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TAXATION POLICY IN EMU

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Taxation policy in EMU

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Abstract

This paper proposes to examine whether and how the introduction of the Euro changed the impact of taxes on the economy or influenced the direction of tax policy. The paper surveys potential theoretical channels through which tax policy and exchange rate regimes are interrelated (capital mobility, strategic tax setting and trade policy). It is difficult to find strong empirical evidence of major, unique changes in the impact or determination of tax policy following the introduction of the Euro owing. The internal market has had by far a greater impact and it has affected all European Union countries. Nevertheless, we highlight that going forward certain specific aspects deserve attention. The most important concerns the use of tax policy by individual EMU countries to improve competitiveness by changing the mix of taxes and thereby achieving an internal devaluation. A second issue deserving attention concerns tax competition particularly in the area of corporation tax. We provide some tentative evidence that capital movements to and from Euro area countries have become more responsive to the levels of corporate taxation.

JEL Classification Numbers: H2, F1

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Contents

1 Introduction

At least since the Delors Report, much attention has been devoted to the implications of the introduction of a common currency for the conduct of budgetary policy and for the appropriate nature of fiscal arrangements between countries. However, tax policy as such has not been seen as raising any specific issues for the coming into existence a common currency. The Euro has not been closely associated with changes in tax policy nor has concern been expressed that the domestic tax systems of Euro area countries are influencing economic activity in the Euro area relative to non-Euro area countries.

At the same time, domestic tax policy decisions within EU member states have been increasingly affected by decisions taken at the EU level. “Tax competition” and the impact of globalisation on the degree of autonomy of tax policy appear to dominate EU wide tax policy debates. Domestic policy within individual countries also appears to be influenced by decisions taken in other EU countries.

It is somewhat surprising that there has been little discussion of the linkages between the Euro and tax policy within the Euro area (and possibly in an indirect fashion for other countries) since many of the issues associated with tax policy (for example, “competitiveness”) overlap with broader policy concerns.

This paper proposes to examine whether and how the introduction of the Euro changed the impact of taxes on the economy or influenced the direction of tax policy. It also seeks to identify any potential problem areas. A two-pronged framework is adopted to provide guidance in interpreting the importance and the potential magnitude of the influence of the Euro on tax policy (and possibly of tax policy on the Euro). The first

follows the three traditional functional branches of analysis put forth by Richard Musgrave (1958): "stabilisation, allocation and distribution"[1].

The other useful framework is that set forth by Frenkel and Razin (1987) to examine the international transmission channels or spillover effects of domestic tax policy. These consist in focusing on price, wealth and tax-revenue erosion channels. The price channel examines the impact of tax changes on the relative prices of goods and financial assets. The wealth channel analyses how changes in tax policy can redistribute holdings of physical and financial assets across countries, individuals and generations. The tax-revenue erosion channel is a by-product of the former two and examines how tax policy changes may be induced by the erosion of tax revenues and can lead to strategic behaviour on the part of the fiscal authorities.

The question of whether the Euro has affected the uses of tax policy for stabilisation purposes has many dimensions. The most obvious dimension is the concern with whether countries that joined the Euro adopted more restrictive tax policies in order to comply with the Maastricht criteria than countries that opted to remain outside the Euro area, and that in so doing these countries chose to change the composition of tax revenues. There is strong anecdotal evidence that this took place in the build up to the Euro in the cases of Italy and Greece. In this paper we substantiate the evidence of increased tax pressure and show that the increase in tax pressure did not continue once the Euro was adopted. We also examine whether the introduction of the Euro resulted in a changing composition of tax revenues. Another dimension concerns whether Euro area countries have been forced to use tax policy to accommodate idiosyncratic shocks

[1] We do not propose to examine the issues associated with "tax assignment" and deeper integration of Euro area countries relative to the other members of the European Union.

which in other circumstances could have been dealt with by exchange rate adjustments. We shall discuss this issue with respect to proposals regarding “internal devaluations”.

As regards allocation effects, theoretical models strongly suggest that shifts from destination to origin based taxes, from income to consumption taxes, and from residence to source based taxes can alter equilibrium exchange rates. To be sure the magnitude of the interaction between taxes and exchange rate regimes is not well understood and there is unfortunately very little (hard) evidence to corroborate some of the implications of theoretical conjectures regarding potential interactions between exchange rate regimes and taxes. At the same time it is important to note that the introduction of the Euro led to a dramatic reduction in risk premia and market segmentation. This in turn has made tax differentials a more significant relative factor in investment decisions and created a climate potentially more conducive to tax arbitrage. We discuss these various potential linkages drawing on various strands of literature that link taxes to trade and to exchange rates.

Capital market integration and tax competition are alleged to limit redistribution because on the one hand it is more difficult for the single country to tax the rich and mobile, and on the other redistributive policies may attract poor individuals from foreign countries. There is evidence to suggest increasing inequality in the Euro area at the same time as overall economic performance has improved. At the same time this development does not appear to have limited the ability of member states to use the tax lever to redistribute income.

In drawing any conclusions regarding the effects of tax policy in the Euro area, it is important to realise that governments are not passive participants to the potential changes in tax incidence which are induced by a move towards fixed exchange rates.

Strategic responses cannot be analysed in a simple incidence model since tax setting behaviour becomes an endogenous decision. It is possible that governments attempt to improve their terms of trade or borrowing and lending on international financial markets by changing the level or composition of taxes or utilise tax policy to attract mobile factors of production to their tax jurisdictions.

The remainder of the paper is organised as follows. The second section examines structure of tax revenues in the Euro area and the changes that have occurred in recent decades. In section three we turn to discuss the potential linkages between EMU and tax policy, focusing on financial and real capital mobility, changes in strategic interactions between governments and the potential impact of changes in tax policy on the trade balance. We then examine in section four some empirical evidence regarding tax policy and EMU in three specific areas: the impact of capital market integration on the tax burden of labour and capital; the effects of EMU on progressivity; the relationship between taxes, exchange rates and employment. In the final section we highlight some potential areas that may require changes in tax policy going forward while the final provides some tentative overall conclusions on how tax policy has changed in the EMU area.

2 The structure of tax systems in the Euro area

2.1 Main features and trends of tax systems prior to EMU

On balance the Euro area has been a "high tax" zone at least since the mid-1980s. As can be seen from Graph 1 the increase in the overall tax levels of tax pressure took place in two successive waves. The first and very rapid increase took place between 1970 and the early 1980s, and saw the tax to GDP ratio within the Euro-zone rise by 6 percentage points from 35 to 41%. The overall tax burden then stabilised at this higher level for

roughly a decade before increasing again by a further three percentage points during the 1990s. Since 2000 the tax burden has stabilised at a rate around 41%.

[Insert Graph 1]

The rise of total revenue as a share of GDP was driven, with a lagged effect, by the rapid growth of government expenditure that began in the 1960s and continued through to the mid-1990s. While differing in size and composition across countries the general rise in expenditure was mainly the result of expanding social transfers in the 70s and 80s triggered by changes enacted a decade earlier as well as the need to confront a sharp slowdown in economic activity and an increasing level of unemployment that followed the first and second oil price shocks. The increase in expenditures was initially largely financed through a persistent and widening budget deficit (European Commission 2000). By the early 1990s, the period of rising government expenditure came to an end with the ratio of expenditures to GDP peaking in 1993. In the years that followed, however, total tax revenue continued to rise (European Commission 2000, Carone et. al. 2007).

The rise in the ratio of tax revenues to GDP between 1970 and 1990 was a general feature of the EU area. It is also interesting to note that on average the increase in tax pressure of EU countries was far more significant than that of other OECD area countries during this period. Nevertheless a number of EU countries were able to stabilise their total-tax to GDP ratios in the 1970s (Ireland and the UK at around 35%) or in the early 1980s (Germany at around 40% and the BENELUX countries at around 45%).

[Insert Table 1]

Over this time period, the overall share in total tax revenues of direct and indirect taxes and of social security contributions remained fairly stable - at around 30-35% - after allowing for changes associated with the business cycle (Carone et. al. 2007, Cnossen 2002). The only notable change was a mild increase in the relative importance of social security contributions and a decrease in indirect taxation (mainly through a reduction in excises). However, this overall stability masked sharp differences in the composition of revenues across countries that have persisted up to this day.

[Insert Table 2]

While the overall structure and composition of tax revenues did not change dramatically, there were profound changes within the broad groups of taxes and in the actual mechanics and workings of individual taxes. As far as consumption taxes are concerned, VAT spread to all countries that acceded to the EU throughout this period. Moreover, the average top VAT rate increased in most countries and there was a general tendency to reduce the number of rate bands. The influence of EU directives also influenced the dispersion of VAT rates across countries[2] reducing it significantly over time. EU directives also aligned the structure of alcohol and tobacco excises more closely.

[Insert Table 3]

There were also very significant changes in the functioning of personal and corporate income taxes. In the case of the personal income taxes, most countries reduced the top personal tax rate (Table 4) and reduced the number of rate bands (Messere et al. 2003). At the same time, in many countries the tax base was widened; for example, many

[2] The efficiency of tax collection of VAT varies significantly across EU countries.

countries limited the deductibility of interest. Many countries also reduced the differential treatment of various types of financial instruments. The 1980s and early 1990s saw the gradual dismantling of exchange controls and in many instances significant changes in inbound and outbound capital movements. These changes were also associated with the growing institutionalisation of savings and of cross-border portfolio capital flows.

[Insert Table 4]

As regards the corporation tax, one can observe a number of common trends taking place over time. The first trend was the decline in the statutory tax rate beginning in the mid-1980s (we shall discuss this trend at greater length in section 4.1) (Table 5). The reduction in statutory rates was accompanied by a widening of the tax base resulting by a reduction of exemptions but most significantly by a cut in the rate of depreciation allowances. Finally, many EU countries in the 1970s introduced some form of imputation system between corporate and personal income taxes. As we shall see below by the 1990s the enthusiasm for tax integration had waned considerably.

[Insert Table 5]

2.2 Tax Revenues and Tax structure in EMU countries: are they different and have they changed?

The coincidence of EMU with a number of other developments it is difficult to carry out a proper analysis of the differentiating features of EMU on tax policy. We use four dummy variables to test whether a wide number of tax ratios have changed following entry in the European Union (Common Market) and the introduction of the Euro. The first dummy is equal to one if a country has actually introduced the Euro. The second is equal to one when a country is discussing whether to join the Euro area. The third is

equal to one when a country is a member of the EU. The forth is equal to one if a country is discussing EU membership. We test the effects of the Euro against the OECD Group of Countries that are not members of the Euro area in the period from 1970 to 2005. The regressions are repeated over four time period all ending in 2005. The results of these regressions should be merely interpreted as descriptions of the data and suffer from the absence of any adjustment for cyclical factors.

[Insert Table 6]

As can be seen from Table 6, EU countries have a much higher tax/GDP ratio relative to other OECD countries and ratio for the EMU area countries is on average even higher. It appears that this higher rate coincided with the announcement of the Euro[3] but not with the actual introduction of the Euro (1999). This suggests some degree of fiscal adjustment associated with the need to comply with the Maastricht criteria. Breaking down by type of tax it appears that the upward adjustment took place with employer related social security contributions. VAT revenues were unaffected. The impact of Euro is most visible on individual and corporate income taxes: EMU countries has lower individual income tax revenues and higher revenues from the corporate tax.

3 The links between EMU and tax policy

It is difficult to establish a direct link between the advent of EMU and changes in the tax system. Firstly, while fiscal rules have been established for EMU they are not specific to taxation. Although tax collections are in many circumstances the easiest policy lever that can be utilised to achieve budgetary objectives there is no specific rule that mandates the use of tax policy. It should also be remembered that with few

[3] We have tested for the announcement of the Euro using alternatively the publication date of the Delors report and the signing of the Maastricht Treaty. The results remain largely unchanged.

exceptions tax policy remains an area of national sovereignty among EU member states. Up to now, the "deeper integration" among EMU countries has not extended to tax policy. Secondly, the internal market programme which preceded EMU by a decade already introduced a number of very significant changes in tax policy whose implications have been fully appreciated only in recent years. One example has been the increased activism of the European Court of Justice in tax matters since the beginning of this decade. Thirdly, it should also be remembered that a several countries that are part of EMU were operating under a quasi-fixed exchange rate regime for over a decade prior to the introduction of the Euro. Fourthly, it is important to note that the Euro area countries are not a homogeneous group. the potential links between tax policy and EMU may differ by country size, as will the potential spillover size of effects. For example, a major tax change in a "large" country in the Euro area could potentially have an impact on the equilibrium exchange rate and thereby affect the overall trade balance of other Euro area countries. A similar change in a small country would not give rise to such spillover effects. Finally, many exogenous developments that have influenced the process of tax reform in EU member states, such as the high levels of unemployment in the nineties and the globalisation of capital markets have been impinging on *all* EU countries and are independent of the existence of the Euro[4]. Similarly, the so-called Tax Package (see Box 1) is addressed to all EU member states.

[4] Ultimately the political and legal processes are mainly driven by structural and institutional changes in the underlying economy which have been very significant in all respects. In our view the most important have been: (1) the creation of the internal market and the EMU, which have greatly increased trade between member countries, fostered the development of single financial market and enhanced capital mobility across Europe; (2) globalisation which has increased competition in goods and factor markets and potentially shifted the nature of exposures to external shocks; (3) ageing which is putting pressure on social security and health systems and, as a consequence, on the fiscal wedge on labour; (4) the enlargement of the EU.

