Grupo de Economía Europea

European Economy Group

Working Paper no. 7/2001

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Tax ratios in macroeconomics: Do taxes really matter?

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Version May 2001

Abstract

In various empirical studies so-called tax ratios (tax revenues expressed as a ratio of some aggregate tax base) are employed as approximations for tax burdens. The most difficult problem in calculating tax ratios is the way in which personal income tax revenues are attributed to labor and capital. We argue that the methodology of Mendoza et al. (1994) is seriously flawed in this respect. Using information from national sources, we calculate more accurate tax ratios for eight OECD countries that differ substantially from those of Mendoza et al. (1997) and which are also differently related to various economic variables.

JEL classification : H20, H29.
Keywords : tax ratios, implicit tax rates, average effective tax rates.

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A previous version of this paper was presented in the "II Complutense International Seminar: European Economic Integration. Deepening and Enlargement", Madrid 7-8 may 2001.

1. Introduction

Do taxes matter for macro-economic performance? Results of recent empirical research differ substantially. Based on a panel model for 18 OECD countries over the period 1966-90 Mendoza et al. (1997) conclude that tax ratios do not affect economic growth. In sharp contrast, Daveri and Tabellini (2000) argue that the increase in unemployment and the slowdown in economic growth in Europe stem from higher labor taxes. An exogenous and lasting increase in labor costs reduces labor demand. Due to a substitution of capital for labor, the marginal product of capital falls, diminishing the incentive to invest and thus to grow. This difference in results is quite remarkable as both studies use so-called tax ratios as approximations for tax burdens[1]. To calculate such ratios, tax revenues are expressed as a ratio of some aggregate tax base (e.g. labor income, capital income, consumption).

Calculating tax ratios is not a straightforward exercise, because several conceptual and practical problems have to be solved[2]. The most important issue concerns the way in which personal income tax revenues are attributed to labor and capital. In this paper we argue that the methodology developed by Mendoza et al. (1994) and updated by Mendoza et al. (1997) is seriously flawed in this respect. Using information from national sources, we are able to calculate more accurate tax ratios for eight OECD countries that differ substantially from those presented by Mendoza et al. (1997). We redo some studies in which tax ratios have been used, focusing on the impact of the use of different tax ratios as well as on the specification of the models used. In some cases our results that are different from those reported in earlier studies.

The remainder of this paper is organized as follows. Section 2 identifies the main methodological problems in calculating tax ratios. Section 3 presents our new estimates of tax ratios and compares them with those of Mendoza et al. (1997). Section 4 contains our empirical results and Section 5 offers some concluding comments.

2. The Methodology of Mendoza et al. (1994)

Table 1 summarizes the methodology employed by Mendoza et al. (1994) to calculate tax ratios. The personal income tax ratio (τ_{per}) is defined as the ratio of revenues from taxes on income, profits, and capital gains of individuals (category 1100 in the OECD Revenue Statistics) to the tax base that consists of wages and salaries (W), the operating surplus of unincorporated enterprises (OSPUE) and the property and entrepreneurial income of households (PEI). The four-digit figures refer to the headings of the OECD Revenue Statistics classification of taxes, the abbreviations refer to variables from the OECD National Accounts. More information is provided in Table 1. The ratio τ_{per} is subsequently

[1] The terms implicit tax rates and effective tax rates are also used. As this terminology is confusing – after all, once a certain tax ratio has been calculated, it is explicit, and the concept of average tax rates might better be restricted to the analysis of tax burdens of individual taxpayers – we will consistently use the term tax ratios.
[2] See Volkerink and De Haan (2001) for an extensive survey.

used to calculate the labor income (τ_{lab}) and capital income tax ratio (τ_{cap}).

Table 1 here.

The labor income tax ratio is defined as the product of the personal income tax ratio (τ_{per}) and wages and salaries (W) plus total social security contributions (2000) and taxes on payroll and workforce (3000) over the sum of wages and salaries (W) plus employers' social security contributions (2200).

The capital income tax ratio is defined as the product of the personal income tax ratio (τ_{per}) and the sum of the operating surplus of private unincorporated enterprises (OSPUE), plus taxes on income, profits, and capital gains of corporations (1200) plus taxes on property (4100), and taxes on financial and capital transactions (4400) over the operating surplus of the economy (OS).

The consumption tax ratio (τ_{con}) is the ratio of taxes on consumption – the sum of general taxes on goods and services (5110), excises (5121), and some other, in terms of revenue almost negligible, taxes – to the consumption tax base. The consumption tax base is the sum of private (C) and public final consumption (G) net of consumption tax revenues (5110+5121). Furthermore, the compensation of employees providing government services (GW) is excluded.

