

Tax Competition, Fiscal Policies, and Income Redistribution

A Simultaneous Equation Model Approach

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Summary:

When capital is not perfectly mobile, tax competition does not cause a convergence towards a zero percent tax rate on capital. Rather, tax competition distinguishes winners (countries in which net capital imports increase) and losers (countries in which net capital exports increase). In this situation, governments in countries which lose tax competition command over five major adjustment strategies: they can increase effective capital taxation and effective labor taxation to stabilize revenues, they can reduce government consumption and social security transfers, and they can substitute revenues by running larger deficits. In practice, governments will chose a combination of adjustment strategies, which depends on the size of the country, the share of immobile tax bases, and initial conditions such as the level of debt, government spending and social security transfers. The impact of tax competition on income redistribution and income inequality, then, depends not only on the adjustment strategies, but also on the way in which countries redistribute income. Since tax competition exert a larger effect on tax policies than on fiscal policies, countries which dominantly redistribute income via the tax system (Anglo-Saxony and to a lesser extent Scandinavian countries) are more likely to experience an increase in income inequality than countries which dominantly redistribute income via social security transfers (continental European welfare states). We test the hypotheses derived from this logic using a simultaneous equation model. We find general support for most predictions derived from the models.

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1. Introduction

The common wisdom of globalization theories largely changed over the year. Twenty years ago, many political economists expected that the international integration of financial markets obstructs governments' ability to tax capital. Tax competition would lead to a race to the bottom; in equilibrium, the effective capital tax rate approaches zero. As a consequence, governments suffer from declining revenues and a growing inability to provide public goods and to redistribute income. The welfare state comes more and more under pressure. Income inequality grows and social tensions arise which jeopardize political stability in the long run (Rodrik 1997; Scharpf 1991). Today we are safe to conclude that none of the above predictions came literally true: Capital tax rates remain far from approaching zero, on average governments spend even more than twenty years ago, post-tax income inequality remains significantly lower than pre-tax inequality and has not significantly risen in most OECD countries since tax competition was triggered off by the US tax reforms between 1984 and 1986.

This article offers a unified explanation for apparent gaps between the predictions of early globalization theories and empirical observations. In a nutshell, we argue that capital mobility and tax competition have less severe effects on fiscal policies and the functioning of the welfare state simply because capital is not fully mobile. With incompletely mobile capital, no government is forced to abandon capital taxation. Rather, governments maintain a positive tax rate to collect revenues from taxing companies, and they will be able to do so because some part of the capital stock is not mobile.¹

This lack of a race to the bottom in capital taxation has a second noteworthy consequence: governments will respond differently to tax competition. The first distinction results from the

1 See Plümper, Troeger and Winner (2009) for a formal analysis of this logic.

fact that some countries win tax competition and become net capital importers, while other countries become net capital exporters. Liberal market economies with a small domestic capital base are most likely to win tax competition. These countries will act most aggressively in tax competition and implement lower effective capital tax rates than larger countries and social welfare states.

Yet, adjustment strategies also differ within this second group of countries – the ones losing tax competition. Governments in these countries have five major adjustment strategies available: increase effective capital and labor tax rates to stabilize revenues, run higher deficits to compensate for declining revenues, and implement cuts in government consumption and social security transfers.

Which combination of adjustment strategies policy makers choose, depends on country size, the size of the immobile capital basis (to GDP and to the total tax basis), initial conditions such as the level of public debt, the size of the public sector, and the generosity of the welfare state, and on the influence of unions on the political decision making process. In short: countries with a less mobile capital basis are more likely to increase effective capital tax rates, countries with weaker unions are more likely to shift revenues to labor taxation, countries with high initial debt level are more likely to increase both capital and labor taxation, countries with a large public sector and social welfare state are more likely to increase taxation and run higher deficits, because governments seek to minimize political adjustment costs.

Whether tax competition has consequences on income inequality and income redistribution depends on the adjustment strategies and on the way in which countries redistribute income. Countries which dominantly redistribute income via taxation will *ceteris paribus* experience a moderate increase in income inequality, because reforms of the tax system are difficult to avoid unless governments are willing to run high deficits. Social welfare states mainly redistribute income via social security transfers. Since fiscal policy adjustments can be avoided by moderately increasing tax rates and deficits, income inequality in these countries is unlikely to change.

The countries winning tax competition – relatively small liberal economies – may keep tax rates either stable or reduce effective capital and labor tax rates moderately. The import of capital ensures that revenues from capital taxation will increase, so that governments in these countries can spend more and enlarge the social welfare system. The economic miracle generated by capital imports and rising revenues allows governments to redistribute more income and reduce income inequality.

We test this logic within a simultaneous equation approach which allows for endogeneity of the effective domestic capital and labor tax rate and the fiscal adjustment strategies. In other words, our empirical model nicely mirrors the fact that governments choose the various elements of their adjustment strategy simultaneously. We demonstrate that our theory is not only much more in line with the obvious observable facts such as persistently high effective capital tax rates and the survival of the welfare state. The various predictions of our theory also find support in analysis of the simultaneous equation model. In short, we find that a) capital tax rates remain relatively high, we observe b) a shift from capital to labor taxation, and we see that c) the political responses to tax competition vary as predicted with the level of government spending and social transfers, with debt and with the electoral system.

Our paper makes two major contributions the literature on tax competition and income inequality: The first contribution is theoretical. Our theory correctly predicts a) the absence of a race to the bottom in capital taxation, b) a significant increase in labor taxation absolute and especially relative to capital taxation, c) cross-country patterns in fiscal policy adjustments, and d) an effect of policy adjustment which is conditional to the size of social security transfers.

The second contribution is methodological: Since our theory holds that tax and fiscal policies are not independent of each other, we test our explanation in a simultaneous equation model that accounts for the complex endogeneity and simultaneity problems caused by the interdependence of tax competition, tax reforms, government spending, income redistribution and income inequality.

2. Why did Income Redistribution Survive Tax Competition?

A Brief Survey of the Literature

No doubt, the early theory of international tax competition sounds plausible. Yet, even a superficial view at the evidence reveals a significant gap between predictions and the persistence of capital taxation, the welfare state, and the relative high stability of unequal capital endowment. But that is not the entire story, because evidence provided by rigorous quantitative research gives more mixed results. Virtually all studies of tax competition detected a positive spatial effect in capital taxation, suggesting that if one country decreases (increases) capital tax rates, others will also decrease (increase) capital tax rates.² Some empirical studies also find that lower capital tax rates are associated with higher effective labor tax rates, indicating a substitution effect between the two major sources of government revenue.³ While these results on tax policy reforms seem generally accepted, the related questions whether tax competition reduces government spending⁴ and increases budget deficits remain controversial. Similarly, researchers remain divided on the effect of tax competition on the ability of policy makers to redistribute income⁵ and trends in income inequality.⁶

With these scattered findings, general empirical support for the early theories of tax competition remains rather limited. Overall, there can be no doubt that the political and social consequences were less severe than scholars initially expected. The social welfare state persists,⁷ governments still tax capital owners and corporations, and, while redistribution has declined and income inequality has risen in some countries, this trend was by no means common to all OECD countries and it has not yet brought about a serious upsurge in political instability.

2 See, inter alia Hallerberg and Basinger (1998), Basinger and Hallerberg (2004), Hays (2003) Swank and Steinmo (2002), and Swank (2006).

3 Plümper et al. (2009).

4 See Garrett and Mitchell (2001). However, some authors argue that government spending remained by-and-large unaffected by globalization (Plümper, Troeger and Manow 2005).

5 While Mahler (2004) finds only „scattered relationships“ between international economic integration and income redistribution, Ganghof and Genschel (2008: 58) maintain that “tax competition (...) has important indirect effects” and “can constrain national redistribution in a major way”.

6 Compare Cusack and Iversen 2000; Kenworthy and Pontusson 2005; Iversen and Soskice 2006 to Goesling (2001), Kentor (2001), Alderson and Nielson (2002), and Lee et al. (2007).

7 Iversen and Cusack (2000), Garrett and Mitchell (2000), and Plümper et al. (2005).

Conditional Theories of Tax Competition

The gap between theoretical expectations of zero capital rates first generation models of tax competition theories predict on the one hand and the persistence of high effective capital tax rates on the other hand set off research which aims at explaining why the consequences of tax competition indeed remain moderate. Virtually all these ‘second generation’ models of tax competition accept the general economic logic of tax competition and thus the predictions of a zero capital tax rate. Starting from there, these models claim that some governments are more constrained than others and thus cannot fully compete for mobile capital. For example, a bicameral system limits the governments’ ability to participate in tax competition. If a smaller number of countries actively competes for mobile capital, the overall competitive pressure declines so that governments in all countries can maintain positive tax rates (Hallerberg and Basinger 1998; Basinger and Hallerberg 2004).

