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How does globalization affect the tax burden on labour income, capital income and consumption in different welfare regimes? The case of Western and Eastern EU Member States[1]

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How does globalization affect the tax burden on labour income, capital income and consumption in different welfare regimes?

The case of Western and Eastern EU Member States

Summary

This paper analyzes the effects of globalization on implicit tax rates (ITRs) on labour income, capital income, and consumption in the EU15 and Central and Eastern European New Member States (CEE NMS). We find a positive effect of globalization on the ITR on labour income in the EU15, but no effect on the ITR on capital income, and a negative effect of globalization on ITR on consumption. In the CEE NMS there is no effect of globalization on any of the three ITRs. We also find differences among the welfare regimes within the EU15. Globalization has a particularly strong effect in the social democratic regime on all ITRs. Globalization has a statistically significant negative effect on the ITR on capital income in the social-democratic and southern regimes, a marginally significant negative effect in the liberal regime, and no significant effect in the conservative regime. Regarding the ITR on consumption, there is a significant negative effect of globalization in the social-democratic, conservative, and liberal regimes. In the case of the ITR on labour income, globalization causes an increase in all four welfare regimes.

Key words: globalization, implicit tax rate on labour income, capital income, and consumption, welfare regimes

JEL Code: H23, H24, H25, F19, F21

I. INTRODUCTION

This paper analyzes the effects of globalization on the taxation of labour income, capital income, and consumption in the EU Member States. The theory of tax competition argues that, as capital becomes increasingly more mobile, firms are able to avoid high taxes by choosing countries with a low capital tax burden, which may result in inefficiently low taxes on capital income and inefficiently low public good provision (Oates (1972); Zodrow and Mieszkowski (1986); Tanzi (1995); Bucovetsky (1991); Wilson (1999); Brueckner (2000); Krogstrup (2004)). However, fewer possibilities to tax mobile capital also implies that more immobile tax bases, notably labour income and consumption, should bear the tax burden necessary to finance a given level of public expenditures.

Indeed, an already extensive empirical literature is available which explores the impact of globalization on the level of the capital income tax burden as well as the tax burden on more immobile tax bases. In this literature, four different measures of tax burden are used : (i) statutory tax rates on corporate income (STR), (ii) corporate income tax revenues as a percentage of GDP or total tax revenues, (iii) implicit tax rates (ITR)[2] on capital income, corporate income, labour income and on consumption expenditures of the Mendoza et al. (1994) type, and iv) effective marginal and average tax rates on corporate income (EMTR and EATR) of the Devereux and Griffith (1998) type.

Studies that test the effect of globalization on the level of STR or EATR (see Swank and Steinmo (2002); Slemrod (2004); Clausing (2007) on STR, and Krogstrup (2005); Dreher (2006a); Garretsen and Peeters (2007); Loretz (2008) on EATR) generally find a negative effect. The empirical results on the effects on the ITR on capital income are inconclusive: Dreher et al. (2008), Swank and Steinmo (2002), and Swank (2006) find no effect; Dreher (2006a) estimates a positive effect, whereas Winner (2005) finds a negative effect. Using the ITR on corporate income, Adam and Kammas (2007), Bretschger (2008) and Bretschger and Hettich (2002) also find a negative effect of globalization. Quinn (1997) finds a positive effect on corporate tax revenues as a percentage of GDP and total revenues.

Concerning ITR on labour income, Adam and Kammas (2007), Winner (2005) and Dreher et al. (2008) find a positive effect of globalization. Dreher (2006a) finds no effect, while Swank and Steinmo (2002) find a negative effect. Furthermore, Bretschger and Hettich (2002) explore the globalization impact on the ratio of the ITR on labour income to that on corporate income. They find a positive relationship which signals that the tax burden is shifted to labour income. Winner (2005) likewise finds a shift from capital to labour income taxation.

[2] ITRs are also referred as average effective tax rates (AETR).

Regarding the globalization effects on the ITR on consumption, Swank and Steinmo (2002), Dreher (2006a), and Dreher et al. (2008) find no effect.

The empirical evidence available so far points towards a negative relationship between globalization and tax law based measures of the corporate income tax burden (STR, EATR) as well as an increase in the tax burden on labour income. Yet, notable features of the existing literature are that these studies (i) are predominantly based on a sample of advanced OECD countries and (ii) do not separate the globalization effects by welfare regimes.

This paper adds to the literature by including the Central and Eastern European New EU Members States (CEE NMS) in the country sample and by focusing on differences in globalization effects between Western (EU15) and CEE NMS. A second novelty of the paper lies in exploring differences in globalization effects across welfare regimes based on an "augmented" Esping-Andersen typology. However, due to limited time-series data for the CEE NMS, the latter analysis is only carried out for the EU15.

Although most of the CEE countries reformed their tax systems along western lines during the transition period (Campbell (2005)), analyzing the CEE NMS in isolation is meaningful for several reasons: first, CEE NMS governments have been especially active in using cuts in effective corporate income tax rates (e.g. Bellak and Leibrecht (2009)), introducing flat rate personal income taxes (e.g. Keen et al. (2008)) and creating special economic zones (e.g. World Bank (2008)) to attract foreign capital (esp. Foreign Direct Investment (FDI)). Second, the tax reforms have probably led to a profit-shifting response of multinational enterprises, which have tried to make use of the lower statutory corporate tax rates in the transition countries (Devereux (2007)). Third, the transition crisis has posed quite extensive fiscal needs in terms of increased unemployment and early pension schemes, which may have shaped taxation decisions (Havlik and Landesmann (2005)). Fourth, the tax structure is quite different in the CEE NMS, e.g. the share of indirect taxes in tax revenues is on average much higher than in the EU15 (e.g. EU Commission (2009: 58)). Fifth, the extent of the informal economy, which is much higher than in EU15, may have increased the preference of the governments for lower tax rates on income to create incentives for formalization as well as a higher share of taxes on consumption (Duman (2009)).

With respect to the separation by welfare regimes, Campbell (2005) suggests that national political and economic institutions mediate how states react to the pressures of globalization. Thus, the institutional environment limits the degree to which national tax regimes converge in response to globalization. Specifically, the institutional configuration of national politics shapes actors' political tax policy strategies. This is in line with the argument

that welfare regimes display path-dependency, and only change gradually within specified paths (Scharpf and Schmidt (2000); Esping-Andersen (1996); Swank (2001)). Different welfare states create different expectations and dependency relations among the citizens, which cannot be changed quickly given electoral considerations (Kautto and Kvist (2002)). This also affects tax policy. For instance, Campbell (2005) argues that the type of labour and business organizations affects the sorts of tax policies these organizations are willing to support. If labour is politically influential, unions support relatively high taxes because they expect this to finance expenditures like social protection. Indeed, Campbell (2005) finds that social-democratic countries set the highest tax rates on both labour and capital income, as they utilize the tax revenue to finance welfare spending and the tax burden is lowest in the liberal welfare state.

We find supportive evidence for an increase in the ITR on labour income and a decrease in the ITR on consumption in response to globalization in the EU15. We do not find a significant effect of globalization on the ITR on capital income, although EATRs on corporate income decrease due to globalization. However there are important differences among the welfare regimes within the EU15. Globalization has a statistically significant negative effect on the ITR on capital income in the social-democratic and southern regimes, a marginally significant negative effect in the liberal regime, and no significant effect in the conservative regime. Regarding the ITR on consumption, the negative effect of globalization applies to the social-deomocratic, conservative, and liberal regimes, but not to the southern regime. In the case of the ITR on labour income, globalization causes an increase in all four welfare regimes. In the CEE NMS globalization has no effect on any of the ITRs, though EATRs are negatively affected by globalization.

The paper is structured as follows: Section two reviews the literature on welfare regime typologies. Section three describes how we measure tax burdens and the globalization process. It also includes some empirical, stylized facts. Section four introduces the control variables used in the empirical analysis. Section five presents the estimation methodology and section six discusses the results. Section seven concludes.