The most serious problem with the approach of Mendoza et al. (1994) involves using the personal income tax ratio as an intermediate step in calculating labor and capital income tax ratios. Income from labor, capital income and transfers is included in the 'tax base' of personal income. It is assumed that the same average tax rates apply to all these income categories. This assumption is implausible, since some income components are largely exempted from taxation, and many OECD countries apply different statutory tax rates to different sources of income. Furthermore, some OECD countries tax (most) social security benefits, whereas others do not. Therefore, ideally, either the tax base of the personal income tax ratio has to include social security contributions in those countries that do tax in order to be comparable to the one countries that do not tax, or the income tax paid by benefit recipients has to be separated out of the tax that is allocated to labor and capital income.

There are several ways to tackle this problem. For some countries, a more specific decomposition can be made on the basis of the OECD Revenue Statistics because category 1100 is divided into category 1110 (taxes on income and profits) and 1120 (taxes on capital gains). If a further breakdown of category 1110 is available, the amount of taxes on wages and salaries can be identified and used. Unfortunately, this option is available for only three countries. A second possibility is that national authorities or some other source provides data needed to split income in category 1100 (see Section 3 for further details).

Another crucial issue in calculating tax ratios is the choice of the proper tax base. Mendoza et al. (1994) use wages salaries and social security contributions as the base for the labor income tax ratio. Since the taxes are related to total labor costs of employers, it is preferable to include employers' contributions for private pension and welfare plans. We therefore use

the sum of Compensation of Employees (CoE) and taxes on payroll and workforce (3000) as the base for the labor income tax ratio. In contrast to the item Wages and Salaries, the item Compensation of Employees consists of wages and salaries, employers' contributions to social security contributions, and employers' contributions to private pension and social welfare plans. We also exclude taxes paid by the self-employed as income by self-employed is earned by a combination of capital and labor. A consistent approach implies that for the capital income tax ratio the taxes on payroll and workforce (3000) should be subtracted from the operating surplus of the economy (OS) in calculating the base for the capital income tax ratio. Consistency also requires the base of the consumption tax ratio to be gross. Gross final consumption includes final government consumption expenditure (wages of government employees). These expenditures are not subject to VAT, but represent consumption spending by households according to National Accounts conventions, so they should be included in the consumption tax base.

Based on the foregoing analysis we propose a modified methodology to calculate tax ratios as shown in the lower part of Table 1. For a discussion of the other minor differences between both approaches, we refer to Volkerink and De Haan (2001).

3. New Calculations of Tax Ratios

As mentioned in Section 2, the most fundamental problem in constructing tax ratios lies in the calculation of the personal income tax ratio. We have used information provided by Eurostat (1997) and Valenduc (1998) to correct for the methodological weakness of previous calculations. The use of these sources implies that the sample of countries is limited to 8 (for the capital income tax ratio) or 9 (for the labor income tax ratio). Calculations for the consumption tax ratio can be done for all OECD countries, but we only report the results obtained for the 9 countries for which we were able to calculate the labor income tax ratio. Figures 1 to 3 compare our ratios with the tax ratios reported by Mendoza et al. (1997)[3] If the line is flat and at 100, the tax ratios match; if the line exceeds 100, the tax ratios of Mendoza et al. (1997) are lower, and vice versa[4].

Figures 1 to 3 here.

It follows that the tax ratios calculated by Mendoza et al. (1997) inaccurately capture both the levels and the trend in tax ratios for the sample of countries and for the time-period analyzed. Their ratios may be simple to calculate, but the price is rather high as in many cases the use of more detailed information yields strikingly different numbers. A drawback

[3] The data as used in Mendoza et al. (1997) are accesible at http://www.econ.duke.edu/mendozae/taxdata.pdf. Our data are accesible at http://www.eco.rug.nl/medewerk/bjorn/pdf/TRtables.pdf.

[4] Apart from differences in methodology, data revisions may explain part of the differences between our data and those of Mendoza et al. (1997). This may be true especially for more recent years as statistics are often revised after one or more years.

of our approach is that – due to data problems – it can only be applied for a limited number of countries.

4. Tax ratios in empirical research

As explained in the Introduction, many studies use tax ratios to test certain hypotheses. This line of research started with the seminal work of Mendoza et al. (1994). These authors report that the tax ratio on capital income is generally negatively correlated with investment, whereas high consumption and labor income tax ratios coincide with less hours worked. Similarly, Daveri and Tabellini (2000) – using the updated data set of Mendoza et al. (1997) – find that high labor taxes strongly contribute to current high unemployment levels in Europe. Their results suggest that, over a period of 30 years, the observed rise of about nine percentage points in the labor tax rate corresponds to a rise in unemployment of about four percentage points. These findings are often used to support a reduction in taxes on labor in Europe – preferably in a co-ordinated fashion – to stimulate employment growth.