Similar arguments have been made with proportional electoral systems and voter preferences. In the former argument, proportional systems provide more and stronger checks and balances, so that political majorities cannot easily choose “transfer maximizing capital tax rates” (Hays 2008: 136). In the latter argument, the ease and speed with which the American tax reforms were mirrored in other countries mainly depends on the distribution of voter preferences: “Extended right-party government will bolster mass and elite support for liberalization and market-oriented policies generally and produce incremental (...) enactments of a variety of neoliberal economic and social policy reforms that lay the groundwork for a shift in the tax policy paradigm. (...) [T]he position of the median voter ultimately determines policy: electoral support for notable reductions in marginal capital tax rates is requisite for adoption of focal reforms. As suggested above, substantial reductions in marginal tax rates on capital imply potential diminution of the commitment to redistribution, suggest economic gains for upper-income strata, and raise the specter of reductions in social protection and public goods provision.” (Swank 2006: 857). According to Swank (2006), the speed of adjustment to tax competition was higher in countries with uncoordinated market institutions. Swank interprets

the findings as determined by partisan differences (Swank 2006: 857), though strong unions and corporatist wage bargaining in itself already provide a disincentive to reducing capital taxation because unions would demand a compensation from employers (Summers, Gruber and Vergara 1993).

If these theories are correct, capital tax rates remain positive because some governments are more constraint than others. This, of course, implies lower pressure on government spending and social security transfers than predicted by first generation theories of tax competition.

Conditional Theories of Government Spending

Political scientists working on government spending and the welfare state have mainly ignored these second generation models of tax competition. Rather, they explain the persistence of the welfare state and high levels of government spending with basically the same factors that have been employed in the recent tax competition literature. Crepaz and Moser (2004: 267, see also Hines 2006: 331) assume: “Countries will have to compete against each other for attracting capital by offering lower wages and taxes thereby leading to a race to the bottom (...). Realizing that significantly extending the scope of social provision, public consumption, and tax burdens will undercut the confidence of business in a profitable rate of return on investment, governments cannot afford to continue providing generous welfare schemes. The end effect of this competitive deregulation (...) is a dismantling of the welfare state, its political institutions, and the social insurance schemes that have protected its populations.”

According to Crepaz and Moser (2004), the effect of tax competition on government spending remains small, not because tax competition does not lead to the predicted zero tax rate equilibrium but because governments’ spending decisions are constrained by political institutions. Along similar lines, Genschel (2002: 266) claims that tax competition has had a rather limited effect on social policies because welfare states not only faced tax competition but were also confronted with slow growth, sticky budgets, increasing public debt and rising unemploy-

ment. In others words, theories claim that tax policies were constrained by the governments inability to reduce spending – and not by governments’ inability to reduce capital tax rates.

In equilibrium, these theories basically predict stable levels of government consumption and social security transfers. If governments can maintain stable levels and patterns of spending, the effect of tax competition on social inequality should remain moderate. But again, political scientists working on income inequality often ignore these insights and develop their arguments from first generation models of tax competition and from the similarly old efficiency hypothesis, which predicts a severe decline in government spending.

Conditional Theories of Income Inequality

Social scientists generally perceive rising income inequality as one of the consequences of tax competition, for basically three reasons: First, capital mobility fosters the process of economic specialization across countries and leads to a higher demand for skilled workers and a much lower demand for unskilled workers in OECD countries. Since re-education has not kept up with these changing demand patterns, high skilled workers experienced a significant pay rise, whereas wages of low wage earners stagnated at best (Gottschalk and Smeeding 1997). Second, tax competition caused a reduction in effective taxation of capital income. Since relatively wealthy individuals own a disproportionately large share of assets in all OECD countries, the decline in capital tax rates reduced the effective tax burden of the rich, while the effective tax burden of the lower income levels remained at least constant. Accordingly, income inequality has risen. And third, declining tax revenues severely reduced the governments’ ability to redistribute income via the ‘welfare state’ (Korpi and Palme 2003).

Yet, if due to institutional constraints tax competition has little effect on tax *and* fiscal policies, income redistribution and income equality should not have faded since the US tax reforms triggered off tax competition. However, scholars working on income inequality stuck to first generation models of tax competition and assumed that without political constraints on redistributive policies, tax competition had distributional consequences. For example, accor-

ding to some authors (Garrett 1998a, 1998b; Minnich 2003: 50) left governments respond differently to tax competition than right governments and veto-players prevent governments from responding to the imperatives of tax competition (Crepaz 2002: 170). Crepaz (2002) claims that coalition governments make it easier for policy makers to change redistributive policies, while institutionalized systems of checks and balances tend to impede policy adjustments. Where second chambers and courts exert an influence on policies, income inequality will remain stable despite the pressures of tax competition.

Similarly, Minnich (2003) draws on the broader corporatist literature to argue that corporatism not only survives globalization, but also mitigates its consequences on income inequality. As before, these explanations contrast with recent developments in the tax competition literature. Scholars now widely agree that tax competition may cause a decline in revenues from capital taxation, but that revenues from taxing corporations are too small to explain social security transfers.

Overall, the various explanations of policy adjustments to tax competition are mutually exclusive. If later models of tax competition are correct, the revenue effects of tax competition remain so small that the welfare state and the political ability to redistribute income do not come under much pressure.

Open Questions and Remaining Puzzles

Policies are not independent of the each other. If this is true, then most if not all empirical analyses of the consequences of tax competition suffer from omitted variable bias because the influence of one policy reform on other policy reforms (for example the influence of a reform of the tax system on the likelihood of fiscal policy adjustment) is typically neglected. We believe that an integrated perspective on tax competition, tax policies, fiscal policy adjustment, and income redistribution is needed. Since governments choose their adjustment strategy, studies which just look at a single policy are likely to lead to wrong inferences.

We also do not believe that the story of tax competition is as straightforward as suggested by the above discussed models. First, while capital tax rates remained more stable and higher than expected by first generation models, not all governments maintained stable effective tax rates. The *winners* of tax competition have moderately reduced effective capital tax rates, and some larger liberal economies kept fairly stable tax rates, but (Southern) continental and Scandinavian welfare states actually increased effective capital tax rates. The second generation models may partly explain these cross-country differences but they are not well equipped to explain the increasing effective capital tax rates in welfare states. And second, if governments respond differently to tax competition we should not expect identical adjustments to fiscal policies. Fiscal policy reforms, then, follow from tax policy adjustments in respect to both capital and labor taxation. At the same time, policy reforms become contingent to each other. When governments increase effective labor tax rates, they do not have to increase capital tax rates or cut spending. When governments cut spending, they can maintain lower capital and labor tax rates.

It seems obvious to us that political instruments are not independent of each other and decided upon simultaneously by governments. Apparently, political scientists need to develop theories which relate political instruments to each other and to the political, institutional and socio-economic settings in which governments decide on policies. In the following section, we will develop such a unified perspective on tax competition – a perspective which aims at explaining different adjustment strategies in tax and fiscal policies along with its consequences on redistribution and income inequality.

3. Theory

Tax competition set in with the US tax reforms between 1984 and 1986 (Swank 2008: 847). After 1986, all governments in OECD countries responded in one or the other way to the US capital tax reforms. Almost all countries reduced nominal tax rates, but the effective capital tax rates hardly changed and even increased further despite tax competition (Plümper et al.

2009). This is puzzling because early theories predict a complete abolition of capital taxation, but also because corporations should care more about effective than about nominal tax rates.

This section explains the policy adjustment to tax competition and provides a partial answer why effective capital tax rates increased. We also discuss the adjustment strategies of governments in tax competition for incompletely mobile capital. When capital is not fully mobile and countries differ in respect to initial conditions when they enter into tax competition, we do not observe a ‘pooling equilibrium’, in which all countries choose the same strategy, but to a ‘separating equilibrium, in which countries employ different strategies (Plümper et al. 2009).

We develop our theory in three major steps: In the first step we explain why governments choose different capital tax policies when capital is incompletely mobile and countries heterogeneous. In a second step, we identify different adjustment options. In short, governments have five major adjustment strategies at their disposal: they can increase capital and labor tax rates, accept higher deficits, and cut government spending and social security transfers. We contend that these differences are systematic: countries with higher initial debt are less likely to run higher deficits in order to cope with declining revenues from capital taxation, countries with stronger unions are less likely to shift the tax burden to labor, while social welfare states seek to maintain high levels of government spending and especially social security transfers. We argue that governments opt for a combination of adjustment strategies which reduces political costs. When choosing a response strategy, governments seek to maximize political support in countries winning tax competition and minimize the loss in political support in countries losing tax competition. This allows us to argue that the effect of tax competition on income redistribution and income inequality has been so small, because a) an increase in income inequality usually leads to a decline in political support and b) many governments had a variety of adjustment strategies available which minimized the effect of tax competition on income inequality. In the final step we explain why some governments perform better in avoiding these costs and especially why income inequality increases in some

countries but not in others. We argue that the choice of adjustment strategies and the way in which countries dominantly redistribute income explains the effect of tax competition on income inequality.

