The Influence of Globalization on Taxes and Social Policy – an Empirical Analysis for OECD Countries*

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Abstract

Using panel regression for the period 1970-2000 the paper analyzes whether globalization has influenced the OECD countries' social and overall spending as well as their tax rates on labor, consumption and capital. Accounting for potential endogeneity of the regressors, the results show that globalization (measured by an index covering 23 variables) did not generally decrease the leeway for independent economic policy. Globalization even increased implicit tax rates on capital (as calculated by Carey and Rabesona 2002) – a result that is mainly driven by economic integration. However, there seems to be competition over tax rates on capital when data based on legislation as suggested by Devereux and Griffith (2003) is employed. Depending on the method of estimation, increasing social integration also influences policies, while political integration does not matter for economic policy in most specifications.

Keywords: globalization, economic policy, government expenditure, social spending, implicit tax rates, dynamic panel, tax competition

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1. Introduction

Critics of globalization claim that increasing economic integration is responsible for reduced social spending and a shift in the tax burden from capital to labor. Whether economic globalization indeed influences policy has been analyzed in numerous empirical studies. The results, however, are far from being conclusive. According to Swank (2001) and Adserà and Boix (2002) globalization increases the tax burden while Rodrik (1997) and Vaubel (1999) show that globalization goes along with decreased tax revenue. Garrett (1995) and Heinemann (2000) do not find any significant influence of globalization on revenue.[1] Whereas Garrett (1995), Quinn (1997) and Swank (2001) show that globalization leads to higher corporate taxes, Hansson and Olofsdotter (2003) report the opposite result. The effect of globalization on social spending is equally disputed: Hicks and Swank (1992) and Vaubel (1999) report a significantly positive, Swank (2001) as well as Garrett and Mitchell (1999) a significantly negative relationship.

In the above-mentioned studies, the influence of globalization has been measured by the extent of capital controls, openness to trade or the amount of foreign direct investment. In doing so, a possible influence of political integration has been neglected. With rising political integration, however, transnational enterprises will find it more difficult to circumvent national regulation. If rising economic integration goes along with more political integration, these effects could cancel each other out. The estimates of economic integration as reported in previous studies would then be biased. Similar arguments can be applied to social integration. Without capital restrictions, competition in taxes and expenditure is more likely the closer the potential host country's culture is to that of the source country and the easier it is to exchange information. This social dimension of globalization could therefore be important for economic policy as well.

[1] Schulze and Ursprung (1999) summarize theoretical and empirical work on this topic.

Most previous empirical studies, like those of Garrett (1995), Quinn (1997) and Swank (2001), proxied the degree of tax competition using tax revenues. However, even if tax rates are decreasing, an improved economic environment could raise revenues. This would conceal existing tax competition (Schulze and Ursprung 1999: 316). Simply taking statutory tax rates instead would not substantially improve the analysis. This is because the tax burden also depends on tax bases. Since tax-exempt amounts, depreciation rules and other tax benefits differ largely across countries, even with similar gross incomes tax bases would be different. To account for this, the more recent studies (Bretschger and Hettich 2002, Hansson and Olofsdotter 2003, among others) employ average effective tax rates. According to this method, which has initially been suggested by Mendoza, Razin and Tesar (1994), actual tax revenue is expressed in relation to the tax base causing this revenue. This implicitly accounts for the effects of different tax benefits.[2] Therefore, I will use such tax rates here. The robustness of the results is tested, however, by employing marginal and average effective tax rates based on an analysis of the legislation underlying different tax regimes ("adjusted statutory rates").

From a policy perspective, of course, the influences of individual elements of globalization on economic policy are important. However, most elements of globalization are highly correlated, so that it is impossible to include them all individually in one regression. Omitting dimensions, on the other hand, causes biased coefficients. Using aggregate indicators of globalization is thus preferable. In any case, only an aggregate measure can be used to study the overall effect of globalization. This is what is done in this paper.

The article contributes to the literature in testing econometrically the overall influence of globalization as well as the individual effects of economic, political and social integration on the OECD countries' economic policy. It is analyzed whether and to what extent globalization influences government's social and overall spending as well as implicit tax rates

[2] For an excellent discussion of tax ratios see Volkerink, Sturm and de Haan (2001), Volkerink and de Haan

on labor, consumption and capital. For the first time in such analysis, potential endogeneity of the explanatory variables is accounted for.

In addition to the covariates that are common in the literature, my regression analysis employs an index of globalization and its different components as independent variables. This index has been developed in Dreher (2003) for 123 countries. It is based on 23 variables that relate to different dimensions of globalization. The variables have been combined to six groups: actual flows of trade and investment, restrictions, variables measuring the degree of political integration, data quantifying the extent of personal contact with people living in foreign countries, data measuring transborder flows of information and a proxy for cultural integration. These dimensions have been combined to three sub-indices and one overall index of globalization with an objective statistical method – exactly the same method that has been applied by Gwartney, Lawson and Samida (2000) in the construction of their well-known economic freedom index.[3] Table 1 reports the individual components. As can be seen, economic, political, and social integration obtained roughly equal weights.[4] Table 2 contains results for the overall index of globalization for the period 1975-2000 as well as the three sub-indices in 2000.[5]

Employing this proxy, what I find is, basically, that globalization increased average effective tax rates on capital and did not influence the other policy instruments analyzed in this study. When adjusted statutory tax rates on capital are employed, the results show that increasing globalization reduces taxes.

(2002) and de Haan, Sturm and Volkerink (2003).

[3] Appendix A describes this method in more detail. For a recent discussion of the concept and measurement of the economic freedom index see Gwartney and Lawson (2003).

[4] Note that the underlying method attributes smaller weights to individual components, the more components of one category are included. Comparing the results for McDonald's restaurants and fdi, e.g., does therefore not mean that restaurants are more important than fdi. If the analysis would include more cultural indicators, individual weights would be lower.

[5] A priori, one might have expected smaller countries to be more globalized. The high value of the index for the USA is, however, due to high political and cultural integration with the rest of the world. The latter appears, because cultural globalization is usually defined as proximity to the USA (see Dreher 2003).

The next section discusses potential influences of globalization on economic policy. Whether increasing integration indeed has an impact on the policy of the OECD countries is examined in Section 3. To this end, I present combined time-series cross-section analysis for the last 30 years. Section 4 discusses various tests for robustness, while the final section summarizes results.

2. Potential influences of globalization on economic policy

There are many ways to confine international political competition. While national restrictions of international transactions have been drastically reduced since the eighties, agreements among governments – be it in the form of harmonized taxes, be it in the form of joint standards – became more frequent.[6] These developments cannot be judged in isolation. Following Vaubel (1999: 283), trade liberalization can easily be explained from a public choice perspective. Economic integration increases efficiency and thus productivity and income. In the short run, with tax rates constant this increases tax revenue. As politicians' time horizon is usually rather short, they are thus in favor of trade liberalization. Similarly, liberalization of capital account restrictions potentially improves the allocation.[7] With rising presence of foreign suppliers and investors, resistance against barriers to market entry rises (Peltzman 1989), which enables the reduction of such regulations (Vaubel 1999: 284). The resulting economic integration potentially increases political competition among governments – and this might endanger governments' revenue. The more political competition increases, thus, the more governments are interested in political integration (Vaubel 1990). The dismantling of economic restrictions therefore leads to more cooperation in politics, since politicians want to retain their leeway in economic policy.