The methodology developed in Mendoza et al. (1994) has also been used by Razin et al. (1998) to examine the effect of taxes on migration and Mendoza and Tesar (1998) have employed the methodology to simulate the effect of US tax reforms on US and European welfare in a real business cycle model[5]Mendoza et al. (1997) use the data to test for the impact of the tax structure on economic growth. On the basis of a panel model using five-year averages over the period 1966-90, they conclude that tax rates are not statistically significant for explaining growth. They also find that labor and capital taxes are negatively related to private investment, while a higher consumption tax leads to more investment.

In this section we report what happens when we redo the analyses of some of the papers referred to above, using our tax ratios. We start with the study by Mendoza et al. (1994) who report the correlations between their tax ratios and some macroeconomic variables. They conclude that the savings rate is generally negatively related to the tax ratio on capital income. They report a similar relation between this tax ratio and the investment rate. The authors furthermore find a negative correlation between the sum of the labor income and consumption tax ratio and hours worked. For France, Germany, Italy and the United Kingdom, we have been able to redo this analysis using our tax ratios instead. Table 2 shows the results. It follows that the correlation for the savings rate and the capital income tax ratio has a sign opposite to that reported by Mendoza et al. (1994) for France and Germany. For Germany and the United Kingdom, we also find that the correlation between this tax ratio and investment has the opposite sign.

Table 2 here.

[5] Several other studies also use or develop tax ratios, see, for example, Lucas (1990), Eurostat (1997), the Directorate General II of the European Commission (1997), Kramer (1998), Valenduc (1998), and the OECD (2000).

Next, we examine whether tax ratios are related to private investment and economic growth, following Mendoza et al. (1997). We start with replicating the investment model of Mendoza et al. (1997) in which the only explanatory variables considered are the convergence factor (log of GDP per capita in 1965, Y_0) and the tax ratios. Time dummies are also included. Table 3 reports the outcomes. The results as shown in column (1) are very similar to those of Mendoza et al. (1997): the consumption tax ratio has a significant positive coefficient, while the impact of the other tax ratios is significantly negative[6] However, when we use our tax ratios the only tax ratio which remains significant is the capital tax ratio (column 2). To get some more degrees of freedom we next use a panel with three-year averages. As follows from column (3) of table 3 this does not affect the outcomes if we employ the data of Mendoza et al. (1997).

Also the results for our tax ratios with three-year averages are very similar to those for the five-year averages (column 4). The differences in results between our results and those of Mendoza et al. (1997) can be caused by two factors: the use of different tax ratios and differences in samples. The final columns of table 3 therefore show the outcomes if we use the same (maximum) sample. It clearly follows that despite the sometimes huge differences between both sets of tax ratios, the results are very similar if the same sample is used. In both regressions the labor tax ratio is not significant, while the consumption tax ratio has a positive and the capital tax ratio a negative impact on investment. These findings suggest that the results reported by Mendoza et al. (1997) are very sensitive with respect to the sample used, but do not change if a better proxy for the tax burden is used. So far, we have followed Mendoza et al. (1997) and only use time dummies. However, when we test the hypothesis that country dummies can be ignored, the hypothesis is strongly rejected. The final columns of table 3 therefore show the results if we add country dummies. In contrast to our previous findings, the labor tax ratio becomes significant, whereas the capital tax ratio becomes insignificant.

Table 3 here.

Table 4 shows the outcomes for our economic growth panels. Again, we follow Mendoza et al. (1997) and include the convergence factor, the tax ratios, and time dummies as explanatory variables. Column (1) shows the results using the data by Mendoza et al. (1997), while column (2) reports the outcomes using our proxies for the tax burden. In contrast to the findings reported by Mendoza et al. (1997), we find that the coefficient of the consumption tax ratio is significant when we use our tax ratios. When we employ three-year averages, the results change somewhat (columns 3-4). In both regressions the coefficient of the capital tax ratio becomes significantly negative, while the labour tax ratio also is significant if we use our tax ratios. When we focus on the same samples (columns 5-6) it follows that none of the coefficients of the tax ratios is significantly different from zero. So again, we conclude that the results of Mendoza et al. (1997) are sensitive to the selection of the sample. Focusing on those countries for which reliable tax ratios can be

[6] See column I of table 4 of Mendoza et al. (1997).

estimated learns that their original conclusion is confirmed, also if we use the tax ratios of Mendoza et al.

Table 4 here.

Finally, table 5 reports our results for unemployment using the model and data of Daveri and Tabellini (2000)[7].These authors argue that labor taxes will have the strongest effect on unemployment if wage negotiations are decentralized and trade unions are powerful but not too large. Therefore, they partition their sample in three groups: continental Europe (and Australia), the Anglo-Saxon countries (and Japan) and the Nordic countries. They report that no correlation between unemployment and labor taxes can be detected across countries. However, when they differentiate between the three groups of countries in their panel of 14 countries over the period 1965-95 they find a very significant effect of labor taxes in continental Europe.