Imperfectly Mobile Capital and the Absence of a Race to the Bottom

Tax competition would cause a race to the bottom if, but only if, capital was fully mobile. Under this condition a country implementing an effective tax rate higher than the lowest available effective tax rate suffers a complete loss of capital which reduces revenues from capital taxation to nil.⁸ In the absence of perfectly mobile capital, however, effective capital tax rates will not approach zero. Governments can generate revenues from the relatively immobile part of the domestic capital stock even if they implement capital tax rates higher than those in other countries. While there are potentially numerous reasons for incompletely mobile capital, we contend that the most obvious reason is that many corporations produce non-tradable goods and services. As a consequence, business activities of these corporations depend on presence in a specific market. Unless effective tax rates are prohibitively high and reduce demand for their goods and services to virtually zero, corporations stay in the market irrespective of the effective tax rate.⁹

Limits to capital mobility allow governments to generate revenue from taxing capital even if other countries offer significantly lower effective tax rates.¹⁰ In consequence, effective capital tax rates will not approach zero in equilibrium (Plümper et al. 2009), and governments can counter the revenue effects of tax competition not only by cutting effective capital tax rates. When capital is not fully mobile, governments may also stabilize revenues by *increasing*

⁸ There was no obvious equilibrium if models of tax competition allowed for subsidies. In this case and with fully mobile capital, governments could not profit from capital taxation, but still redistribute income from less to more mobile capital.

⁹ Other factors include capital concentration, tax system intransparency, legal measures against tax arbitrage, and factors other than taxes which influence firms' competitiveness.

¹⁰ We are aware that factors other than tax rates (such as infrastructure, the provision of skilled labor etc.) influence the location decision of capital owners. Yet, these factors have been present before tax competition started and the US tax reform act of 1986 can be seen as an external shock to the previous equilibrium distribution of capital.

effective capital tax. In this case, the country's taxable capital base will definitely decline as the mobile share of the domestic capital base leaves the country, but the higher tax rates on the remaining capital may compensate for the revenue loss resulting from the country's declining capital base if the larger part of the capital base is sufficiently immobile. As we will later see, these consequences influence countries' fiscal policy adjustments to tax competition. Before we turn to discussing these fiscal adjustments, we first provide a theoretical argument which identifies the likely winners of tax competition.

Winners and Losers in International Tax Competition

Capital mobility creates incentives for lowering effective capital tax rates. However, these incentives are not strong enough to turn capital taxation into an unviable policy instrument and to bring about full convergence of effective capital tax rates. Competitions distinguish winners from losers. This is not different in international tax competition.

Countries that win international tax competition will become net importers of foreign capital. These capital inflows and the ability to tax them provide great opportunities. Governments can pay off public debt, reduce labor taxes or increase government consumption and social transfers. Countries losing tax competition will become net exporters of capital. For these countries, a reduction in effective capital tax rates is less desirable. On the one hand, lower effective capital rates will prevent capital outflows, thereby maintaining a relatively large taxable capital base. On the other hand, however, lower capital rates imply a decline in revenues from the taxation of the domestic capital base.

Whether a country wins or loses tax competition depends mainly on the relative size of the countries' capital stocks. If countries with a relatively small domestic capital stock reduce effective capital tax rates to competitively low levels, they will attract capital inflows which are significant relative to their domestic capital base. As a consequence, revenues from capital taxation may increase despite lower tax rates because the tax base grows significantly. If countries with a relatively large domestic capital stock reduce effective capital tax rates, they

will still attract an inflow of capital, but the revenues generated from this additional capital is less likely to compensate for the revenue losses caused by the reduction in effective capital tax rates.

In other words: Country size matters because of the relative strengths of the tax base effect and the tax rate effect. If a country reduces the effective capital tax rate, revenue from the existing capital base declines. This is the tax rate effect. At the same time, however, the country imports additional capital which increases revenue (unless the new tax rate equals zero or is negative). This is the tax base effect. In large countries, the tax rate effect dominates, because the tax base the country can attract is small relative to its own tax base. In small countries the tax base effect dominates because the capital imports are large relative to its initial capital base. *Ceteris paribus*, small countries act more aggressively in tax competition, because they are much more likely to win tax competition.¹¹

Yet, while certainly the most important single determinant of competitiveness in international tax competition, country size is not the only factor. Additional influences have been stressed in the political economic literature of taxation and fiscal policies: To start with, the electoral system influences the number of parties represented in parliament and thus the probability of a coalition government. Since coalition governments spend significantly more than single party governments (Persson and Tabellini 2000, chapter 5), the need to raise large revenues is politically more pressing in proportional systems, which not only leads to higher effective capital *and* labor tax rates before tax competition unfolds its effects, but also makes incumbents more vulnerable to spending cuts (Hays 2003, 2008). These high levels of spending and spending rigidity both provide a crucial obstacle to a country's effective

¹¹ This argument mirrors the economic research on asymmetric tax competition (Bucovetsky 1991, Wilson 1991, Kanbur and Keen 1993, Peralta and van Ypersele 2005). Proponents of this approach argue that a symmetric account of tax competition eliminates possible terms of trade effects and a conflict of interest between the competing jurisdictions cannot arise. Within the asymmetric tax competition model, the small country faces a more elastic tax base and undercuts the tax level of the large country in an asymmetric Nash equilibrium. The tax base of the small country will thus be larger than in the closed economy case opening the possibility for the small jurisdiction to gain from tax competition. The predictions of asymmetric tax competition find ample empirical support. All else equal, larger countries tend to impose higher tax rates on mobile capital than small countries (Bucovetsky 1991, Wilson 1991, Kanbur and Keen 1993).

political participation in tax competition. Apparently, governments in countries with a high initial level of government consumption caused by social security transfers would have to reduce spending and transfers much more than liberal market economies to become highly attractive for foreign capital. Yet, welfare state retrenchment is politically more costly if demand for their provision was high in the first place. Governments in welfare states usually face intense public opposition to severe cuts in government spending in general and social security transfers in particular.

This argument points to the importance of labor market institutions. Countries with more flexible labor markets and with lower levels of income redistribution are able to cut capital taxes more aggressively. Adjustment strategies thus also depend on labor market institutions and unemployment. In countries with either weak labor market institutions (USA, UK, Ireland) or low unemployment rates (Switzerland, Japan), governments find it comparably easy to cope with the pressures of tax competition on public households. These countries actually shift a larger share of revenues to the taxation of labor and consumption. Countries with less flexible labor markets can not easily increase labor taxes because social security transfers (Continental Europe) or public employment (Scandinavia) has already made labor relatively expensive. Further hikes in labor costs threaten to further reduce the demand for labor, thereby giving rise to higher unemployment. Hence, union density not only contributed to a large welfare state, union density also provided an important obstacle to welfare state retrenchment.

Governments which compensate losses in capital tax revenues by increasing deficit spending can more easily reduce effective capital tax rates, thereby competing more aggressively for mobile tax bases. Already highly indebted countries which could not or not as easily use deficits to balance declining capital tax revenues (such as Belgium and Italy) came under pressure. Debt service in these countries had already burdened tax payers before tax competi-

tion put tax systems under additional stress. Further increases in public debts were prohibitively costly, because interest rates tend to increase with higher initial debt levels.¹²

In sum, countries differed significantly when the abolition of capital controls and the US tax reforms triggered tax competition between all major OECD countries. Small economies faced the largest incentives to attract foreign capital by radically reducing effective capital tax rates while liberal economies faced the lowest political costs of actually doing so. As a consequence, small liberal economies with low initial levels of government consumption, social security transfers and public debt were most likely to profit from tax competition. On the other end of the distribution, large welfare states with strong unions and a high debt burden were least likely to win tax competition. Even if these countries reduced effective capital tax rates significantly, they would still not be able to attract significant inflows of capital, because governments in smaller, more liberal economies would find it easy to undercut their tax rates.

Tax Policy and Fiscal Adjustment to International Tax Competition

Since capital is not fully mobile and thus the effective capital tax rate remains significantly above zero for all countries, revenues from taxing capital do not necessarily decline. First, revenues from capital taxation may in fact increase in small liberal economies which offer competitively low capital tax rates. While revenues from the domestic capital base decline, the taxation of imported capital can overcompensate for these losses. We already dubbed these countries the winners of tax competition. Second, countries with a relatively immobile capital base may increase effective capital rates to maintain previous revenue levels from taxing capital. In this latter case, the taxable domestic capital base will decline, but the higher effective tax rate can lead to stable or even higher revenues.¹³

12 At the same time, the European monetary integration and the Maastricht criteria added pressure on these governments. Seeing the necessity to be not left behind, they had to reduce budget deficits and public debts. For these countries, the consolidation of public households became arguably more important than to enter into a competition with low tax countries that they would almost certainly lose.