Hence, in most respects it is arguable that the influence of the EMU on tax policy – if any - is a question of incremental change or a matter of "degree". The remainder of this section reviews factors that may have altered the influences of taxes on economic decisions and the setting of tax policy largely from this standpoint.

Box 1: The Commission view on fiscal implications of EMU

The fiscal implications of EMU during the build up to monetary union were generally viewed through the lens of budgetary policy. For example, the *One Market, One Money Report* (Emerson et al. (1990)) highlighted the role of budgetary policy in stabilizing the economy in case of temporary shocks or adjusting against a permanent shock, the potential for EMU to tighten the budget constraint and reduce fiscal autonomy, the impact of EMU on fiscal discipline, and the need for coordination to avoid the negative macroeconomic spillovers of national fiscal policies. An additional issue which was widely debated at the time was whether EMU required a larger budget at the EC level to provide for coinsurance among member States (Eichengreen, 1993, Masson, 1996).

In discussing the implications of EMU for taxation and the provision of public goods, a major concern was whether tax competition would prompt the need for enforcing convergence in taxing and spending through harmonization or through the transfer of powers to a supranational government. Emerson et al. (1990) took the view that EMU would generally not entail major qualitative changes for taxation and spending with respect to the '1992 + EMS' reference situation: the largest part of the effects of economic union already resulted from the completion of the internal market and the specific effects of EMU could be considered incremental.

From this standpoint, the *One Market, One Money Report* acknowledged that EMU could have an additional impact on specific areas, especially corporate and capital income taxation. In the field of corporate income tax, besides stressing the case for harmonization of the tax base and for a minimum rate as proposed in the same year by the Ruding Report, and for tax neutrality with respect to cross border investment along the lines of the Commission Communication on company taxation in 1990 (SEC(90) 601), the report anticipated some of the themes which are currently debated by envisaging that the corporate income tax could become one of the Community's own resources or, as an alternative, that a fixed apportionment scheme could be used to allocate the tax base among member States. In the field of capital income the report advocated a Community solution - which anticipated in some respects the "Tax Package" (see below) - either through the adoption of common reporting rules or through the establishment of a minimum withholding tax.

The *One Market, One Money Report* was sanguine regarding the effects of tax competition:

"the need for harmonization or centralization is limited to certain categories of taxes which account for a relatively small part of government revenues: in particular, neither income taxes nor social security contributions need to be harmonized, while for VAT rates, only a reduction in cross country differences is warranted." (Emerson, 1990, p. 130).

There was only a brief reference to the possibility that the loss of the nominal exchange rate could lead governments to rely on tax instruments to influence the real exchange rate, but the problem was not further elaborated.

In the build up to the introduction of the Euro, the general approach of the Emerson Report, i.e. that EMU did *not* raise any major additional tax issues over and above those entailed by the Internal Market, remained the basic stance taken by both policy makers and external commentators. To be sure, tax issues became a much greater concern in the general policy debate within the EU but the differentiation of EMU-specific tax issues from those of the Internal Market more generally were often difficult to discern. For example, the approach towards tax competition changed quite noticeably in the middle of the 90's. In 1996, following the proposal made by the Commission at the informal meeting of Economics and Finance Ministers (ECOFIN) at Verona, a period of intensive discussions among EU Member States began, which lead eventually to the so-called "Tax package" (Cattoir, 2006). The Commission document argued that tax competition was bringing about the fiscal degradation of the structure of tax system by shifting the tax burden to the less mobile tax base – labour – in order to recover the tax lost from the erosion of other more mobile bases, mainly capital.

The document voiced a widespread concern that the high tax burden on labour was one of the main reasons for the rising level of unemployment in Europe and for the rising share of the underground economy (Daveri and Tabellini, 2000). The document endorsed also a much stronger view on the need of substantial harmonization in the field of capital taxation "The diversity of national tax regimes for capital income, and particularly the generally favourable treatment given to interest paid to non-resident, produces economic distortions both within and between Member States, non compatible with the notion of a single capital market within the EU." p. 5

3.1 Capital mobility

There are many reasons for believing that the mobility of financial capital and the location and investment decisions of companies have been affected by the introduction of the Euro and that this "deeper" integration influenced certain types of tax change and affected the channels through which tax policy influences economic decisions.

1.1.1. Financial Markets

Hardouvelis et al. (2006) suggest three potential dimensions specific to the introduction of the Euro that may have enhanced capital mobility within the Euro area.

Firstly, the creation of the Euro zone was preceded by a gradual regulatory harmonization among European financial markets, including the development of a common payment and settlement system, and by the abolition of various restrictions on non-residents, including in some instances the vestiges of capital controls (Licht 1997). It was also preceded by a concerted effort among EU countries to satisfy the Maastricht criteria for joining the Eurozone amongst one of which was the "nominal convergence" of inflation and long-term interest rates toward German levels[5].

Secondly, the introduction of the Euro improved transparency, standardized pricing in financial markets, and reduced investors' transaction and information costs. Moreover, it removed various legal restrictions within the EU on the foreign currency composition of

[5] The effort to satisfy the Maastricht criteria also led to better-balanced fiscal budgets, which may have led to a "real convergence" of European economies, that is, an increased synchronization in business cycles across the European economies.

assets held by institutional investors, like pension funds and life insurance companies. The market expectations before the advent of the monetary union may well be affected by the broadening of investment opportunities across the EMU countries. As a consequence the integration of European stock markets may have increased as the probability of the formation of a monetary union gained strength (Danthine et al. 2000).

Finally, the introduction of a single currency, coupled with the nominal and real convergence just outlined, should have led to a more homogeneous valuations of equities in EMU countries and a reduction of the "home bias" by eliminating the intra-European currency risk. To the extent that currency risk was priced, the overall exchange rate exposure of European stocks was reduced. (Danthine et al. 2001, De Santis et al. 2006, Fidora et al. 2006, Fratzscher 2002, Galati and Tsatsaronis 2003, Hartmann et al. 2003, Lane 2006, Pagano and von Thadden 2004).

There are several potential linkages between the heightened mobility of savings in the Euro area for both the impact of taxes and for the setting of tax policy. For example, the presence of a wide range of tax sensitive foreign investors in domestic financial markets may also change the nature of domestic tax policy formulation, particularly in bond markets. Withholding taxes on interest payments to non-residents have often been revised in the face of heightened capital mobility because of the distortions to which they can give rise. The abolition of withholding tax in the US was largely triggered by the inability of the US authorities to hinder inflows through tax favoured channels. In the late 1990s foreign market participants in the Italian government bond market argued strongly for a change in the nature of the withholding tax regime on government bonds on the grounds that reimbursement of tax withheld under the existing double taxation agreements was cumbersome and uncertain. In order to achieve "nominal convergence"

this “risk premium” should be eliminated. As a result Italy shifted from withholding tax at source (i.e. on individual coupons at the payment date and the pricing of bonds on a net of accrued tax basis) to exemption from withholding for all domestic corporate entities and foreign investors from treaty countries. Domestic and international paying agents were entrusted for withholding accrued tax on all other investors[6]. Violi (2004) argues that in the build up to the introduction of the Euro the tax-exempt status afforded to foreign investment was an important factor in fostering convergence in bond yields across Europe; such status has removed the distortion implied by double taxation on interest income and has contributed substantially to a more level playing field in Euro area financial markets.

As regards stock markets, heightened capital mobility may have resulted in changes in the “marginal investor”, i.e. the investor affecting the prices of assets in markets. There is considerable evidence suggesting that the behaviour of “marginal investors” is determined by the institutional characteristics of markets (Allen and Michaely, 2003) and that existing pricing relationships have changed in line with market practices, participation and regulatory restrictions (Lasfer, 2007). Foreign participation in markets is also associated with a greater volume of arbitrage activity on ex-dividend days Liljeblom, and Felixson (2004), In the case of the Euro, a recent study by Simonetta (2007) suggests that the dividend payout behaviour of Euro-area companies changed following the introduction of the Euro with companies having higher “free float” becoming more reactive to the implicit tax rates associated with price changes on ex-

[6] Favero, Giavazzi and Spaventa (1998) discuss the convergence of yields on Italian government bonds in the period immediately preceding the introduction of the Euro

dividend dates. He interprets this result as due to the decline in the "risk premium" and the greater presence of international price sensitive investors.

1.1.2. Foreign direct investment

Monetary integration may affect FDI through different channels. First, monetary integration reduces macroeconomic uncertainty by removing exchange rate volatility, declining and stabilizing inflation, reducing price dispersion across members. It also increases transparency and credibility of rules and policies. These effects are important since the greater the economic and political uncertainty, the more likely the firm will wait before entering the market. Indeed, uncertainty about future returns may deter irreversible investments as there is an 'option value' of waiting (Dixit and Pyndick, 1994).

Second, by removing intra-Euroland exchange rate volatility, monetary integration increases the certainty-equivalent value of expected profits of risk-averse firms and should foster overall FDI. Moreover, this removal of volatility reduces trade costs and may favour vertical FDI insofar as firms fragment their production and locate their activities in different countries according to international differences in factor prices. However, if foreign investment is a way to serve foreign markets (horizontal FDI), a removal of exchange rate volatility may decrease FDI and increase trade as a substitute.

Finally, a single currency could promote FDI by easing comparison of international costs and price decisions and by reducing transaction costs, such as currency conversion costs and in-house costs of maintaining separate foreign currency expertise (Bloningen, 2005, Crowley and Lee, 2003, Goldberg and Kolstad, 1994, Jeanneret 2007, Kiyota and Urata, 2004, Pain, 2002).

The literature on the determinants of the interactions between foreign direct investment decisions and taxation is wide ranging. There is growing evidence that differences in statutory rates affect the multinationals decision on where to locate new plants and where to report profits (Gordon and Hines 2002). However, the focus of this paper, namely whether changes in exchange rate regimes or the creation of common currency areas affected the impact of tax policy on decision making has not been examined. To be sure, a recent paper by Petroulas (2007) using balance of payment data suggests that the introduction of the Euro raised inward FDI flows by approximately 16% within the Euro area, by approximately 11% to non-members and weakly by around 8% from non-member countries into the Euro area.

Currency stability within the Euro area may also have affected intra-group financial policies and specifically profit shifting behaviour to lower taxed jurisdictions within the Euro area. There is much evidence that intra-company profit-shifting increased significantly in the late 1990s. For example, Altshuler and Grubert (2005) Weichenrieder (1996) and Huizinga et al. (2008) suggest that many transactions may have been redirected between European countries to take advantage of specific tax provisions to minimise the global burden of multinationals. However, these shifts have been the result of changes in taxation that cannot be associated directly with EMU and in some cases relate to changes in tax provisions of non-EU countries (for example, the treatment of “hybrid” entities in the United States has facilitated tax planning strategies between related parties).

3.2 Strategic tax setting

The increased mobility of tax bases may have enhanced the interdependence of national tax policies leading to tax competition. Indeed, there is overwhelming anecdotal

evidence that governments decisions on domestic tax issues are often affected by the choices of foreign countries (Simmons 2006 reports some examples). However, this type of evidence is not sufficient to answer more specific questions like "did strategic interdependence increase as a result of higher economic integration?" or "are countries changing their tax system because policies abroad are more conducive to better resource allocation?"[7].

In the last decade several studies have tackled this issue highlighting the difficulty in devising tests which can provide strong statistical evidence of strategic behaviour. Besides specific statistical issues which are discussed in Brueckner (2003), the main problem every study faces is to find a strategy to disentangle the effects of common movements of exogenous explanatory variables of tax policies from the strategic reactions to the choices made by foreign governments.

An illustrative example is provided by the evolution of statutory tax rates on corporate income. Since the 80s there is a clear convergence of statutory tax rates and a reduction in their mean value. The dynamics of the statutory rates are not entirely reflected in the evolution of the marginal tax rate on investments as the rate cuts have been usually coupled with a widening of the tax base. Therefore, it cannot be taken as *prima facie* evidence of a "race to the bottom" for attracting investment. The convergence in statutory rates is consistent with the theoretical prediction that increased economic integration of capital stimulates strategic interaction forcing high tax countries to reduce their rates in order to avoid profit shifting towards low tax countries and to attract new multinational firms.

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[7] For example, lower tax rates with base broadening may be an attempt to attract foreign investment or create a more level playing field among domestic companies (see below).

The problem is to weight this explanation with competing ones. One alternative is suggested by the view that the corporate tax is a backstop to the income tax (Gordon and MacKie Mason 1995). When the corporate tax rate is lower than the tax rate on personal income the burden of the income tax could be reduced by retaining earnings within a corporation or by reclassifying labour and interest income as business income. The size of the gain from such strategies depends on a number of factors, such as the effective tax rates on capital gains, the degree of integration between corporate and personal income tax, the structure and burden of social security contributions. In any case, there is empirical evidence which confirms that taxpayers do react to differences in rates (see Weichenrieder 2005 for a survey). If the corporate tax is a backstop to the income tax corporate tax rates are related to personal tax rates on labour and capital income and trends in corporate tax rates can be driven by changes in personal taxation.

The trend in top individual tax rates in Table 4 is consistent with this interpretation as it is similar to the one depicted in Table 5 for corporate tax rate: since the 80s tax rates converge to a lower mean value.