[6] In the late nineties there have been initiatives to prevent "harmful" tax competition in the EU as well as in the OECD (Devereux, Lockwood and Redoano 2002: 2). See also European Commission (1998), OECD (1998) and van der Hoek (2003).
[7] Tax revenue can, however, decline in capital exporting countries.

The relationship between economic integration and economic policy has been frequently analyzed in the empirical literature. The (simplified) line of reasoning is as follows:[8] Higher economic integration induces mobile factors of production to migrate to the country with the lowest taxes. In order to maintain their tax bases, governments might engage in competition for the lowest tax rates and therefore reduce tax rates on capital ("race to the bottom"). Since as a consequence revenues decline, the state's capacity to redistribute is also lower and expenditures decline as well. The international competition might thus confine the governments' scope for spending ("disciplining hypothesis").[9]

The disciplining hypothesis has, however, also been questioned. Apolte (2001) shows that Leviathan governments might not be sufficiently restricted by economic integration. Baldwin and Krugman (2000), Kind et al. (2000) and Ludema and Wooton (2000) show that reduced transport costs can increase agglomeration forces. Linkages among producers and between producers and consumers lead to the agglomeration of production. As long as the benefits from agglomeration exceed the costs imposed by taxation, globalization increases governments' leeway to tax mobile factors. Economic integration might thus lead to higher tax rates on capital.[10]

In the absence of (sufficient) agglomeration forces the government might try to develop new sources of revenue as an alternative to reducing expenditures in the wake of international competition. To this end, the more immobile tax bases are better suited. One would thus expect that taxes on labor and consumption rise with economic globalization. Governments could, however, also react to the increasing stress of competition with increasing political integration. They might prevent competition, for example, with (unofficial) agreements. They could decide on a minimum tax rate, as has been done, e.g., in the EU with VAT rates. As another example, European Commissioner Monti (1998) argues in

[8] For a review of theoretical models on tax competition in the EU see Krogstrup (2002). See also Schulze and Ursprung (1999) and Wilson and Wildasin (2004).
[9] See, e.g., Brennan and Buchanan (1980).

favor of tax coordination, since otherwise labor would be penalized for being less mobile as compared to capital.

If economic integration indeed fosters political integration, those two dimensions of globalization might be highly correlated.[11] If political integration – as has been done in all previous empirical studies – is not accounted for, the estimated effect of globalization represents the joint effect of both dimensions. Since the effect of the two dimensions might go in opposite directions, this could result in an insignificant coefficient. If the political effect exceeds the economic effect, this could also explain the above-mentioned results of Garrett (1995), Quinn (1997) and Swank (2001), showing a positive impact of globalization on corporate taxes. A country's degree of political integration with the rest of the world therefore necessarily has to be included in an analysis of economic integration. The same is true for technical and cultural aspects, which are probably highly correlated with economic integration as well.[12] If the coefficients estimated in previous studies mainly reflect technological changes or increasing cultural proximity instead of measuring the true influence of economic integration, recommendations derived from those studies are meaningless.

These considerations lead to the following hypotheses: Economic integration induces tax competition. However, tax rates on capital do only decrease if agglomeration forces do not offset the pressure on taxes (and might increase otherwise). Without significant agglomeration, tax rates on labor and consumption are expected to rise as a consequence of economic integration. When the effects of agglomeration dominate, tax rates on consumption and labor are not expected to rise (or might even decline).

Total government expenditures are expected to decrease as a consequence of economic integration (when political competition actually confines the governments' leeway). Again, however, the presence of significant agglomeration forces might allow for an increase in

[10] See Wilson and Wildasin (2004) for a detailed discussion.
[11] In fact, the correlation between the indices of political and economic integration employed in this study is 0.20.

expenditures. The same is probably true for social spending. In any case, social spending could also rise with globalization if governments expand the welfare state in order to insure their citizens against the risks of globalization („compensation hypothesis“).

Political integration, on the other hand, can be used to confine competition. Such integration is therefore likely to increase tax rates, since it is no longer possible to compare the situation in one country with those in others and exit strategies become less feasible. This reduced competition might also lead to higher government total and social spending.

In terms of social integration, likely influences are less clear. On the one hand, higher cultural integration facilitates migration. Differences in tax burdens or expenditures can then more easily lead to exit. The resulting increased competition should be reflected in lower tax rates (and therefore lower expenditure). On the other hand, cultural integration can make a country more attractive to foreign investment. This could even increase the governments' leeway to raise taxes and spending.

The next section analyzes econometrically whether the results of previous studies can be confirmed or invalidated if the analysis does not only account for economic, but also for political and social integration.

3. Empirical Analysis

In order to test whether and to what extent globalization affected the OECD countries' economic policy, I estimate combined cross-section time-series regressions. The dependent variables are total and social spending relative to GDP and average effective tax rates on labor, consumption and capital. The average effective tax rates are calculated in Carey and Rabesona (2002) and are a variant of the original Mendoza et al. (1994) data. All data are averages over five years – they cover the period 1970-2000. Since some of the data are not

[12] Correlation between the indices of social and economic integration is 0.58.

available for all 30 OECD countries or all periods, the panel data are unbalanced and the number of observations depends on the choice of explanatory variables.[13] I found significant fixed country and period effects in all specifications. However, the coefficients of the country and time effects are not reported in the tables. All standard errors are estimated robustly. All variables, their precise definitions and data sources are listed in the Appendix.

For each policy variable the system of equations to be estimated is

$$y_{it} = \alpha + \beta y_{it-1} + \gamma' G_{it} + \eta' X_{it} + \eta_i + \eta_t + \varepsilon_{it} \quad (1)$$

with y being the different policy measures, G representing the globalization indices, X being a vector of control variables, and where η_i is a country fixed effect, and η_t is a period fixed effect.

Table 3 reports the results when β in (1) is restricted to zero. Since I found significant first-order autocorrelation in all models, the disturbance term is modeled as an AR(1) process.

The same explanatory variables are employed to explain each policy variable. I start explaining the different dependent variables with the overall index of globalization. The second column adds variables that have been shown to be significant in previous studies: The share of under 15-year old and over 64-year old people relative to population, the rate of unemployment, the share of government employees in all employees (Razin, Sadka and Swagel 2002), a dummy for left wing governments (Vaubel 1999), economic growth and a proxy for the costs of international trade (Hansson and Olofsdotter 2003).