13 Most governments will not rely solely on this adjustment strategy, because the potential economic consequences of significant capital outflows seem dire and the political costs high. However, raising capital taxes in combination with other adjustment measures appears a viable strategy to many governments and

Tax competition exerts more fiscal pressure on countries with a higher share of mobile capital, but even governments in these countries have a variety of adjustment strategies at their disposal. A first line of defense is offered by changes to the tax system itself. A rather obvious alternative consists in shifting revenue from capital taxation to other taxes, most notably to labor taxes. This usually implies an increase in the gap between effective labor tax rates and effective capital tax rates (Schulze and Ursprung 1999, Plümper et al. 2009). Raising labor taxes often offers an easy response to declining revenues from the taxation of capital, especially since relatively moderate increases in labor taxes can already fully compensate for the losses in revenues from capital taxation. This is so because revenue from labor taxes on average exceeds revenue from corporate taxation by at least factor 2 in most OECD countries (Hines 2006: 343). Thus, on average, a 2 percentage point increase in labor taxation compensates for a 4 percentage points decline in capital taxation. This shift towards labor taxes, however, is more difficult in countries where unions are strong. Therefore, governments are less likely to shift the tax burden to labor in countries where unions are relatively strong. In addition, shifting the tax burden towards labor will be a politically risky strategy for left parties, which depend on votes and electoral participation of workers (Ganghof 2007, Troeger 2008).

As a second line of defense, governments may – at least for some time – ignore declining revenues from capital taxation and simply allow higher deficits. In doing so, they can prevent an increase in taxes and still maintain previous levels of government spending and social transfers. This is a viable strategy in large countries or in countries with a large and popular welfare state where labor taxes already are relatively high. Obviously, welfare states are very unlikely to win international tax competition, therefore radically cutting capital taxes does not appeal to them. However, in order to make the do nothing and run deficits strategy work, governments must have relatively low initial levels of public debt. For countries which

especially so for countries with a relatively large share of immobile capital, that is with a large agricultural and a large service sector. Thus, a large and competitive service industry as in the UK, a rapidly growing construction industry as in Spain, and a large and highly subsidized agricultural sector as in Italy and France in principle allow governments to maintain relatively high levels of capital taxation.

entered highly indebted into international tax competition, accumulating even higher debts is prohibitively costly.

Governments can choose a combination of the above measures to shelter government spending and social transfers from being affected by tax competition. This may explain why the welfare state survives the age of capital mobility and tax competition surprisingly well. But not all governments were able or willing to leave spending levels in order. In countries where income redistribution depends more on the tax system than on public employment and social transfers, for example the United States, using tax reforms rather than fiscal policy to deal with the adverse effects of tax competition proved less attractive. Governments in large liberal economies sought to maintain comparably low effective capital and labor tax rates – a policy preference, which came at the price of declining social transfers, cuts in government spending and higher deficits. In countries which dominantly redistribute income by public employment (Scandinavian countries) and social transfers (continental European countries), countries with high union density and where left parties were in power, adjustment via spending and transfer would have caused political tensions. These countries were more likely to defend the welfare state.

In consequence, tax competition does not inevitably lead to policy convergence. Quite to the contrary: *Since* international market integration reduces political autonomy, but makes different adjustment strategies viable, countries may actually become less similar.¹⁴ Economic internationalization may favor ‘market solutions’ (Stephens, Huber and Ray 1999: 164), but not at all costs. Yet, governments are not *coerced* to implement liberal policies. Rather, for social welfare states that have no chance of winning international tax competition, sticking to active welfare state policies and increasing tax rates will actually be the only politically viable solution.

14 In technical terms, globalization brings about a separating equilibrium, in which governments in competitive and uncompetitive countries respond differently to intensifying competition.

Social Consequences of Tax Competition and Fiscal Policy Adjustment

As yet, we have argued that tax competition leads to moderate adjustments in the tax system: all countries will shift the tax burden towards higher taxes on labor (and other more immobile tax sources). Some countries, the countries losing tax competition, will increase both, tax rates on capital and labor, other countries, the winning countries, will reduce taxes on capital and labor. However, in all countries, the reliance on labor taxation increases. Since even governments in countries losing tax competition have three options to keep government spending and social transfers stable – higher capital tax rates, higher labor tax rates, higher deficits – tax competition does not bring about significant fiscal policy adjustments in the vast majority of OECD countries.

In short, therefore, tax competition has a larger impact on taxation than on spending. For this very reason, the social consequences of tax competition differ largely. To start with the obvious, the countries winning tax competition can afford to increase government spending and social transfers, because revenues increase due to the import of capital. Income inequality in these countries will gradually decline. Countries which redistribute income via government spending and especially via social transfers will not experience much change in income inequality simply because the economic pressure on changing fiscal policies remains moderate. However, countries which traditionally redistribute income via the tax system, Anglo-Saxony countries, will experience a significant decline in redistribution and an associated increase in income inequality.

In other words, governments in welfare states faced much less pressure on tax revenues than early globalization theories predicted. Thus, the survival of the welfare state is no surprise. The optimal adjustment strategy for governments in social welfare states was to raise capital and labor tax rates, moderately increase deficit spending, and keep government spending and social transfers at least stable. In effect, redistribution and inequality remains modest. Large liberal economies choose a combination of cuts in the already weak social security system and higher deficits. At the same time, they shift taxation to labor, which eventually causes a mo-

derate increase in inequality and a further decline in redistribution. New Zealand and to a lesser extent the UK and the USA serve as examples for very different strategies. Since initial debt was lower for the USA and the UK than for New Zealand, tax increases and spending cuts remained more moderate in the former countries. In New Zealand the government had to increase labor taxes and reduce social transfers to prevent a severe financial crisis caused by rising debts. As a consequence, income inequality rose significantly.

Our theory further predicts that welfare states respond according to their initial conditions: if debt was already high when tax competition kicked in, the increase in labor taxation was significant. When debt was initially low, the increase in labor taxation remained moderate. In Scandinavian countries, where government consumption was significantly higher than in any other country, governments have a strong incentive to increase effective capital and labor tax rates. However, due to initially very high spending levels a stabilization of tax revenues proved to be difficult. Thus, these countries are likely to bring spending closer in line with spending in continental European countries.

In a way of summarizing: Whether policy adjustments exert an influence on income inequality depends on how countries redistribute income. In Anglo-Saxon countries and Scandinavian countries, redistribution depends on the tax system. Unless these countries profited from significant capital inflows, tax competition had at least a small influence on income inequality. In contribution based social welfare states, the redistribution of income depends much more on government spending and social transfers. Since pressure on fiscal policies remained weak, governments found it comparably easy to defend the welfare state without having to accept raising income inequality.

Tax Competition and the Welfare State: Overview and Hypotheses

Countries respond differently to tax competition. These differences are systematic and largely determined¹⁵ by country size, and the political and economic conditions when tax reforms in the US and the abolition of capital controls triggered what is now known as international tax competition. With respect to tax policies, our model predicts a positive effect of the capital tax rate in other countries on the tax rate in the country under observation. In other words, when some countries reduce their effective capital tax rate, other countries follow suit (tax competition effect). We observe the predicted burden shift from capital to labor taxation if lower capital tax rates are associated with higher labor tax rates. The predicted coefficient is thus negative. Yet, our argument suggest that union strengths and possibly left governments reduce the size of this effect. In particular, when unions are more powerful and influential, the shift towards labor tax rates should be significantly smaller than in countries with weak unions and conservative governments. In addition, the effective capital and labor tax rates are also influenced by the size of the country (+), the size of the immobile capital stock (+), initial debt and spending levels (+). Table 1a summarizes these theoretical predictions for effective domestic capital and labor tax rates.

Table 1a: Tax Policy Predictions

| | effective capital tax rate | Effective labor tax rate |
|---|----------------------------|--------------------------|
| effective capital tax rate in other countries | + | |
| predicted capital tax rate | | - |
| country size | + | + |
| union strengths | n.a. | control |
| left government | n.a. | control |
| capital tax * union | | + |
| capital tax * left | | + |
| initial debt ratio | + | + |
| initial gov. consumption | + | + |
| size of non-tradable sector | + | |

¹⁵ Our theoretical argumentation is probabilistic rather than deterministic. Structural constraints do not determine political behavior but the political and economic conditions make certain political adjustment choice more likely than others.

Tax competition influences fiscal policies more when governments cannot actively participate in international competition for mobile capital and reduce effective tax rates below the average effective capital tax rate in other countries. Our theory expects rising public debts when governments lose tax competition. These countries are predominantly large social welfare states which have to finance the loss in revenue and high welfare state spending with both higher debts and higher tax rates. If, however, initial debts already had been high, governments cannot avoid cutting overall government consumption and welfare spending, though they may still be unable to reduce public debt significantly. With similar consequences, members of the EMU also have to struggle with tighter criteria (Maastricht) for deficit spending and debt creation and we, therefore, predict lower overall debt ratios. Table 1b summarizes the prediction of our theory for fiscal policies.