Further evidence of the link between corporate and individual tax rates is provided by Slemrod (2004) and Clausing (2007). Obviously, simple correlation does not tell us anything about causality. It is possible that higher mobility of profits and firms forced a convergence in statutory tax rates and this caused a similar convergence in individual rates. But causality may well go in the opposite direction. The trend towards flatter income taxes (with smaller tax brackets and lower top rates), illustrated in section 2, was certainly driven, at least in the 80s, by the growing concern about the negative effect of highly progressive rates on labour supply. Furthermore, as shown by Fuest and Weichenrieder (2002) in many OECD countries the decrease in top personal rates on

capital income has been larger than the decrease in corporate rate and is certainly related to a widespread tendency to abandon comprehensive income taxation and to introduce separate schedular taxation for interest and/or dividend income.

Summing up, to the extent that the corporate tax is a backstop to personal income taxation, the correlation among corporate tax rates of different countries can be the result of common trends in tax rates on personal income.

Another view is that countries are not engaged in tax competition but in yardstick competition. According to this view, countries try to mimic each other's tax policy to seek the votes of informed voters (Besley and Case, 1995). More simply it is also arguable that the lowering and convergence of statutory tax rates across countries merely reflect a convergence in economic structures and/or dominant economic thinking (Slemrod, 2004). According to these positions the reduction in statutory rates accompanied by the a widening of the tax base – a widespread phenomenon in the late 1980s and early 1990s following the US Tax Reforms – was due to the opinion that it was conducive to a more neutral tax environment.

Among European countries, an additional source of correlation in corporate tax rates cuts, which is usually overlooked by the literature, is the general switch from full integration between corporate and personal taxes towards double taxation of dividend income at (usually) reduced rates. The disappearance of the imputation system is related to the more general move towards schedular taxation of capital income. The debate on the dual income tax in the Nordic countries has highlighted several reasons for such a change. Among the most relevant, it is the increasing awareness that non linear taxation of capital income is untenable in well developed capital markets (Alworth 1998). However, the dismissal of the full imputation system was catalyzed by the decisions of

the European Court of Justice and by the action of the European Commission which developed the view that the imputation system, by discriminating foreign investors, is not consistent with the EU Treaty. It is likely that the extra revenue from the removal of the tax credit related to imputation has been compensated, at least in part, by a reduction in the corporate tax.[8]

Bearing in mind the previous caveats, it is useful to survey the main results of a small number of papers which provide empirical test for strategic interaction in corporate taxes. Altshuler and Goodspeed (2002) investigate the interaction between corporation tax revenues as a proportion of GDP among OECD countries between 1968 and 1999. Devereux et al. (2002) test whether OECD countries compete with each other over statutory and effective marginal tax rates (EMTR) on corporate income using data from 1982 to 1999. Besley et al. (2001) analyze the interdependence in setting average rates for five different taxes in the OECD between 1965 and 1997. Finally, Redoano (2007) examines the interaction in statutory corporate tax rates among European countries in the period 1970-1999.

All papers find evidence of strategic interaction among countries. In particular, the tests performed by Devereux et al. (2002) and Redoano (2007) support the hypothesis that countries compete in statutory rates in order to attract profits, while Devereux et al. (2002) rejects the hypothesis of strategic interaction in EMTR for attracting investment. However the evidence on the relationship between economic integration and strategic interaction is somewhat puzzling. Besley et al. (2001) find that interdependence is

[8] Germany (2001), Finland (2005), France (2004), Ireland (1999), Italy (2004), Portugal, UK (1999) have all moved from imputation to partial exemption or (modified) classical system. In Germany, Italy, and the UK, higher personal taxation of dividend income has been explicitly linked to reductions in corporate income tax rates.

higher the more mobile tax base is. Further they find higher interdependence amongst EU countries than between EU and non-EU countries. In contrast, Redoano (2007) shows that competition appears to be higher among non-EU countries; EU members seem to compete mainly among themselves, but with less intensity. Altshuler and Goodspeed (2002) find that interaction among EU countries has become weaker over time. At first, these findings may seem to contrast with the theory which suggests that market integration should enhance strategic interaction in tax policies. Nonetheless, it should be borne in mind that market integration has two different effects. First, it increases capital mobility and makes each government revenues more dependent on the tax rates of neighbour countries. Second, it widens the size of the world capital market making each single country relatively small. This reduces the interdependence among fiscal policies.

3.3 Tax policy, exchange rate adjustments and trade balance

One of the most significant implications of the single currency is that individual EMU countries can no longer rely on nominal exchange rate adjustments. The consequences for domestic tax policies of the change in exchange rate regime can be evaluated from both a positive and normative framework.

In an ideal setting with perfectly competitive markets and flexible prices, the change in regime would have no implications for tax policies as any change in the nominal exchange rate would be offset by a suitable adjustment in the domestic price level leaving the real exchange rate unaffected. When some prices are rigid or sticky, the short run impact of tax policy and the adjustment process to the new long run equilibrium will be in general different under flexible or fixed nominal exchange rate. This is illustrated by the well known Mundell-Fleming model of a small open economy,

where a fiscal expansion increases the equilibrium level of domestic income under fixed exchange rates, while it translates into an exchange rate appreciation with no real consequences on equilibrium income under a flexible exchange rate regime.

The literature has seldom analysed the impact of domestic tax reforms on the nominal exchange rate, the capital account and the ensuing adjustment of the trade balance. One study in this vein is Sinn (1985) who argued that the accelerated tax depreciation regime introduced in 1981 in the United States was the driving force behind the investment boom in that country, high world interest rates, the strength of the US Dollar, and the US trade deficit at the beginning of the eighties. The mechanism envisaged by Sinn was the following. The introduction of the accelerated tax depreciation reduced the effective marginal tax on capital invested in United States and drove the post tax return on investment above the pre-tax interest rate. This difference triggered a capital inflow into United States which in turn brought about an exchange rate appreciation and a current account deficit. Under a fixed exchange rate regime, the cut in the effective marginal tax would eventually lead to the same current account deficit. But the mechanism would be different. The increase in net imports would be driven by the increase in domestic income brought about by the capital inflow.

The longer term consequences of tax policies on exchange rates have also been examined in a neoclassical monetary growth model by Kimbrough (1984). He shows that a cut in the corporation income tax rate may have almost any impact on the various balance of payments accounts even if, as a practical matter, a cut in the corporation income tax rate is likely to lead to an improvement of the capital account and deterioration of the current and service accounts. The trade account may either improve or deteriorate depending on the magnitudes of the rate of growth of the domestic

population and the world real interest rate. A reduction in the corporation income tax rate results in a one-shot appreciation of the domestic currency even if the steady-state rate of depreciation will be unaffected.

Similar complications to transmission mechanisms were also considered in passing by Meade (1978a) and subsequently examined in greater detail by Meade (1978b) who looked at the impact on the structure of interest rates and the trade balance from a unilateral shift from an income tax to an expenditure tax. In particular Meade noted that if one country followed an income tax and the other adopted an expenditure tax, under certain types of expenditure tax regimes the global interest rate level could be undetermined with potential implications for exchange rates.

From a normative perspective, where the nominal exchange rate is consider as a policy instrument, the introduction of the single currency raises the issue of whether domestic taxes may be used to affect the trade balance. This question has been largely neglected both in the debate which preceded EMU and in the economic literature that has discussed the economic consequences of Euro. This is rather surprising since, as noted by Calmfors (1998), the variations of social security contributions paid by employers is one of the most direct substitute for nominal exchange changes. In particular, in the short run with fixed nominal wages, a cut in social security contributions paid by employers lowers the labour cost relative to foreign prices measured in domestic currency in the same way as a nominal exchange-rate devaluation (Calmfors, 1993). If the government budget is kept balanced by raising the tax burden on workers and households or by reducing public expenditure, there are no direct effects on aggregate demand and the final outcome is a devaluation of the real exchange rate. The similarity between an “external” and an “internal” exchange rate devaluation is most clear when

the reduction in social security contributions is financed by an increase in taxes on labour income such as a employee contributions, personal income tax, or VAT. Employees will experience in both cases a loss in purchasing power in terms of imports. At the same time, to the extent that lower labour costs are reflected in lower prices for domestically produced commodities, the purchasing power in terms of domestic goods will remain unchanged.

A mechanism similar to the internal depreciation can be found in the so called “EMU buffer funds” set up in Finland at the end of the nineties through an agreement among the central organizations of the social partners - with support from the government. The basic idea of the buffers is that during good times, employers and employees pay slightly higher social security contributions than necessary - with the result that, during bad times, increases in these contributions can be controlled by using the buffer fund for paying social security costs. In theory the funds could be use to actively stabilise the economy, i.e. lower the social security contribution in a recession and raise them again in a boom. The agreement by the social partners on the funds does not mention this possibility but does not exclude it either. A cut in social security contribution financed by the buffer funds will produce an expansionary effect larger than a nominal depreciation because of the increase in aggregate demand.

Some additional insights on the impact of domestic taxes on the trade balance are also provided by the literature which has developed from a longstanding controversy on VAT. The debate is rooted in the United States where it is commonly argued that the border tax adjustment for VAT on exports places foreign countries (notably the

European countries) at an unfair competitive advantage in world markets relative to the United States which are more reliant on the corporate income tax[9].

From a theoretical perspective the literature has reached an almost unanimous consensus on the conclusion that a uniform VAT, whether destination- or origin-based, is irrelevant to trade behaviour under a number of assumptions (Keen and Sayd, 2006). A uniform destination based VAT taxes all final goods which are consumed domestically at the same effective rate regardless of whether there are produced domestically or abroad. As a consequence VAT does not distort the choice between domestically produced and foreign commodities, and does not affect the intertemporal distribution of production and consumption.

However, the irrelevance of VAT to trade rests on the assumption of uniform rates across all consumption goods. Apart from the case where a discriminatory rate is set on foreign produced goods there are several cases where rates differ significantly across goods. The first one is given by several (mainly) non-tradeable goods and services which are exempted by law (such as financial intermediation, education and transports, or activities which are exempted because their turnover is below a given threshold) or exempted because they operate in the informal economy or taxed at a lower rates (e.g. foodstuffs). In this case, as noted by Krugman and Feldstein (1989) the VAT will tend to decrease the size of the tradable sector and hence the export intensity of countries.

The second exception occurs when producers do not receive the right refunds for their exports. Refunding of credits is the "Achilles heel" of the VAT. Several OECD countries have detected significant tax frauds related to the credit refund. This has led

[9] In the United States the Domestic International Sales Corporation (DISC) and its successor FISC were created with the objective of offsetting the adverse competitive effects of corporate tax. These regimes were found contrary to GATT rules.

some countries to introduce complex administrative measures that may significantly undermined the functioning of the VAT system (Harrison and Krelove 2005). In the absence of a correct refund VAT may work either as an export tax (if the credit is limited) or as an export subsidy (in the case of an undue refund). Finally, tax rates may vary across time. A fully anticipated increase in VAT lowers the real return on savings leading consumer to anticipate consumption to avoid the higher tax in the future. As a consequence a fully anticipated raise in VAT brings about a deterioration of the trade balance which is financed through an inflow of capital from abroad.

More recently, a small number of papers had tried to test the theoretical predictions by the empirical analysis of the effect of domestic taxes on trade balance. Desai and Hines (2005) have considered the impact of the VAT on export and trade intensity. Their results are somewhat mixed (at least for high-income countries): in the presence of fixed effects, a simple dummy representing the presence or absence of a VAT has no effect on either export or trade intensity. The share of VAT in total tax revenue, however, is significantly and negatively related to both. As regards the trade impact of the corporate tax, Slemrod (2004) finds a significant positive association between corporate tax revenues relative to GDP and trade intensity. In a far more ambitious study, Keen and Sayd (2006) partly confirm these results. They find that increased reliance on VAT revenue tends to be associated with a sharp reduction in net exports, which quickly fades. The results also point, however, to powerful and complex effects from the corporate tax. Increases in corporate taxation—whether measured by revenues or the statutory rate—are associated with sharp short-run increases in net exports (consistent with induced capital flows abroad); these are then subsequently and quickly reversed

(consistent with increased income from investments abroad), leaving an increase in net exports that converges to zero.

4 The impact of EMU on the main functions of the tax system

To what extent higher capital mobility, tax competition and the change of the exchange rate regimes had triggered a change in the tax systems in the Euro area? The discussion of the previous section has highlighted several potential linkages between these factors and the tax policies. In this section we will focus on three issues: a) whether higher capital mobility brought about a shift of the tax burden from capital to labour b) whether it caused a reduction in tax progressivity c) whether domestic tax reforms were driven by the aim of achieving an internal devaluation.

The first two issues are relevant as they represent the major concerns on fiscal policy at the time of the introduction of Euro. As discussed in Box 1, the fear that the integration of capital market could lead to a shift of the tax burden from capital to labour was fuelled by a stunning consistency between the theory and the empirical evidence available at that time. Revenues from capital income and statutory rates on corporate income appeared to be on a sharp downward trend in existing member countries and a number of (relatively small) accession countries were proceeding to adopt very low rates of corporate tax.

In contrast, the third issue has been largely neglected but may become a relevant matter in the near future as some members of the Eurozone have recently sought to implement changes in the tax mix which may substitute for devaluations of the nominal exchange rate in the attempt to stimulate the growth without breaching the Growth and Stability Pact.