The first two columns of table 5 report our replication of the OLS results of Daveri and Tabellini (2000) as reported in the first columns of their table 9. Our findings are very similar (in the first case, even exactly the same), with only one exception. In the specification with the change in unemployment as dependent variable, we find a much higher coefficient for labor taxes in Anglo-Saxon countries than Daveri and Tabellini. The next columns of table 5 show that the basic findings do not change very much if we still use the tax ratios of Daveri and Tabellini but confine the sample to those countries for which we have alternative tax ratios. Columns (5) and (6) show that the use of our tax ratios does not affect the conclusion that labor taxes have a positive impact on unemployment in continental European and Anglo-Saxon countries. The only difference between our findings and those of Daveri and Tabellini (2000) is that we consistently find a much higher coefficient for the labor tax ratio in Anglo-Saxon countries. In other words, the claim by Daveri and Tabellini that high labor taxes are responsible for the differences in unemployment performance between the Anglo-Saxon and continental European countries is not supported by our findings.

Table 5 here

As explained in the Introduction, Daveri and Tabellini (2000) argue that different labor tax ratios also lead to differences in investment and economic growth performance. Therefore, we have redone the panel regressions as reported in tables 3 and 4, differentiating between the three groups of countries. For those countries for which the authors do not provide a classification, we have used data published in the OECD Employment Outlook of 1994 to classify the remaining countries. To keep as many degrees of freedom as possible, we focus on the largest possible samples using three-year averages. The results as reported in table 6 only partly support Daveri and Tabellini's views. For investment we find that in the models with and without country dummies labor taxes have a higher effect in continental European

[7] We thank the authors for kindly providing their data.

countries if we use the data of Mendoza et al. (1997) (columns 1 and 5). However, if we use our tax ratios (columns 2 and 6) there is hardly any difference across the three groups of countries. The growth regressions offer even less support for the views of Daveri and Tabellini. Using the data of Mendoza et al. (columns 3 and 7) yields similar coefficients across the three groups of countries. Also when we employ our tax ratios (columns 4 and 8), there is not much support for the Daveri-Tabellini point of view.

Table 6 here

5. Concluding Remarks

In this paper we have argued that the construction of tax ratios, as pioneered by Mendoza et al. (1994), and updated by Mendoza et al. (1997) is seriously flawed. Especially the way personal income tax revenues are attributed to labor and capital is criticized. Using information from national sources, we calculate more accurate tax ratios for eight (nine) OECD countries that differ substantially from those reported by Mendoza et al. (1997). This result is relevant also from a policy perspective, since the results of studies in which these tax ratios are calculated play a role in the policy debate. For instance, the findings of Daveri and Tabellini (2000) are often cited in support of a co-ordinated change in the tax system in the European Union. It is believed that lowering taxes on labor will stimulate employment growth. Of course, the conclusions of this type of studies depend critically on the data used. From a policy perspective it is interesting that also when we use our tax ratios we still find a very significant effect of labor taxes on unemployment in continental European and Anglo-Saxon countries. However, there is much less support for the view that the high labor tax ratios also explain the slowdown in investment and economic growth in Europe.

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Table 1: Tax Ratios: Mendoza et al. (1994) versus Volkerink and De Haan (2001)

Mendoza et al.(1994)		
Personal income tax ratio	τ_{per}	1100 /(W+OSPUE+PEI)
Labour income tax ratio	τ_{lab}	$(\tau_{per} \cdot$ W+2000 +3000)/W+2200
Capital income tax ratio	τ_{cap}	$(\tau_{per} \cdot$ (OSPUE +PEI)+1200 +4100 +4400)/OS
Consumption tax ratio	τ_{con}	(5110 +5121)/[C +G – GW - (5110 +5121)]
Volkerink &De Haan (2001)		
Labour income tax ratio	τ_{lab}	(a · 1100 +2100 +2200 +3000)/(CoE +3000)
Capital income tax ratio	τ_{cap}	(ß · 1100 +1200 +4000 +5125 +5212 +6100)/(OS - 3000)
Consumption tax ratio	τ_{con}	(5000 - 5125 - 5212 - other)/(C +G)

Note: a: the fraction of the revenues from personal income taxation (1100) that can be attributed to (employed) labor income. ß: the fraction of the revenues from personal income taxation (1100) that can be attributed to capital income. other: other revenues from category 5000 that cannot be attributed to taxes on consumption. More details are provided in Volkerink and De Haan (2001).

