

Feld, Lars P.

**Working Paper**

## On tax competition: the (un-)expected advantages of decentralized fiscal autonomy

Marburger Volkswirtschaftliche Beiträge, No. 2004,25

**Provided in Cooperation with:**

Faculty of Business Administration and Economics, University of Marburg

*Suggested Citation:* Feld, Lars P. (2004) : On tax competition: the (un-)expected advantages of decentralized fiscal autonomy, Marburger Volkswirtschaftliche Beiträge, No. 2004,25, Philipps-Universität Marburg, Fachbereich Wirtschaftswissenschaften, Marburg

This Version is available at:

<https://hdl.handle.net/10419/29846>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*

PHILIPPS-UNIVERSITÄT MARBURG  
Fachbereich Wirtschaftswissenschaften

Lars P. Feld

On Tax Competition:  
The (Un-)Expected Advantages of  
Decentralized Fiscal Autonomy

Nr. 25/2004

Volkswirtschaftliche Beiträge

Marburg 2004

[Forthcoming in: KURT LEUBE (ed.), *Austrian Economics Today II: Reforms for a Competitive Economy*, FAZ Buch, Frankfurt 2004]

Prof. Dr. Lars Feld  
Philipps-Universität Marburg X Philipps University at Marburg  
FB Wirtschaftswissenschaften X Dept. of Business Administration and Economics  
Abteilung Finanzwissenschaft X Public Finance  
Am Plan 2 • D-35037 Marburg  
Tel. ++49-6421-2821702 • Fax ++49-6421-2824852  
E-Mail: [feld@wiwi.uni-marburg.de](mailto:feld@wiwi.uni-marburg.de)

## **On Tax Competition: The (Un-)Expected Advantages of Decentralized Fiscal Autonomy**

LARS P. FELD\*

Philipps-University of Marburg, Public Finance Group, Am Plan 2, D-25037 Marburg (Lahn), feld@wiwi.uni-marburg.de

### **1. Introduction**

Tax competition is much discussed in the political arena these days. Although it is not a new phenomenon, the political pressure has increased to restrict tax competition by intensifying tax coordination and accomplishing tax harmonization. This particularly holds for the EU which has established a Code of Conduct for business taxation in 1997 and is about to establish a system of information exchange with respect to capital income taxation (allowing Austria, Belgium and Luxembourg a minimum source tax on capital income as an alternative). In 2001, the Commission has additionally released the so called ‚*Ruding II*‘-report in which a uniform corporate tax base with formulary apportionment is proposed for the EU. In addition, the OECD (1998) aims at stronger tax coordination among its members also favoring a system of information exchange. Such a system would necessarily involve the abolishment of (or the reduction of the strictness of) bank secrecy laws around the world (Feld 2002).

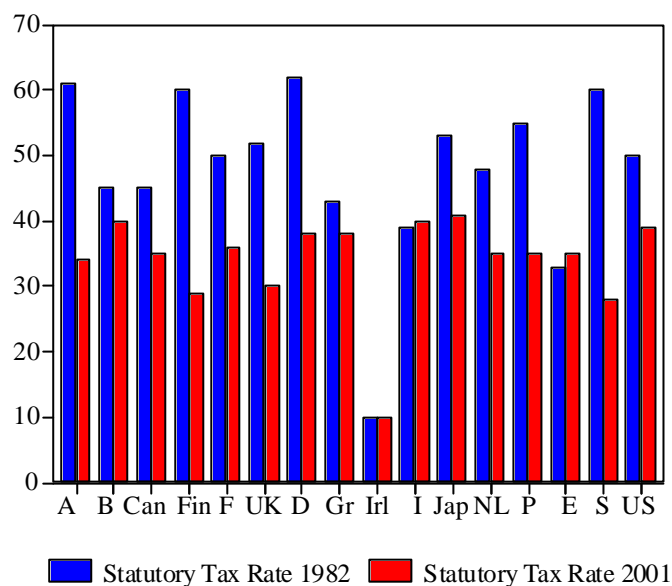
The starting point of discussions about tax competition is the supposed ‚race to the bottom‘ in company taxation. It is usually argued that the increased capital mobility that follows from globalization provides incentives for states to reduce tax rates in order to attract businesses. Keeping other things equal, firms choose their location in countries with lower corporate income tax rates. The strategic reduction of tax rates of one country induces another country, perhaps the one in which a firm already has branches, to follow suit such that a ruinous competition between states presumably results. Consequently, public services are said to be provided inefficiently and capital owners are accused of not paying their ‚fair‘ share of taxes. Income redistribution may not be financed to the same extent as before and welfare states are under pressure. These are the fears of the governments of European welfare states.