The dependency ratio controls for demographic factors. With a higher dependency ratio, taxes and expenditures are also expected to be higher. Regarding expenditures and taxes on capital and consumption, the same is true for unemployment. However, with respect to taxes on labor, a negative coefficient is expected. The share of government employment in total employment indicates the breadth of government involvement in the economy, and is expected to increase taxes and expenditures. Left governments are more likely to tax capital

[13] Results for a balanced panel are discussed in Section 4.

and usually have a higher preference for bigger states than central or right wing governments do. Expenditures and taxes are thus expected to be higher when left governments hold office. This is especially true for taxes on capital.

In the tax competition literature, economic growth is expected to reduce tax rates on capital (e.g. Hansson and Olofsdotter 2003), while expenditures are likely to increase at times of economic prosperity. With respect to the consumption and labor tax rates, the impact of growth could be in either direction. Reductions in the costs of international trade increase the importance of agglomeration forces and are thus expected to lead to increases in tax rates (and expenditures). This is because the resulting decrease in factor mobility allows governments to increase tax rates (see Hansson and Olofsdotter 2003 for a detailed discussion).

The results are presented in Table 3. As can be seen (and in line with our a priori hypothesis), higher unemployment leads to significantly higher government total and social expenditures. However, contradicting our expectations, tax rates on labor are significantly higher as well. This might reflect reversed causality, as higher labor taxes probably imply rising unemployment. In fact, unemployment no longer significantly affects taxes on labour when the lagged value is employed instead of the contemporaneous one. The problem of endogeneity will be discussed in the context of Arellano-Bond estimation below.

The results also show that a greater public sector (as measured by government employees relative to total employees) increases total government expenses, with a coefficient significant at the one percent level. Higher economic growth reduces overall and social expenditure but has no effect on taxes. Again, the impact on social and total spending is probably due to reversed causality. In fact, the coefficient is significantly positive if the lagged value of growth is included in the regressions instead of the contemporaneous value.

In order to proxy the costs of international trade I follow Hansson and Olofsdotter (2003) who employ imports including costs for insurance and freight relative to imports free on board. As the results show, this proxy is insignificant in all regressions. Arguably, the

insignificance of the proxy for costs of trade might result from the presence of the index of globalization in the regressions. As discussed, the index of globalization might also be a proxy for reduced transaction costs, leading to agglomeration. When the index of globalization is excluded from the regressions, however, the coefficient remains insignificant in all regressions.

The governments' political leaning and the dependency ratio are also insignificant in all regression.

While globalization does not significantly influence government spending, taxes on labor and on consumption, the results show that taxes on capital depend significantly on globalization (when the other variables are also included). As the results show, taxes on capital do significantly increase with globalization. The issue will be further investigated below.

Table 4 replicates the analysis for the dynamic model of equation (1), containing the lagged endogenous variable. The lagged dependent variable is included, because government spending and taxes change only slowly over time instead of being changed instantaneously. These changes might entail some adjustment costs on the private sector or might be politically blocked by interest groups (Devereux, Lockwood and Redoano 2002: 4). However, in the presence of fixed country effects the OLS estimator is inconsistent. To deal with this, I employ the GMM estimator as suggested by Arellano and Bond (1991) in addition. This estimator first-differences the estimating equation and uses lags of the dependent variable from at least two periods earlier as well as lags of the right-hand side variables as instruments. Since there are more instruments than right-hand side variables, the equations are over-identified and instruments must be weighted in an appropriate way. I only present results from the Arellano-Bond one-step estimator, which uses the identity matrix as a weighting matrix. The two-step estimator weighs the instruments asymptotically efficiently using the GMM1

estimates. However, in small samples like the one used here, standard errors tend to be under-estimated by the two-step estimator (Arellano and Bond 1991: 291).

As Table 4 shows, inclusion of the lagged endogenous variable to the OLS regressions does not change most of the results. However, applying the Arellano-Bond estimator leads to a dramatic loss of observations, since information from two periods is discarded by differencing and instrumenting. This results in generally lower t-statistics. A smaller share of working-age people relative to population now significantly reduces total government spending and (when estimated with OLS) taxes on capital. While the Arellano-Bond test of second-order autocorrelation accepts the specification at the one percent level, the Sargan-test, which amounts to a test of the exogeneity of the explanatory variables, rejects the overidentifying restrictions in the regression explaining overall government expenditure. Therefore, I performed estimations treating all right-hand side variables as predetermined instead of strictly exogenous (not reported in the table). The results are unchanged (and both specification tests now accept the instruments). The dependency ratio's counterintuitive impact is in line with the results of Razin, Sadka and Swagel (2000). In their explanation, the negative coefficient reflects an increase of the anti-tax coalition in an aging society.

Unemployment does no longer significantly influence taxes on labor. In the OLS-regression, higher economic growth significantly reduces taxes on labor. When estimated with GMM, the results also show that taxes on consumption are higher if a left government holds office. This relationship is significant at the five-percent-level. At the ten percent level, higher costs of trade reduce taxes on labor (when estimated with OLS), which is in line with the a priori hypothesis. Also at the ten percent level, taxes on capital rise with the share of government employment in total employment. The lagged endogenous variable is significant in most OLS specifications and always insignificant when estimated with GMM.

Most importantly, the results with respect to the index of globalization are in most cases unchanged. This gives rise to the conclusion that the globalization of the last 30 years

did not have a major influence on tax rates and expenditure policy in OECD countries, the only exception being tax rates on capital that did increase with globalization. This effect is significant at the five-percent-level in the OLS regression. It is still significant at the ten-percent-level when estimated with GMM. The results show that tax rates on capital rise by about three percentage points with an increase in the index by one point. Since the index of globalization is scaled arbitrarily, it is not sensible to interpret the absolute magnitudes of the coefficients. However, according to the estimates the increasing integration of, e.g., Canada with the rest of the world from 1985 to 1995 or Norway's from 1980 to 2000 is responsible for an increase in average effective tax rates on capital of about three percentage points each.[14] Increasing the index value from its lowest value of 1.6 for Turkey in 1985 to its highest value of 6.5 for the US in the year 2000 increases tax rates on capital by 16.4 percentage points according to the OLS regressions and 13.4 percentage points when estimated with GMM.

The results lead to the conclusion that there has been no erosion in tax rates on capital following globalization. A look at graph 1 shows that the positive relation between the index of globalization and tax rates on capital is rather obvious. The simple correlation is 0.7, which is, of course, highly significant.

In what follows, I assess which dimensions of globalization are responsible for the derived relationship and whether individual sub-indices have a significant influence in spite of the overall insignificance. Instead of the overall index of globalization the three sub-indices are included in the regressions. Again, notice that the small sample size makes the GMM estimates merely suggestive.

Table 5 reports the results. As can be seen, the disaggregated analysis confirms the previous estimates: In almost all cases the coefficients of the globalization variables are completely insignificant. Again, the tax rate on capital is the only exception. The results show

[14] In fact, the increase has been 7.69 and, respectively, 0.61 percentage points.

that economic integration increases these taxes, with a coefficient significant at the ten percent level when estimated with OLS and, respectively, the five percent level in the GMM estimation. The positive coefficient of the overall index of globalization reported in Tables 3 and 4 does thus not arise because the impact of political integration dominates those of economic integration.