Note: classification of the OECD National Accounts and Revenue Statistics

OECD Revenue Statistics

1100	Taxes on income, profits, and capital gains on individuals
1200	Taxes on income, profits, and capital gains on corporations
2000	Social security contributions
2100	Social security contributions of employees
2200	Social security contributions of employers
3000	Taxes on payroll and workforce
4000	Taxes on property
4100	Recurrent taxes on immovable property, land taxes et .
4400	Taxes on financial and capital transactions et .
5000	Taxes on goods and services
5110	General taxes (on goods and services)
5121	Excises
5125	Taxes on investment goods
5200	Taxes on use of goods and performance of activities
5212	Motor vehicles duties not paid by households
6100	Other taxes paid by corporations

OECD National Accounts

OS	Operating surplus of corporate and quasi-corporate enterprises
OSPUE	Operating surplus of private unincorporated enterprises
W	Wages and salaries
PEI	Property and entrepreneurial income
CoE	Compensation of employees
C	Private final consumption expenditure
G	Government final consumption expenditure
GW	Compensation of employees of producers of government services

Table 2: Tax Ratios and Macroeconomic Variables

	Savings/GDP		Investment/GDP		Hours		Averages		
	Mean	Corr(τ_{cap},S)	Mean	Corr(τ_{cap},I)	Mean	Corr(τ_{lab}+ τ_{lab},H)	τ_{cap}	τ_{con}	τ_{lab}
Austria	0.07	0.37	-	-	-	-	0.17	0.18	0.37
Belgium	0.11	-	0.10		105.25	-0.70	-	0.15	0.43
Finland	0.03	-0.12	0.12	-0.05	-	-	0.18	0.18	0.35
France	0.08	0.78	0.10	-0.55	107.04	-0.72	0.27	0.16	0.38
Germany	0.08	0.15	0.19	0.07	108.68	-0.80	0.62	0.13	0.35
Ireland	-	-	-	-	-	-	0.16	0.18	0.29
Italy	0.14	-0.72	0.07	-0.58	101.15	0.56	0.17	0.13	0.43
The Netherlands	0.09	-0.03	0.12	-0.12	107.02	-0.62	0.31	0.14	0.44
United Kingdom	0.04	-0.16	0.11	0.31	103.33	-0.65	0.46	0.13	0.28

Note: Data from OECD (1998), Bureau of Labor Statistics (2000), and Volkerink and De Haan (2000).

Table 3: Some simple panel regressions for private investment (dependent variable: gross investment as share of GDP)

	(1) 5-years av.	(2) 5-years av.	(3) 3-years av.	(4) 3-years av.
	Full sample	Full sample	Full sample	Full sample
Explanatory var:	MMA	VDH	MMA	VDH
Y_0	1.70 (1.76)	3.47 (1.59)	1.70 (2.33)	3.57 (2.27)
τ_{cap}	-0.16 (-4.49)	-0.14 (-3.92)	-0.15 (-5.50)	-0.15 (-6.02)
τ_{lab}	-0.28 (-5.73)	-0.04 (-0.48)	-0.26 (-6.64)	-0.05 (-0.86)
τ_{con}	0.17 (2.45)	0.14 (0.62)	0.16 (2.91)	0.10 (0.63)
R^2 (adj.)	0.33	0.36	0.30	0.48
No. obs.	60	21	109	40
	(5) 3-years av.	(6) 3-years av.	(7) 3-years av.	(8) 3-years av.
	Joint sample	Joint sample	Joint sample	Joint sample
Explanatory var:	MMA	VDH	MMA, country dummies	VDH, country Dummies
Y_0	-5.21 (-2.37)	-2.28 (-0.80)	3.47 (13.56)	3.57 (7.88)
τ_{cap}	-0.11 (-5.18)	-0.13 (-4.18)	0.02 (0.39)	0.03 (0.55)
τ_{lab}	-0.05 (-0.88)	-0.09 (-1.26)	-0.53 (-4.99)	-0.43 (-3.81)
τ_{con}	0.41 (9.33)	0.48 (1.92)	-0.06 (-0.51)	-0.24 (-0.77)
R^2 (adj.)	0.78	0.78	0.92	0.90
No. obs.	27	27	27	27

Period dummies are included in columns (1)-(8). In columns (7) and (8) also country dummies are included. In contrast to Mendoza et al. (1997) we do not report outcomes excluding outliers. The basic conclusions do not change if we do.

Table 4: Some simple panel growth regressions (dependent variable: growth of GDP per capita)

	(1) 5years av.	(2) 5-years av.	(3) 3-years av.	(4) 3-years av.
	Full sample	Full sample	Full sample	Full sample
Explanatory var:	MMA	VDH	MMA	VDH
Y_0	-0.88 (-1.87)	-1.03 (-1.71)	-0.80 (-1.85)	-0.20 (-0.26)
τ_{cap}	-0.03 (-1.76)	0.01 (0.54)	-0.04 (-2.93)	-0.05 (-2.38)
τ_{lab}	-0.01 (-0.57)	-0.04 (-0.44)	0.00 (0.22)	-0.07 (-2.51)
τ_{con}	0.02 (1.04)	0.10 (2.02)	0.01 (0.74)	-0.08 (-0.87)
R^2 (adj.)	0.20	0.72	0.28	0.15
No. obs.	60	21	109	40
	(5) 3-years av.	(6) 3-years av.	(7) 3-years av.	(8) 3-years av.
	Joint sample	Joint sample	Joint sample	Joint sample
Explanatory var:	MMA	VDH	MMA, country dummies	VDH, country Dummies
Y_0	1.18 (0.55)	1.68 (2.66)	0.78 (1.21)	0.85 (1.06)
τ_{cap}	-0.05 (-1.56)	-0.05 (-1.55)	-0.23 (-3.02)	-0.10 (-0.83)
τ_{lab}	-0.08 (-0.96)	-0.08 (-0.84)	0.31 (1.79)	-0.11 (-0.37)
τ_{con}	-0.06 (-0.66)	-0.21 (-0.85)	0.02 (0.11)	0.12 (0.32)
R^2 (adj.)	0.00	0.00	0.00	0.00
No. obs.	27	27	27	27