Often, descriptive empirical evidence is taken to trace such a race to the bottom of taxes over time. For example, the OECD tax ratios are used to argue that the share of corporate income taxes has declined over time while labor taxation has increased. These macroeconomic tax

---

\* Written version of the lecture given at the conference on „Austrian Economics Today II: Reforms for a Competitive Economy“ organized by the Hayek Institute and the Austrian Ministry of Finance, Vienna (Austria), November 21, 2003. Forthcoming in: KURT LEUBE (ed.), *Austrian Economics Today II: Reforms for a Competitive Economy*, FAZ Buch, Frankfurt 2004. – I would like to thank the participants of the conference, in particular Hans Rentsch, for valuable discussions and comments.

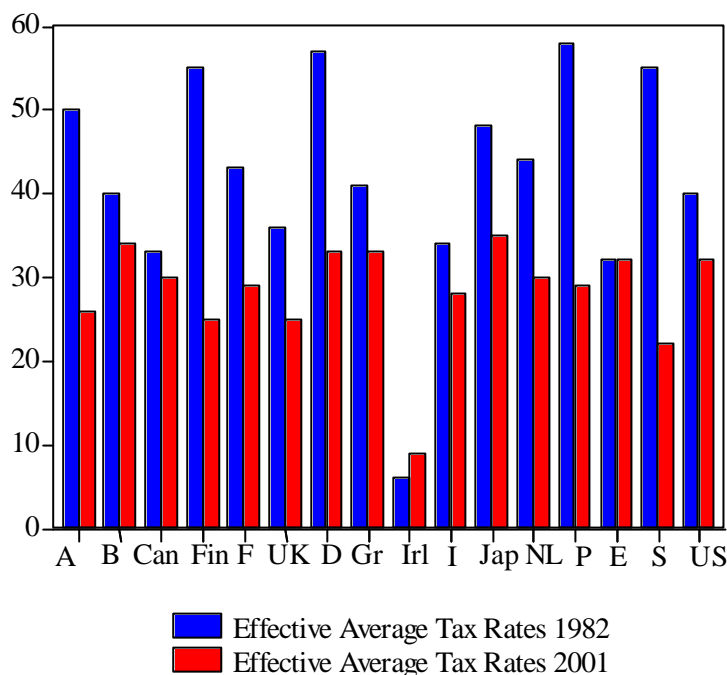
ratios do however not provide reliable evidence on tax burdens of firms because they reflect the interaction of tax policy, location choice and general business development. The ratios are calculated as the tax revenue from corporate income taxes divided by GDP. Tax revenue results from multiplying statutory tax rates with individual tax bases and summing it over the number of taxpayers. Corporate tax bases are however particularly sensitive to business cycle developments such that the base depends on GDP. Changes in tax ratios may thus result from changes in tax rates, in the definition of tax bases, in the number of taxpayers and in GDP. Indeed, tax ratios to a large extent reflect business cycle developments.



*Figure 1: Statutory Corporate Income Tax Rates in Percent, 16 OECD Countries, 1982 and 2001*  
 Source: Devereux, Griffith and Klemm (2002)

A look at statutory corporate income tax rates in selected OECD countries (*Figure 1*) reveals that one of the components of tax ratios has declined markedly in recent decades. On average, they fell from 47.9 percent in 1982 to 33.9 percent in 2001. For some countries, like Austria (A), Finland (Fin) and Sweden (S) but also Germany (D), the reduction is even more important. Only Italy (I) and Spain (E) have slightly increased their statutory corporate tax rates during these decades, while Ireland (Irl) has remained at a very low level. Investment by firms is however not only influenced by statutory tax rates. Firms consider the actual tax burden that is levied on new investment projects including any kind of tax deductions and relieves. The actual tax burden is measured by *effective* tax rates which are calculated on the basis of tax rate *and* tax base differentials. If a plant has already been established, firms take marginal investment decisions and consider *marginal* effective tax rates. Location choice, on the other hand, is a total decision such that *average* effective tax rates have an impact on firms' location decisions. Average effective corporate tax rates of selected OECD countries are shown in *Figure 2*. They fell even more strongly from 42 percent in 1982 to 28.3 percent in 2001 on average. Again Finland, Sweden, Austria and Germany, but also Portugal (P) are the countries with strongest reductions in effective tax burdens. Statutory tax rates are nevertheless important for international taxation. They influence in which countries firms locate their profits via

transfer pricing. In addition, statutory rates serve as signals for foreign firms which do not sufficiently know the details of another country's tax code. Thus, the two figures perfectly reflect the concerns of policymakers in the OECD.