4.1 Has capital market integration shifted the tax burden from capital to labour?

A central result in the theory of optimal taxation is that source-based taxes on capital income are inefficient instruments with which to raise revenue in a small open economy. Under perfect capital mobility a small open economy faces a perfectly elastic supply of capital. Any source-based tax on capital will bring about an outflow of capital which drives up the pre-tax return and decreases the marginal productivity of other immobile domestic productive factors. As a result the burden of the tax is fully borne by the immobile factors, e.g. labour, which must accept a lower compensation. It is clearly more efficient to tax the immobile factors directly, preventing the fall in productivity, rather than indirectly via the capital tax. Insofar as the voting process forces governments to implement Pareto efficient tax policies, the theory predicts a gradual decline of capital income taxes, and a parallel increase in taxes on labour, as capital markets integrate.

In fact, these trends are evident in the eighties and mid nineties when considering the implicit tax rates on capital and labour for the EU-15 and EU-12 which are reported in graph 2.

[Insert Graph 2]

However, quite surprisingly, the same graph shows that these trends were somewhat reversed in the last decade. Why did capital income taxation not decline further as predicted by the theory?

The first possible explanation is that tax competition has brought about a change in the structure of capital income taxation, with a shift from source-based to residence-based taxes. There is no reason for a small open economy to give up residence-based capital taxation provided it has sufficient information to tax foreign investments by its

residents. However, there is no clear evidence of such a change in the data. We should observe, for example, a gradual dismissal of the main source-based tax, namely the corporation tax. But despite the sharp decline in statutory tax rates, shown in table 5, corporate tax revenues relative to GDP remained stable or even increased in most OECD countries (Sorensen, 2007). [10] Furthermore, as highlighted by Devereux et al (2002) no clear trend can be detected in EMTRs, as the cuts in statutory rates went along with reductions in investment-related deductions.

A number of papers have tried to solve the "puzzle" of the surviving corporate tax. It is important to distinguish the problem of the stability of revenue from that of the stability of the EMTRs. The first reason is that the EMTRs can be driven down to zero without repealing the corporate tax, by exempting the normal return to capital. This can be achieved either through a cash-flow tax or by allowing the deduction of the opportunity cost of equity (as in the ACE proposal) or capital (as in the BEIT proposal) invested in the firm. In this case the tax base is given by the pure risk premium on capital invested in the company and by any return in excess to the normal return to capital which may stem from the exploitation of a scarce natural resource or by advantages due to a particular location (low input cost or conglomeration effects) and can be certainly positive. The second reason is that changes in revenue actually collected may be driven not only by tax reforms but also by several factor which affect the tax base.

[10] Steward and Webb (2006) analyse the evolution of corporate tax burdens – measured as corporate tax collected on GDP and on total taxes – in the OECD countries between 1950 and 1999. Descriptive analysis of these time series reveals no evidence of a competitive 'race to the bottom' in corporate taxation and little evidence of even a harmonization of the tax burden.

In order to disentangle the different variable which affects corporate revenue Sorensen (2007) analyses a useful decomposition of the ration between the corporate tax and GDP:

R/GDP = (R/C)(C/P)(P/GDP)

which shows that an increase in the ratio of corporate taxes (R) on GDP may be due to an increase of the average effective tax burden on corporate sector (R/C), an increase in the share of total profits accruing to the corporate sector (C/P) or, eventually, to an increase in the share of profits (P) in GDP. Sorensen (2007) calculated such decomposition for a number of OECD countries back to the early 1980s. The data show that the changes in revenue over GDP are mainly driven by the first two factors, given that the profit share of GDP is almost stable over the period. There is no clear tendency of the average effective tax rate to decline over time. As for EMTR this may be the result of the base broadening reforms which had offset the sharp reduction in statutory rates.

For the U.S., Auerbach (2006) noticed that an additional factor which may have contributed to raise the average effective rate in recent years is an unprecedented increase in profit volatility. Given the asymmetry of the tax system, which does not provide for an immediate compensation or tax credit in case of losses, the average tax rate on net corporate profits had increased substantially simply because a larger proportion of firms were experiencing losses. Unfortunately, there is no evidence on whether this phenomenon is widespread internationally.

However, the most clear and interesting trend is given by the rise in the ratio between profits in the corporate sector and total profits. This may reflect both a growing divergence in profitability between the corporate sector and the rest of the economy or

an increasing preference for the corporate organizational form. In part the growing importance of incorporated firms may be due to structural transformation of the economy such as the decline of sectors with a higher intensity of non-corporate firms, e.g. agriculture. But it may also reveal important side effects of tax competition. In closely held corporations, entrepreneurs may usually choose to receive a large part of their compensation as salary or profit. To the extent that the decline in corporate rates has reduced the effective tax burden on profit relative to labour income, there should be a reduction in the personal income tax base and an increase in corporate profits. The growth in corporate profits may also reflect higher incentive to defer taxes on capital income by reducing interest payments (Fuest and Weichenrieder, 2002).

A second type of income shifting occurs through the choice of legal form of companies. Entrepreneurs face a choice between a (closely held) corporation and other legal forms of doing business, such as the (sole) proprietorship or partnerships. Lower corporate tax rates may have induced them to switch to the corporate form, which then broadens the corporate tax base. Using a panel of European data Mooij, de and Nicodème (2007) have found a large and significant effect of lower corporate tax rates on incorporation choices. Their simulations suggest that between 12% and 21% of corporate tax revenue can be attributed to income shifting and that income shifting have raised the corporate tax-to-GDP ratio by some 0.25%-points since the early 1990s. This reconciles, albeit in part, the empirical evidence with theory. As predicted by the theory it seems that tax competition is driving down the tax burden on capital income but, given the optimal response of taxpayers, aimed at reducing the overall tax bill, the revenue loss shows up in personal taxation of business income rather than corporate tax as expected. This behaviour is in accordance with the results of the simple regressions in the previous

section, which documented an increase in corporate tax revenues and a fall in individual income taxes after the introduction of Euro.

Other forms of change in organisational form may also have contributed to the stability of corporate tax and has been apparently neglected by the literature. A share of corporate tax revenue may simply stems from the reallocation of revenue in the public sector. The main example is given by privatization. In many countries (e.g. United Kingdom, see Florio, 2004) State owned enterprises were not responsible to pay company taxes (Mintz et. al. 2000). But even in the case where they did pay corporate taxes, the privatization process usually leads to higher profit and higher tax revenues. Overall, the large scale privatizations of the nineties may then explain a significant share of corporate tax revenue. Another example of revenue reallocation is given by countries with large natural resources which may have changed the classification of revenue. This is illustrated by the United Kingdom with reference to revenues from oil and gas production. The graph 3 shows that the corporate income tax has gradually replaced the royalty payment and part of the petroleum revenue tax.

[Insert Graph 3]

Finally mention should be made of changes in organisational form associated with ‘demutualisation’. This change is most apparent in the case of UK building societies which were largely transformed into companies in the 1990s but similar phenomena have occurred in continental companies.

It is more difficult to find consistent explanations for the relative stability of EMTRs. Ex-post changes in the tax bases and taxpayers’ behavioural responses cannot account for variations in the EMTRs as the latter are ex-ante measures of the tax burden on investment based on tax provisions rather than company data.

A first reason for the survival of positive source-based EMTRs may be found in the nature of foreign direct investments (FDI). It is well know that most FDI is in the form of M&A. Brakman et al. (2006) calculate that 78% of all FDI, in value term, are M&A while greenfield investment account for just 22% of total FDI value. Within M&A, 97% of deals are acquisitions. Further, the share of M&As have risen sharply in the last decades as shown by Calderon (2004). While it is clear that a reduction in EMTR increases the net return on capital and makes the country more attractive for greenfield investment, the effect on the probability of a takeover by foreign company is less obvious. To the extent that taxes on income are capitalized in the value of the assets a reduction in EMTR will increase the value of domestic companies leaving unchanged the net return that a foreign company may earned through a take-over. This suggests that the existing literature may overstate the case for the inefficiency of source-base capital income taxation by focusing on the case of greenfield investment.[11]

A second reason which may explain why small countries choose to levy a source-based tax on capital is related to redistribution. The argument against capital taxation in a open economy rests on the assumption that governments can optimally tax the immobile factors which ultimately bear the burden on the capital income tax. Notice that when the governments wish to affect the distribution of income this is equivalent to assume that the government may levy optimal differential lump-sum taxes. In the more sensible framework where the government may only levy a linear or a non-linear tax on labour income the source-based tax is an efficient tool for redistributing income to the extent

[11] For a review of the recent literature and an empirical analysis on the effect of taxes on M&A see Huizinga and Voget (2005).

that the tax is shifted onto the wages of workers with different abilities in different proportions (Arachi 2007, Huber 1999).

4.2 Was there a reduction in tax progression and in the redistribution carried out by the tax system?

Capital market integration and tax competition are alleged to limit redistribution because on the one hand it is more difficult for the single country to tax the rich and mobile, and on the other redistributive policies may attract poor individuals from foreign countries (Feld 2000, Wildasin 2000).

Tax progression may vary for two different reasons: the revenue composition may change, and the progression of each single tax may vary. With reference to the first reason, we have shown that there is no clear evidence that EMU has forced a significant shift among taxes. This leaves us with the question on whether the progression of the PIT tax has been affected by the single currency. We have already noticed that there is a general trend among OECD countries towards a reduction of tax brackets and marginal tax rates in the PIT. However, these changes in the tax schedule does not allow to conclude that the PIT have become less progressive as the shape of the average tax function depends on tax allowances and credits.

One way to evaluate the overall change in progression is to rely on the average personal income tax rates on gross labour income calculated by OECD based on the framework used in the OECD publication “Taxing Wages”. The OECD tax database contains data since 2000. We took the difference of average tax rates (excluding social security and payroll taxes) between 2000 and 2006 for two different types of single earners without children: one with income equal to 67% of the income of the average worker (AW) and another with income equal to 167% of that of the AW. The changes in tax rates are

depicted in graph 4. The graph shows some general trends. First, most countries in the Eurozone have decreased the average rate on low incomes (exceptions are Austria, France and Spain). But at the same time, the majority of countries have decreased the average tax rate on high income.

[Insert Graph 4]

The impact on tax progression can be evaluated through graph 5 where tax progression is measured by the ratio between the difference of the average tax rates at 167% of average earnings and at 67% of average earnings and the average tax rate at 167%, using the formula: (T167-T67)/T167. When an observation lies above the 45 degrees line tax progression as increased since 2000. Only three countries (Austria, France, and Spain) show a reduction in tax progression while the remaining 9 countries have moved toward higher progression.

[Insert Graph 5]

However, the most interesting feature of the data is that EMU countries seem to behave differently from the rest of OECD countries. On average, non Euro countries have reduced the tax progression of the PIT. Albeit preliminary, these findings are suggestive that there may be a relationship between capital market integration and the political demand for higher tax progression. A possible explanation is provided Arachi and D'Antoni (2004). Higher capital mobility reduces the variance in the return for capital owners while at the same time increases the wage risk of immobile sector specific skilled workers. Redistribution among workers plays an insurance role and makes the investment in specific skills more attractive. The insurance effect of redistribution can be stronger than the distortionary effect, so that the optimal progression of the labour income tax can increase when capital markets become more integrated.

4.3 Have domestic tax reforms been driven by concerns regarding the relation between taxes, international trade and domestic employment?

To our knowledge there is no empirical study on the impact of domestic taxes on trade in the Eurozone. The only limited evidence is provided by some simulations performed with the Commission services QUEST model in European Commission (2002). The study analyses the effects on the main macroeconomic variables of different discretionary fiscal measures for three countries: Germany, Ireland and Greece. The simulations show that a permanent tax shift from labour income taxes to VAT may have sizeable positive long-run effects on GDP for a large country like Germany, while the impact is negligible in the short run and for the small countries, Ireland and Greece. The effects on the trade balance, are in general negligible. Only in the long run (three years after the policy change) Germany experiences a reduction in net exports. It is not clear, however, whether the "tax swap" considered by the Commission can be strictly interpreted as an internal devaluation as the reduction in labour income taxes seems to include taxes which are not (at least in the short run) production costs such as those paid by the employees.

We looked for further empirical evidence by conducting a simple analysis on the correlation between the trade balance and current values of domestic taxes on GDP using and unbalanced panel of OECD countries from 1970 to 2005. The results are reported on Table 6.[12]

[Insert Table 6]

[12] Though not reported, all specifications include country effects, year dummies to control for any unobserved common time-specific effects and per-capita GDP. All standard errors are heteroskedasticity-robust.

We considered first a very simple specification where net exports in goods and services on GDP are regressed on VAT, corporate tax, and total tax revenue as a percentage of GDP. The estimates (column 1) confirms the main findings of Keen and Sayed (2006): export performance is unrelated to reliance on VAT, but positively related to reliance on corporate taxes. However, while Keen and Sayed (2006) reports a negative correlation between the trade balance an total tax revenues, no significant association can be detected in our sample. Column 2 test whether employer social security contributions have an impact on the trade balance. The theory on internal devaluation predicts a negative association between these two variables. In contrast, the estimated coefficient is positive and is not significant. We further explored whether the sensitiveness of trade to domestic taxes has changed with the creation of EMU. To this end column 3 uses two dummies (the first equal to one for EMU countries up to 1998 and the second equal to one for EMU countries for the period 1999-2005) interacted with the tax variables. There is no evidence that the association between trade and VAT is different between EMU and other OECD countries before and after the introduction of the new currency. But, interestingly, there is weak evidence that the single currency has increased the responsiveness of net exports to employers social security contributions. Further, the estimated coefficient for employer SSC for EMU countries after the introduction of Euro has a negative sign as predicted by the theory (column 4). A similar pattern can be detected for the corporate income tax. The sensitiveness of trade to the corporate tax is significantly higher for EMU members, and further increases after the introduction of Euro.