Period dummies are included in columns (1)-(8). In columns (7) and (8) also country dummies are included. In contrast to Mendoza et al. (1997) we do not report outcomes excluding outliers. The basic conclusions do not change if we do.

Table 5: Some simple panel regressions (dependent variable: unemployment rate, u)

	(1) 5-years av.	(2) 5-years av.	(3) 5-years av.	(4) 5-years av.
	Full sample	Full sample	Joint sample	Joint sample
Explanatory var:	TD, levels	TD, differences	TD, levels	TD, differences
τ_{labEUR}	0.54 (8.62)	0.44 (4.03)	0.53 (4.79)	0.56 (2.65)
$\tau_{labANGLO}$	0.25 (6.20)	0.59 (5.37)	0.79 (2.24)	0.75 (3.63)
$\tau_{labNORDIC}$	0.11 (0.68)	0.09 (0.60)	0.05 (0.17)	0.14 (0.26)
Unemployment benefit	0.14 (3.83)	0.06 (1.35)	-0.09 (-1.15)	-0.11 (-0.80)
Employment protection	-1.00 (-1.72)	-1.10 (-1.80)	5.21 (2.86)	3.14 (1.47)
R^2 (adj.)	0.78	0.04	0.65	0.30
No. obs.	84	70	24	17
	(5) 5-years av.	(6) 5-years av.		
	Joint sample	Joint sample		
Explanatory var:	VDH, levels	VDH, differences		
τ_{labEUR}	0.55 (4.49)	0.60 (2.46)		
$\tau_{labANGLO}$	0.82 (3.52)	0.77 (3.22)		
$\tau_{labNORDIC}$	-0.10 (-0.51)	-0.02 (-0.05)		
Unemployment benefit	-0.04 (-0.62)	-0.07 (-0.58)		
Employment protection	5.46 (2.85)	2.68 (2.09)		
R^2 (adj.)	0.69	0.37		
No. obs.	24	17		

Table 6: Some simple panel investment and growth regressions (dependent variable: investment/GDP or growth of GDP per capita)

	(1) 3-years av., Investment	(2) 3-years av., Investment	(3) 3-years av., Growth	(4) 3-years av. Growth
	Full sample	Full sample	Full sample	Full sample
Explanatory var:	MMA	VDH	MMA	VDH
Y_0	-1.68 (-1.35)	2.51 (2.12)	-1.69 (-2.41)	-0.02 (-0.03)
τ_{cap}	-0.15 (-4.24)	-0.02 (-0.50)	-0.06 (-2.98)	-0.07 (-2.54)
τ_{labEUR}	-0.20 (-7.24)	-0.24 (-2.42)	0.02 (0.91)	-0.04 (-0.79)
$\tau_{labANGLO}$	-0.09 (-2.46)	-0.22 (-2.86)	0.05 (2.17)	0.04 (1.25)
$\tau_{labNORDIC}$	-0.11 (-2.40)	-0.14 (-1.36)	0.05 (1.69)	-0.05 (-0.99)
τ_{con}	0.08 (1.17)	-0.34 (-2.51)	-0.01 (-0.40)	-0.00 (-0.03)
R^2 (adj.)	0.38	0.67	0.30	0.11
No. obs.	109	40	109	40
	(5) 3-years av., Investment	(6) 3-years av., Investment	(7) 3-years av., Growth	(8) 3-years av., Growth
	Full sample, Country dummies	Full sample, Country dummies	Full sample, Country dummies	Full sample, Country dummies
Explanatory var:	MMA	VDH	MMA	VDH
Y_0	-17.68 (-2.13)	1.83 (0.00)	4.39 (0.72)	-1.89 (-0.00)
τ_{cap}	0.00 (0.09)	0.07 (0.31)	-0.14 (-3.88)	-0.14 (-3.06)
τ_{labEUR}	-0.24 (-2.33)	-0.36 (-0.91)	0.13 (1.59)	-0.11 (-2.14)
$\tau_{labANGLO}$	-0.21 (-1.78)	-0.23 (-0.09)	0.20 (1.76)	1.62 (3.54)
$\tau_{labNORDIC}$	0.06 (0.50)	0.06 (0.06)	0.12 (1.28)	-0.70 (-4.66)
τ_{con}	-0.20 (-1.14)	-0.79 (-0.50)	0.07 (0.69)	0.06 (0.27)
R^2 (adj.)	0.85	0.00	0.47	0.36
No. obs.	109	40	109	40