This result is compatible with theoretical arguments outlined in Section 2 and previous empirical research. Quinn (1997) and Rodrik (1997) find that the capital tax burden is positively related to integration. Devereux, Lockwood and Redoano (2002) show that a county's openness increases average tax rates on several classes of investment. Krogstrup (2003) reports capital taxes to increase significantly with capital account liberalization (as measured by Quinn's 14-point index).[15]

There are several possibilities to explain the positive correlation between capital taxes and globalization. First, and in line with the hypothesis developed in Section 2, the positive influence of economic integration on capital taxes might be due to agglomeration effects (with the index of globalization being a better proxy for the costs of trade as the proxy based on imports c.i.f. and imports f.o.b.).

Second, this result supports the political economy literature arguing increased globalization moves the median voter to the left. This is not contradicted by the insignificance of the dummy for left governments in most regressions since it might well be that all parties moved to the left, which would not be reflected by the dummy.

Third, the globalization index could be correlated with a general upward trend in overall tax revenues at the same time. The index would then capture the overall trend in tax

[15] All these results are contrary to Genschel (2001) who argues that the increasing tax competition due to globalization considerably decreased governments' leeway for independent policy. Although Genschel concedes that taxes on capital did on average not decrease he claims they would nevertheless be higher without integration, since the economic environment deteriorated. My analysis refutes this conjecture since it controls for the economic environment.

revenues instead of capturing the effect of globalization. Like in Krogstrup (2003), however, adding overall tax revenues (as a percent of GDP) to the regression does not change the result.

And finally, the result might be due to omitted variables bias. Inclusion of additional plausible covariates like a country's per capita GDP does, however, not change the result.

The influence of social integration on capital taxes is less clear. In the within-groups specification, the relationship is positive and significant at the five-percent-level. Social integration seems to increase a country's attractiveness, which increases leeway for increasing taxes. When estimated with GMM, however, the coefficient looses its significance. The results also show that political integration does not matter for economic policy.

The next section discusses the robustness of these results and presents extensions.

4. Further Discussion

There are four important issues that have not been investigated so far. The first issue is the lack of data for some variables and the resulting unbalanced panel. To test whether the lack of a significant impact of the index of globalization on expenditures, labor taxes and consumption taxes is due to a different dependent variable or a different sample, I replicate all regressions employing a balanced sample instead. As it turns out, this has almost no impact on the results reported in the tables. There are three exceptions: The impact of the index of globalization on capital taxes is significant at the ten percent level in the balanced sample even when no control variables are included. Also at the ten percent level, social expenditures are lower with rising economic integration (in the OLS specification of Table 5) and taxes on capital are higher with higher social integration (in the GMM specification of Table 5).

Second, as a potential shortcoming of the procedure used to derive the globalization indices, changes in the index over time might to some extent reflect missing data instead of real changes in globalization (Dreher 2003). To examine this shortcoming an alternative procedure to derive the index has been used as well: In those years where no data for some

categories exist, the latest data available have been employed for constructing the indices. Changes in the index over time therefore only reflect changes in the underlying data. The main results of the analysis are unchanged.

Third, as has been pointed out by Volkerink, Sturm and de Haan (2001), and Carey and Rabesona (2002), plausible changes in the definitions of tax ratios can lead to substantially changed results. To test for the robustness of the result regarding capital taxation, I therefore replicate the regressions, using three alternative measures of the tax burden. The first is taken from Volkerink and de Haan (2001) and is a different application of the Mendoza et al. (1994) methodology. The second and the third have been constructed by Devereux and Griffith (2003) and are based on an analysis of the legislation underlying the tax regimes. I focus on their base cases for the effective average tax rate and the effective marginal tax rate.

As one additional problem with the regressions presented so far, fourth, tax rates and government spending in a particular country might depend on tax rates and spending in other countries rather than (or in addition to) being dependent on globalization. Following Devereux et al. (2002), a country's policy reaction function can be written as

$$y_{i,t} = R_i(y_{-i,t-1}, X_{i,t}) \tag{2}$$

with $y_{-i,t-1}$ being the vector of tax rates and, respectively, expenditures in all other countries at time t-1. Clearly, this equation cannot be estimated given available degrees of freedom. Following the earlier literature, Devereux et al. (2002) therefore suggest replacing the vector $y_{-i,t-1}$ by the weighted average $A_{i,t} = \sum_{j \neq i} \omega_{ij} y_{jt}$. The assumption is thus that every country responds in the same way to the weighted average tax rate. I employ two different weights ω_{ij} . The first weight derives naturally from this analysis. Countries are likely to respond more to taxes and expenditures of other countries the more they are integrated with

the rest of the world.[16] The first weight used here is thus the index of globalization. The second weight is the inverse of the number of countries included – in other words, each country obtains the same weight.

The system of equations is thus

$$y_{it} = \alpha + \beta y_{it-1} + \gamma_1' G_{it} + \gamma_2 A_{it-1} + \eta' X_{it} + \eta_i + \varepsilon_{it} \quad (3)$$

The fixed period effects are excluded from the system, as they are largely included in the weighted average and the lagged dependent variable (see Devereux et al., 2002, for details). Note that the weighted average enters the regressions with a lag. From a theoretical perspective this is preferable, as it takes time for a country to respond to changes in other countries' policies. Econometrically, this allows estimation without instrumenting the potentially endogenous contemporaneous average policy variables (Devereux et al. 2002).

All previous regressions have been replicated with the lagged average of the respective policy variable for all countries (other than i) included. In no case are there substantial changes, with the average policy variables always being insignificant. The tables therefore only report the (OLS-)results for capital taxes. In addition to the tax ratios by Carey and Rabesona (used so far), the tables include results when the Devereux/ Griffith and Volkerink/ de Haan measures for the burden of capital taxation are used instead. All equations are estimated with and without the lagged dependent variable included in the regression.

As can be seen from columns 1-4 of Table 6, including the (lagged) average of other countries' tax rates to explain the Carey/ Rabesona tax ratios produces results similar to those reported in Table 5. At the ten percent level of significance capital tax rates are higher with higher economic integration – at the five percent level at least, they rise with social integration. In no regression is the weighted or unweighted average of other countries' taxes significant – whether or not the lagged dependent variable is included.

[16] Arguing along similar lines, Devereux et al. (2002) employ countries' openness to international flows.

Columns 9-12 of Table 6 contain results for the capital tax ratios taken from Volkerink and de Haan (2001). At the five percent level at least, capital tax ratios are higher with higher economic integration in all regressions. When the lagged endogenous variable is excluded, tax ratios also rise with political integration, which is in line with the a priori hypothesis. Political integration implies political collusion, leading to higher tax rates on capital. It is interesting to note that the dummy for left governments is significant at (least at) the ten percent level, with the expected sign.