II. GROUPING OF COUNTRIES INTO WELFARE REGIMES

The welfare state literature indicates considerable heterogeneity among the Western European countries related to the institutional setting of a country. Esping-Andersen (1990) developed a widely used typology of three welfare regimes, grouping countries based on their stratification, decommodification, and the mix between private and public social security

institutions. The first group consists of social-democratic regimes which are universalistic and egalitarian with high degrees of decommodification, little stratification and social security payments provided universally by the state (Sweden, Finland, Denmark, Norway). The second comprises conservative regimes strongly associated with employment protection, with the family at the heart of the protection, a medium decommodification, and social security provided partly by the state and partly by the market (Germany, France, Austria, Belgium, Italy, Japan, Switzerland and the Netherlands). Finally, the third group encompasses liberal regimes with low decommodification, high stratification, restricted role of the state, a low level of social security, and a significant private insurance contribution (UK, USA, Ireland, Canada, Australia). This classification is later extended by adding a separate welfare regime group for the southern European countries (Italy, Spain, Greece, Portugal) by Ferrera (1996) and Bonoli (1997). As opposed to previous research which treats countries like Spain, Portugal and Greece as latecomers on the same path of continental conservative welfare states, Ferrera (1996) argues that southern countries are *inter alia* characterized by a highly fragmented and polarized welfare regime with generous pensions paired with substantial gaps in the social safety net, a departure from the corporatist tradition in the field of health care, a highly collusive mix between public and private institutions in the welfare sphere and the persistence of clientelism in the distribution of cash subsidies.

Due to its wide use in the literature, we use Esping-Andersen's classification. Although these welfare regimes are developed based on social expenditure structures, they reflect institutional and political structures that might determine the influence of social actors on tax policy. Furthermore, expenditure structures create a path dependency that also locks in tax regimes (Scharpf and Schmidt (2000); Esping-Andersen (1996); Swank (2001)). As discussed in Section 3 on the stylized facts of the tax rates on capital and labour income and consumption, the tax structures of welfare regimes can be quite different.

While some studies see welfare states in the CEE NMS within the liberal regime based on a mix of social insurance and social assistance, and a partial privatization of social policy with just a few corporatist attributes (e.g. Ferge (2001), Standing (1996)), others argue that the CEE NMS constitute a separate post-socialist regime type (Aidukaite (2004), Lelkes (2000)). Nölke and Vliegenthart (2009) argue that the CEE NMS form a dependent market economy model that differs from coordinated or liberal market economies due to its dependency on foreign capital. Fenger (2007) distinguishes a "post-communist European type" and a "former USSR type", where the former mixes characteristics of both the conservative and the social-democratic types. Bohle and Greskovits (2007) distinguish between a neoliberal type in the

Baltic States, an embedded neoliberal type in the Visegrad states, and a neo-corporatist type in Slovenia. Alternatively, Orenstein and Hass (2005) distinguish between European and Eurasian post-communist welfare states where the European category includes all CEE NMS as well as other former Yugoslav republics. According to Orenstein and Haas (2005), good prospects of joining the EU pushed for the development of welfare states in the CEE NMS, and they therefore find less of a difference between the Baltic countries and the other countries within the CEE NMS.

These studies suggest that the countries in the CEE NMS constitute a welfare regime in transition different from those found in the EU15. Therefore, we estimate the effects of globalization on taxes separately for the EU15 and the CEE NMS. However, further tests of diversity among the CEE NMS are not possible due to limited degrees of freedom.

III. MEASURING TAX BURDEN AND GLOBALIZATION

1. Measuring the tax burden on capital income, labour income and consumption

As mentioned, different types of tax rates are used as dependent variables in empirical studies. STRs on corporate income are taken directly from the tax code, however they do not account for the changes in the tax base. EMTR and EATR on corporate income are calculated based on the neoclassical investment theory and on actual and future tax law data. They measure the tax burden on a hypothetical investment project (Devereux and Griffith (1998))[3]. These rates are thus forward looking rates. ITRs are calculated by dividing the total tax revenue from capital income, labour income or consumption by the pre-tax income of the respective production factor or consumption (e.g. corporate income tax revenues divided by gross operating surplus).[4] These rates are backward looking rates and are available not only for corporate income but also for capital, labour income and consumption. Therefore ITRs are especially suitable for exploring whether globalization has led to a decline in the tax burden on capital and an increase in the tax burden on labour and/or consumption within a unified framework.

For this reason we base our analysis mainly on ITRs. However, we also explore the effects of globalization on the level of EATRs to highlight the difference in the globalization effects between backward and forward looking measures of corporate tax burden.

For the ITRs we use Eurostat data (see European Commission (2009)). The advantage

[3] The EMTR is based on the costs of capital of an investment project at the break-even point. The EATR measures the tax burden on a project earning a positive economic rent.

[4] A widely used method to calculate ITRs using National Accounts data has been developed by Mendoza et al.. (1994).

of the Eurostat dataset is that it is the first to cover all 27 EU member states, including the CEE NMS. Two data sources are used for the ITRs: The data for the period starting in 1995 is taken from Eurostat database. For the period prior to 1995 European Commission provides the data in its publication (European Commission (2000)). The growth rate of this data is used to extend the Eurostat data backwards from 1995 to 1970 or 1980.[5] The time period for most CEE NMS ranges from 1995 to 2007. The data on the ITR on capital in Romania, Bulgaria and Slovenia, which only begins in the late 1990s, is further extended backwards to 1995 with own calculations, based on the method used by the European Commission (2000).[6] In sum, the data reaches back to 1970 for nine EU15 countries[7], to 1980 for six EU15 countries[8], and to 1995 for most CEE NMS (see Tables A.1 and A.2). Data on EATR for EU15 is taken from Michael Devereux's IFS homepage and from Devereux et al. (2008). For the CEE NMS, the data is from Devereux et al. (2008). Thus, EATR data for the EU15 ranges from 1982 to 2005 and 1998-2006, respectively. The EATR data for the CEE NMS is available for the period between 1998 and 2006.

In OECD countries, STR on corporate income increased until the late 1970s and began dropping significantly from the second half of the 1980s onward (Devereux (2007)). Like STRs, both EMTR and EATR on corporate income have constantly fallen since the 1980s, as can be seen in Figure 1a-b. This trend also applies to the CEE NMS.

[Figure 1a-b about here]

Figures 2a-c show the development of the ITR on capital income, consumption and labour income in the EU15 grouped by welfare state regimes and the CEE NMS (unweighted average).

[Figures 2a-c about here]

The ITR on capital income stayed rather stable at 24,9% (overall sample mean) due to a broadening of the tax base, particularly in the case of corporate income (rising profits, legal changes regarding deductions, allowances etc.; see Devereux et al. (2002); European Commission (2008)). Regarding the different welfare regimes, since the 1970s the ITR on

[5] For data availability see Table A.1.
[6] For the ITR on capital income tax revenue on capital income is divided by operating surplus (data source: Eurostat)
[7] Belgium, Germany, Denmark, France, Ireland, Italy, Luxemburg, Netherlands, United Kingdom.
[8] Austria, Spain, Finland, Greece Portugal, Sweden.

capital income has fallen in the liberal welfare regime (apart from a recent increase) and risen in the social-democratic regime with stronger upturns and downturns. In the southern regime the ITR on capital income which was formerly lower than in the other welfare regimes has risen strongly since the mid-1990s. In the conservative regime it rose in the early 1970s and then has decreased slightly. Within the conservative regime France is a particular exception with a continuously increasing ITR on capital. In the CEE NMS the mean of the ITR on capital income is much lower than in the EU15 (16% compared to 27%, as can be seen in Tables A.3 and A.4). The highest rate is for the Czech Republic with 25.9% and it is as low as 10% in the Baltic countries. The average in the CEE NMS decreased until 2000 and then slightly increased.

However, there are also important differences in the trends among the CEE NMS. While in Slovenia the ITR on capital has risen from a very low level, it has decreased in Latvia and Estonia, and it plummeted from a higher level in Slovakia while remaining quite stable in most other CEE NMS.