The previous conclusions are only provisional. A more sophisticated analysis is needed to control for the endogeneity of the tax variables and to detect more complex dynamic

effects, especially for VAT and corporate taxation. However, with reference to VAT and corporate taxes, Keen and Syed (2006) have shown that the results of the simple specification in column 1 (no trade effects of VAT, strong short run effects of corporate tax) are confirmed by a more general dynamic model. Therefore our regression results suggest that the introduction of Euro has increased the responsiveness of trade to domestic taxes, in particular the corporate tax and employers social security contributions. The association between taxes and trade is consistent with the theory of the internal devaluation: a cut in employer tax related costs as a positive effect on net exports while an increase in VAT is neutral. [13]

In the light of this conclusion it appears somewhat surprising that until recently there is little evidence that tax reforms have been driven by trade concerns given the potential trade effects. Apart from the cases discussed in section 3.3, in the past decades the main reforms in the field of social security contributions have actually resulted in an *increase* in employer SSC to finance growing entitlement programmes. To be sure since the introduction of the Euro there have been a number of reductions in SSC, but these have been, by and large, targeted to specific groups or sectors. A summary analysis of changes in VAT and social security contribution revenues as a percentage of GDP did not reveal any significant correlation. Why did Euro Countries not pursue "internal devaluations" more often?

A first set of reasons, highlighted by Calmfors (1998), stems from political economy considerations. The obvious difference between an external and an internal devaluation

[13] We also tested additional specifications which include SSC paid by employees as a percentage of GDP. In the simple regression with no interacted dummies, the estimated coefficient of this variable is negative but not significant. Using interacted dummies the regressions shows a significant negative impact on trade for countries outside the Eurozone, while the coefficients are still not significant for EMU members, both before and after the introduction of EMU, as predicted by the theory of internal devaluation.

is that the latter requires an explicit political consensus to vary taxes or expenditures whereas devaluations are at the discretion of governments or the monetary authorities. The quest for a political agreement may find several hurdles in the choice of the tax increases or expenditure cuts needed to finance a reduction in employers' contribution since each alternative would have different distributional consequences[14]. In the case of tax-financed internal devaluations, a VAT increase is not entirely equivalent to an increase in employee social security contributions or to a tax on labour. An increase in VAT falls on the consumption of all residents. A fully anticipated increase in VAT lowers the real return on savings leading consumers to reduce current consumption in order to avoid the higher tax in the future and tends to entail a reduction of net exports in the short run[15]. By contrast, a fully anticipated increase in the tax on employees' labour income does not lead to an immediate impact on consumption and net exports.

The difficulties related to the political process could be partly overcome if the cut in social security contributions is debt financed, as in the case of the Italian reduction of IRAP, or through the creation of "buffer funds" as in the case of Finland. However, these strategies may currently be constrained by the limit set on debt financing by the Stability and Growth Pact.

A second set of reasons that may explain why countries have not relied on internal devaluations is that the final effects of such a strategy on unemployment are unclear. Hoon and Phelps (1996) explore the effects of a shift to an increased VAT offset by

[14] Besson (2007) argues that the introduction of a Social VAT to replace a part of SSC would not have the degree of widespread social consensus that similar measures had in Denmark in the late 1980s and that the ideal design from a political standpoint (i.e. reductions in SSC aimed at lower income groups) would not necessarily be sufficient to offset foreign competitive pressures

[15] An unanticipated increase in VAT decreases the value of existing assets and leads to a decrease in current consumption.

lighter payroll taxation in a version of the labor-turnover model of unemployment. They find that such a shift decreases the natural rate of employment in a closed economy and in a two country world, while for a small open economy whose interest rate is given by the world rate, the tax shift is neutral for employment. In contrast, Goerke (1999) finds that in an efficiency wage model of employment the shift from SSC to VAT has uncertain economic consequences which depend on whether VAT is shifted forward into consumer prices and on the nature of the employment compensation system.

Finally, the ambiguity on the employment consequences of a "internal devaluation" is also consistent with the fact that despite the widespread concerns on the effect of taxes and social security contributions on labour cost the theoretical prediction and the empirical evidence are rather mixed (Arpaia e Carone 2004). From a theoretical perspective, the incidence of SSC depends on a series of institutional factors such as the relative strength of unions, the centralization of the wage bargaining process, the structure of product and capital markets, and the interaction of tax with other institutions (e.g. the fiscal treatment of unemployment benefits). Furthermore, the degree of shifting of social security contributions on labour may also depend on the link between the tax payment and the future benefit. If this link is strong and correctly perceived by the agents the negative effects of SSC may be significantly alleviated (Butler, 2002, Disney, 2004). This implies that, when there is a link between SSC and benefits the shift from SSC to value added taxes increases the tax wedge.[16]

The empirical evidence mirrors the mixed results of the theoretical analysis. The study by Arpaia and Carone (2004) suggests that there is probably some wage resistance in

[16] This point is acknowledged by European Commission (2002) that observes that the simulated effects of an internal devaluation on GDP are larger for Germany than for Ireland and Greece since the indexation of benefits to taxes is lower in Germany and consequently labour income taxes are more distortionary.

the short-term but not in the long-term, although the transition to the long-term can be very long and therefore the short-term impact and the dynamics of adjustment can be longlasting. In the short-term, an increase in the tax wedge has an impact on the labour cost and thus on employment, although limited. The estimates suggest that a 1 percentage point increase in the tax wedge leads to a contemporaneous increase in the real labour costs of only 0.1%.

As mentioned above until recently there has not been much evidence of explicit policies directed at achieving an internal devaluation. However, in 2007 Germany increased its VAT rate by 3 p.p. to 19% and has reduced at the same time its social security contributions for employment from 6.5% to 4.2% [17]. In 2007, Italy cut the tax wedge on labour by reducing its value added business tax (Irap). The cut was financed by reforming the mandatory severance indemnity scheme (TFR). The reform turned the existing fully funded scheme run by individual firms into a pay as you go scheme run by the National Social Security Agency (INPS). The additional revenue came from the "first generation" effect of the reform. More recently, the proposal of a "social VAT" have been hotly debated during the French election campaign and resulted in a government report on the feasibility of its introduction (Besson, 2007).

5 Tax systems in the EMU: future developments and prospects for reforms

The wide survey of theory and evidence presented in this paper confirms the difficulties to single out some clear links between the introduction of the common currency and the evolution of tax system in the Euro area. However there are several interesting conclusions that can be drawn.

[17] A similar policy was followed in 1998. In 1987, Denmark introduced a "social VAT" to calm an overheated economy while reducing the impact of the tax measures on the export sector.

First, the data show a clear effect of the adjustment to the Maastricth criteria on total tax revenue. Countries joining the Eurozone where characterized by high fiscal pressure but their total tax to GDP ratio has increased more than other EU and OECD countries after 1992.

Second, most of the concerns that were raised during the build up to monetary union did not materialised. In the *One Market, One Money report* the Commission took the view that the main effect of Euro on tax system would have operate through the increased mobility of capital. In the mid of the '90ies the Commission voiced the fear that capital mobility was bringing about a shift of the tax burden to the less mobile tax base – labour – causing in turn high employment and hindering redistribution. The empirical literature has confirmed that the common currency has increased both the mobility of financial an real capital but there is no clear evidence that this has fostered strategic interaction among EMU countries and a decline of capital income taxes, in particular the corporate income tax. Furthermore, there are no apparent signs that higher capital mobility is jeopardizing the progression of the PIT.

However, we have highlighted several factors that may have disguised the erosion of capital income taxes: income shifting between the personal and the corporate tax bases, the privatization process, revenue reallocation in countries with large natural resources, changes in organisational form associated with 'demutualisation'. Further, we have shown that the sensitiveness of the trade balance to corporate taxation has increased in the EMU, which may be taken as tentative evidence that capital movements to and from Euro area countries have become more responsive to the levels of corporate taxation. As a consequence, the case for further corporate tax coordination in the Eurozone should be taken up seriously.

At present one of the main objective of the European Commission in the tax field is to provide companies with a consolidated corporate tax base for their EU-wide activities focusing in particular on the Common Consolidated Tax Base (CCTB). The Commission strategy is mainly driven by the aim of removing in a systematic way the tax obstacles which exist for companies operating in more than one Member State in the Internal Market. From this perspective, the CCTB does not rise any obvious problems or advantages directly related to EMU. In contrast, it may have relevant consequences for tax competition. In the short run such proposal is likely to increase the sensitivity of direct investments to national corporate tax rates and may lead to a further decline in tax rates and revenues. However, the implementation of a CCTB may provide the basis for an effective discipline among EMU countries. Even if the European Commission has stated at several occasions that it has no intention to link the CCTB with any proposal to harmonize tax rates, it is a fact that the harmonization of the tax base opens the possibility of implementing a mutually beneficial minimum level of taxation in the Eurozone.

Finally, the recent experience of the largest EMU countries (Germany, France and Italy) suggests that members of the Eurozone are looking for changes in the tax mix which may substitute for devaluations of the nominal exchange rate in the attempt to stimulate the growth without breaching the Growth and Stability Pact.

The prospect that internal devaluations may proliferate in the Eurozone raises a number of issues. The first question is whether there is the need to limit national autonomy in this field or to coordinate the choices of single member States. If the answer is yes, the further question is what kind of coordination could minimize the inefficiency of

strategic interaction allowing a sufficient degree of national autonomy in the choice of the tax mix.

The history of the EMS leaves little room for arguing against the need to set a limit to "beggar-thy-neighbour" devaluations. The real issue is which kind of constraint is needed. From a theoretical perspective, it is quite hard to find a way to prevent countries to affect the real exchange rate through taxes. As explained in the previous section, an internal devaluation may be achieved in several ways: the necessary element is only the cut in taxes which increase the labour cost. However, in the limited sample of significant attempts to pursue such a strategy, the cut in social security contribution paid by employers has been financed mainly through an increase in VAT (e.g. the reform implemented in Germany and the debate on social VAT in France). Simple considerations can explain such behaviour. From the one hand in recent years many Euro countries have failed in any attempt to reduce public expenditure. From the other hand, a shift of taxation from employers to employees is likely to face a strong political opposition on the equity ground. The quest for avoiding competitive internal devaluations, leads therefore to analyse the need for further coordination of VAT.

This is the field where the Commission exerted a strong effort during the 1990s. The Commission initiatives were driven by the objective of improving the functioning of the internal market. Ever since it adopted its first and second VAT Directives in April 1967, the Community has been committed to introducing a "definitive system" of taxation which eliminates import taxes and export tax exemptions in trade between the Member States by taxing goods and services in "the Member State of origin" (Bill, 2004). The abolition of internal border controls and formalities in 1993, removed one the basis of the working of the normal system of destination VAT for intra-EC trade and stimulated

several proposals for a definitive origin-based VAT system (Keen et al, 1996). The large literature which rapidly developed on the theme provided clear policy guidelines.[18] Under the origin principle countries have the incentive to set taxes at a level which is inefficiently low. The inefficiency of tax competition is larger the wider are the differences in country size. Small countries undercut large countries and produce the largest tax externalities. The introduction of a minimum tax rate is Pareto improving while the welfare effect of harmonization o tax rates is in general ambiguous. Following these prescriptions the rules determining the tax base and the procedures for tax collection and administration were harmonized to some extent (even if there remain significant differences among Member States), the range of statutory rates was reduced and minimum statutory rates were set.[19] This has resulted in a convergence of statutory tax rates, despite differences persist in the efficiency of tax collection due to national derogations and exemptions and to the different size of the informal economy (Mathis, 2004).

Is this framework adequate to deal with the possibility of a strategic use of VAT to affect the real exchange rate? To answer the question notice first that the transition to the origin principle was never completed and that there are no sign that the 'transitional system' implemented in 1993 is going to be replaced in the near future (Bill, 2004, Cnossen, 2002). In practice in the 'transitional system' the origin principle is applied to individual cross-border shopping while the destination principle applies to transactions between firms (on a reverse charge basis). Despite the widespread concern that cross border shopping may rapidly swell due to the change in regime, the more recent

[18] Lockwood (2001) provides an excellent synthesis of the theoretical literature.
[19] As explained below, there is also a political commitment on a maximum rate of 25%.

evidence suggest that there have been no significant changes in cross-border purchasing patterns, nor any significant distortions of competition or deflections of trade through disparities in VAT rates (Cnossen, 2002). De facto, VAT still adhere to the destination principle both in intra- and extra-EU transaction.