As Table 7 shows, the results regarding the impact of integration on capital taxation are rather different when the adjusted statutory tax rates proposed by Devereux and Griffith (2003) are used as dependent variables instead. Columns 1-4 report results for the effective average rate, while results for the effective marginal rate are reported in columns 5-8. In five out of eight regressions the coefficient of economic integration is again significant, but with a negative sign. There is also evidence that taxation is lower with more social integration. It seems that there might be some degree of competition over the adjusted statutory rates, that is not reflected in the implicit rates. Statutory rates might be more sensitive as they are more important for politicians to attract capital (Hansson and Olofsdotter 2003). Comparing the results for the adjusted statutory tax rates with those for the implicit rates suggests that changes are made to statutory rates as a consequence of economic and social integration, and that these changes are more than offset by other changes affecting tax payments and the tax base.

5. Summary

Globalization has been severely criticized as being responsible for a shift in tax burden from mobile capital to immobile labor. Critics also claim that although the OECD countries' actual spending did on average increase over the last 30 years, spending (and taxes on capital)

would be higher without globalization, because the economic environment deteriorated since the seventies.

This paper did not make specific policy recommendations. Instead it tested whether, overall, globalization has the effects its critics claim. It analyzed the influence of globalization on the OECD countries' tax and expenditure policies in the last 30 years. Contrary to previous studies, the analysis not only took economic but also social and cultural integration explicitly into account. For the first time in such analysis, potential endogeneity of the regressors has been allowed for.

The results showed that only tax rates on capital have been influenced by globalization. While the positive effect of globalization on average effective capital tax rates could be due to the dominance of political integration over economic integration, the disaggregated analysis showed that economic integration is responsible for this positive relationship – a result that is supported by theoretical models and is most likely due to agglomeration forces allowing governments to increase tax rates on capital as a consequence of reduced transportation costs. The results for average effective tax rates are in stark contrast to those achieved for (average and marginal) tax rates based on tax legislation. Regarding these adjusted statutory rates, globalization indeed leads to competition.

The results also showed that few economic variables robustly influence tax rates – probably because decisions to change taxes are dominated by political considerations. This remains an avenue for future research.

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Table 1: Components of the Index of Globalization

A.	**Data on Economic Integration**	**[35%]**
	i) Actual Flows	(50%)
	Trade (in percent of GDP)	(23%)
	Foreign Direct Investment (in percent of GDP)	(29%)
	Portfolio Investment (in percent of GDP)	(27%)
	Income payments to foreign nationals (in percent of GDP)	(22%)
	ii) Restrictions	(50%)
	Hidden Import Barriers	(20%)
	Mean Tariff Rate	(30%)
	Taxes on International Trade (in percent of current revenue)	(24%)
	Capital Account Restrictions	(26%)
B.	**Data on Political Engagement**	**[28%]**
	Embassies in Country	(34%)
	Membership in International Organizations	(34%)
	Participation in UN Security Council Missions	(32%)
C.	**Data on Social Globalization**	**[38%]**
	i) Data on Personal Contact	(24%)
	Outgoing telephone traffic	(31%)
	Transfers (in percent of GDP)	(9%)
	International Tourism	(1%)
	Telephone Average Costs of Call to USA	(33%)
	Foreign Population (in percent of total population)	(26%)
	ii) Data on Information Flows	(39%)
	Telephone Mainlines (per 1000 people)	(18%)
	Internet Hosts (per capita)	(15%)
	Internet Users (as a share of population)	(18%)
	Cable Television (per 1000 people)	(16%)
	Daily Newspapers (per 1000 people)	(16%)
	Radios (per 1000 people)	(17%)
	iii) Data on Cultural Proximity	(37%)
	Number of McDonald's Restaurants (per capita)	(100%)

Notes: The number in parenthesis indicates the weight used to derive the indices. Weights may not sum to 100 because of rounding.

Source: Dreher (2003).

Table 2: Index of Globalization

	Index of Globalization						Political Integration	Social Integration	Economic Integration
	1975	1980	1985	1990	1995	2000	2000		
USA	4.56	4.61	4.53	4.50	6.09	6.48	7.88	6.90	4.92
Canada	5.49	4.99	4.65	4.79	5.67	6.26	7.61	6.28	5.17
Sweden	5.18	4.53	4.56	5.00	5.36	6.00	7.85	5.00	5.62
Finland	4.32	4.25	4.15	4.12	4.75	5.71	6.79	4.97	5.67
Denmark	5.28	4.63	4.38	4.23	4.55	5.69	7.26	4.60	5.63
Luxembourg	5.45	4.97	5.46	5.34	5.37	5.61	2.21	5.10	8.84
Belgium	6.30	5.33	5.40	5.43	5.24	5.48	7.33	3.49	6.18
Switzerland	4.86	4.61	5.32	5.13	4.76	5.44	5.63	4.81	5.96
UK	5.04	4.73	4.68	4.74	4.64	5.44	7.04	3.73	6.01
France	4.24	4.15	4.15	4.14	4.61	5.36	8.58	3.17	5.19
Norway	4.37	4.32	4.01	4.22	4.66	5.35	6.62	4.45	5.31
Netherlands	5.31	4.69	4.47	4.42	4.77	5.31	5.52	4.08	6.46
Germany	4.26	4.04	4.57	4.27	4.36	5.20	6.99	3.70	5.38
Austria	4.44	4.54	4.15	4.31	4.47	5.10	6.75	3.61	5.39
Australia	3.58	3.38	3.29	4.06	4.64	5.03	4.37	5.92	4.60
Ireland	3.59	3.63	3.62	3.85	4.04	4.95	4.92	3.30	6.75
New Zealand	3.31	3.24	3.12	3.38	4.06	4.91	3.35	5.70	5.30
Italy	4.14	3.83	3.82	3.80	3.90	4.50	7.05	2.05	5.11
Japan	3.92	3.56	3.54	3.75	3.63	4.38	4.84	4.24	4.16
Portugal	2.23	2.49	2.30	2.63	3.10	4.10	4.88	2.12	5.61
Spain	2.85	2.85	2.84	3.13	3.65	3.95	5.31	1.96	5.01
Iceland	3.49	2.94	2.91	2.97	3.07	3.90	2.05	4.35	4.87
Czech Rep.	.	.	.	.	2.91	3.75	4.48	2.19	4.86
Poland	2.77	2.95	3.58	2.71	2.79	3.74	6.30	1.93	3.65
Greece	3.01	2.90	2.69	2.73	2.90	3.70	4.30	2.27	4.76
Hungary	2.77	2.36	2.39	2.43	3.22	3.49	4.16	2.28	4.26
Korea, Rep.	2.71	2.52	2.33	3.04	2.99	3.25	3.65	2.39	3.86
Turkey	1.85	1.60	1.71	1.96	2.68	3.18	4.22	1.62	4.04
Slovak Rep.	.	.	.	.	2.35	3.06	2.80	1.94	4.48
Mexico	2.19	2.32	1.92	2.36	2.62	2.88	3.44	1.40	4.03

Notes: All indices range between 0 (not globalized) and 10 (globalized). Countries are ranked by their overall globalization score in the year 2000. See Appendix A for details.