*Figure 2: Effective Average Corporate Tax Rates in Percent, 16 OECD Countries, 1982 and 2001*  
 Source: Devereux, Griffith and Klemm (2002)

This descriptive evidence is taken by governments of EU welfare states as supporting the fears of a race to the bottom. It provides the basis for the political supply side, i.e. for finance ministers and the Commission, to develop far-reaching proposals for tax harmonization in Europe. Additional pressure to harmonize corporate taxation also originates from the demand side of the political process. Multinational firms often argue that international differences in tax laws impose strong transaction costs and hence distort international investment decisions. Neither the descriptive evidence from *Figures 1* and *2* nor the anecdotal evidence provided by multinationals suffices however to support such claims for tax harmonization. Any sober discussion of tax competition requires instead to, first, find out what impact tax competition may have on the allocation of scarce resources and how it may affect income redistribution by the state. Second, it is necessary to provide evidence for or against the arguments that are brought forward in the discussion. Hence, empirical evidence should be provided on the existence and the actual economic impact of tax competition. The questions that need to be asked are: How does tax competition work? What is the impact of tax competition on the efficiency of public goods' provision and on the effectiveness of income redistribution? Is there any influence of tax competition on regional convergence and economic growth? And finally: Could tax competition, in analogy to competition in private markets, serve as a discovery procedure in the public sector such that better public policies are more quickly detected and diffused?

In this paper, these issues are discussed by starting with the potential influence of tax competition on the efficiency of the public sector, the effectiveness of income redistribution and

economic growth (*Section 2*). The hypotheses that follow from this theoretical discussion are confronted with the results from econometric studies that provide more systematic empirical results than the above-mentioned descriptive evidence. In *Section 3*, the empirical evidence on the existence of tax competition is surveyed, while an overview on empirical tests of the effects of tax competition is presented in *Section 4*. Finally, a summary and some policy implications follow in *Section 5*.

## 2. Possible Effects of Fiscal Competition

### 2.1. A Primer on Fiscal Competition

Although the political discussion is mainly about tax competition, it must be recognized at the outset of the analysis that the state is also offering public services in exchange for the taxes that citizens pay and hence provides a bundle of goods and services for certain *tax prices*. In the following, fiscal competition is therefore discussed instead of tax competition. This switch in the terminology allows to avoid many mis-understandings that often come up in the political and scientific debates. Given that clarification, the analysis of fiscal competition can naturally start from drawing an analogy between competition in private markets and competition between states. Since A. Smith (1776), economists perceive competition as the driving force for efficient market outcomes. The *invisible hand* leads private actors to follow individual preferences. In a dynamic perspective, competition serves as a discovery procedure and induces useful innovation and technological change. Competition is thus necessary for a growing economy. Tiebout (1956) argues that competition between jurisdictions works in a similar fashion. In a global world, different countries offer different tax rates and different levels of public services to mobile factors of production. Mobile production factors can choose their location or residence in a country whose public sector supply best fits their preferences and interests. Individuals and firms *vote by feet* and thereby reveal their preferences for public goods. This leads to an efficient provision of public services under certain conditions.

In addition, decentralized provision and financing of public services allows to use decentralized information to the largest possible extent. The closer a government is to the people, the better it is informed about their wishes and demands. Decentrally dispersed knowledge about public problem solutions can thus be used more efficiently (Kerber 1998). Finally, the frustration of citizens about public policy solutions is minimized, the more decentralized public goods' provision is. Finding median preferences across the national populace necessarily involves less differentiation among individuals. Decentralization allows to differentiate public goods and services such that those who want to have more or a better quality of public goods can move to the jurisdiction with higher levels of publicly provided goods. Citizens are willing to pay higher prices for that offer and could thus be charged higher tax prices. Similarly those who want to have less can move to jurisdictions with lower levels of public services. The migration process leads to more homogeneous jurisdictions and to lower frustration costs. In general, these arguments hold for competition between national, regional or local jurisdictions as well as for labor and capital alike.