The ITRs on labour are on average higher than those on capital. The development has been more homogenous among the different welfare regimes in the EU15 with an overall increasing trend in most countries compared to the early 1970s. Countries in the social-democratic welfare regime have the highest ITR on labour income which has risen until the turn of the millennium and has decreased since then. The lowest ITR on labour income is levied by the liberal regime. It rose until the late 1980s, since which it has decreased slightly. The ITR on labour income in countries of the conservative regime lies between those of the social-democratic and the liberal regime, and has constantly risen almost converging with that of the social-democratic regime eventually. The ITR on labour income in the southern regime has also constantly risen, although it is still lower than that of the conservative and social-democratic welfare regimes. The ITR on labour income in the CEE NMS is higher than in the EU15, although the difference is relatively small (37% to 33%, as can be seen in Tables A.3 and A.4). The average in the CEE NMS is at about the same level as in the conservative regime, with Hungary, the Czech Republic and Slovenia showing the highest rates. On average, the ITR on labour in the CEE NMS remained quite stable or declined slightly. Combining this with the lower ITR on capital, it can be argued that the CEE NMS rely more heavily on labour taxes.

With respect to the ITR on consumption, the social-democratic countries once again show the highest ITR by far. It rose in the late 1980s, decreased in the early 1990s and since then has stayed more or less constant. In the liberal regime the ITR on consumption increased

during the late 1970s and early 1980s, and has decreased slightly since 1985. In the conservative welfare regime the ITR on consumption rose somewhat since the 1990s. Again in southern countries the ITR on consumption is lower than in the EU15. However, it has been constantly rising, with a particularly strong increase in the late 1980s and early 1990s. The level of the ITR on consumption in the CEE NMS corresponds to the level in the conservative and liberal regime, with a decline until the early 2000s which has reversed in recent years.

Overall, the descriptive analysis of the ITRs underlines the relevance of estimating different effects of globalization among welfare regimes.

2. Measuring the globalization process

Globalization is a multi-facetted phenomenon comprising economic, social, institutional and political aspects (Dreher (2006b); Dreher et al., (2008)). In the empirical literature globalization is frequently measured by a country's openness to trade or FDI (see Gemmel et al. (2008) for a review). However, using either trade or FDI to measure globalization, thus excluding other flows of income and capital or changes in *de jure* measures or social and political dimensions of globalization might result in biased estimates (Dreher et al. (2008)). We therefore base our analysis on the KOF globalization indices, developed by Dreher (2006b) and Dreher et al. (2008), which incorporate these different dimensions. These are weighted indices of various globalization variables, where the weights are determined via principle component analysis. Each variable entering the KOF measure is transformed to an index on a scale from 1 to 100, where 100 is the maximum value of the variable in the period 1970 to 2006. The data is transformed according to the percentiles of the original distribution. For the current analysis the KOF indices have the additional advantage of also being available for the CEE NMS.

We use two different KOF indices, one capturing economic globalization and one also considering social, political and institutional aspects of the globalization phenomenon: (a) *KOFecon* which incorporates actual FDI, income and trade flows, as well as legal restrictions on FDI and trade. The "flow-part" of the index brings together FDI stock and flows, exports and imports, portfolio investments (stock of assets and liabilities) and income payments to foreign nationals, all normalized by GDP. The "restrictions-part" of the index includes *de jure* measures of formal openness such as hidden import barriers, mean tariff rates, taxes on international trade as a percentage of current revenue and capital account restriction; (b) *KOFglobal* which combines economic globalization with social and political globalization,

incorporating the number of embassies and high commissions in the country, the number of international organizations of which the country is a member, the number of international treaties signed, personal contacts, information flows and cultural proximity (Dreher (2006b)).

IV. CONTROL VARIABLES

In addition to the globalization variables, further explanatory variables capturing mainly domestic determinants of tax rates are included in the estimations as control variables bringing together different explanatory variables in the previous empirical literature (e.g. Dreher (2006a); Adam and Kammas (2007); Bretschger and Hettich (2002); Swank and Steinmo (2002); Winner (2005)).

Total expenditures of general government as a ratio to GDP (variable *expenditures*) should be positively related to ITRs since they induce higher financial needs.

The general government consolidated gross debt as percent of GDP (*debt*) can have either a positive or negative effect on ITRs. On the one hand public debt can serve as substitute for taxes: when taxes are lowered, expenditures have to be financed by debt. On the other hand there exists a borrowing effect: the higher the public debt, the more taxes have to be levied to pay for the debt.

The population older than 65 years as a share of total population (*oldage*) is expected to be positively correlated with implicit tax rates, because a higher share of dependent population results in higher fiscal needs. Furthermore, with a higher fraction of elderly people, the labour force shrinks, leading to a higher financial burden per employee.

The growth rate of real GDP *(growth)* aims to capture cyclical effects and is expected to have a negative effect on labour and capital tax rates. Based on a tax competition model with a balanced budget, rational governments will lower tax rates when growth is high as low economic growth leads to a lower interest rate and capital exports (see Bretschger and Hettich (2002), Adam and Kammas (2007)).

Inflation, measured as the change in the GDP deflator (*inflation*), is expected to affect taxes through different channels. If tax law contains an amount expressed in nominal values (e.g. levels of tax brackets with progressive taxation or an amount of personal deduction for the income tax), inflation might affect tax revenues positively and negatively (Thuronyi, 1996): First, taxpayers are pushed into higher labour income tax brackets and tax revenues rise at a higher rate than the tax base. The same may happen in the case of proportional business taxes if depreciation allowances are based on historical values. Second, due to collection lags in tax administration, inflation may lead to a decrease in ITRs as the tax base

increases at a higher rate than tax revenues. Third, if the tax base is measured in non-indexed nominal values, as is sometimes the case with property taxes or when tax revenues are based on "specific taxes", inflation may cause an erosion of tax revenues and a decrease in the ITR.

Government Party (*gov_party*) is an ordinal variable ranging from 1 to 5 that controls for the partisan effect (1 = hegemony of right-wing (and centre) parties, 5 = hegemony of social-democratic and other left parties (see Table A.2 for more details). The tax rates are expected to be lower, the more right wing the governing political parties tend to be, assuming that they would advocate a more neoliberal economic policy stance with tight fiscal policy and lower public expenditures, as well as lower taxes to stimulate business and increase labour supply.

As smaller countries are typically more open than larger countries, a country's relative size (*size*) is included in the set of regressors following Winner (2005) in order to cope with a possible small country bias. This variable is measured as the proportion of a country's GDP to the average sample GDP. We expect a positive sign on the coefficient of this variable when explaining the variation in the ITR on capital income as larger countries have an incentive to levy higher tax rates (Bucovetsky (1991)).

Tables A.1 to A.4 in the appendix contain information on the measurement of the variables, the databases used and descriptive statistics.

V. ESTIMATION METHODOLOGY

We explore the effect of globalization on the various ITRs by using the baseline model shown in Equation 1:

$$ITR_{jit} = a + \beta_{jg} G_{it-1} + \beta_{jc} C_{it-1} + \alpha_{ji} + \omega_{jt} + \varepsilon_{jit} \quad (1)$$

where j = capital, labour or consumption. We estimate separate equations for the EU15 and CEE NMS to allow for country-group-specific coefficients. Thus, the country index i ranges from 1 to 15 for the EU15 countries and from 1 to 10 for the included CEE NMS; t is the time index ranging from 1970 to 2006 for the EU15 and 1995 to 2006 for the CEE NMS. G_{it-1} represents the one year lagged globalization indicator. $C_{it} - 1$ is the matrix of one year lagged control variables outlined above. α_{ji} captures country fixed effects, ω_{jt} captures time fixed effects and ε_{jit} is the remainder error term. In the case of capital income taxes, we also estimate the EATR on corporate income as an alternative dependent variable to the ITR on capital income.

