory tax rates in Europe. As this variation coefficient is smaller than for the current effective tax rates of 0.23 (see the second column of table A1), both proposals improve the neutrality of the tax system by inducing convergence of effective tax rates.

<sup>17</sup> Note that the tax base indicator and the statutory tax rate are negatively correlated. In particular, the correlation coefficient equals -0.3.

**Table 5.14 Simulation of effective tax rates under different proposals**

	situation in 1999			harmonisation tax base			harmonisation tax rate	
	STR	ETR	TBI	CB	CB-FA	HST-FA	CSTR	MINETR
Austria	34	21.7	0.64	29.7	29.7	17.7	21.7	26.2
Belgium	39	20.3	0.52	34.1	34.1	20.3	17.7	28.3
Denmark	32	28.1	0.88	28.0	28.0	16.7	30.0	30.2
Finland	28	28.2	1.01	24.5	24.5	14.6	34.3	29.9
France	33.3	37.0	1.11	29.1	29.1	17.3	37.9	37.9
Germany	40	41.9	1.05	35.0	35.0	20.8	35.7	43.8
UK	30	32.5	1.08	26.2	26.2	15.6	36.9	34.9
Greece	40	35.2	0.88	35.0	35.0	20.8	30.0	36.6
Ireland	32	21.1	0.66	28.0	28.0	16.7	22.4	25.1
Italy	37	38.3	1.04	32.3	32.3	19.3	35.3	39.5
Netherlands	35	27.5	0.78	30.6	30.6	18.2	26.7	30.6
Portugal	34	27.9	0.82	29.7	29.7	17.7	28.0	33.2
Spain	35	25.1	0.72	30.6	30.6	18.2	24.4	27.8
Sweden	28	29.6	1.06	24.5	24.5	14.6	36.1	32.3
mean	34.1	29.6	0.87	29.8	29.8	17.7	29.8	32.6
standard deviation	3.96	6.70	0.19	3.50	3.50	2.10	6.50	5.40
variation coefficient	0.12	0.23	0.22	0.12	0.12	0.12	0.22	0.17

STR = statutory tax rate; ETR = effective tax rate; TBI = tax base indicator; CB = common base taxation; CB-FA = common base taxation combined with formula apportionment; HST-FA = home state taxation combined with formula apportionment; CSTR = common statutory tax rate; MINETR = minimum effective tax rate.

Likewise, we simulate the impact of the combination of home state taxation and formula apportionment on the effective tax rates in Europe (see the sixth column of table A1). Here, we adopt an extreme assumption that all firms will locate their statutory headquarter in the member state with the smallest base in order to minimise their EU-wide tax bill. Thus, we substitute the Belgian tax base indicator of 0.52 for each other country's tax base indicator, and calculate a new set of effective tax rates by multiplying it with the appropriate statutory tax rates. This yields a mean effective tax rate of 17.7, which is almost 12%-points lower than in 1999. The variation coefficient, however, is equal to that under common base taxation (i.e. equal to the variation coefficient of the statutory tax rates). Hence, home state taxation scores equally well on the neutrality criterion.

The seventh column in table A1 computes the effective tax rates under a regime of harmonised statutory tax rates at the European mean in 1999 of 34.1%. The tax base indicators are assumed to maintain at their 1999 values. We see that the mean value of the effective tax rates is equal to 1999, but that variation coefficient drops marginally from 0.23 to 0.22 (equal to the variation coefficient of the tax base indicator). Hence, also the harmonisation of statutory tax rates improves neutrality, albeit less than the harmonisation of the tax base (compare the

variation coefficient under harmonisation of statutory tax rates with that under common base and home state taxation).

The final column of table A1 simulates the impact of the minimum effective tax on neutrality. We did this experiment as follows. The implied minimum effective tax rate for each individual firm is assumed to be the minimum effective tax rate in Europe in 1999, i.e. the Belgian rate of 20.3%. Subsequently, we used the Worldscope database of 6000 companies in Europe and compare the reported tax rate of a company with the minimum tax rate of 20.3%. For companies that report a tax rate below 20.3%, we change the tax rate to this minimum level. For all other companies, we do not change the effective tax rate. With this alternative set of tax rates for companies, we calculate a new set of mean effective tax rates for all countries. The final column of table A1 reveals that the mean effective tax rate rises in all countries, most notably in low-tax countries such as Austria, Belgium, Ireland and Portugal. The European mean rises by 3%-points. However, the variation coefficient declines from 0.23 without a minimum rate, to 0.17 with the minimum effective tax rate of 20.3%. Hence, this proposal scores positively on the neutrality criterion. More specifically, neutrality improves more than under a harmonisation of the statutory tax rate, but less than under a harmonisation of the tax base.

For revenue sharing and the European corporate income tax, the outcome for neutrality is obvious: as both tax bases and tax rates are harmonised, all effective rates are equal. Thus, the variation of effective tax rates reduce to zero. These proposals score best on the neutrality criterion.