Oates (1972, p. 30) consequently proposes his *decentralization theorem* according to which a decentralized provision and financing of public goods at the lowest possible level is efficient in a world of high mobility of production factors and people with different preferences. However, the decentralization theorem only holds if the *correspondence principle* (Oates 1972) or the *principle of fiscal equivalence* (Olson 1969) is respected. Both principles similarly require that the jurisdiction that decides upon the level of public services should comprise the consumers of that good and those that carry the costs as taxpayers. Only in this case, the sum of the marginal willingnesses to pay for public goods corresponds to the marginal tax price. Whenever the principle of fiscal equivalence is violated, decentralized provision and financing of public goods may lead to inefficiencies. This could be the case if externalities or economies of scale in consumption exist. Moreover, equity issues may pose problems for a competitive provision and financing of public services.

## 2.2. Externalities and Economies of Scale

Externalities from fiscal competition might result in the form of regional or fiscal externalities. Regional externalities are comprised of positive or negative benefit spillovers as well as cost spillovers. Positive benefit spillovers come up for example if Dutch tourists use the German highway system, but do not contribute according to their marginal willingness to pay. *Congestion* externalities will arise. Negative benefit spillovers may exist in the case of cross-border pollution. Cost spillovers exist in the case of *tax exporting*, for example if multinational corporations whose shares are internationally distributed are taxed in a particular country. Because the shareholders of a multinational company cannot participate to the same extent in the political process as those of a national corporation, a government has incentives to raise corporate income taxes to inefficiently high levels above the willingness to pay of the shareholders of multinationals. The costs of public services are externalized because a part of the tax burden is paid by residents from other jurisdictions providing incentives for inefficiently high levels of public services or for excessive taxation (Huizinga and Nielsen 1997).

*Fiscal externalities* work in the opposite direction of tax exporting. They may arise from strategic tax competition for mobile capital. Germany is for example in tax competition with Ireland. If Ireland drops the corporate income tax rate, it attracts German firms. This relocation reduces the tax burden of the Irish residents because provision costs can be distributed among more taxpayers. However, the relocation increases the tax burden of German residents because less taxpayers have to finance that given amount of German public services. If both countries do not consider the changes in tax burdens in each country when deciding about the level of public services, fiscal externalities arise (Zodrow and Mieszkowski 1986, Wilson 1986). This argument does not hold to the same extent if public infrastructure is becoming an additional parameter for relocation decisions. Infrastructure is then adjusted in the fiscal competition game such that fiscal externalities might finally vanish (Keen and Marchand 1997). Moreover, cost or benefit spillovers on the one hand and fiscal externalities on the other hand might compensate for each other such that public goods can be efficiently provided (Bjorvatn and Schjelderup 2002, Sørensen 2000, 2004, Noiset 2003). An inefficient provision of public services might only result if *economies of scale* (non-rivalness) in consumption exist, i.e. when the government provides public goods in the Samuelsonian sense (Sinn 2003). Fiscal

competition enforces the benefit principle of taxation such that mobile production factors can only be charged the marginal costs of their use of public goods. Mobile taxpayers do however not contribute to cover the high inframarginal (fixed) costs of public infrastructure. If this is not to lead to an inefficiently low level of public services, the fixed costs must be covered by immobile taxpayers. This can lead to an undesired income distribution.

### *2.3. Income Redistribution*

With respect to personal income redistribution, fiscal competition poses more important problems. Continue the Germany-Ireland example: Germany presumably has a higher progressivity of income taxes and pays higher levels of social transfers than Ireland. Income redistribution is hence more pronounced in Germany than in Ireland. This provides incentives for Irish social welfare recipients to move to Germany because they can expect higher transfer payments. High income earners from Germany – *ceteris paribus* – follow the incentive to emigrate to Ireland. These migration incentives impede the decentralized income redistribution at the national levels (Stigler 1957, Sinn 2003).

There do not exist many theoretical arguments against this reasoning. A frequently heard argument is that high income and wealthy people have incentives to voluntarily contribute to the social welfare state in order to obtain social peace (Buchanan 1975). The voluntary income redistribution is the higher the more decentralized the organization of income redistribution is, because recipients are known to or can be more easily identified by contributors. Many observers question however whether the funds obtained from voluntary contributions to income redistribution suffice to secure a minimum income of the poor.