The fact that European VAT is at present mainly destination-based is crucial for understanding the incentives countries may have to manipulate the tax in order to increase competitiveness. Under a destination-based VAT an internal devaluation can be achieved by increasing the VAT rate and cutting employer SSC. Under the origin principle an increase in VAT rate would raise the price of domestically produced commodities relative to the price of imports. Therefore in order to achieve a devaluation of the real exchange rate under the origin based principle, the VAT rate should be cut and the revenue loss should be finance through an increase in taxes on employees.

The predominance of the destination principle both in intra- and extra-EU transaction is also fundamental to identify the welfare loss due to strategic interaction and possible remedies. To the extent that a country succeeds to achieve a welfare improving increase in net exports by cutting tax related labour cost and raising destination-based VAT, it will inflict a welfare loss to its trading partners. This implies that a process of competitive internal devaluation will lead to VAT rates which are inefficiently high, rather than too low as in the case of tax competition under the origin principle. Furthermore, if we focus on the welfare of Eurozone countries, the largest damages may be caused by large countries. It is likely that a successful internal devaluation by a small country will have a negligible impact on the nominal exchange rate between Euro and other currencies. As a consequence, the devaluation of the real exchange rate will hurt in the same way trading partners in and outside the Eurozone. In contrast, when the

same policy is implemented by a large country, there may be an effect on the nominal exchange rate. To the extent that the increase in net exports will trigger an appreciation of Euro with respect to the other currencies, Eurozone countries will suffer a greater loss of competitiveness.

These simple considerations suggest three solutions which range from weak to strong forms of coordination. The first one is the introduction of a maximum VAT rate. Since its original proposal on VAT rates (COM(87)321) the Commission has recommended several times the introduction of a maximum rate of 25%, but the Council only agreed in 1996 to make "every effort" not to go beyond that level. The problem is that such a limit seems too high to be effective: the largest economies (Germany, France, Italy, Spain) have rates which are still significantly lower, ranging from 16% to 20%, and many of them (France, Italy and Spain) apply a reduced rate on a substantial share of the tax base. On the other hand, the implementation of a explicit maximum rate at 20% would drastically reduce the national autonomy in this field, leaving a band of 5 percentage points only.

The alternative to the maximum rate could be found in the reform of the EU own resources. At present, the VAT-based own resource results from the application of a uniform rate of call (around 0.33 % in 2007) to a common tax base. This base is a theoretical construct that compensates for the fact that neither the VAT rates nor the list of goods and services covered by VAT are harmonised at EU level. As a consequence the payment of each member State is not affected by variations in revenue due to changes in its own tax bases and rates. In contrast, a tax sharing scheme of actual VAT revenues, could be a means to internalize the effect of beggar-thy-neighbour strategies,

as this would raise the perceived cost of raising revenue through VAT for national governments.

The third solution is given by the transition to the definitive origin-based regime. As explained above, in order to decrease the ratio between domestically produced good and imports, a country should cut VAT and increase taxes on the income of employees. However from one hand tax rates cannot be reduced below the minimum levels already set and on the other hand it may be difficult to find the consensus for increasing taxes on labour, given that in many countries the tax wedge on labour is quite high.

It is worthwhile to notice that, even with perfect price flexibility, under the destination principle uncoordinated tax setting brings about inefficient equilibria (Arachi, 2001). The tax rates are too high and a coordinate reduction in rates on imported goods (through a maximum rate) yield a Pareto improvement (Lockwood, 2001). This implies that EMU may act as forerunner for a new coordination strategy in VAT field that may be later extended to the rest of EU countries.

6 Conclusions

Tax policy as such has not been generally seen as raising any specific issues for the coming into existence of a common currency. The Euro has not been closely associated with changes in tax policy nor has concern been expressed that the domestic tax systems of Euro area countries are influencing economic activity in the Euro area relative to non-Euro area countries. At the same time tax policy is very actively discussed within the European Union.

This paper has examined whether and how the introduction of the Euro changed the impact of taxes on the economy or influenced the direction of tax policy. The paper surveyed potential theoretical channels through which tax policy and exchange rate

regimes are interrelated (capital mobility, strategic tax setting and trade policy). It is difficult to find strong empirical evidence of major, unique changes in the impact or determination of tax policy following the introduction of the Euro. The internal market has had by far a greater impact and it has affected all European Union countries.

Nevertheless, we highlighted that going forward certain specific aspects deserve attention and call for further tax coordination among EMU and EU countries. The most important concerns the use of tax policy by individual EMU countries to improve competitiveness by changing the mix of taxes and thereby achieving an internal devaluation. A second issue deserving attention concerns tax competition particularly in the area of corporation tax. We provided some tentative evidence that capital movements to and from Euro area countries have become more responsive to the levels of corporate taxation.

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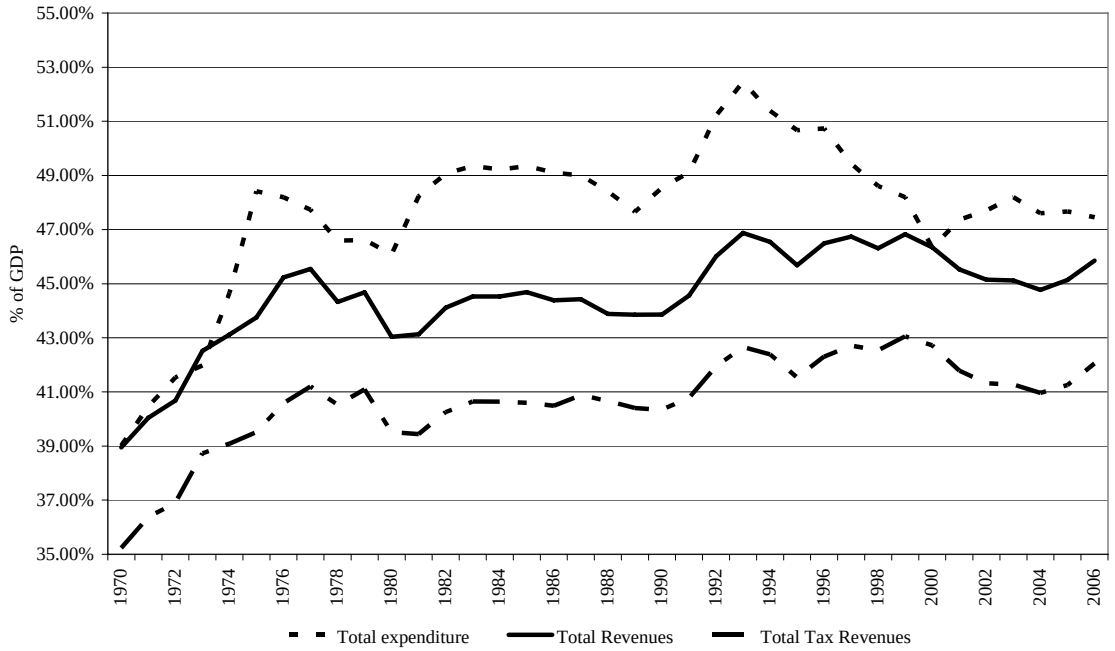
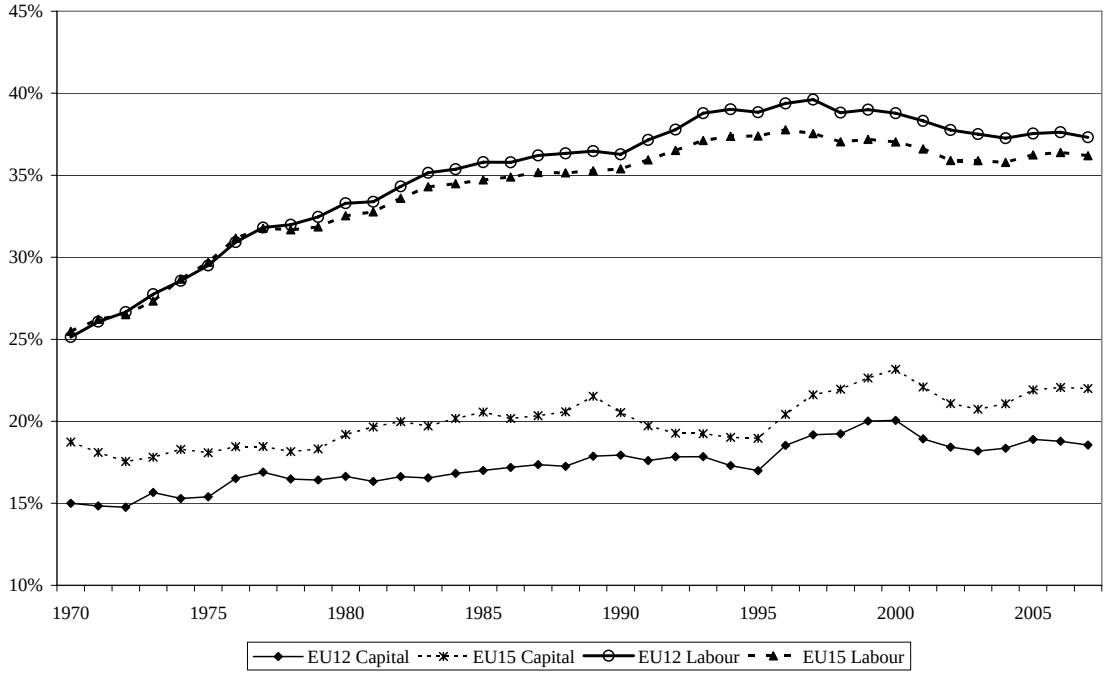
Tables and figures

Graph 1: Long term trends in general government total expenditure, total revenue and overall tax ratio in the Euro-zone



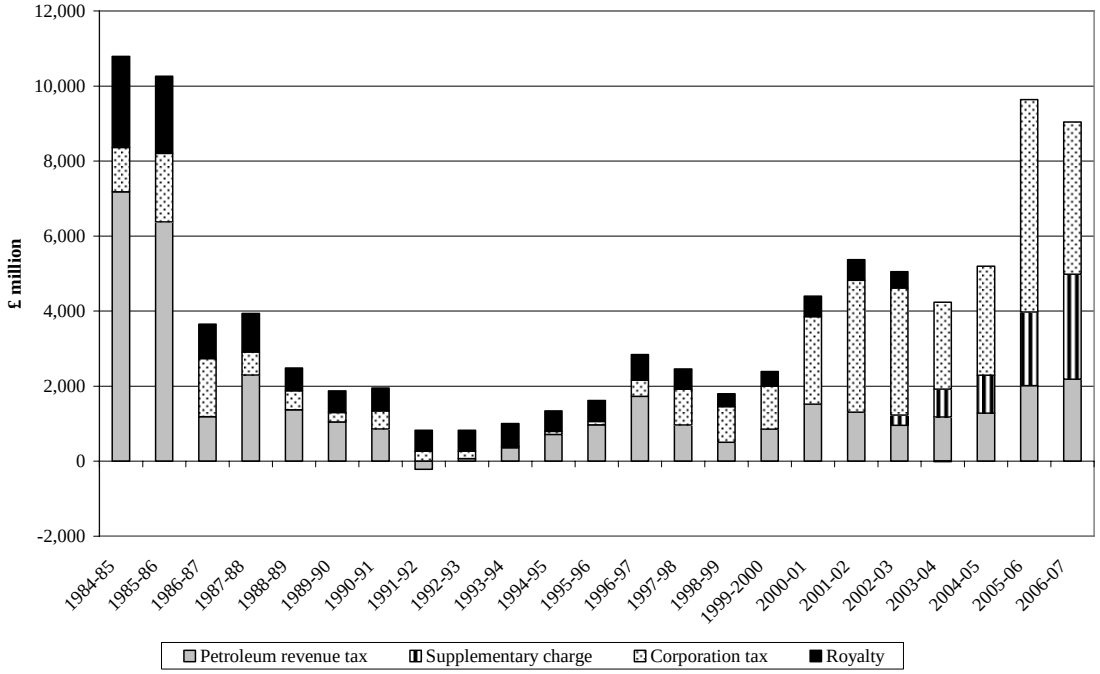
Source: Own calculations based on AMECO data

Graph 2: Implicit tax rates on labour and capital



Source: unpublished data by Carlos Martinez

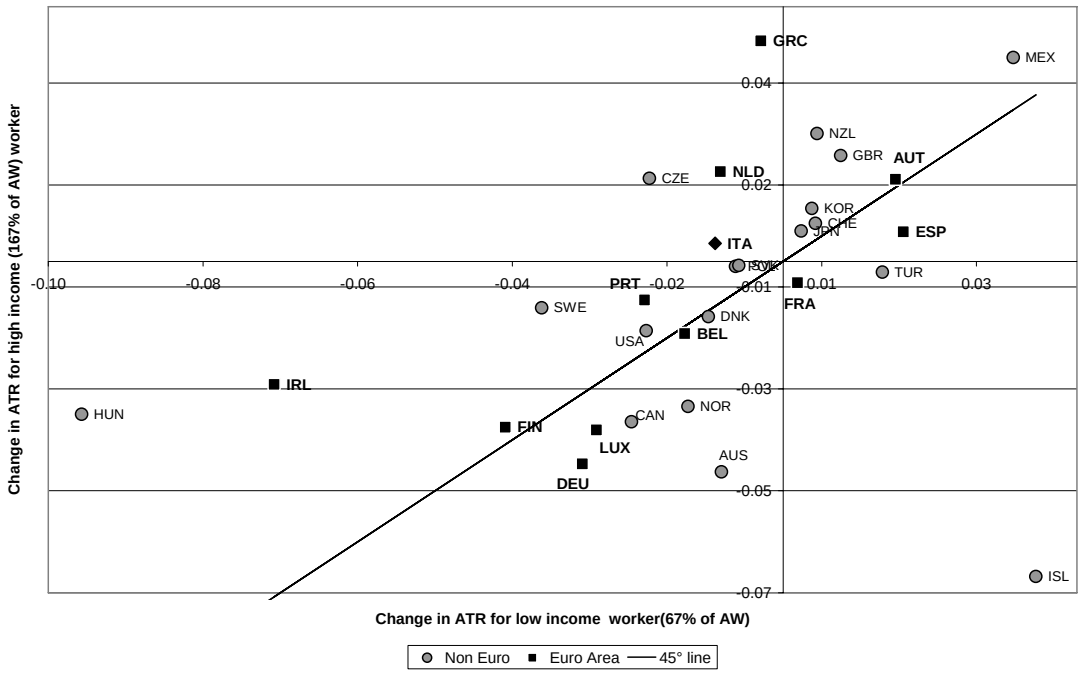
Graph 3 Revenues from oil and gas production in UK: 1984-2007