## 6 Options for reform

Internationalisation is an ongoing process. It is characterized by increasing capital mobility, a growing importance of multinational enterprises, and more cross-ownership relationships across countries. This puts pressure on uncoordinated company tax systems. What would be a desirable policy response to the trend of internationalisation?

### 6.1 The case for tax coordination

We conclude that the case for tax coordination is rather subtle. On the one hand, tax coordination entails a number of benefits. It can reduce compliance and enforcement costs which are high due to fifteen distinct tax codes within the EU. Moreover, tax coordination can be a viable backstop to the fiscal externalities associated with tax competition. Empirical evidence indeed suggests that tax competition is important: statutory tax rates are declining which suggests tax competition for paper profits; preferential tax regimes abound in various EU member states; and governments strategically respond to each other's tax setting behaviour. On the other hand, however, tax competition may be a welcome disciplinary device for reducing government failures. Moreover, infringement on national tax sovereignty may reduce welfare to the extent that countries can no longer pursue the policies that best reflect the preferences of their citizens. As from the empirical side, effective tax rates have remained constant during the last decade, suggesting that tax competition for real capital is virtually absent.

Hence, the optimal design of company taxation in Europe is likely to be neither a complete absence of coordination, nor a complete harmonisation. Indeed, the challenge for Europe is to find intermediate forms of tax coordination that strike a balance between the costs and benefits of tax coordination. Proposals of this kind are, among others, harmonisation of the tax base, formula apportionment with base sharing, a minimum statutory tax rate, and a minimum effective tax rate. When assessing the merits and demerits of these proposals, one faces several additional trade-offs. For instance, proposals that focus on reducing the opportunities for profit shifting, hardly reduce tax competition for real capital and vice versa. Moreover, reducing the complexity of corporate taxes for companies under formula apportionment involves a plethora of complications for tax administrations. Furthermore, the welfare effects of tax coordination are typically unevenly distributed: large countries tend to gain more than small countries, if the latter gain at all. Smaller countries are thus unlikely to press hard for tax coordination, unless a package deal makes it attractive for small and large countries alike.

## 6.2 The case for national tax reform

For the Netherlands, there is a case for a reduction in the statutory corporate tax rate. The mean statutory rate in the EU has fallen five percentage points and will fall even further if member states press on with their announced tax cuts. The Dutch rate has remained constant over the last ten years, and has now become relatively high. If the Netherlands does not respond, then tax arbitrage with respect to paper profits -- which is found to be an important phenomenon -- will precipitate elsewhere.

Although effective tax rates on companies have remained constant in the EU, there is also a case for a lower average corporate tax burden. Indeed, this parameter has a significant impact on the location of foreign investments. The statutory rate does not play an independent role for location decisions. Internationalisation tends to boost the gains from a lower effective tax burden on corporations since it makes real capital more mobile, especially in the long run. A lower tax burden on companies, however, involves a cost in terms of public revenue and provides a windfall gain to foreign investors that reap location-specific rents.

This prompts to the combination of a lower statutory rate, combined with a broadening of the tax base, e.g. by scrapping accelerated depreciation, alleviating tax incentives, or reducing the tax deductibility of interest on the corporate level. Base broadening cum rate reduction is what actually occurred in most EU countries during the last decade and which was a leading principle in the recent reforms in Dutch labour income taxation. An additional benefit from this policy is that it would make the tax system more neutral in its treatment of debt and equity, thereby reducing the incentives for thin capitalization.

The problem with base broadening cum rate reduction is that it inevitably redistributes the corporate tax burden across industries: some sectors suffer more than others from a broadening of the tax base. Moreover, somewhat paradoxically, base broadening cum rate reduction will raise the marginal effective tax rate on capital. This is because, in contrast to tax-base allowances, the statutory corporate tax rate applies to extraordinary profits. The higher marginal effective tax rate will raise the user cost of capital, thereby discouraging domestic capital formation. To mitigate these problems, a reduction in the average company tax burden might be desirable.

## 6.3 The choice between tax coordination and national tax reform

In short, national reform in company taxation enhances the attractiveness of a country as a location for industries. And if all countries do so, it may yield a better investment climate in entire Europe. However, what makes the case for national tax reform also makes the case for tax coordination. Indeed, national reform typically reflects a strategic response of governments who engage in tax competition. As we have argued, this causes adverse external effects on other countries. Therefore, a prolonged sequence of national tax reforms under tax competition is

probably a sub-optimal response to internationalisation. Coordination is therefore desirable. How countries go about coordinating their tax systems is a matter of political priorities that cannot be determined by economists alone. Indeed, we have stressed a number of trade-offs that lie at the heart of the debate on tax coordination. Given recent trends in capital income tax systems, it seems most obvious to focus on putting an end to profit shifting and reducing the numerous complexities in company taxation in Europe.



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