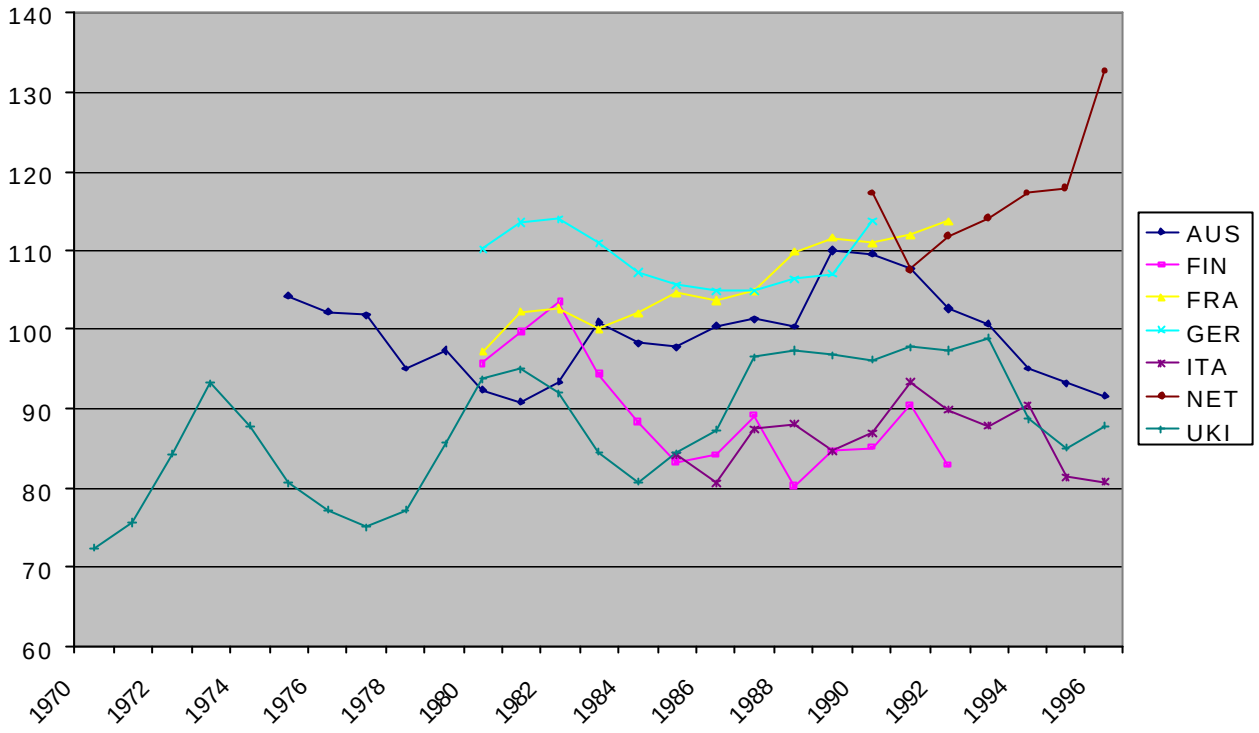

Figure 1. A comparison of labor tax ratios.