### *2.4. Regional Convergence*

In the political discussion, a frequently heard argument focuses on regional instead of personal income positions. It is contended that fiscal competition results in a situation of poor regions becoming poorer and rich regions becoming richer. The more ‘good’ taxpayers reside in a region, the lower the tax burden needs to be to finance a ‘necessary’ amount of infrastructure. Poor regions however need to increase the tax burden to finance such a ‘necessary’ amount of infrastructure. Fiscal competition then perpetuates income differentials and exacerbates the convergence problems of the periphery. Such permanent differences in growth performances will however also prevail if agglomeration economies in central regions exist. The competition between interregionally active firms induces a concentration of industrial activities in economic centers because of an interaction between economies of scale in production, agglomeration economies and diseconomies, and transport costs. Economic activity is more concentrated in the center while the periphery has below average economic activity. Ludema and Wooton (2000), Kind, Knarvik and Schjelderup (2000) and Baldwin and Krugman (2002) analyze the impact of tax competition on the economic development of central and peripheral regions under the conditions normally emphasized by the theory of economic geography. Agglomeration economies in the centers allow them to a certain extent to levy relatively higher taxes than the periphery without inducing firms to relocate to the periphery with lower taxes. The periphery has however no other alternative than to attempt at compensating their location disadvantages by levying lower taxes. A strong decrease of tax rates is necessary to compen-



sate for agglomeration advantages of the center. For example, Ireland has followed this policy in the EU during the last decade and has been very successful. Tax harmonization would then be harmful because it would exacerbate the resource differences between center and periphery and easily lead to demands for higher fiscal equalization.

### *2.5. Alternatives to Tax Competition*

These arguments deliberately accept the premise that tax competition describes a clear-cut behavior in the international fiscal competition game. This is however only a fiction. If tax rates are not available as policy parameters to attract mobile firms, the other available parameters will be used. The state may attempt at attracting firms by offering subsidies or tax holidays. Governments bid for firms. *Subsidy competition* results if tax competition is precluded. Such subsidies follow a different rationale. Capital already invested in a certain location can be more easily taxed than new investment of multinationals. When considering investment in a country, multinational enterprises anticipate that they will face problems in repatriating location specific investment after it has been undertaken such that a ‘*hold-up*’ problem results. Firms will also anticipate that a danger of excessive taxation results from that hold-up and will abstain from investing in a country leading to adverse effects on economic growth. Firms thus aim at obtaining credible commitments from the governments of potential locations that their location specific rents are not taxed in a confiscatory way. Governments use the opportunity to commit themselves in order to induce firms to invest in their jurisdiction. They hence offer subsidies or *tax holidays* to compensate firms for the potential loss from the expected hold-up (Doyle and van Wijnbergen 1994, Bond and Samuelson 1986, Black and Hoyt 1989). Janeba (2000, 2002) argues that tax competition solves the problem of providing credible commitments more efficiently than tax holidays or subsidies. Governments don’t need to provide subsidies as credible commitments because tax competition reduces corporate income taxes to a reasonable level. Another alternative to tax and to subsidy competition is a competition in *tax enforcement* as the most inefficient kind of fiscal competition for firms. For example, some German states offer a lax tax enforcement to firms in order to attract them to their jurisdiction because they do not have the possibility of changing tax rates in the largely harmonized German tax system and are additionally restricted by European law to offer subsidies to firms. The lax tax enforcement invites tax evasion and tax fraud as the most detrimental way of avoiding taxation.

### *2.6. Political Economy Issues*

These arguments shed some light on the actual behavior of governments. The state does not always do what it ought to. Political actors follow their own self-interest and seek to get rents from the political process. If a government of a member country attempts at securing private rents by increasing taxes, taxpayers can avoid excessive taxation by migrating to countries with lower tax burdens. The government cannot increase the tax burden of the mobile factor above the level of migration costs (Brennan and Buchanan 1980). It therefore has to take the interests of the mobile factors into account. Fiscal competition preserves a realistic possibility of migration. Tax harmonization would be counter-productive because it would facilitate the exploitation of tax bases to *Leviathan* governments.