Table 1b: Fiscal Policy Predictions

| | debt/deficit | government consumption | social transfers |
|-------------------------------------|--------------|------------------------|------------------|
| relative effective capital tax rate | + | + | + |
| relative effective labor tax rate | + | + | + |
| initial debt/deficit | + | - | - |
| initial gov. consumption | - | + | + |
| union strengths | control | control | control |
| left government | control | control | control |
| majoritarian electoral system | control | control | control |
| trade openness | control | control | control |
| emu | - | n.a. | n.a. |

Both tax policy and fiscal policy adjustment affect income redistribution and inequality. However, governments find it easier to avoid fiscal policy adjustment than tax policy reforms, since deficits and higher tax rates affect political support less than significant cuts into spending and social security nets. This holds especially true for social welfare states, which redistribute mainly via government spending and social transfers. We have argued that social welfare states mainly redistribute income by social security transfers. For these countries, relatively high effective capital tax rates have little effect on income inequality and redistribution.

For liberal market economies which redistribute income via the tax system, relatively high capital tax rates are associated with increase in inequality.

Table 1c: Inequality and Redistribution Predictions

| | income redistribution | income inequality |
|--|-----------------------|-------------------|
| relative effective capital tax rate | +/- | +/- |
| relative effective labor tax rate | - | + |
| social security transfers | + | - |
| government consumption | + | - |
| majoritarian electoral system | control | Control |
| rel eff cap tax rate * social security transf. | + | - |

4. Research Design and Analysis

The theory developed in the previous section requires an instrumental variable simultaneous equation model (ivse model). This model not only deals with estimation problems posed by simultaneity and endogeneity, but also allows precisely translating the theoretical model into an empirical specification. To maintain readability, we discuss all technical details of the model specification in appendix 2 and 3, which provide a justification of our estimation and identification strategies.

Data

Available information allows us to analyze time-series cross-sectional data which covers 21 OECD countries over up to 26 years (due to missings we analyze only 508 out of 546 possible observations). We do not account for unit fixed effects¹⁶ since we include the initial conditions for all countries as well as an EMU dummy which are time invariant and capture most of the initial variation. We allow the error term to follow a first order autoregressive

16 See Plümper and Troeger 2007 for a discussion of the pro's and con's of fixed effects.

process (Plümper et al. 2005), which allows for an appropriate estimate of the short-term adjustment processes our theory predicts.

The theory above tells a simplified story – a story that draws a direct line between countries’ constitutional and institutional variation in the era of tax competition to tax policies to government spending and redistribution and finally to socio-economic outcomes.

Before we start discussing what we consider to be exogenous and how we specify the simultaneous equations model, let us briefly explain how we believe ‘tax competition’ should be modeled. As Franzese and Hays (Franzese and Hays 2007) have convincingly argued, early globalization research remains unsatisfactory inasmuch as it modeled tax competition in a simple linear-additive fashion based on Quinn’s (1997) measure of ‘capital account openness’. This specification remains unconvincing because capital account openness may be a necessary condition for tax competition, but it is definitely not a sufficient condition. For example, capital account openness does not account for the fact that economic pressure on capital tax rates are a function of the difference of the tax rates in the country of interest and comparable countries. We therefore follow others¹⁷ in specifying tax competition as the dependence of tax policy in country i on tax policies in all other countries $-i \neq i$. Tax competition is thus modeled as a classical textbook example of endogeneity: Tax policy in country i depends on tax policy in countries $-i$ and vice versa.¹⁸ For the purpose of our study, we maintain that constitutional and institutional factors as well as country size are exogenous and therefore provide good instruments for the endogenous effective capital tax rate. (Franzese and Hays 2007). As the theoretical discussion reveals, the effect of globalization and market integration on taxation, government spending and redistribution cannot be examined independently. When estimating these effects we are faced with different kinds of co-determination, simultaneity and endogeneity. Governments decide simultaneously about revenue and expenditure and

¹⁷ See Hallerberg and Basinger 1998, Franzese and Hays 2007, Swank 2008 and Plümper et al. (2009).

¹⁸ As in Plümper et al. (2009) we weight the spatial capital tax lag with FDI inflows in order to capture possible learning effects.

therefore about tax rates, transfers and public good provision. Yet, taxation is not only contingent on domestic factors but also on decisions of policy makers in other countries.

To solve these problems and avoid biased estimation results we employ a simultaneous equation approach, which allows tackling the problem of endogeneity in policy decisions. We use an instrumental variable approach to overcome the endogeneity of the spatial capital tax lag and account for the multi-stage nature where redistribution and income inequality depend on decisions about taxation and spending. We thus estimate seven simultaneous equations for capital taxation, labor tax rates, the debt ratio, government consumption, social security transfers, relative redistribution and inequality of disposable income (see appendix 3 for the full specification of the simultaneous equation model).¹⁹ We opt for full system estimation (3SLS) since we assume co-varying error processes across equations and thus 3SLS produces more efficient results. Yet, we are aware of the drawbacks of full system estimation in case one of our equations is miss-specified and therefore conduct single equation 2SLS estimation to check the robustness of our results.²⁰

Results

We present the results of a single ivse model in three levels: the first stage estimates tax policies, where effective capital taxation of country i depends, *inter alia*, on a weighted average of capital taxation in other countries whereas labor taxation is partially determined by domestic decisions on capital tax rates. This captures the notion that tax competition has a tax system effect, e.g. governments shift at least parts of the tax burden on capital towards labor which is less mobile and therefore reacts less elastic to taxation. In addition we add an interaction effect between the domestic capital tax rate and union density as well as left cabinet portfolio to the right hand side of the labor tax equation. We test for the effect of

¹⁹ Identification of the system of equations and exclusion restrictions are discussed in appendix 4.

²⁰ The estimation results are displayed in appendix 6 and show only very minor changes to the point estimates and standard errors which do not change the substantive findings.

country size (measured by GDP), initial government consumption and debt ratio (in 1980 – before tax competition was triggered) as well as the size of the non-tradable sector (measured as value added of the service industry). Moreover, we control for union density and left government portfolio.²¹ In the second stage, we estimate the effect of the difference between country *i*'s effective capital tax rate and the weighted mean of *j*'s (instrumentalized) capital tax rates on fiscal policy (debt ratio, government spending and social security transfers). According to our argument, countries could abstain from cutting government consumption and social security transfer if they allowed for higher capital tax rates than other countries. This policy, however, should inevitably lead to higher deficits and thus rising debt rates. Again, we examine the impact of initial levels of government consumption and debt. In addition we control for trade openness (exports + imports / GDP), EMU membership, partisanship of the government, union density and the electoral system. We also analyze how pressures on the social welfare state such as unemployment and the share of people aged over 65 affect fiscal strategies. In the final third stage we estimate the joint effect of tax and fiscal policies (especially social security transfers) on income redistribution and income inequality. We also test the impact of actual fiscal adjustment strategies (debt ratio and government spending) as well as the electoral system, unemployment and the share of elderly people.

Table 4 presents the estimation results of a full system 3SLS model. All endogenous and therefore instrumented right-hand-side variables are grey shaded.

²¹ Data source and description for all left hand side and right hand side variables can be found in appendix 2

Table 4: Simultaneous Equation Estimate for Tax Competition and its Fiscal and Social Consequences

| | 1 st stage | | 2 nd stage | | | 3 rd stage | |
|--|-------------------------------|-----------------------------|------------------------|------------------------------------|-----------------------------------|----------------------------|----------------------------------|
| | effective capital tax rate | effective labor tax rate | debt ratio | government consumption ratio | social security transfer ratio | relative redistribution | post tax income inequality |
| capital tax rate (-i) FDI / (i) capital tax difference | 0.009 (0.001) *** | -0.662 (0.023) *** | | | | | |
| labor tax difference | | | 0.127 (0.024) *** | 0.051 (0.003) *** | -0.025 (0.005) *** | -0.010 (0.001) *** | 0.004 (0.001) *** |
| captax diff * soc sec transfers | | | 1.913 (0.050) *** | 0.078 (0.005) *** | 0.038 (0.009) *** | 0.006 (0.001) *** | -0.003 (0.000) *** |
| captax diff * majoritarian | | | | | | 0.001 (0.0001) *** | -0.0002 (0.0000) *** |
| capital tax * union density | | 0.009 (0.000) *** | | | | | |
| capital tax * left government | | 0.000 (0.000) | | | | | |
| pre-tax GINI | | | | | | 0.981 (0.112) *** | 0.215 (0.048) *** |
| log GDP | 3.865 (0.158) *** | 2.834 (0.099) *** | | | | | |
| GDP (bill. current \$) | -0.0006 (0.0001) *** | -0.001 (0.0001) *** | | | | | |
| union density | -0.049 (0.009) *** | -0.082 (0.012) *** | -0.343 (0.019) *** | -0.005 (0.002) | -0.078 (0.004) *** | | |
| left government | -0.001 (0.003) | 0.031 (0.005) *** | -0.076 (0.006) *** | 0.001 (0.001) | -0.006 (0.001) *** | | |
| majoritarian | | | -11.038 (0.753) *** | -2.005 (0.095) *** | -3.786 (0.165) *** | -0.042 (0.008) *** | 0.018 (0.004) *** |
| size of non-tradable sector | 0.075 (0.027) *** | | | | | | |