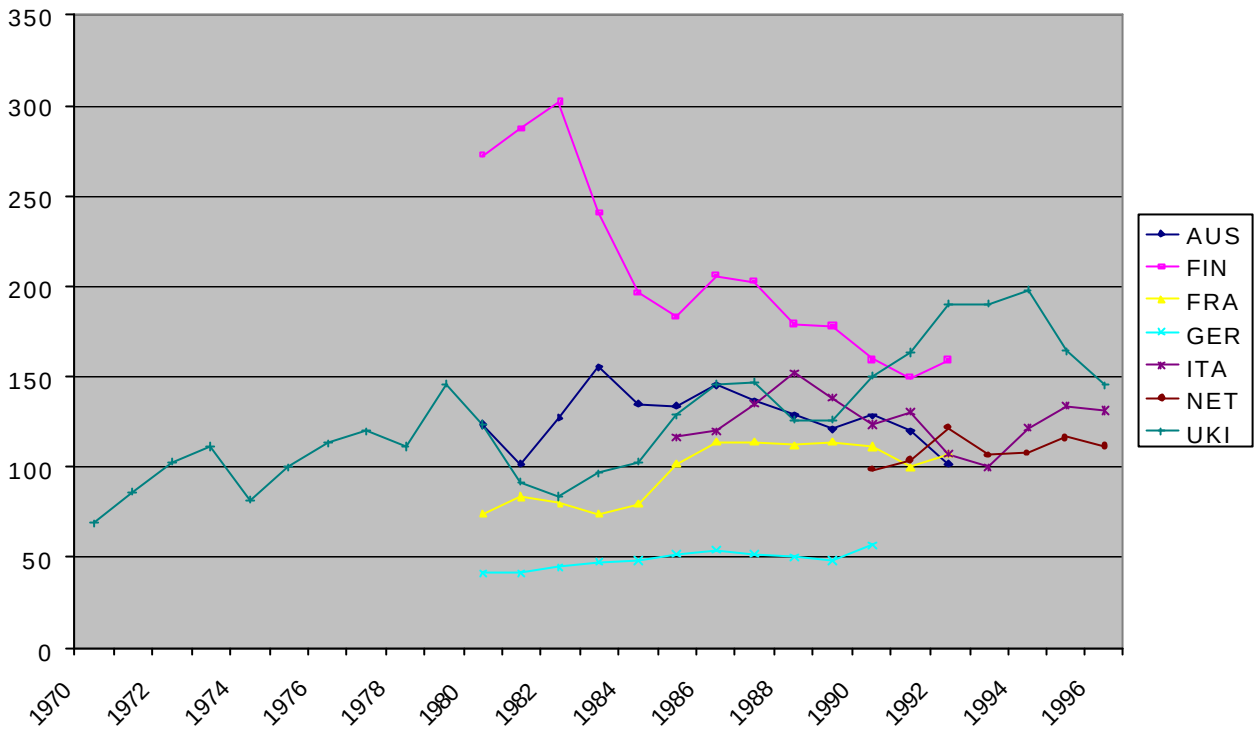

Figure 2. A comparison of capital tax ratios.

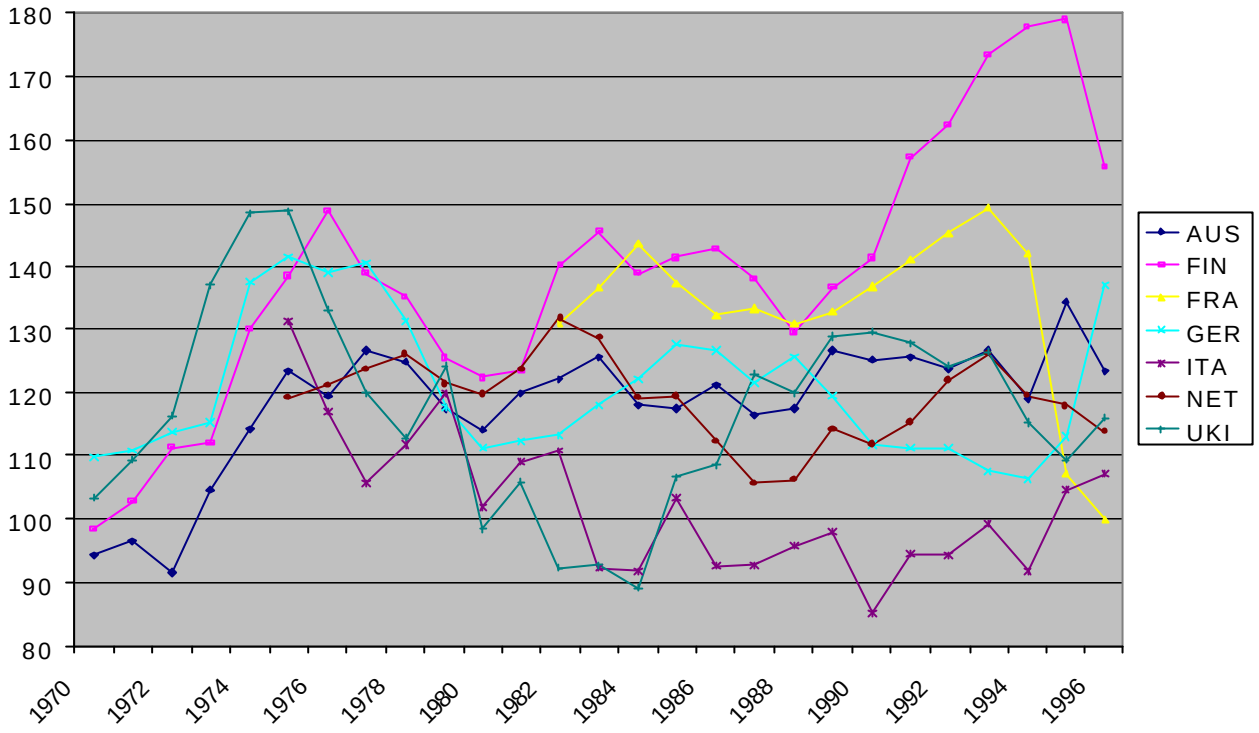

Figure 3. A comparison of consumption tax ratios.