As described in section 2, we further test for the heterogeneity of the effects of globalization in different Western European welfare state regimes, i.e. the social-democratic, conservative, liberal and southern regime. Therefore, the following equation is estimated:

$$ITR_{jit} = \sum_{k=1}^{4} \beta_{jgk} D_k G_{it-1} + \beta_{jc} C_{it-1} + \sum_{k=1}^{3} \rho_k D_k T + \alpha_{ji} + \omega_{jt} + \varepsilon_{jit} \qquad (2)$$

where D_k is a dummy variable representing the different welfare regimes. D_1 stands for the social-democratic regime. D_1 is 1 if a country belongs to the social-democratic welfare regime and zero otherwise. D_2 stands for the conservative regime, D_3 for the southern regime and D_4 for the liberal regime. The estimated coefficients β_k can be directly interpreted as the marginal effect of a one-unit increase in the respective globalization indicator on ITR_j conditional on the respective welfare regime. The trend is also interacted with the regime dummies to account for path-dependency of the welfare regimes. As we include a full set of time dummies, one welfare specific trend cannot be identified. Therefore only three welfare specific trends are included into Equation (2). Including the fourth welfare-specific trend would not change the results as its impact is captured by ω_{jt}. Due to data limitations, other control variables are not interacted.

Globalization, as well as all the control variables except the fraction of elderly people and the government cabinet gravity, enter into Equations 1 and 2 with a one year lag. This is done for two reasons: First, to cope with time lags in the political and fiscal decision process and, second, to mitigate potential problems due to endogeneity. A better way to cope with endogeneity issues would be to apply a GMM-approach. However, due to the low number of cross-sections (countries), a reliable GMM-estimation is precluded (also see Potrafke (2009)).[9] A second best approach is to use lagged values of the right hand side variables (see Wooldridge (2002: 301)).

In each estimation the variance-covariance-matrix of the remainder error term, ε_{jit}, is calculated using the approach developed by Newey and West (1987). Therefore, standard errors are fully robust with respect to serial correlation as well as general heteroscedasticity (see Baum et al. (2007)).[10]

Finally, note that we do not include a lagged dependent variable in the empirical models, as the resulting estimates would suffer from the Nickell-bias. As already noted, reliable GMM-estimation is precluded due to the small number of cross-sections. However, the

[9] The cross-sectional dimensions are 15 (EU15) and 10 (CEE NMS), respectively.

[10] Newey-West-HAC robust standard errors are chosen as the alternative cluster-robust standard errors need a rather large number of clusters (here countries) for reliable inference. Typically a minimum cluster dimension of about 50 is required (see Nichols and Schaffer 2007). Estimations are carried out with Schaffer's xtivreg2 Stata command (see Schaffer (2010)).

inclusion of country-fixed effects, of the time fixed effects as well as of lagged total expenditures in the empirical models should account for inertia in the endogenous variable.

VI. ESTIMATION RESULTS

1. Globalization and effective tax rates in the EU15 and CEE NMS

Table 1 shows the results for the basic specification in Equation (1) for EU15 and the CEE NMS using two alternative KOF globalization indices as explanatory variables.

[Table 1 about here]

For the EU15 neither *KOFecon* nor *KOFglobal* has a significant effect on the ITR on capital income, but domestic factors do affect capital taxes. As expected, *size* has a positive effect on the ITR on capital income. Larger countries have a higher tax burden on capital income which is in line with the predictions of the theoretical literature (see Bucovetsky, 1991) and empirical findings (also see Adam and Kammas (2007), Bretschger and Hettich (2002), Garretsen and Peeters (2007), Winner (2005)). Total government expenditures as a share of GDP (*expenditures*) affect the ITR on capital positively, which is in line with the findings of Slemrod (2004). *Debt* has a negative impact on the ITR on capital income. So debt and capital taxes are substitutes. Growth affects capital taxes negatively. This is in line with Adam and Kammas (2007) and Bretschger and Hettich (2002). The fraction of elderly people in total population *(oldage)* has the expected positive effect on the ITR on capital income. Time effects are jointly significant.

Regarding the ITR on labour income in the EU15, both economic and total globalization indices have a significant and positive effect. The tax burden on the immobile factor is on the rise due to globalization. An increase in government expenditures leads to increasing labour taxes. In contrast to capital taxes, rising public debt leads to higher ITR on labour income, as also found by Swank and Steinmo (2002). Thus, public debt seems to be financed by taxes on labour. The fraction of elderly people again, as expected, has a positive effect on the ITR on labour income. Time fixed effects are jointly significant.

In the case of the ITR on consumption in the EU15 both globalization indices have a negative significant effect. The negative effect on ITR on consumption may be due to several reasons: first, high agglomeration effects (more firms, infrastructure etc.) might offset the pressure to lower capital taxes and therefore also offset the pressure to increase other taxes (Dreher, 2008). Second, globalization leads to a decline in tariffs, and thereby taxes on consumption. Third, the decline in tariffs in turn puts a higher pressure on firms to compete in more open markets; lower value added taxes both lowers their costs of inputs and increases

demand for their output, and eases some of the competitive pressures; thus government may have an incentive to support their firms' competitiveness and demand via lower value added taxes. The relative size of the country positively affects the ITR on consumption. Rising total government expenditures imply an increase in ITR on consumption, whereas public debt has a negative impact. As with taxes on capital income, debt and consumption taxes are substitutes. The fraction of elderly people in total population has also a positive effect on ITR on consumption. Time fixed effects are jointly significant.

Inflation and government party do not have an effect on any of the three ITRs in the EU15. The insignificant coefficient of partisan effect is in line with Dreher (2006a) and Swank and Steinmo (2002) and the zero-effect of inflation is consistent with Swank and Steinmo (2002).

In the CEE NMS there is no effect of globalization on all three implicit tax rates. One reason for this could be that the restructuring of the tax system along western lines as well as the adaptation to globalization has already taken place in the early stage of transition which is not covered by our estimation period (Campbell (2005)).[11] Regarding the effect of the domestic factors in the CEE NMS, only government expenditures as ratio to GDP and the composition of the government cabinet have impact on ITR on capital income. Higher expenditures lead to higher capital income tax rates. In contrast to the findings for the EU15, the government party has a significant and positive effect on the ITR on capital income. Thus, left-wing governments levy a higher tax burden on capital income. Time fixed effects were jointly insignificant, and therefore excluded.

Economic growth has a negative effect on the ITR on labour income in the CEE NMS, while higher public expenditures imply a higher ITR on labour income. In contrast to taxes on capital, government party has a negative coefficient, which implies that left-wing parties levy a lower tax burden on labour income. *Oldage* is insignificant in the specification with *KOFglobal*, but has an unexpected negative effect on ITR on labour income in the specification with *KOFecon*. A higher share of pensionists may reduce the share of active labor and consequently the tax revenues from labor's income, since "pensions are usually exempted from income taxation or taxed at a lower rate than the rest of the labor's income" (Adam and Kammas, 2007:328). Relatively smaller CEE NMS have higher ITR on labour as indicated by the negative coefficient of size. Time fixed effects were jointly insignificant and

[11] These results are robust, if we control for the effects of flat-tax reforms. To test this we introduced a flat-tax dummy in the empirical model. This dummy variable is 0 for countries which do not have a flat tax, and 1 for countries with a flat tax system, starting in the year when the flat tax was introduced. The results are available upon request.

are therefore excluded. The ITR on consumption in the CEE NMS is also positively affected by government expenditures. Gross consolidated public debt has a negative effect on consumption taxes, thus debt and consumption taxes are substitutes. As with labour taxes, left-wing governments levy a lower ITR on consumption. Time fixed effects are jointly significant.

Next, we turn to the estimations with the EATR on corporate income as the dependent variable. The results are displayed in Table 2. In the EU15, we find a significant negative effect of economic globalization on EATR; the broad globalization index also has a marginally significant negative effect (p-value of 0.11). In the case of the CEE NMS, *KOFglobal* has a negative effect on the EATR, but the effect of *KOFecon* is not significant. The time effects are jointly significant in all specifications other than Specification 3 in Table 2, where they are excluded.