Source: HM Revenue & Customs

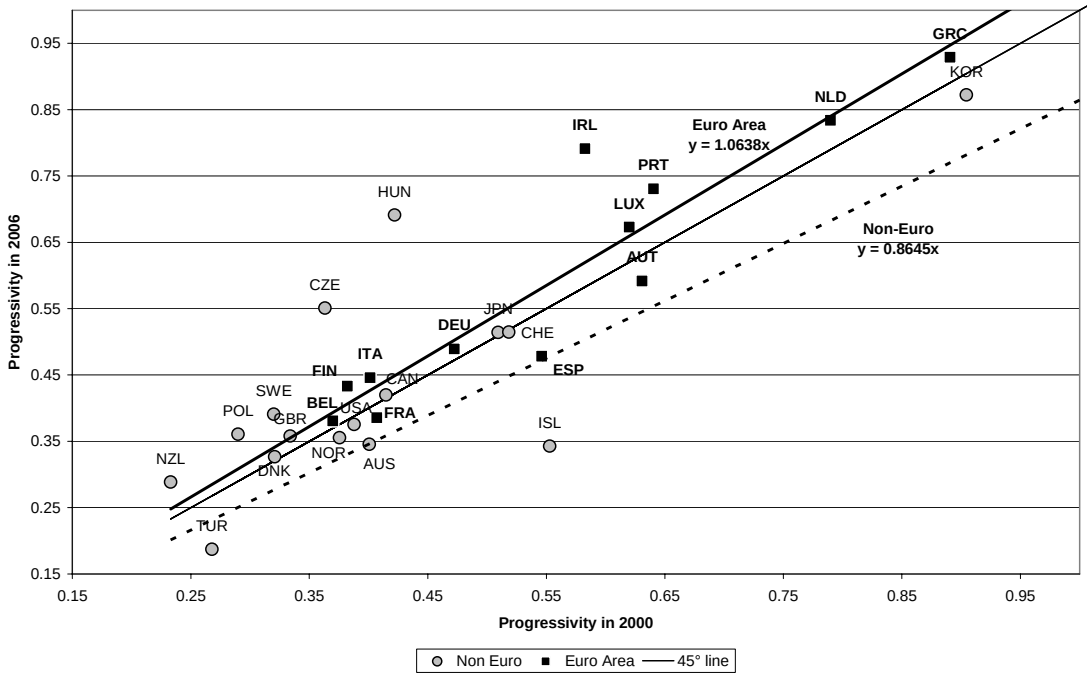
http://www.hmrc.gov.uk/stats/corporate_tax/table11_11.pdf

Graph 4: Changes in ATR on labour income 2000-2006



Source: OECD Taxing Wages database and own calculations

Graph 5: Progressivity of income taxes: 2000 and 2006



Mexico (1.75 in 2000, 1.24 in 2006) has been taken out to improve visibility
Source: OECD Taxing Wages database and authors' own calculations

Table 1 Change in Tax Pressure (1970-2006)

Tax Revenue/GDP Ratio						
	1970	1980	1990	1995	2000	2005
AUSTRIA	33,9	39,0	39,6	41,3	42,8	42,0
BELGIUM	33,9	41,3	42,0	43,8	45,2	45,5
BULGARIA				-	33,1	35,9
CYPRUS				26,7	30,0	35,6
CZECH REPUBLIC				36,2	33,8	36,3
DENMARK	38,5	43,1	46,5	48,8	49,4	50,3
ESTONIA				37,9	31,3	30,9
FINLAND	31,7	35,9	43,9	45,7	47,2	43,9
FRANCE	31,7	35,9	43,9	42,7	44,1	44,0
GERMANY	35,7	41,6	39,5	39,8	41,9	38,8
GREECE	21,9	23,6	28,7	32,6	37,9	34,4
HUNGARY				41,6	38,5	38,5
IRELAND	28,4	31,0	33,1	33,1	31,7	30,8
ITALY	25,7	29,7	37,8	40,1	41,8	40,6
LATVIA				33,2	29,5	29,4
LITHUANIA				28,6	30,1	28,9
LUXEMBOURG	23,5	35,7	35,7	37,1	39,1	38,2
MALTA				27,3	28,2	35,3
NETHERLANDS	34,1	41,8	41,1	40,2	39,9	38,2
POLAND				37,1	34,0	34,2
PORTUGAL	18,4	22,9	27,7	31,9	34,3	35,3
ROMANIA				-	-	28,0
SLOVAKIA				39,6	32,9	29,3
SLOVENIA				40,2	38,6	40,5
SPAIN	15,9	22,6	32,5	32,7	33,9	35,6
SWEDEN	38,2	46,9	52,7	49,0	53,4	51,3
UNITED KINGDOM	37,0	35,2	36,5	35,6	37,6	37,0
OTHER OECD Countries						
AUSTRALIA	21,5	26,6	28,5	28,8	31,1	31,1
CANADA	30,9	31,0	35,9	35,6	35,6	33,5
ICELAND	27,4	29,6	31,0	31,2	38,3	42,4
JAPAN	19,6	25,4	29,1	26,9	27,1	16,8
KOREA	-	17,2	18,9	19,4	23,6	25,6
MEXICO	-	16,2	17,3	16,7	18,5	19,3
NEW ZEALAND	26,0	30,6	37,4	36,6	33,6	36,6
NORWAY	34,4	42,5	41,5	41,9	42,8	44,3
SWITZERLAND	19,8	25,3	26,0	27,8	30,5	30,0
TURKEY	12,5	17,9	20,0	22,6	32,3	32,3
UNITED STATES	27,0	26,4	27,3	27,9	29,9	26,8
EU-27						
weighted average				39,7	40,7	39,6
arithmetic average				37,7	37,7	37,4
EA-13						
weighted average				39,9	41,3	39,9
arithmetic average				38,6	39,9	39,1
EU-25						
weighted average				39,7	40,9	39,7
arithmetic average				37,7	37,9	37,8
OECD TOTAL	27,8	31,4	34,2	35,1	36,6	36,6
OECD EUROPE	28,5	33,8	36,5	37,6	39,1	39,1

Table 2 Structure of tax revenue Eurozone (weighted averages)

	EU			EU25			EU13		
	1970	1980	1990	1995	2000	2005	1995	2000	2005
Consumption	38,0	31,6	31,1	27,9	28,0	28,3	26,5	26,9	26,9
VAT	16,1	16,3	17,9	16,7	17,1	17,3	16,0	16,8	16,6
Excices[a]	21,9	15,3	13,2	11,2	10,8	10,9	10,5	10,1	10,3
Labour	48,8	56,9	55,1	56,0	55,3	56,4	58,6	57,8	58,8
Income Tax[b]	16,2	19,7	18,8	21,9	23,8	23,6	20,2	22,5	22,4
Social security contributions	32,6	37,2	36,3	34,2	31,5	32,8	38,4	35,3	36,4
Capital	13,2	11,5	13,8	16,1	17,0	15,5	15,1	15,6	14,5
Corporation Tax	5,3	5,1	6,5	7,5	8,0	6,7	7,0	7,7	6,5
Income tax	2,8	2,1	3,2	1,8	2,2	2,0	1,7	1,9	1,7
Property taxes[c]	5,1	4,3	4,1	6,8	6,8	6,9	6,4	6,0	6,2
Total	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0

a Taxes on tobacco, alcohol, petrol, motor vehicles and other specific goods and service.

b Including taxed on labour income imputed to the self-employed and payroll taxes

c Taxes on net wealth, immovable property and property transfers. Sources: Updated from Martinez-Mongay (2000) and OECD (2001)

Source: Cnossen 2002 and own calculations based on European Commission (2007)

Table 3 VAT rates

	Implemented	Standard rate													Reduced rate	Domestic zero rate (2)	Specific rate applied within specific region
		1976	1980	1984	1988	1990	1992	1994	1996	1998	2000	2003	2005	2006			
Australia	2000	-	-	-	-	-	-	-	-	-	10,0	10,0	10,0	10,0	-	yes	-
Austria	1973	18,0	18,0	20,0	20,0	20,0	20,0	20,0	20,0	20,0	20,0	20,0	20,0	20,0	10.0 and 12.0	no	16 (a)
Belgium	1971	18,0	16,0	19,0	19,0	19,0	19,50	20,5	21,0	21,0	21,0	21,0	21,0	21,0	6 and 12.0	yes	-
Canada	1991	-	-	-	-	-	7,0	7,0	7,0	7,0	7,0	7,0	7,0	7,0	-	yes	15 (b)
Czech Republic	1993	-	-	-	-	-	-	22,0	22,0	22,0	22,0	22,0	19,0	19,0	5	no	-
Denmark	1967	15,0	22,0	22,0	22,0	22,0	25,0	25,0	25,0	25,0	25,0	25,0	25,0	25,0	-	yes	-
Finland	1994	-	-	-	-	-	-	22,0	22,0	22,0	22,0	22,0	22,0	22,0	8.0 and 17.0	yes	-
France	1968	20,0	17,6	18,6	18,6	18,6	18,6	18,6	20,6	20,6	20,6	19,6	19,6	19,6	2.0 and 5.5	no	0.9, 2.1, 8.0, 13.0, 19.6 (c) 1.05, 1.75, 2.1 and 8.5 (d)
Germany	1968	11,0	13,0	14,0	14,0	14,0	14,0	15,0	15,0	16,0	16,0	16,0	16,0	16,0	7	no	-
Greece	1987	-	-	-	16,0	18,0	18,0	18,0	18,0	18,0	18,0	18,0	18,0	19,0	4.5 and 9.0	no	3.0, 6.0, 13.0 (e)
Hungary	1988	-	-	-	25,0	25,0	25,0	25,0	25,0	25,0	25,0	25,0	25,0	20,0	5 and 15	no	-
Iceland	1989	-	-	-	-	22,0	22,0	24,5	24,5	24,5	24,5	24,5	24,5	24,5	14	yes	-
Ireland	1972	20,0	25,0	23,0	25,0	23,0	21,0	21,0	21,0	21,0	21,0	21,0	21,0	21,0	4.8 and 13.5	yes	-
Italy	1973	12,0	15,0	18,0	19,0	19,0	19,0	19,0	19,0	20,0	20,0	20,0	20,0	20,0	4.0 and 10.0	yes	-
Japan	1989	-	-	-	-	3,0	3,0	3,0	3,0	5,0	5,0	5,0	5,0	5,0	-	no	-
Korea	1977	-	10,0	10,0	10,0	10,0	10,0	10,0	10,0	10,0	10,0	10,0	10,0	10,0	-	yes	-
Luxembourg	1970	10,0	10,0	12,0	12,0	12,0	15,0	15,0	15,0	15,0	15,0	15,0	15,0	15,0	3.0, 6.0 and 12.0	no	-
Mexico	1980	-	10,0	15,0	15,0	15,0	10,0	10,0	15,0	15,0	15,0	15,0	15,0	15,0		yes	10 (f)
Netherlands	1969	18,0	18,0	19,0	20,0	18,5	17,5	17,5	17,5	17,5	17,5	19,0	19,0	19,0	6	no	-
New Zealand	1986	-	-	-	10,0	12,5	12,5	12,5	12,5	12,5	12,5	12,5	12,5	12,5	-	yes	-
Norway	1970	20,0	20,0	20,0	20,0	20,0	22,0	22,0	23,0	23,0	23,0	24,0	25,0	25,0	8.0 and 13.0	yes	-
Poland	1993	-	-	-	-	-	-	22,0	22,0	22,0	22,0	22,0	22,0	22,0	7	yes	-
Portugal	1986	-	-	-	17,0	17,0	16,0	16,0	17,0	17,0	17,0	19,0	19,0	21,0	5.0 and 12.0	no	4.0, 8.0 and 15.0 (g)
Slovak Republic	1993	-	-	-	-	-	-	25,0	23,0	23,0	23,0	20,0	19,0	19,0		no	-
Spain	1986	-	-	-	12,0	12,0	13,0	16,0	16,0	16,0	16,0	16,0	16,0	16,0	4.0 and 7.0	no	2.0, 5.0, 9.0 and 13.0 (h)

																	0.5 and 4.0 (i)
Sweden	1969	17,65	23,46	23,46	23,46	23,46	25,0	25,0	25,0	25,0	25,0	25,0	25,0	25,0	6.0 and 12.0	yes	-
Switzerland	1995	-	-	-	-	-	-	6,5	6,5	6,5	7,5	7,6	7,6	7,6	2.4 and 3.6	yes	-
Turkey	1985	-	-	-	10,0	10,0	10,0	15,0	15,0	15,0	17,0	18,0	18,0	18,0	1.0 and 8.0	no	-
United Kingdom	1973	8,0	15,0	15,0	15,0	15,0	17,5	17,5	17,5	17,5	17,5	17,5	17,5	17,5	5	yes	-
Unweighted average		15,6	16,6	17,8	17,2	16,8	16,5	17,5	17,8	17,9	17,8	17,8	17,7	17,6			

Key to abbreviations:

- : Not applicable

n.a.: Data not provided

Explanatory notes:

1. Rules as of 1. day of the tax year (1. January in all countries except Australia, New Zealand and the United Kingdom).