| | | | | | | | |
|---|-----------------------|-----------------------|------------------------|-----------------------|-----------------------|------------------------|-----------------------|
| Unemployment rate | | | 2.036 (0.057) *** | 0.130 (0.007) *** | 0.081 (0.013) *** | 0.000 (0.001) | -0.000 (0.000) |
| Share of elderly people | | | 2.099 (0.113) *** | 0.165 (0.014) *** | 0.530 (0.024) *** | -0.002 (0.002) | 0.001 (0.001) |
| Trade per GDP | | | 0.136 (0.010) *** | -0.024 (0.001) *** | -0.010 (0.002) *** | | |
| EMU member | | | -17.805 (0.687) *** | 0.219 (0.083) ** | 1.791 (0.145) *** | | |
| initial debt | 0.034 (0.007) *** | 0.030 (0.005) *** | 1.148 (0.014) *** | -0.031 (0.002) *** | -0.038 (0.003) *** | | |
| initial gov. con. | 0.612 (0.037) *** | 0.954 (0.023) *** | -3.187 (0.089) *** | 0.596 (0.009) *** | 0.452 (0.017) *** | | |
| Actual debt | | | | | | -0.0004 (0.0001) ** | 0.0002 (0.0001) ** |
| actual gov consumption . | | | | | | -0.005 (0.001) *** | 0.002 (0.001) *** |
| actual social security transf. | | | | | | -0.004 (0.001) *** | 0.002 (0.000) *** |
| Intercept | -90.00 (4.121) *** | -45.06 (2.681) *** | 54.042 (2.851) *** | 8.181 (0.325) *** | 4.313 (0.570) *** | 0.178 (0.048) *** | 0.076 (0.021) *** |
| Rho (e _{t-1}) | 0.948 (0.013) *** | 0.969 (0.011) *** | 0.959 (0.017) *** | 0.862 (0.019) *** | 0.911 (0.018) *** | 0.479 (0.028) *** | 0.487 (0.028) *** |
| N obs | 508 | 508 | 508 | 508 | 508 | 508 | 508 |
| R ² | 0.939 | 0.964 | 0.967 | 0.976 | 0.945 | 0.569 | 0.557 |
| chi ² | 7267.1 *** | 13945.2 *** | 15732.0 *** | 21252.0 *** | 9213.0 *** | 777.2 *** | 746.1 *** |
| DWH test of endogeneity of all RHS end. variables | 0.182 (0.670) | 73.83 (0.000) *** | 68.63 (0.000) *** | 7.43 (0.024) ** | 3.76 (0.153) | 44.96 (0.000) *** | 44.53 (0.000) *** |
| Underidentification tests: H0: matrix of reduced from coefficients has rank=K-1 (underidentified), Ha: rank>=K (identified) | | | | | | | |
| Anderson CC LR | 3045.45 | 439.2 | 777.7 | 838.9 | 802.1 | 571.1 | 570.1 |
| Chi ² | (0.000) *** | (0.000) *** | (0.000) *** | (0.000) *** | (0.000) *** | (0.000) *** | (0.000) *** |
| Cragg-Donald Chi ² | 200000 (0.000) *** | 697.9 (0.000) *** | 1840.2 (0.000) *** | 2140.7 (0.000) *** | 1955.9 (0.000) *** | 1055.6 (0.000) *** | 1052.5 (0.000) *** |
| Endogenous right-hand-side variables are grey-shaded | | | | | | | |

First of all, most left-hand-side variables are well explained (especially tax and fiscal policies) which allows for precise predictions of the instrumental equations. Both endogeneity and overidentification tests lead to the conclusion that the simultaneous equation model overall is well specified and identified. The estimated effects for the variables are in line with the predictions of our theory. We will discuss all three levels of our model on turn:

At the first level, the tax policy estimates, we find that a country’s effective capital tax rates become lower, if other countries reduce their capital tax rate (*tax competition effect*). When effective capital tax rates decline, labor taxation goes up (*tax system effect*). However, the burden shift remains moderate if union density is high. Apparently, left governments shift the burden not significantly less than conservative governments. Figures 1a and 1b display the effects:

Figure 1a: Marginal Effect of Capital Tax Rate on Labor Tax Rate as Union Density Changes

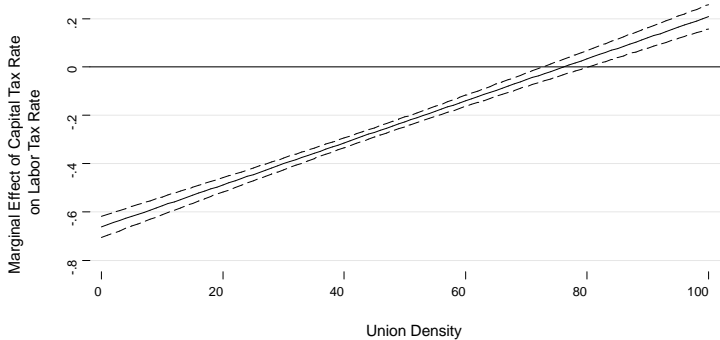
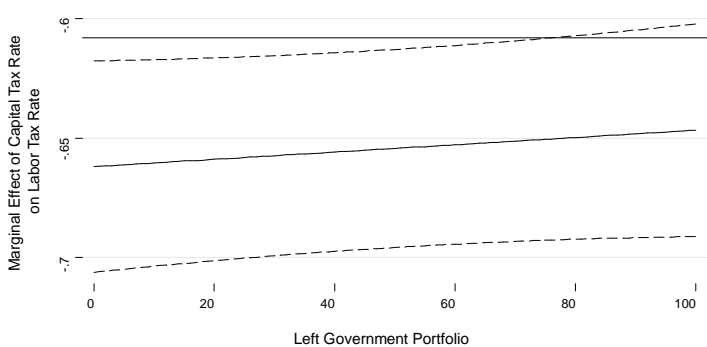


Figure 1b: Marginal Effect of Capital Tax Rate on Labor Tax Rate as Left Government Changes



Our estimates also support our prediction that tax rates on both capital and labor remain relatively high in countries in which the initial fiscal conditions were not very favorable to tax

competition. High initial levels of government consumption and debt reduce a government's ability to aggressively reduce capital taxes in order to attract foreign capital (*initial conditions effect*). Similarly and regardless of the initial fiscal conditions, large countries (measured by GDP) find it difficult to fully compete with small countries for internationally mobile capital stocks. Large countries implement higher tax rates on capital than smaller countries since the tax rate effect outweighs the tax base effect of possible capital inflows (*country size effect*).

Our theory rests on the assumption that capital is not fully mobile. In order to turn this assumption into a testable hypothesis, we operationalize this de facto capital mobility by the size of the non-tradable service sector. The larger the non-tradable sector the less the average de facto mobility of capital and the easier it is for governments to implement higher taxation. Indeed the empirical results support this notion – the larger the value added of the service sector the higher average effective capital tax rates remain.

At the second level, the fiscal policy adjustments, we generally observe substantively weaker effects. In other words, the effect of tax competition on fiscal policies remains moderate. We find that governments use higher capital and labor taxes to maintain high levels of government consumption and social security transfers. However, while governments use capital taxation to stabilize government spending, we observe a declining contribution of capital taxation to social security transfers and a reciprocal increase in the importance of labor taxation for social security transfers.²²

At the third level, our results suggest that tax competition exerts a small but not negligible effect on income redistribution and income inequality though governments used relatively high tax rates to keep the fiscal policy adjustments moderate. However, this effect is

²² We find mostly expected results for our controls. First, countries with majoritarian electoral systems have both lower spending and debt levels, which is consistent with previous results (Persson and Tabellini 1999). Second, though we cannot solve the 'old' discussion between the compensation and the efficiency hypotheses, we find more support for the former: Openness to trade increases government spending and social security transfers and reduces public debt (*efficiency hypothesis*). Third, higher unemployment rates and a larger dependency ratio increase the debt, government consumption and social security spending. Fourth, EMU membership reduces a country's debt ratio.

contingent upon social security and welfare spending. Countries which redistribute income mostly via social transfers will use higher tax rates on capital to redistribute from capital owners to wage earners and thereby reduce income inequality. Thus, when social welfare states implement relatively high capital and labor tax rates, fiscal policy adjustments will be moderate and the effect of tax competition on redistribution and inequality small. The same cannot be said for countries that dominantly redistribute via a progressive tax system. Even if these countries kept relatively high capital and labor taxes, did income redistribution decline and inequality increase. Thus, social security transfers offered a better way to prevent an increase in income inequality. This finding, of course runs counter the doom theories of tax competition, which predicted that governments have to abandon the welfare state to prevent capital flight.