[Table 2 about here]

How do our results compare to related literature?[12] Our results pertaining to the absence of a significant effect of globalization on ITR on capital income are in line with Dreher et al. (2008), Swank and Steinmo (2002), and Swank (2006). However, Dreher (2006a) finds a positive effect while Winner (2005) finds a negative effect of globalization on the ITR on capital income. Adam and Kammas (2007), Bretschger (2008) and Bretschger and Hettich (2002) likewise find a negative effect of globalization, but they use the ITR on corporate income as the dependent variable. Their measures of globalization are also limited to the trade volume, the Quinn indices on capital or goods market integration, or the IMF index of restrictions on capital mobility. The difference in the sample (a subsample of the OECD countries vs. EU15) can also explain part of the difference. As we show below, there are differences in how different welfare regimes filter the effects of globalization on the ITRs. Thus, the results are sensitive to the country sample.

Our results for the EATR on corporate income are in line with the studies of Krogstrup (2005), Dreher (2006a), Garretsen and Peeters (2007) and Loretz (2008). The question that arises is why globalization has no effect on ITR on capital income but a negative effect on EATR. One reason for this might be that the EATR strongly depends on the development in the STR (see Devereux and Griffith (1998)). STRs have an important signalling function for investors and are therefore an object of tax competition –much more so than ITRs (Ganghof (2000)). Therefore, studies explaining the EATR tend to find negative effects.

[12] Given that most of the former literature is for pools of sub-samples of OECD countries, the comparison is based on the results for the EU15 only.

Devereux et al. (2002) provide several reasons for the differences between EATR and ITR related to the differences concerning the measurement of the tax bases (ex post vs. ex ante) and the use of national accounts data vs. tax law data. Moreover, ITR on capital income include not only corporate taxation, but also inheritance, estate, property, stamp and gift taxes and the tax revenues contain not only source paid taxes (as with EATR), but also residence-based taxes (revenue collected from profits earned abroad and repatriated). Swank (1998) and Swank (2006) provide a further reason why globalization might have no effect on ITR on capital income. He argues that there has been a general policy shift from 'market conforming' to 'market regulating' policy caused by a spread of neoliberal policy and theory. Government's aim changed from redistribution to promoting growth by encouraging investment. So the change in tax policy may not only be caused by globalization, but also by a general change in policy. This policy shift is also in line with the cutting of the tax rates and broadening of the tax base, which means that the policy goals shifted from redistribution towards efficiency as the deadweight-loss of taxation depends in a non-linear way on the statutory tax rate and on the possibilities to substitute taxable income with non-taxed items.

Regarding the ITR on labour, the positive effect of globalization in the EU15 is in line with Dreher et al. (2008), Adam and Kammas (2007) and Winner (2005). Bretschger and Hettich (2002) also find a shift of the tax burden to labour income, although they do not estimate the effect on the ITR on labour income separately, but rather in the form of the ratio of taxes on capital to labour. However, Dreher (2006a) finds no effect and Swank and Steinmo (2002) find a negative effect on the ITR on labour income.[13]

In contrast to our study, other studies estimating the effect of globalization on the ITR on consumption do not find a significant effect (Swank and Steinmo (2002); Dreher (2006a); Dreher et al. (2008)), whereas we find a negative effect in the EU15.

2. Globalization, taxes and welfare regimes in EU15

Table 3 reports the results of the effect of globalization in different welfare regimes. The time fixed effects are jointly significant in all specifications other than in specification 8. The welfare regime specific trends are also jointly significant in all specifications other than in specification 5, where they are excluded.

[13] It is also worth noting that the rise in the tax burden on labour in the EU15 is in particular driven by increasing social security contributions (Ganghof (2000); Adam and Kammas (2007)). Social security contributions are often capped, and therefore have a regressive effect (Glyn (2006)). So aside from the increasing tax burden on labour income, there is a bottom up redistribution of the tax burden within labour (Prasad (2008)).

[Table 3 about here]

There is an interesting difference between the welfare regimes particularly in the case of ITR on capital income. According to our estimations there is a significant negative effect of globalization on the ITR on capital income in both the social-democratic and the southern welfare regimes. In the social-democratic regime this result is robust to the selection of the globalization indicator whereas in the southern regime the effect stems only from total globalization. In the liberal regime there is also a negative effect of total globalization, which is borderline significant (p-value of 0.11). Our results indicate that in the southern, social-democratic and liberal welfare regime the efforts to attract or keep the mobile factor of production have led to a downward pressure on ITR on capital. In the southern regime this can be explained by other location or productivity disadvantages of these countries. In the liberal regime it is in line with the political preferences to attract capital by offering lower tax rates. The pressure in the social-democratic countries may be due to their initial conditions with higher ITR on capital in the 1980s.

A rise of globalization implies an increase in the ITR on labour income in all four welfare regimes. Except for the southern regimes the effect is robust to the measure of globalization; in the southern regime the significant effect is due to total globalization. This is interesting, as southern countries showed the strongest increase in labour taxes. Apparently, this rise is due to social and political globalization as well as domestic factors rather than the economic dimension of globalization. The positive effect of economic globalization is the largest in the social-democratic regime. This might be considered in line with the broad agreement of the labour unions in the social-democratic countries to preserve the competitiveness of their firms while preserving a certain level of social welfare regime. However, the effect of total globalization in the liberal regime is relatively pronounced. The political and social dimensions of globalization seem to have brought in additional upward convergence effects within the liberal regime.

Globalization has a negative effect on ITR on consumption in the social-democratic, conservative and liberal welfare regimes while there is no effect in the southern welfare regime. The negative significant effect is robust to the measure of globalization in the social-democratic and conservative regimes, but not in the liberal regime, where the negative effect is only due to total globalization.

We also tested the effects of globalization on EATR on corporate income in different welfare state regimes within the EU15. The results are displayed in the last two columns of

Table 3. Globalization has a negative effect on EATR on corporate income in the conservative, southern and liberal regimes, but the result differs according to the measure of globalization: economic globalization has a negative effect in the conservative and southern regimes, and total globalisation in the liberal regime. In the social-democratic welfare regime economic globalization has a negative effect as well, but it is only marginally significant (p-value of 0.11).

Finally, we carried out several robustness checks in all specifications in Tables 1-3. First we excluded inflation, since it is in most cases insignificant. Secondly, we used unemployment instead of growth as a proxy for cyclical effects. This specification is estimated with and without inflation. The results regarding globalization are robust.[14]

VII. SUMMARY AND CONCLUSIONS

This paper analyzes the effects of globalization on the ITR on labour income, capital income, and consumption with an emphasis on the differences between the EU15 and CEE NMS as well as differences among welfare regimes in the EU15. Overall, our results confirm that globalization leads to a higher tax burden on labour income in the EU15: there is a positive effect of globalization on the ITR on labour income in the EU15, but no effect on the ITR on capital income. In the case of the ITR on consumption globalization has a negative effect.

The most striking difference arises between the EU15 and the CEE NMS; in the latter there is no effect of globalization on any of the three ITRs. Another difference between the EU15 and the CEE NMS is that the government party plays a more important role in the latter. Left wing governments levy a higher tax burden on capital income and a lower tax burden on labour income and consumption in the CEE NMS.

There are also differences between the welfare regimes within the EU15. Globalization has a significant negative effect on the ITR on capital income in the social-democratic and southern regimes, a borderline significant negative effect in the liberal regime, and no significant effect in the conservative welfare regime. Regarding the ITR on consumption, there is a significant negative effect of globalization in the social-democratic, conservative, and liberal welfare regimes. In the case of the ITR on labour income we find evidence that globalization causes an increase in all four welfare regimes.

[14] The results are available upon request.