Table 3: Globalization and Economic Policy (1970-2000, OLS AR(1), static model)

	Government spending, total		Government spending, social		Taxes on labor		Taxes on consumption		Taxes on capital	
Index of Globalization	-0.31	-0.11	-0.60	-0.97	-0.08	0.05	-0.47	-0.34	1.97	3.41
	(0.74)	(0.28)	(0.83)	(1.65)	(0.10)	(0.06)	(1.06)	(0.66)	(1.61)	(2.40**)
Dependency ratio		-1.00		-10.43		12.76		4.51		-31.76
		(0.17)		(0.91)		(0.73)		(0.45)		(0.90)
Unemployment (percent)		0.21		0.50		0.28		-0.03		0.21
		(3.99*)		(5.75*)		(2.05**)		(0.37)		(0.86)
Government employment (relative to all employment)		0.62		-0.03		0.17		0.17		0.79
		(4.66*)		(0.11)		(0.47)		(0.87)		(1.48)
Costs of Trade		2.94		3.77		8.79		-5.72		1.80
		(0.77)		(0.70)		(0.74)		(1.17)		(0.48)
Economic growth		-0.17		-0.31		-0.29		0.05		-0.17
		(2.36**)		(2.83*)		(1.50)		(0.45)		(0.46)
Left governments, Dummy		0.09		0.16		-0.11		0.13		-1.81
		(0.35)		(0.40)		(0.17)		(0.36)		(1.56)
Number of countries	30	26	29	26	23	22	25	24	24	22
Number of observations	139	85	102	85	79	70	91	82	77	66
R^2 (within)	0.25	0.73	0.32	0.73	0.11	0.31	0.16	0.22	0.19	0.40

Notes: All Regressions contain individual intercepts for each country and period. Standard errors are estimated robustly.
t-statistics in brackets: significant at the 1-percent-level (*), 5-percent-level (**) and 10-percent-level (^{o})

Table 4: Globalization and Economic Policy (1970-2000, OLS and GMM, dynamic model)

	Government spending, total		Government spending, social		Taxes on labor		Taxes on consumption		Taxes on capital	
	OLS	GMM	OLS	GMM	OLS	GMM	OLS	GMM	OLS	GMM
Index of Globalization	0.14 (0.35)	-0.16 (0.40)	-0.73 (1.04)	-0.74 (1.10)	0.03 (0.04)	0.51 (0.48)	-0.67 (1.15)	-0.68 (1.03)	3.34 (2.61**)	2.73 (1.74^{o})
Dependency ratio	-8.51 (1.71^{o})	-9.56 (2.34**)	-13.45 (1.61)	-2.92 (0.30)	-0.55 (0.05)	-6.00 (0.47)	-0.75 (0.12)	-10.57 (1.43)	-35.99 (2.18**)	-54.57 (1.44)
Unemployment (percent)	0.15 (2.71*)	0.17 (3.19*)	0.47 (4.57*)	0.53 (4.72*)	0.15 (1.14)	0.30 (1.22)	0.04 (0.51)	-0.01 (0.10)	-0.09 (0.37)	0.15 (0.30)
Government employment (relative to all employment)	0.45 (4.52*)	0.29 (2.56**)	0.20 (1.08)	0.15 (0.74)	0.13 (0.34)	0.14 (0.42)	0.09 (0.45)	-0.05 (0.25)	0.70 (0.99)	1.21 (1.93^{o})
Costs of Trade	1.12 (0.22)	1.16 (0.32)	0.05 (0.01)	0.91 (0.16)	-24.69 (1.95^{o})	-20.71 (1.25)	1.85 (0.49)	4.04 (0.74)	3.43 (0.12)	0.33 (0.01)
Economic growth	-0.28 (3.24*)	-0.25 (3.00*)	-0.49 (2.59**)	-0.31 (1.65^{o})	-0.66 (3.78*)	-0.42 (1.28)	0.08 (0.53)	0.06 (0.49)	-0.05 (0.14)	0.03 (0.08)
Left governments, Dummy	0.20 (0.75)	0.52 (1.60)	0.24 (0.43)	0.37 (0.68)	-0.27 (0.25)	-0.41 (0.48)	0.71 (1.48)	1.00 (2.11**)	-2.03 (1.32)	-1.37 (1.03)
Lagged endogenous variable	0.35 (3.01*)	0.33 (1.42)	0.26 (2.02**)	0.06 (0.17)	0.60 (5.38*)	0.02 (0.05)	0.49 (4.15*)	0.08 (0.28)	0.11 (0.72)	-0.21 (0.38)
Number of countries	28	27	26	25	22	21	24	21	22	19
Number of observations	115	86	89	62	71	49	83	59	67	45
R^2 (within)	0.63		0.81		0.70		0.47		0.53	
Sargan-Test (p-value)		0.0003		0.50		0.67		0.82		0.32
Arellano-Bond-Test (p-value)		0.03		0.61		0.85		0.50		0.98

Notes: All regressions contain individual intercepts for each period. The OLS regressions also include an individual intercept for each country.
Standard errors are estimated robustly. t-statistics in brackets: significant at the 1-percent-level (*), 5-percent-level (**) and 10-percent-level (^{o})

Table 5: Dimensions of globalization and economic policy (1970-2000, OLS and GMM, dynamic model)

	Government spending, total		Government spending, social		Taxes on labor		Taxes on consumption		Taxes on capital	
	OLS	GMM	OLS	GMM	OLS	GMM	OLS	GMM	OLS	GMM
Economic Integration	0.22	-0.12	-0.50	-0.69	0.10	0.28	-0.04	-0.59	2.63	3.25
	(0.70)	(0.42)	(0.90)	(1.47)	(0.15)	(0.33)	(0.10)	(1.14)	(1.69^{o})	(2.34**)
Social Integration	-0.06	-0.06	-0.30	-0.11	0.23	0.08	-0.27	-0.20	1.34	0.95
	(0.36)	(0.25)	(1.08)	(0.26)	(0.60)	(0.14)	(0.93)	(0.62)	(1.97**)	(1.24)
Political Integration	0.13	0.01	0.02	-0.69	-0.45	0.35	-0.23	-0.38	0.07	-0.22
	(0.57)	(0.04)	(0.04)	(1.47)	(0.63)	(0.56)	(0.81)	(0.90)	(0.09)	(0.27)
Dependency ratio	-7.26	-9.71	-14.18	-4.71	-0.88	-3.44	0.29	-10.74	-33.23	-47.67
	(1.37)	(2.25**)	(1.56)	(0.47)	(0.07)	(0.25)	(0.04)	(1.32)	(1.80^{o})	(1.24)
Unemployment (percent)	0.15	0.17	0.48	0.54	0.17	0.25	0.03	-0.02	-0.25	-0.04
	(2.66*)	(3.01*)	(4.58*)	(4.68*)	(1.32)	(1.05)	(0.41)	(0.20)	(0.77)	(0.07)
Government employment (relative to all employment)	0.43	0.29	0.23	0.21	0.15	0.15	0.07	-0.04	0.59	0.94
	(4.27*)	(2.47**)	(1.23)	(1.06)	(0.38)	(0.43)	(0.32)	(0.19)	(0.84)	(1.63)
Costs of Trade	1.06	1.04	-0.05	0.32	-22.76	-21.02	2.11	2.66	12.31	8.93
	(0.21)	(0.28)	(0.01)	(0.05)	(1.96**)	(1.25)	(0.57)	(0.46)	(0.37)	(0.31)
Economic growth	-0.28	-0.25	-0.48	-0.30	-0.65	-0.48	0.07	0.10	-0.001	0.13
	(3.22*)	(2.94*)	(2.39**)	(1.55)	(3.81*)	(1.49)	(0.46)	(0.68)	(0.00)	(0.67)
Left governments, Dummy	0.13	0.50	0.12	0.39	-0.02	-0.70	0.70	1.15	-1.71	-1.34
	(0.45)	(1.50)	(0.21)	(0.74)	(0.02)	(0.77)	(1.37)	(2.03**)	(1.11)	(0.98)
Lagged endogenous variable	0.33	0.36	0.25	0.06	0.58	0.15	0.47	0.35	0.10	-0.22
	(2.86*)	(1.58)	(1.92^{o})	(0.17)	(5.19*)	(0.46)	(3.65*)	(1.73^{o})	(0.69)	(0.45)
Number of countries	28	27	26	25	22	21	24	21	22	19
Number of observations	115	86	89	62	71	49	83	59	67	45
R^2 (within)	0.64		0.81		0.70		0.47			
Sargan-Test (p-value)		0.0005		0.62		0.50		0.49		0.46
Arellano-Bond-Test (p-value)		0.04		0.56		0.93		0.91		0.79