In addition, fiscal competition enables citizens to comparatively evaluate the performances of representatives and hence reduce the information asymmetries in political markets (*„yardstick competition“*). For example, German voters can compare the performance of the German federal government to that of the French government. If France has a comparably high level and quality of public services under otherwise same conditions, but offers them at lower tax prices than Germany, German voters have incentives to throw the German government out of office at the next election day. The German government will anticipate this threat in its decision to increase tax rates. Fiscal competition does hence not only work through the migration mechanism, but also improves citizens' ability to exert voice in the political process (Besley and Case 1995, Bordignon, Cerniglia and Revelli 2003, Salmon 2003). The government is forced to provide public services at relatively lower costs and at the level desired by citizens.

### 2.7. *Political Innovation and Economic Growth*

Yardstick competition may also be a mechanism to lead to a dispersion of knowledge in politics. It is well-known from private markets that competition induces product and process innovation. Competition between governments may as well lead to *political innovations*. Governments can experiment with new solutions for economic problems in a decentralized fashion. Better solutions succeed in a process of imitation, copycatting and adaptation by other jurisdictions. Competition between jurisdictions thus becomes a discovery process which contributes to the progress in the public sector. Supreme Court justice Louis Brandeis already contended in 1932: *„It is one of the happy incidents of the federal system that a single courageous state may, if its citizens choose, serve as a laboratory; and try novel social and economic experiments without risk to the rest of the country“* (quote by Oates 1999, p. 1132). In this context Oates (1999) speaks of *‘laboratory federalism’* and points out that the reform of welfare in the U.S. in 1996 followed these considerations (see Inman and Rubinfeld 1997).

The higher innovative capacity of fiscal competition as a possible explanation for economic growth of countries is however contested. In a competitive system, a government is re-elected if it provides services that are at least not worse or not more expensive than those in other jurisdictions. Each government has incentives to wait initially in order to imitate only those policies of other jurisdictions that have turned out to be relatively successful. If the government of a state is uncertain about re-election, it has an incentive to act as a free-rider with respect to the policy innovations of other jurisdictions finally reducing their absolute amount (Rose-Ackerman 1980). Schnellenbach (2004) studies the incentives for policy innovations in systems competition by particularly focusing on the incentives of voters. As voters normally have little incentives to be politically informed before elections, policy innovations are mainly possible in times of crises. Citizens' incentives to become informed on policy innovations are however improved by high mobility and elements of direct democracy in political decision-making processes. Political rents of governments can then be reduced by competition, and politicians can be offered incentives to innovate.

Given these arguments, it could be asked whether fiscal competition or fiscal cooperation between jurisdictions has an effect on their economic growth. Still, fiscal competition theoretically has ambiguous effects because on the one hand it might induce higher efficiency of public goods' provision and higher political innovation and hence a better economic perform-

ance of jurisdictions. On the other hand, fiscal competition might lead to a migration of mobile production factors to centers of economic activity where agglomeration economies can be realized such that single poorer regions suffer from that competition.

### **3. The Existence of Fiscal Competition**

All the potential outcomes of fiscal competition discussed in *Section 2* need not necessarily result from fiscal competition in the real world. Solely theoretical arguments do not suffice to assess whether fiscal competition is harmful or not and whether fiscal harmonization or cooperation should be undertaken. It is necessary to shed some light on the empirical validity of the arguments. Before the impact of fiscal competition on efficiency, redistribution and growth can be assessed, evidence on the existence of fiscal competition needs to be discussed. Fiscal competition exists if two conditions are met: First, taxes and public spending play a significant role in the choice of location of industry and of residence of individuals (*mobility hypothesis*). If there is no fiscally induced mobility, neither beneficial nor detrimental effects of fiscal competition can result. Second, governments actually use fiscal instruments to attract firms or individuals. If no strategic tax setting can be observed, a race to the bottom cannot develop (*strategy hypothesis*).

#### *3.1. Empirical Evidence on Location Choice*

The evidence on fiscal induced capital mobility is clearly speaking in favor of fiscal competition. A large body of evidence that stems from international, regional or local data exists according to which taxes and public spending play a role for location decisions of firms. The weakest evidence is found with respect to foreign direct investments (Feld 2000). More recent studies by Grubert and Mutti (1991) and Hines and Rice (1994) report that international direct investment of multinational firms depends on corporate income taxes. The higher taxes, the lower is foreign direct investment. Devereux and Freeman (1995) explain foreign direct investment in Germany, France, the U.K., Italy, Japan, the Netherlands and the U.S. between 1984 and 1989 by including a rich set of additional explanatory factors. They do however not find a robust influence of taxes on foreign direct investments if labor market characteristics of the countries are additionally considered. These inconclusive results might be grounded in the high aggregation level of foreign direct investment figures or may be attributed to the fact that statistics on foreign direct investment or on portfolio investment are not reliable.