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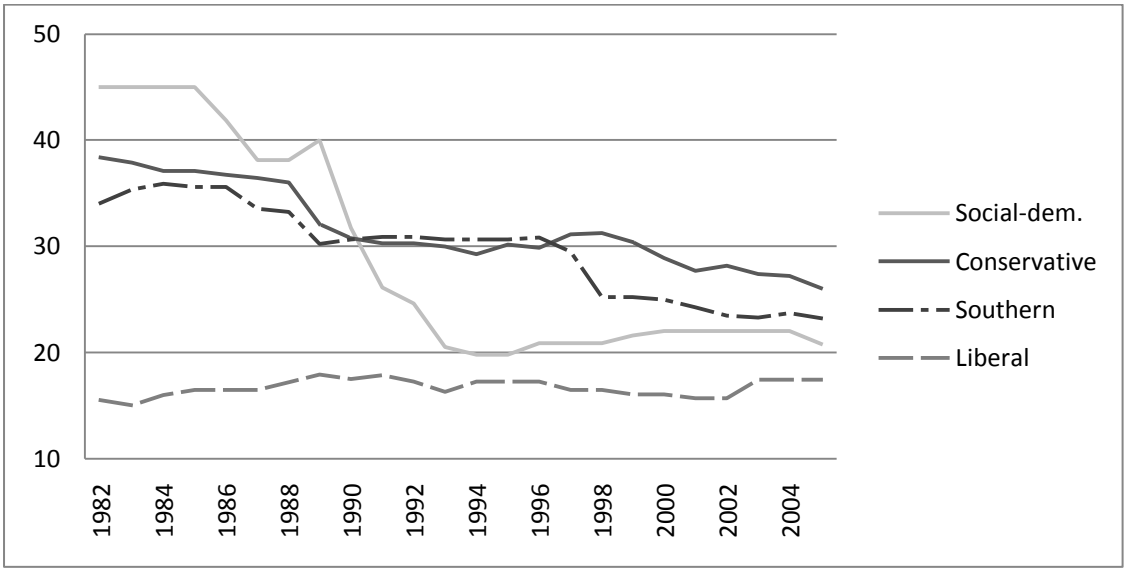
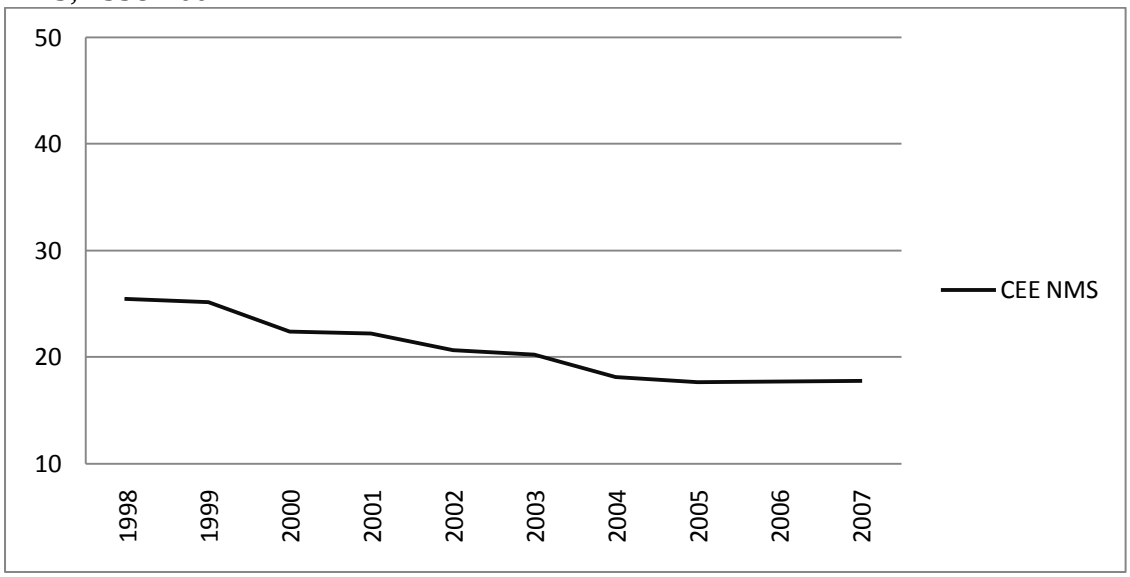
Figure 1a: Effective average tax rate on corporate income (unweighted average) in the EU15, 1982-2005



Data Source: IFS and Devereux et al. (2008)

Figure 1b: Effective average tax rate on corporate income (unweighted average) in the CEE NMS, 1998-2007



Data Source: Devereux et al. (2008)

Figure 2a: Implicit tax rates on capital income in the EU15 and the CEE NMS 1970 – 2007

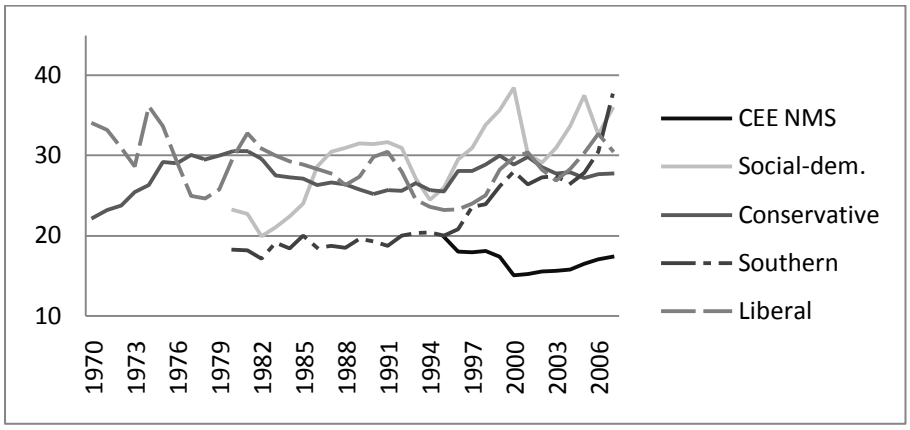


Figure 2b: Implicit tax rates on labour income in the EU15 and the CEE NMS, 1970 – 2007

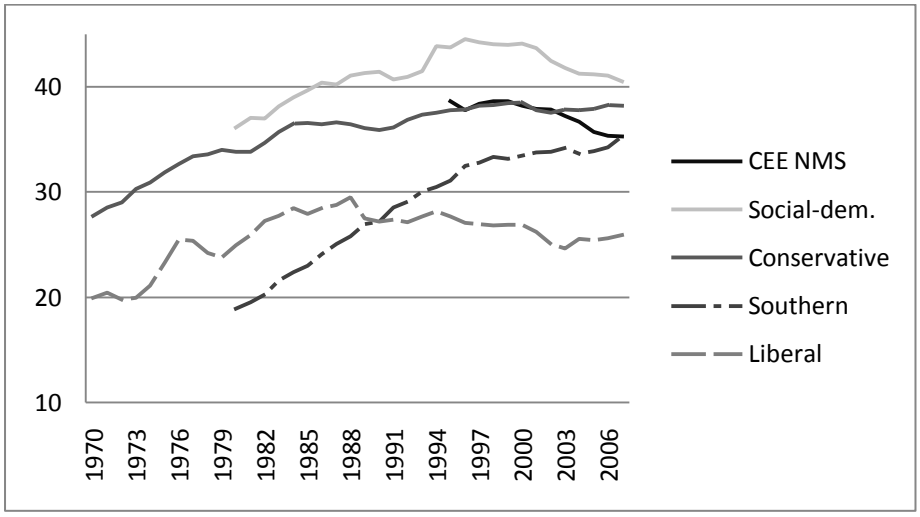
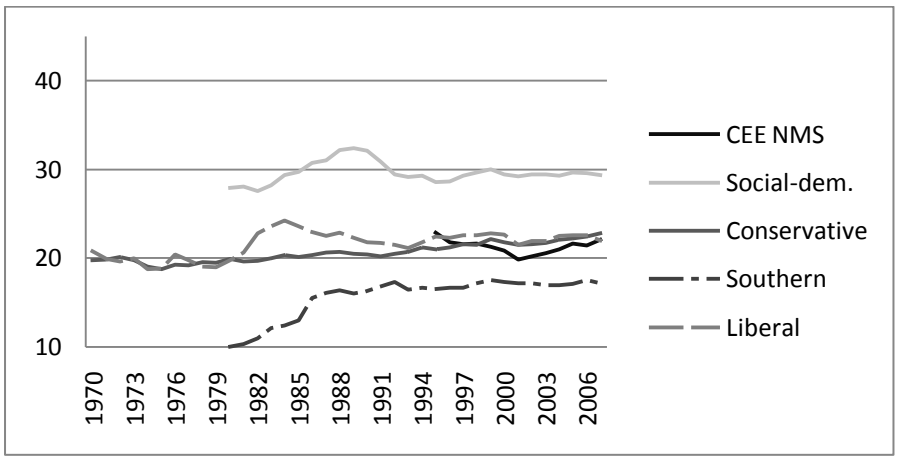


Figure 2c: Implicit tax rates on consumption in the EU15 and the CEE NMS 1970 – 2007



Data Source: Eurostat, European Commission (2000)

Note: Due to shorter time series, Romania and Bulgaria have been excluded, as their inclusion in the later years and absence in the earlier years impose a misleading change in the trend of the aggregate average for the region as a whole.