Notes: All regressions contain individual intercepts for each period. The OLS regressions also include an individual intercept for each country.
Standard errors are estimated robustly. t-statistics in brackets: significant at the 1-percent-level (*), 5-percent-level (**) and 10-percent-level (^{o})

Table 6: Dimensions of globalization and taxes on capital (1970-2000, OLS, static and dynamic models)

	Carey/Rabesona				Volkerink/de Haan			
	(1)	(2)	(3)	(4)	(9)	(10)	(11)	(12)
Economic Integration	2.57	2.21	2.61	2.25	2.39	3.12	2.18	2.90
	(1.85^{o})	(1.89^{o})	(1.88^{o})	(1.92^{o})	(2.47**)	(3.98*)	(2.22**)	(3.49*)
Social Integration	1.36	1.46	1.39	1.49	-0.17	-0.35	-0.23	-0.50
	(2.64*)	(3.22*)	(2.59**)	(3.18*)	(0.39)	(0.80)	(0.52)	(1.19)
Political Integration	0.20	-0.03	0.26	0.06	0.36	0.70	0.35	0.77
	(0.34)	(0.04)	(0.42)	(0.10)	(0.82)	(2.15**)	(0.79)	(2.08**)
Dependency ratio	-32.69	-29.30	-32.80	-30.12	-5.73	-12.66	-1.46	-6.28
	(1.94^{o})	(2.17**)	(2.90*)	(2.21**)	(0.44)	(0.87)	(0.14)	(0.50)
Unemployment (percent)	-0.23	-0.28	-0.23	-0.27	0.03	0.04	0.02	0.01
	(0.80)	(1.17)	(0.78)	(1.15)	(0.36)	(0.46)	(0.17)	(0.11)
Government employment	0.57	0.76	0.55	0.75	0.49	0.43	0.50	0.43
(relative to all employment)	(0.86)	(1.93^{o})	(0.82)	(1.94^{o})	(1.46)	(1.24)	(1.41)	(1.23)
Costs of Trade	-10.99	-7.91	-9.24	-7.65	-0.52	1.50	-0.77	1.54
	(0.36)	(0.38)	(0.31)	(0.37)	(0.09)	(0.24)	(0.13)	(0.26)
Economic growth	-0.03	-0.13	-0.05	-0.14	0.20	0.07	0.30	0.22
	(0.12)	(0.56)	(0.17)	(0.61)	(0.67)	(0.20)	(1.21)	(0.79)
Left governments, Dummy	-1.74	-2.54	-1.75	-2.56	1.66	1.64	1.62	1.58
	(1.18)	(1.91**)	(1.19)	(1.92^{o})	(1.97^{o})	(1.85^{o})	(1.92^{o})	(1.77^{o})
Lagged endogenous variable	0.09		0.09		0.23		0.26	
	(0.61)		(0.61)		(1.41)		(1.68^{o})	
Average Tax Ratio, t-1 (unweighted)	-0.31	-0.17			-0.45	-0.78		
	(0.78)	(0.44)			(0.80)	(1.49)		
Average Tax Ratio, t-1 (weighted)			-0.07	-0.05			-0.05	-0.09
			(0.70)	(0.53)			(0.54)	(0.98)
Number of countries	22	22	22	22	15	15	15	15
Number of observations	67	74	67	74	73	73	73	73
R^2 (within)	0.56	0.47	0.56	0.47	0.66	0.64	0.66	0.62

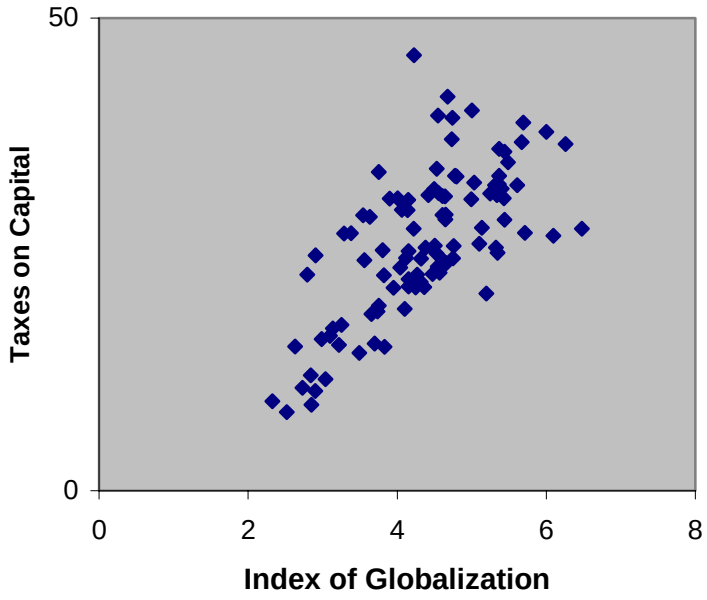
Notes: All Regressions contain individual intercepts for each country. Standard errors are estimated robustly.
t-statistics in brackets: significant at the 1-percent-level (*), 5-percent-level (**) and 10-percent-level (^{o})

Table 7: Dimensions of globalization and taxes on capital (1970-2000, OLS, static and dynamic models)