5. Conclusion

Tax competition has never been as intense and devastating for public budgets as the early globalization literature has suggested. We have argued that the relatively moderate influence of tax competition on government spending, social welfare systems, income redistribution and income inequality results from two factors: First, de facto capital mobility remains incomplete. And second, the countries' ability to credibly and aggressively participate in international tax competition varies largely.

We have shown that small liberal economies had all advantages on their side. These countries could expect capital inflows which were important relative to their own capital stock. Though larger liberal economies could possibly expect larger capital inflows, these inflows remained relatively unimportant in relation to their own domestic capital stock. Governments in welfare states with high levels of government spending and large social security system were unlikely winners of tax competition. In order to become competitive, governments must have reduced spending levels and cut redistribution. As a consequence, countries which could not expect to

become large-scale capital importers did not (most welfare states) or at least not fully (large liberal economies) participate in international tax competition.

Accordingly, the political adjustment strategies to tax competition co-varied with country size, constitutional and institutional conditions and the socio-economic performance of countries. It remained a politically plausible response strategy to simultaneously raise capital and labor taxation to maintain a high level of public spending and a generous social welfare system.

Perhaps most interestingly, we find that tax policy reforms affect income inequality only in liberal market economies where government spending remains low. In these countries, higher labor taxes leads to a decline in income redistribution and less income equality. In social welfare states income redistribution is largely determined by spending and not by tax policies. The impact of tax competition on the welfare states therefore remained indirect: Higher labor taxes cause a significant upward shift in labor costs which caused labor market problems.

Our findings shed light on some lasting discussions among globalization scholars. For example, proponents of the ‘compensation’ hypothesis claimed that international market integration causes labor market uncertainty which in turn fuels popular demand for redistribution and labor market restrictions. In contrast, proponents of ‘efficiency’ hypothesis argued that redistribution imposes inefficient costs on corporations which make them less competitive, less profitable, and finally urges them to either cut employment or the leave the country altogether. We have shown that government responses to tax competition do not fit perfectly to either of these theories. First, governments do not necessarily attempt to improve the competitiveness of domestic corporations by effectively cutting capital taxation. And second, the decline in revenues raised from the taxation of capital does not necessarily bring about a decline in total government spending.

At least at the surface our finding support an argument put forward by Huber and Stephens (1993). In their view, social welfare policies and income redistribution, once implemented, log in by creating their own support bases: “Once institutionalized, social policies develop

support bases in addition to those groups their original enactment.” (Stephens et al. 1999: 167) Broad social coalitions prevent governments from implementing significant cuts in entitlements. In other words: the welfare state creates conditions in which a growing number of individuals depend on the social transfers. Reducing these transfers may perhaps eventually lead to a more efficient outcome. However, the recipients of these transfers neither know the distribution of welfare gains nor do they know whether they will profit from market liberalization, tax cuts, and a decline in the size of the welfare state (Fernandez and Rodrik 1991). Our findings are consistent with Stephens et al.’s explanation of the survival of the welfare state – but it is not identical. We argue that unsustainable public debt, high unemployment rates and a large welfare state prevent governments from actively competing in tax competition. Hence, not only distributive coalitions of groups profiting from redistribution stabilize the welfare state, but also the grim expectations of entering into a competition with small liberal economies – into a competition that the welfare state cannot win.

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Appendix 1: Separating Equilibria in International Tax Competition: A Typology

Table A1: Tax and Fiscal Policies: A Comparison over Time and Across Country Group

| | small liberal market economies | | large liberal market economies | | coordinated market economies | |
|-----------------------------|-----------------------------------|-------|-----------------------------------|-------|---------------------------------|-------|
| | 80-85 | 95-99 | 80-85 | 95-99 | 80-85 | 95-99 |
| effective capital taxation | 15.8 | 18.7 | 33.6 | 35.0 | 21.6 | 26.5 |
| marginal corporate tax rate | 29.5 | 22.7 | 45.0 | 35.0 | 42.3 | 33.7 |
| effective labor tax rate | 28.0 | 29.8 | 31.1 | 33.7 | 38.6 | 44.5 |
| government consumption | 15.4 | 13.2 | 20.1 | 18.7 | 19.9 | 20.5 |
| social security transfers | 14.2 | 11.2 | 11.8 | 12.9 | 15.4 | 17.3 |
| Debt | 50.9 | 41.1 | 36.0 | 50.4 | 40.5 | 65.8 |

Appendix 2: Operationalization and Data Sources

Table A2: Variable Description

| Variable | Description | Source |
|------------------------|--|--|
| captax | Average effective tax rate on capital | Calculations from OECD Revenue Statistics based on formula provided by Volkerink and DeHaan (2002) |
| labtax | Average effective tax rate on labor | |
| captax _{i,-i} | Difference between domestic capital tax rate and average capital tax rate in all other countries | Own calculations base don the above variables |
| captax _{-i} | FDI weighted spatial lag of average effective capital tax rates | |
| labtax _{i,-i} | Difference between domestic labor tax rate and average labor tax rate in all other countries | OECD Main Economic Indicators |
| debt | Debt as percentage of GDP | |
| idebt | Initial Debt ratio (1980) | Worldbank World Development Indicators |
| socsec | Social Security Transfers as percentage of GDP | |
| govcon | Central Government Consumption as percentage of GDP | OECD labor market statistics |
| igovcon | Initial government consumption (1980= | |
| gdp | GDP in billions of current US\$ | Swank 2002 |
| loggdp | Natural Logarithm of GDP | |
| trade | Trade openness measured as (exports+imports)/GDP | OECD National Account Statistics |
| unemp | Unemployment rate | |
| pop65 | Share of population aged 65 and over | OECD labor market statistics |
| ud | Union Density | |
| left | Left cabinet portfolio as percentage of all cabinet portfolios | Swank 2002 |
| nt | Size of the non-tradable sector, measure as value added of the service sector as percentage of GDP | |
| maj | Electoral system: Plurality (1), Proportional (0) | Beck et al. 2005: World Bank database of Political Institutions |
| emu | Member of the European Monetary Union | |
| quinn | FDI weighted spatial lag of legal capital and current account openness | Quinn 1997 |
| ginidi, ginipsi | income inequality, disposable income, private sector income | Mahler and Jesuit 2006, Luxembourg Income Study |
| redis | difference between pre-tax and post-tax | |

| | | |
|----------------------|--|--|
| quinn _i | income inequality FDI weighted spatial lag of legal capital and current account openness | Quinn 1997 |
| ginipsi _i | FDI weighted spatial lag of private sector income inequality | Mahler and Jesuit 2006, Luxembourg Income Study |
| gdppc _i | FDI weighted spatial lag of per capita GDP | World Bank World Development Indicators |
| govcon _i | FDI weighted spatial lag of Government consumption | FDI inflows form WDI |
| trade _i | FDI weighted spatial lag of trade openness: (exports+imports)/ GDP | |
| pop _i | FDI weighted spatial lag of total population | |

Appendix 3: Estimation of the System of Simultaneous Equations

We estimate seven simultaneous equations with correlated error processes across all equations. In addition, we include a spatial capital tax lag in order to account for the tax competition arguments. This spatial lag is weighted substantively by FDI inflows and instrumented by the equally weighted spatial lags of domestic variables (Franzese and Hays 2007; Plümper and Neumayer 2009). Our theory predicts endogeneity issues since the labor tax depends on capital taxation (tax system effect), fiscal policies (debt ratio, government consumption and social security transfers) depend on capital and labor taxation and redistribution as well as income inequality are partially determined by a combination of taxation and fiscal policies. We thus estimate the system of equations by a combination of three stage least squares and two stage least squares (for the spatial tax lag) procedures.