Table 1: The effects of globalization on implicit tax rate on capital income, labour income and consumption, two-way fixed effects estimation; time period: 1970-2006 for EU15, 1995 - 2006 for CEE NMS

	EU 15						CEE NMS					
	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
	ITR cap	ITR cap	ITR lab	ITR lab	ITR con	ITR con	ITR cap	ITR cap	ITR lab	ITR lab	ITR con	ITR con
$KOFglobal_{(t-1)}$	-0.108		0.308***		-0.088**		-0.066		-0.043		-0.048	
	(0.333)		(0.000)		(0.012)		(0.670)		(0.657)		(0.638)	
$KOFecon_{(t-1)}$		0.044		0.124***		-0.069***		0.017		-0.020		-0.050
		(0.618)		(0.000)		(0.007)		(0.860)		(0.689)		(0.278)
$size_{(t-1)}$	3.820***	3.855***	0.200	0.256	0.480**	0.405*	12.274	11.571	-12.783*	-11.917*	-7.944	-6.809
	(0.000)	(0.000)	(0.492)	(0.352)	(0.022)	(0.055)	(0.128)	(0.144)	(0.085)	(0.099)	(0.270)	(0.310)
$growth_{(t-1)}$	-0.426**	-0.456**	-0.065	-0.007	0.019	0.040	0.166	0.162	-0.191**	-0.194**	0.065	0.057
	(0.023)	(0.019)	(0.165)	(0.859)	(0.711)	(0.443)	(0.149)	(0.155)	(0.043)	(0.037)	(0.161)	(0.214)
$inflation_{(t-1)}$	-0.127	-0.115	0.000	-0.002	0.029	0.037	0.024	0.026	-0.043	-0.041	-0.012	-0.013
	(0.225)	(0.259)	(0.998)	(0.972)	(0.446)	(0.330)	(0.175)	(0.143)	(0.202)	(0.199)	(0.550)	(0.484)
$expenditures_{(t-1)}$	0.283***	0.233**	0.150***	0.181***	0.171***	0.189***	0.286**	0.304**	0.151**	0.153**	0.181***	0.180***
	(0.006)	(0.049)	(0.000)	(0.000)	(0.000)	(0.000)	(0.016)	(0.016)	(0.027)	(0.030)	(0.000)	(0.000)
$debt_{(t-1)}$	-0.045**	-0.043*	0.062***	0.061***	-0.059***	-0.062***	-0.055	-0.065	0.043	0.042	-0.072***	-0.069***
	(0.038)	(0.061)	(0.000)	(0.000)	(0.000)	(0.000)	(0.128)	(0.102)	(0.128)	(0.136)	(0.000)	(0.000)
$oldage_{(t)}$	1.219**	1.031*	0.337**	0.686***	0.720***	0.647***	0.081	-0.330	-0.641	-0.744*	-0.218	-0.324
	(0.031)	(0.060)	(0.041)	(0.000)	(0.000)	(0.000)	(0.951)	(0.772)	(0.280)	(0.093)	(0.620)	(0.442)
$gov\_party_{(t)}$	-0.228	-0.222	-0.081	0.049	0.039	0.012	0.489**	0.489**	-0.313**	-0.307**	-0.280**	-0.279**
	(0.241)	(0.261)	(0.177)	(0.423)	(0.474)	(0.829)	(0.020)	(0.019)	(0.043)	(0.047)	(0.025)	(0.019)
R2	0.397	0.396	0.856	0.823	0.439	0.444	0.194	0.192	0.495	0.494	0.559	0.565
N	383	383	401	401	401	401	95	95	99	99	99	99
Time effects	Yes	Yes	Yes	No	Yes	Yes	No	No	No	No	Yes	Yes
F-test TD	0.000	0.000	0.002	0.233	0.000	0.000	0.380	0.249	0.418	0.387	0.000	0.000

Newey-West-HAC robust p-values in parentheses; estimates based on Schaffer's xtivreg2 command with bw(2) robust option; F-test TD = p-values of test of joint significance of time dummies; ITR cap: implicit tax rate on capital income, ITR lab: ITR on labour income, ITR con: ITR on consumption; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 2: The effects of globalization on effective average tax rates on capital income, two-way fixed effects estimation; time period: 1982-2005 for EU15, 1998 - 2006 for CEE NMS

	EU 15		CEE NMS	
	(1) EATR	(2) EATR	(1) EATR	(2) EATR
$KOFglobal_{(t-1)}$	-0.191		-0.371*	
	(0.116)		(0.076)	
$KOFecon_{(t-1)}$		-0.263***		-0.062
		(0.001)		(0.560)
$size_{(t-1)}$	-1.369*	-1.260*	-48.816***	-46.971***
	(0.073)	(0.092)	(0.000)	(0.000)
$growth_{(t-1)}$	-0.167	-0.091	0.232	0.209
	(0.208)	(0.514)	(0.100)	(0.109)
$inflation_{(t-1)}$	-0.003	0.037	-0.108	-0.354**
	(0.983)	(0.767)	(0.352)	(0.026)
$expenditures_{(t-1)}$	-0.580***	-0.518***	0.783***	0.753***
	(0.000)	(0.000)	(0.001)	(0.000)
$debt_{(t-1)}$	0.012	0.027	-0.367***	-0.258***
	(0.635)	(0.280)	(0.002)	(0.009)
$oldage_{(t)}$	-0.480	-0.585	1.517	3.449**
	(0.352)	(0.227)	(0.124)	(0.014)
$gov\_party_{(t)}$	0.117	-0.051	-0.289	-0.357
	(0.489)	(0.768)	(0.394)	(0.302)
R2	0.712	0.722	0.704	0.762
N	274	274	72	72
Time effects	Yes	Yes	No	Yes
F-test TD	0.002	0.048	0.119	0.065

Newey-West-HAC robust p-values in parentheses; estimates based on Schaffer's xtivreg2 command with bw(2) robust option; F-test TD = p-values of test of joint significance of time dummies; EATR: effective average tax rate on corporate income; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3: The effects of globalization on implicit tax rate on capital income, labour income, consumption, and the effective average tax rate on corporate income in the different welfare regimes in the EU15, two-way fixed effects estimation; time period: 1970-2006*.