	Devereux/ Griffith (average rate)				Devereux/ Griffith (marginal rate)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Economic Integration	-3.42	-8.23	-3.58	-7.96	-3.37	-6.64	-4.08	-7.36
	(1.25)	(3.85*)	(1.33)	(4.17*)	(1.61)	(2.90*)	(1.87^{o})	(3.19*)
Social Integration	-1.60	-3.06	-1.70	-2.83	-0.90	-0.22	-1.51	-3.01
	(1.66)	(2.47**)	(2.03**)	(2.77*)	(0.61)	(0.21)	(1.02)	(1.81^{o})
Political Integration	0.77	0.94	0.89	1.29	0.02	-2.09	0.34	-0.82
	(1.13)	(0.97)	(1.31)	(1.32)	(0.02)	(1.21)	(0.34)	(0.85)
Dependency ratio	-14.23	-65.84	-23.47	-81.25	-54.26	-58.24	-50.50	-48.53
	(0.39)	(1.94^{o})	(0.60)	(2.42**)	(1.59)	(1.74^{o})	(1.44)	(1.43)
Unemployment (percent)	-0.78	-0.83	-0.71	-0.74	-0.77	-0.86	-0.74	-0.84
	(2.33**)	(2.23**)	(2.23**)	(1.96^{o})	(2.24**)	(2.31**)	(2.18**)	(2.26**)
Government employment	1.08	0.13	1.19	0.23	0.24	-0.05	0.46	0.23
(relative to all employment)	(1.14)	(0.11)	(1.29)	(0.20)	(0.27)	(0.05)	(0.53)	(0.23)
Costs of Trade	-16.60	-11.99	-15.80	-10.89	-20.91	-20.44	-22.02	-21.46
	(0.85)	(0.58)	(0.93)	(0.61)	(0.78)	(0.87)	(0.78)	(0.88)
Economic growth	0.14	-0.29	0.08	-0.38	0.35	0.17	0.37	0.23
	(0.28)	(0.53)	(0.15)	(0.74)	(0.52)	(0.27)	(0.54)	(0.35)
Left governments, Dummy	1.04	1.85	1.28	2.12	1.65	1.57	1.95	1.91
	(0.52)	(0.80)	(0.65)	(0.95)	(0.76)	(0.66)	(0.89)	(0.81)
Lagged endogenous variable	0.43		0.43		0.30		0.29	
	(2.69**)		(2.56**)		(2.75*)		(2.55**)	
Average Tax Ratio, t-1 (unweighted)	-0.10	-0.51			0.31	0.29		
	(0.21)	(1.07)			(1.09)	(0.78)		
Average Tax Ratio, t-1 (weighted)			-0.09	-0.21			0.03	0.04
			(0.77)	(1.59)			(0.26)	(0.30)
Number of countries	18	18	18	18	18	18	18	18
Number of observations	63	68	63	68	63	68	63	68
R^2 (within)	0.62	0.56	0.63	0.58	0.65	0.58	0.64	0.57

Notes: All Regressions contain individual intercepts for each country. Standard errors are estimated robustly.
t-statistics in brackets: significant at the 1-percent-level (*), 5-percent-level (**) and 10-percent-level (^{o})

Graph 1: Tax Rates on Capital (Carey and Rabesona) and Globalization



Appendix A: Construction of the Index of Globalization (Dreher 2003)

To construct the indices of globalization, each variable (of Table 1) has been transformed to an index with a zero to ten scale, whereas higher values denote more globalization. When higher values of the original variable indicate higher globalization, the formula $((V_i-V_{min})/(V_{max}-V_{min})*10)$ has been used for transformation. Conversely, when higher values indicate less globalization, the formula is $((V_{max}-V_i)/(V_{max}-V_{min})*10)$. This is the procedure employed by Gwartney, Lawson and Samida (2002) in the construction of their economic freedom index. The weights for the sub-indices are calculated using principal components analysis. The year 2000 is used as the base year. For this year, the analysis partitions the variance of the variables used. The weights are then determined in a way that maximizes the variation of the resulting principal component, so that the index captures the variation as fully as possible.

If possible, the weights determined for the base year are then used to calculate the indices for each single year back to 1970. Where no data are available, the weights are readjusted to correct for this.

Appendix B: Definitions

Government Expenditure, total:	General government final consumption expenditure (percent of GDP).
Government Expenditure, social:	Public Social Expenditure in percent of GDP.
Effective tax rates on labor, consumption and capital:	Actual revenue in relation to tax base.
Average adjusted statutory tax rate on capital:	Average effective tax rates based on analysis of the legislation underlying different tax regimes.
Marginal adjusted statutory tax rate on capital:	Marginal effective tax rates based on analysis of the legislation underlying different tax regimes.
Dependency ratio:	Dependents to working-age population.
Unemployment (percent):	Total unemployment in percent of total labor force.
Government employment:	General government employment (producers of government services) as a percent of working age population.
Costs of Trade:	Value of imports c.i.f. relative to value of imports f.o.b.
Economic Growth:	Real GDP growth in percent.
Left Governments, Dummy:	Dummy with the value 1, if chief executive is from a left party and zero otherwise.

Appendix C: Descriptive Statistics and Data Sources

Variable	Source		Average	Std. Dev.
Index of Globalization	Dreher (2003)	overall between within	4.02	1.08 0.99 0.46
Economic Integration	Dreher (2003)	overall between within	4.71	1.21 1.03 0.61
Political Integration	Dreher (2003)	overall between within	2.60	1.42 1.21 0.76
Social Integration	Dreher (2003)	overall between within	5.11	1.71 1.59 0.71
Government Spending, total	World Bank (2002)	overall between within	17.85	4.72 4.47 1.50
Government Spending, social	OECD (2003)	overall between within	19.66	7.18 6.93 2.58
Effective Taxes on Consumption	Carey and Rabesona (2002)	overall between within	16.71	5.28 5.16 1.40
Effective Taxes on Capital	Carey and Rabesona (2002)	overall between within	26.42	7.83 7.79 2.88
Effective Taxes on Capital	Volkerink and de Haan (2001)	overall between within	20.26	6.19 5.60 2.92
Effective Taxes on Labor	Carey and Rabesona (2002)	overall between within	30.41	9.55 9.14 2.75
Average adjusted statutory tax rate on capital	Devereux and Griffith (2003)	overall between within	25.42	10.51 8.63 5.96
Marginal adjusted statutory tax rate on capital	Devereux and Griffith (2003)	overall between within	35.32	10.28 7.64 6.48
Dependency Ratio	World Bank (2002)	overall between within	0.54	0.09 0.07 0.05
Unemployment (percent)	World Bank (2002) European Commission (2003)	overall between within	6.11	4.05 3.19 2.70
Government Employment	Cusack (1998) OECD (2000)	overall between within	10.87	5.72 6.63 1.41
Costs of Trade	IMF (2003)	overall between within	1.0004	0.22 0.21 0.03

Appendix C (continued)

Variable	Source		Average	Std. Dev.
Economic Growth	World Bank (2002)	overall	2.38	1.71
		between		1.08
		within		1.37
Left Governments, Dummy	Beck et al. (2001)	overall	0.45	0.42
		between		0.31
		within		0.29