2. "Domestic zero rate" means tax is applied at a rate of zero to certain domestic sales. It does not include zero rated exports.

Country-specific footnotes:

(a) Applies in Jungholz and Mittelberg.

(b) The provinces of Newfoundland and Labrador, New Brunswick, and Nova Scotia have harmonized their provincial sales taxes with the federal Goods and Services Tax and levy a rate of 15%

Other Canadian provinces, with the exception of Alberta, apply a provincial tax to certain goods and services. These provincial taxes apply in addition to GST.

(c) Applies in Corsica

(d) Applies to overseas departments (DOM) excluding French Guyana.

(e) Applies in the regions Lesbos, Chios, Samos, Dodecanese, Cycladen, Thassos, Northern Sporades, Samothrace and Skiros.

(f) Applies in the border regions.

(g) Applies in Azores and Madeira.

(h) Applies in the Canary Islands

(i) Applies in Ceuta and Melilla.

Table 4. Top individual income tax rates 1975-2005

	1975	1980	1985	1990	1995	2000	2005
Australia	65	61.5[(1)]	60	48	47	48.5	48.5
Austria	62	62	62	50	50	45	50
Belgium	60	76.3	71.6	55	55	63.9	53.5
Canada	47	61.9[(1)]	34	29	29	46.4	46.4
Czech Republic					43	32	32
Denmark	40	66[(1)]	39.6	68	63.5	59.7	59.7
Finland	51	51	51	43	39	48.7	51.8
France	60	60	65	51.8		53.3	55.9
Germany	56	56	56	53	53	53.8	45.2
Greece	63	60	63	50	45	45	40
Hungary				50	44	40	38
Iceland			38			45	40
Ireland	77	60	65	56	48	44	42
Italy	72	72	65	50	51	46.4	44.1
Japan	75	75	70	50	50	50	50
Korea, Republic of	63[(2)]	89.3[(1)]	55	50	45	44	38.5
Luxembourg	57	58.4	57	56	50	47.2	38.9
Mexico	42[(2)]	55	55	35	35	40	30
Netherlands	71	72	72	60	60	60	52
New Zealand	60	60	66	33	33	39	39
Norway	73	75.4[(1)]	40	17	13.7	47.5	43.5
Poland					45	40	40
Portugal		80[(1)]	60	40	40	35	40
Slovak Republic					42	35	19
Spain	62	65.5	66	56	56	48	45
Sweden	87	86.5[(1)]	80	65	30	55.4	56.6
Switzerland	44	41[(1)]	11.5	11.5	11.5	43.2	42.1
Turkey	68		55	50	55	35.6	30.6
United Kingdom	83	83[(1)]	60	40	40	40	40
United States (Federal Data)	70	70	50	28	39.6	46.7	41.4

[(1)] 1994

[(2)] 1974

Source: 1975-1995 Otpr World Tax Database; 2000-2005 OECD Taxing Wages database

Table 5 Statutory Tax Rates on corporate income including local taxes and surcharges

	1980	1990	1995	2000	2005
Austria	55	39	34	34	25
Belgium	48	41	40,17	40,17	33,99
Cyprus	42,5	42,5	25	29	10
Czech Republic	n.a.	n.a.	41	31	26
Denmark	40	40	34	32	30
Estonia	n.a.	n.a.	26	26	24
Finland	59	41	25	29	26
France	50	37	36,67	36,67	34,93
Germany	52,8	57,7	56,8	51,63	38,29
Greece	43,4	46	40	40	35
Hungary	n.a.	40	19,64	19,64	17,68
Ireland	45	43	40	24	12,5
Italy	36,25	46,37	52,2	41,25	37,25
Latvia	n.a.	n.a.	25	25	15
Lithuania	n.a.	35	29	24	15
Luxembourg	40	39,4	40,9	37,45	30,38
Malta	32,5	32,5	35	35	35
Netherlands	48	35	35	35	31,5
Poland	n.a.	40	40	30	19
Portugal	40	36,5	39,6	35,2	27,5
Slovak Republic	n.a.	n.a.	40	29	19
Slovenia	n.a.	n.a.	25	25	25
Spain	33	35	35	35	35
Sweden	40	40	28	28	28
United Kingdom	52	34	33	30	30
Australia	46	39	33	34	30
Canada	46	38	38	44,6	36,1
Iceland	0	0	0	30	18
Japan	40	37,5	37,5	40,87	39,54
Korea	30	30	30	30,8	27,5
Mexico	42	36	34	35	30
New Zealand	45	33	33	33	33
Switzerland	11,5	9,8	9,8	24,93	21,32
Turkey	0	46	25	33	30
United States	46	34	35	39,34	39,28

Table 6: Tax structure in EMU and OECD countries

		85-05	90-05	95-05	00-05			85-05	90-05	95-05	00-05
Total Tax Revenues	**Oecd average**	**30.46**	**30.16**	**30.18**	**30.68**	**Individuals**	**Oecd average**	**9.71**	**9.54**	**9.30**	**9.26**
		(0.00)	**(0.00)**	**(0.00)**	**(0.00)**			**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**
	Euro accession	**-1.21**	**-1.22**	**-1.23**	**1.51**		**Euro accession**	**-2.16**	**-2.24**	**-1.68**	**3.16**
		(0.23)	**(0.21)**	**(0.25)**	**(0.80)**			**(0.00)**	**(0.00)**	**(0.03)**	**(0.45)**
	Euro discussion	**3.28**	**2.85**	**-3.64**	**-8.00**		**Euro discussion**	**0.21**	**-1.29**	**-5.79**	**-11.83**
		(0.00)	**(0.01)**	**(0.02)**	**(0.20)**			**(0.75)**	**(0.12)**	**(0.00)**	**(0.01)**
	EU accession	**5.21**	**4.16**	**12.88**	**12.86**		**EU accession**	**2.80**	**3.16**	**9.78**	**11.49**
		(0.00)	**(0.01)**	**(0.00)**	**(0.00)**			**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**
	EU discussion	**1.22**	**3.02**	**0.78**	**1.80**		**EU discussion**	**-1.85**	**-0.46**	**-2.89**	**-3.43**
		(0.36)	**(0.04)**	**(0.68)**	**(0.48)**			**(0.05)**	**(0.66)**	**(0.04)**	**(0.05)**
Social Security Contributions (Employers)	**Oecd average**	**2.81**	**2.53**	**2.43**	**2.49**	**Property**	**Oecd average**	**2.24**	**2.37**	**2.35**	**2.31**
		(0.00)	**(0.00)**	**(0.00)**	**(0.00)**			**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**
	Euro accession	**0.21**	**0.36**	**0.36**	**1.65**		**Euro accession**	**0.14**	**0.09**	**0.06**	**-0.43**
		(0.60)	**(0.35)**	**(0.42)**	**(0.52)**			**(0.31)**	**(0.49)**	**(0.72)**	**(0.65)**
	Euro discussion	**2.32**	**3.58**	**1.95**	**0.26**		**Euro discussion**	**-0.42**	**-0.80**	**-0.92**	**-0.24**
		(0.00)	**(0.00)**	**(0.00)**	**(0.92)**			**(0.00)**	**(0.00)**	**(0.00)**	**(0.81)**
	EU accession	**0.25**	**-0.77**	**1.72**	**1.80**		**EU accession**	**1.09**	**1.32**	**1.84**	**1.57**
		(0.65)	**(0.20)**	**(0.06)**	**(0.14)**			**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**
	EU discussion	**1.43**	**1.33**	**0.57**	**0.80**		**EU discussion**	**-1.18**	**-1.10**	**-1.45**	**-1.34**
		(0.01)	**(0.02)**	**(0.47)**	**(0.47)**			**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**

P-values in round brackets

Table 6: continues

		85-05	90-05	95-05	00-05			85-05	90-05	95-05	00-05
Social Security Contributions (Employees)	**Oecd average**	**1.56**	**1.62**	**1.78**	**1.88**	**Goods& Services**	**Oecd average**	**9.66**	**9.45**	**9.42**	**9.50**
		(0.00)	**(0.00)**	**(0.00)**	**(0.00)**			**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**
	Euro accession	**0.28**	**0.31**	**0.37**	**1.25**		**Euro accession**	**-0.53**	**-0.51**	**-0.47**	**-1.56**
		(0.28)	**(0.25)**	**(0.21)**	**(0.08)**			**(0.20)**	**(0.19)**	**(0.28)**	**(0.51)**
	Euro discussion	**0.64**	**1.26**	**1.55**	**0.83**		**Euro discussion**	**0.40**	**0.10**	**-1.22**	**-0.33**
		(0.01)	**(0.00)**	**(0.00)**	**(0.32)**			**(0.28)**	**(0.83)**	**(0.05)**	**(0.89)**
	EU accession	**0.83**	**0.45**	**0.14**	**-0.22**		**EU accession**	**0.66**	**0.22**	**0.41**	**-1.36**
		(0.02)	**(0.28)**	**(0.83)**	**(0.79)**			**(0.23)**	**(0.72)**	**(0.65)**	**(0.22)**
	EU discussion	**0.86**	**0.54**	**0.33**	**0.46**		**EU discussion**	**1.47**	**2.39**	**3.51**	**5.39**
		(0.01)	**(0.18)**	**(0.55)**	**(0.53)**			**(0.01)**	**(0.00)**	**(0.00)**	**(0.00)**
Corporate	**Oecd average**	**2.11**	**2.17**	**2.34**	**2.64**	**Value added**	**Oecd average**	**4.03**	**4.38**	**4.58**	**4.93**
		(0.00)	**(0.00)**	**(0.00)**	**(0.00)**			**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**
	Euro accession	**0.68**	**0.64**	**0.38**	**-1.11**		**Euro accession**	**-0.03**	**-0.02**	**-0.24**	**-1.80**
		(0.00)	**(0.01)**	**(0.20)**	**(0.57)**			**(0.93)**	**(0.94)**	**(0.51)**	**(0.04)**
	Euro discussion	**-0.10**	**-0.33**	**-0.12**	**1.40**		**Euro discussion**	**0.98**	**0.53**	**-0.54**	**0.59**
		(0.63)	**(0.22)**	**(0.78)**	**(0.49)**			**(0.00)**	**(0.21)**	**(0.37)**	**(0.57)**
	EU accession	**1.12**	**1.23**	**0.97**	**0.78**		**EU accession**	**0.03**	**-0.23**	**0.73**	**0.58**
		(0.00)	**(0.00)**	**(0.11)**	**(0.40)**			**(0.94)**	**(0.66)**	**(0.38)**	**(0.57)**
	EU discussion	**-0.36**	**-0.27**	**-0.13**	**-0.28**		**EU discussion**	**2.08**	**2.44**	**2.56**	**2.81**
		(0.23)	**(0.44)**	**(0.80)**	**(0.73)**			**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**

P-values in round brackets

Table 7: Taxes and net exports

	1	2	3	4
VAT/GDP	0.064	0.182	-0.164	
	(0.147)	(0.178)	(0.144)	
$(VAT/GDP)_{noEA}$				-0.164
				(0.144)
$(VAT/GDP)_{EAanteEuro}$			-0.089	-0.254
			(0.164)	(0.185)
$(VAT/GDP)_{EApostEuro}$			0.047	-0.117
			(0.374)	(0.392)
SSC/GDP		0.111	0.023	
		(0.086)	(0.052)	
$(SSC/GDP)_{noEA}$				0.023
				(0.052)
$(SSC/GDP)_{EAanteEuro}$			-0.086	-0.062
			(0.131)	(0.122)
$(SSC/GDP)_{EApostEuro}$			-0.510*	-0.486*
			(0.274)	(0.275)
CIT/GDP	1.084***	1.212***	0.766***	
	(0.178)	(0.194)	(0.158)	
$(CIT/GDP)_{noEA}$				0.765***
				(0.159)
$(CIT/GDP)_{EAanteEuro}$			0.635 **	1.400***
			(0.312)	(0.301)
$(CIT/GDP)_{EApostEuro}$			1.057***	1.823***
			(0.257)	(0.244)
TAX/GDP	-0.059	-0.161***	0.034	0.034
	(0.039)	(0.052)	(0.040)	(0.040)
Obs.	695	656	656	656
R-squared	0.44	0.44	0.48	0.48

All regressions include countries effects, years effects, per-capita GDP control.
Robust standard errors in parentheses.
*means significant at 10 percent; **significant at 5 percent; ***significant at 1 percent.