	(1) ITR cap	(2) ITR cap	(3) ITR lab	(4) ITR lab	(5) ITR con	(6) ITR con	(7) EATR	(8) EATR
KOFglobal*social-dem$_{(t-1)}$	-0.663**		0.380***		-0.145***		-0.173	
	(0.020)		(0.000)		(0.001)		(0.418)	
KOFglobal*conserv$_{(t-1)}$	-0.019		0.244***		-0.224***		-0.140	
	(0.906)		(0.000)		(0.000)		(0.369)	
KOFglobal*southern$_{(t-1)}$	-0.327**		0.115*		-0.002		-0.149	
	(0.028)		(0.094)		(0.949)		(0.508)	
KOFglobal*liberal$_{(t-1)}$	-0.527		0.294**		-0.245***		-0.648**	
	(0.115)		(0.016)		(0.000)		(0.025)	
KOFecon*social-dem$_{(t-1)}$		-0.306*		0.279***		-0.178***		-0.251
		(0.053)		(0.000)		(0.000)		(0.117)
KOFecon*conserv$_{(t-1)}$		-0.038		0.102***		-0.182***		-0.223**
		(0.729)		(0.002)		(0.000)		(0.042)
KOFecon*southern$_{(t-1)}$		-0.205		0.054		0.032		-0.309*
		(0.203)		(0.429)		(0.470)		(0.053)
KOFecon*liberal$_{(t-1)}$		0.051		0.138**		0.051		-0.116
		(0.829)		(0.032)		(0.383)		(0.607)
size$_{(t-1)}$	2.980***	2.659***	-0.102	-0.144	-0.147	-0.107	-0.678	-0.892
	(0.000)	(0.000)	(0.654)	(0.499)	(0.507)	(0.594)	(0.368)	(0.240)
growth$_{(t-1)}$	-0.293*	-0.363*	-0.035	-0.042	0.064	0.072	-0.114	-0.156
	(0.098)	(0.052)	(0.428)	(0.348)	(0.208)	(0.152)	(0.388)	(0.273)
inflation$_{(t-1)}$	0.004	-0.015	0.021	0.014	0.117***	0.104**	0.172	0.198
	(0.975)	(0.892)	(0.586)	(0.699)	(0.007)	(0.012)	(0.232)	(0.127)
expenditures$_{(t-1)}$	0.170*	0.162	0.157***	0.140***	0.154***	0.168***	-0.517***	-0.452***
	(0.088)	(0.132)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
debt$_{(t-1)}$	-0.068***	-0.062**	0.061***	0.066***	-0.051***	-0.044***	0.051*	0.062*
	(0.009)	(0.019)	(0.000)	(0.000)	(0.000)	(0.000)	(0.077)	(0.057)
oldage$_{(t)}$	0.901	0.504	-0.368*	-0.350*	0.179	0.031	-0.231	-0.881
	(0.224)	(0.532)	(0.053)	(0.072)	(0.340)	(0.885)	(0.722)	(0.252)
gov_party$_{(t)}$	-0.053	-0.081	-0.093*	-0.063	0.047	0.019	-0.077	-0.081
	(0.756)	(0.636)	(0.073)	(0.215)	(0.378)	(0.721)	(0.658)	(0.647)
trend*social-dem	0.678**	0.864***	-0.066	-0.164**		0.263***	-0.943***	-0.465*
	(0.045)	(0.001)	(0.455)	(0.015)		(0.000)	(0.000)	(0.064)
trend*conserv	-0.145	0.244	0.103	0.120**		0.141**	-0.680***	-0.305**
	(0.617)	(0.334)	(0.219)	(0.048)		(0.028)	(0.004)	(0.047)
trend*southern	0.565*	0.823**	0.506***	0.490***		0.132*	-0.585	0.034
	(0.087)	(0.013)	(0.000)	(0.000)		(0.078)	(0.182)	(0.919)
trend*liberal								-0.056
								(0.681)
R2	0.495	0.481	0.882	0.882	0.522	0.565	0.741	0.702
N	383	383	401	401	401	401	274	274
Time effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
F-test TD	0.000	0.000	0.002	0.003	0.000	0.000	0.017	0.122
F-test trend	0.002	0.001	0.000	0.000	0.283	0.001	0.001	0.116

Newey-West-HAC robust p-values in parentheses; estimates based on Schaffer's xtivreg2 command with bw(2) robust option; F-test TD = p-values of test of significance of time dummies; F-test trend = p-value of test of joint significance of trends; ITR cap: implicit tax rate on capital income, ITR lab: ITR on labour income, ITR con: ITR on consumption, EATR: effective average tax rate on corporate income; * the estimation period for EATR is 1982-2005; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Appendix

Table A. 1: Data Availability

Implicit tax rates
1970-2007: BE, GE, DE, FR, IE, IT, LU (no ITR on capital available), NE, UK 1980- 2007: AT,ES, FI, GR, PT, SE 1995-2007: CZ, EE, HU (ITR on capital since 2000), LT, LV, PL, SK, SI Later than 1995: BG 1999 - 2007, RO: ITR on capital 1998-2004, ITR on labour and consumption 1999-2007 All data from Eurostat; ITR on capital for BG, HU, RO, SI partly own calculations
Effective average tax rates
1998-2007: AT, BE, CZ, GE, DE, EE, ES, FI, FR, GR, HU, IE, IT, LT, LU, LV, NE, PL, PT, SE, SI SK, UK 1982-2005: AT, BE, GE, ES, FI, FR, GR, IE, IT, NE, PT, SE, UK

Table A. 1: Data Sources and Description

KOFglob	Index of economic, political, and social globalization, ranging from 1 to 100	ETH Zurich, KOF	1970-2006
KOFecon	KOF Index of economic globalization, combining actual flows and restrictions,	ETH Zurich, KOF	1970-2006
growth	Growth rate of real GDP	AMECO	1970-2007
debt	General government consolidated gross debt	AMECO	1970-2007
inflation	Inflation, GDP deflator (def_GDP-def_GDP(-1))/def_GDP(-1)	AMECO	1970-2007
expenditures	Total expenditures of general government as percentage of GDP	AMECO	1970-2007
oldage	Population>64 as percentage of total population	AMECO	1970-2007
gov_party	govparty Cabinet composition (Schmidt-Index): (1) hegemony of right-wing (and centre) (2) dominance of right-wing (and centre) parties (3) balance of power between left and right (4) dominance of social-democratic and other left parties (5) hegemony of social-democratic and other left parties	Comparative political Dataset I and III (for CEEC), University of Bern	1970-2007
size	GDP as share of GDP of the sample (in t)	AMECO	1970-2007
ITR cap	Implicit tax rates on capital income	Eurostat, European Commission	1970-2007
ITR con	Implicit tax rate on consumption	Eurostat, European Commission	1970-2007
ITR lab	Implicit tax rate on labour income	Eurostat, European Commission	1970-2007
EATR, CEE NMS	effective average tax rate on capital income	Devereux et al.. (2008)	1998-2007
EATR, EU15	effective average tax rate on capital income	IFS and Devereux et al.. (2008)	1982-2005

Table A. 2: Data Summary – EU15 1970-2007

Variable	Obs	Mean	Std. Dev.	Min	Max
ITR cap	471	26.92389	9.020406	7.035894	56.0146
ITR lab	510	33.26076	7.575503	8.167932	49.4
ITR con	510	21.18629	5.475494	5.429917	34
EATR	312	28.3315	9.054362	5	48.14182
KOFglobal	555	72.53857	12.36946	46.58926	92.63542
KOFecon	555	70.79017	15.91551	39.57584	98.71632
size	570	6.399091	7.071815	0.1470244	24.26684
growth	570	2.972333	2.428373	-6.571302	11.49454
expend	432	47.93289	6.69618	29.26713	71.68213
debt	554	51.54973	29.27375	4.0563	134.1601
oldage	569	14.16474	2.139734	9.150367	19.99225
infl	570	6.311238	5.552342	-1.876682	27.21265
govparty	552	2.650362	1.469299	1	5

Table A.4: Data Summary – CEE NMS 1995-2007

Variable	Obs	Mean	Std. Dev.	Min	Max
ITRcap	114	16.11934	6.474288	4.9	35.1
ITR lab	122	36.71066	3.39788	28	43.7
ITR con	122	20.96557	3.278978	15.5	30.8
EATR	80	20.725	4.666891	12.7	36.7
KOFglobal	120	72.31573	7.866955	50.53387	85.15943
KOFecon	120	71.66487	11.92914	37.1984	92.30254
size	130	0.4731876	0.5502601	0.0560642	2.250158
growth	130	4.81797	3.322996	-9.39712	12.23314
expend	125	41.56814	5.620584	33.1694	54.46833
debt	123	30.08343	20.21959	3.4876	105.0563
oldage	130	14.20665	1.673192	10.87208	17.28471
infl	130	19.34649	84.32772	-0.8533621	948.2813
govparty	120	2.65	1.149717	1	5