Table A3: System of equations

Stage 1:

$$\text{captax}_i = a + \text{captax}_{i-1} + \text{loggdp}_i + \text{gdp}_i + \text{ud}_i + \text{left}_i + \text{nt}_i + \text{igovcon}_i + \text{idebt}_i + e_i$$

with

$$\text{captax}_{i-1} = a + \text{quinn}_{i-1} + \text{gini}_{i-1} + \text{gdppc}_{i-1} + \text{govcon}_{i-1} + \text{trade}_{i-1} + \text{population}_{i-1} + e_{i-1}$$

as instrumental equation.

$$\text{lbtax}_i = a + \text{captax}_i + \text{loggdp}_i + \text{gdp}_i + \text{ud}_i + \text{left}_i + \text{captax}_i * \text{ud}_i + \text{captax}_i * \text{left}_i + \text{igovcon}_i + \text{idebt}_i + e_i$$

Stage 2:

$$\text{debt}_i = a + \text{captax}_{i-1} + \text{lbtax}_{i-1} + \text{ud}_i + \text{left}_i + \text{maj}_i + \text{unemp}_i + \text{pop65}_i + \text{trade}_i + \text{emu}_i + \text{igovcon}_i + \text{idebt}_i + e_i$$

$$\text{govcon}_i = a + \text{captax}_{i-1} + \text{lbtax}_{i-1} + \text{ud}_i + \text{left}_i + \text{maj}_i + \text{unemp}_i + \text{pop65}_i + \text{trade}_i + \text{emu}_i + \text{igovcon}_i + \text{idebt}_i + e_i$$

$$\text{socsec}_i = a + \text{captax}_{i-1} + \text{lbtax}_{i-1} + \text{ud}_i + \text{left}_i + \text{maj}_i + \text{unemp}_i + \text{pop65}_i + \text{trade}_i + \text{emu}_i + \text{igovcon}_i + \text{idebt}_i + e_i$$

Stage 3:

$$\text{redis}_i = a + \text{captax}_{i,t} + \text{lbtax}_{i,t} + \text{captax}_{i,t} \cdot \text{socsec}_i + \text{captax}_{i,t} \cdot \text{maj}_i + \text{maj}_i + \text{debt}_i + \text{govcon}_i + \text{socsec}_i + \text{ginipsi}_i + \text{unemp}_i + \text{pop65}_i + e_i$$

$$\text{ginidi}_i = a + \text{captax}_{i,t} + \text{lbtax}_{i,t} + \text{captax}_{i,t} \cdot \text{socsec}_i + \text{captax}_{i,t} \cdot \text{maj}_i + \text{maj}_i + \text{debt}_i + \text{govcon}_i + \text{socsec}_i + \text{ginipsi}_i + \text{unemp}_i + \text{pop65}_i + e_i$$

Subscripts denote countries (i) other countries (-i) and years (t).

Appendix 4: Identification and Exclusion Restrictions

Given this set of endogenous variables we need at least 56 exclusion restrictions for the 7 equations to be just identified (without relying on cross equation identification). Each of the 7 equations has one normalization restriction because one variable is taken to be the left-hand-side explained variable. Thus, each equation in our system is autonomous because it has substantive meaning in isolation from the other equations in the system. Since we have enough exclusion restrictions within each structural equation we do not need to rely on cross equation restrictions to achieve identification of our system. Table A3 shows that we have 117 exclusion restrictions from which 32 are simultaneous. Thus, we have 85 exclusion restrictions throughout the system which are distributed in a way so that every single equation is at least identified under the condition that all variables labelled exogenous are indeed uncorrelated with any of the error terms of the seven equations.

We used standard (but usually not very powerful) overidentification and exogeneity tests. Overidentification of all equations in the system allows for a more efficient estimation of the structural parameters. However, since the exclusion restrictions imply that the coefficients of these variables are zero in the equations from which they are excluded, miss-specification leads to inconsistent estimation of the parameters. A more reliable test is to compare the 3-SLS results to a set of independent 2-SLS estimates. If all equations in the system are correctly specified, system procedures are asymptotically more efficient than a single-equation procedure such as 2SLS. Yet, single equation models are more robust with respect to miss-specification. Since specification is an issue, we estimate a 2SLS version of our model

which turns out to give substantively identical results. We therefore conclude that no tests suggest mis-specification of our model.

Appendix 5: 2SLS instrumental variable estimation of each single equation

| | 1 st stage | | debt ratio | 2 nd stage | | 3 rd stage | |
|--|----------------------------|--------------------------|------------------------|------------------------------|--------------------------------|-------------------------|----------------------------|
| | effective capital tax rate | effective labor tax rate | | government consumption ratio | social security transfer ratio | relative redistribution | post tax income inequality |
| capital tax rate (-i) FDI / (i) capital tax difference | 0.007 (0.002) *** | -0.833 (0.034) *** | 0.106 (0.026) *** | 0.050 (0.003) *** | -0.022 (0.005) *** | -0.011 (0.001) *** | 0.005 (0.001) *** |
| labor tax difference | | | 1.973 (0.055) *** | 0.074 (0.005) *** | 0.037 (0.010) *** | 0.007 (0.001) *** | -0.003 (0.000) *** |
| captax diff * soc sec transfers | | | | | | 0.001 (0.0001) *** | -0.0003 (0.0000) *** |
| captax diff * majoritarian | | | | | | 0.002 (0.001) ** | -0.001 (0.000) *** |
| capital tax * union density | | 0.012 (0.001) *** | | | | | |
| capital tax * left government | | 0.001 (0.000) *** | | | | | |
| pre-tax GINI | | | | | | 1.092 (0.118) *** | 0.167 (0.050) *** |
| log GDP | 3.851 (0.161) *** | 2.803 (0.113) *** | | | | | |
| GDP (bill. current \$) | -0.0005 (0.0001) *** | -0.001 (0.0001) *** | | | | | |
| union density | -0.046 (0.009) *** | -0.163 (0.017) *** | -0.348 (0.021) *** | -0.001 (0.002) | -0.077 (0.004) *** | | |
| left government | -0.001 (0.003) | 0.009 (0.006) | -0.076 (0.006) *** | 0.001 (0.001) | -0.006 (0.001) *** | | |
| majoritarian | | | -10.547 (0.866) *** | -1.976 (0.097) *** | -3.802 (0.167) *** | -0.047 (0.009) *** | 0.021 (0.004) *** |
| size of non-tradable sector | 0.103 (0.029) *** | | | | | | |
| Unemployment rate | | | 2.017 (0.066) *** | 0.129 (0.007) *** | 0.081 (0.013) *** | 0.001 (0.001) | -0.000 (0.000) |
| Share of elderly | | | 1.940 | 0.170 | 0.532 | -0.001 | 0.001 |

| | | | | | | | |
|---|-------------|-------------|-------------|-------------|-------------|--------------|--------------|
| people | | | (0.127) *** | (0.014) *** | (0.024) *** | (0.002) | (0.001) |
| Trade per GDP | | | 0.148 | -0.024 | -0.010 | | |
| | | | (0.011) *** | (0.001) *** | (0.002) *** | | |
| EMU member | | | -18.656 | 0.287 | 1.838 | | |
| | | | (0.794) *** | (0.087) *** | (0.149) *** | | |
| initial debt | 0.035 | 0.024 | 1.150 | -0.031 | -0.038 | | |
| | (0.007) *** | (0.005) *** | (0.014) *** | (0.002) *** | (0.003) *** | | |
| initial gov. con. | 0.592 | 0.927 | -3.264 | 0.600 | 0.447 | | |
| | (0.037) *** | (0.024) *** | (0.092) *** | (0.010) *** | (0.017) *** | | |
| Actual debt | | | | | | -0.001 | 0.0002 |
| | | | | | | (0.0001) *** | (0.0001) *** |
| actual gov consumption . | | | | | | -0.007 | 0.003 |
| | | | | | | (0.001) *** | (0.001) *** |
| actual social security transf. | | | | | | -0.005 | 0.002 |
| | | | | | | (0.001) *** | (0.000) *** |
| Intercept | -90.973 | -39.13 | 57.38 | 7.97 | 4.341 | 0.176 | 0.077 |
| | (4.178) *** | (3.151) *** | (3.157) *** | (0.334) *** | (0.583) *** | (0.049) *** | (0.021) *** |
| Rho (e_t-1) | 0.947 | 0.970 | 0.969 | 0.886 | 0.904 | 0.609 | 0.622 |
| | (0.013) *** | (0.013) *** | (0.020) *** | (0.021) *** | (0.019) *** | (0.040) *** | (0.040) *** |
| N obs | 508 | 508 | 508 | 508 | 508 | 508 | 508 |
| R ² | 0.939 | 0.961 | 0.966 | 0.976 | 0.945 | 0.564 | 0.551 |
| F test | 779.3 *** | 1131.9 *** | 1184.3 *** | 1704.9 *** | 714.6 *** | 57.6 *** | 54.9 *** |
| DWH test of | 0.182 | 73.83 | 68.63 | 7.43 | 3.76 | 44.96 | 44.53 |
| endogeneity of all | (0.670) | (0.000) *** | (0.000) *** | (0.024) ** | (0.153) | (0.000) *** | (0.000) *** |
| RHS end. variables | | | | | | | |
| Underidentification tests: H0: matrix of reduced from coefficients has rank=K-1 (underidentified), Ha: rank>=K (identified) | | | | | | | |
| Anderson CC LR | 3045.45 | 439.2 | 777.7 | 838.9 | 802.1 | 571.1 | 570.1 |
| Chi ² | (0.000) *** | (0.000) *** | (0.000) *** | (0.000) *** | (0.000) *** | (0.000) *** | (0.000) *** |
| Cragg-Donald Chi ² | 200000 | 697.9 | 1840.2 | 2140.7 | 1955.9 | 1055.6 | 1052.5 |
| | (0.000) *** | (0.000) *** | (0.000) *** | (0.000) *** | (0.000) *** | (0.000) *** | (0.000) *** |
| Endogenous right-hand-side variables are grey-shaded | | | | | | | |