This has induced an extensive empirical literature on investment behavior of multinational firms that mainly uses large firm level data sets (Hines 1997). Grubert and Mutti (2000) focus on new investment of multinationals at particular locations in a cross section analysis for 500 firms in 60 countries in 1992. They find that higher average effective corporate income tax rates on distributed earnings reduce the probability that multinationals invest in a location. Altshuler, Grubert and Newlon (2001) find a relatively important impact of effective tax rates on investment of multinationals in 58 different countries for the years 1984 and 1992. The relative importance of taxes for international investment has doubled during that period. The most convincing study on location choice of multinationals has been conducted by Devereux and Griffith (1998). For more than 1600 firms between 1980 and 1994, they analyze the im-

fact of taxes on U.S. multinationals' investment in Germany, France or the U.K. as a two step decision. In the first step, multinationals decide whether to invest at all in Europe. The choice to invest at home or in Europe is largely independent from taxes and follows along long-term sales strategies of firms. The second step of the decision consists in the choice of the particular country if a firm has already decided to invest in Europe. Average effective corporate tax rates have an important impact on that second decision. Evidence corroborating the importance of taxes for location choice is found for federal states (see Newman und Sullivan 1988, Bartik 1991, Wasylenko 1991, Feld 2000 for surveys). Hines (1996) presents evidence that multinationals locate in U.S. states with lower taxes. Feld and Kirchgässner (2003) study the impact of personal and corporate income taxes on the distribution of firms between the Swiss cantons and on cantonal employment. They find significant negative effects of taxes on the number of small and medium sized firms in different classes of rates of return in 1981/82 and 1991/92 and on cantonal employment between 1985 and 1997. The higher taxes, the lower is the number of firms and employment. All in all this is strong evidence that international and interregional location decisions are affected by tax rate differentials.

Tax rate differentials do however not only affect real investment of multinational corporations. They also have an effect on transfer prices that are set between parent companies and subsidiaries. If the parent locates in a high tax jurisdiction and the subsidiary is located in the low tax jurisdiction, the multinational corporation has incentives to set the prices for services provided by the subsidiary at higher levels in order to reduce profits and thus also taxes paid in the high tax jurisdiction. For the period 1981 to 1988, Swenson (2001) presents evidence that multinationals with parent companies in the U.S. and subsidiaries in Germany, France, the U.K., Japan and Canada increased transfer prices by 8.2 percent on average when foreign tax rates decreased by one percentage point. Mintz and Smart (2004) present similar evidence for Canada. Declared taxable profits of firms that have branches in more than one Canadian province declines by 4.3 percent in the case of tax hikes while otherwise similar firms that only have branches in one province declare profits that are by 1.6 percent lower. Finally, Grubert and Slemrod (1998) argue that transfer prices are particularly strongly influenced by taxes if a subsidiary's specialization is in research and development. In R&D, the internationally accepted dealing at arm's length principle cannot be used because most of the products of the subsidiary do not exist in the market such that market prices cannot serve for comparisons. They present evidence for U.S. parents with R&D subsidiaries in Puerto Rico that their transfer prices strongly depend on tax rate differentials.

### *3.2. Empirical Evidence on Residence Choice*

Support for the mobility hypothesis is also found with respect to migration and residence choice of individuals. Lower taxes and/or higher levels of public services attract individuals – ceteris paribus. There is however a first notable difference between location choice and residence choice. Because capital is internationally more mobile than labor, the international evidence on fiscally induced migration is rather non-existent. This also holds for the EU although mobility between member states has considerably increased. Labor market conditions and general economic development of a country may serve as the main pull factors in international migration. Public finance still appears to be too unimportant for most researchers to

take it into account. This holds although there is anecdotal evidence from firms which have difficulties to attract highly qualified people to high tax jurisdictions.

Many empirical studies do however exist for regional or local migration and the impact of fiscal policy on residence choice of individuals. These studies have been mainly performed by using U.S. and Swiss data because income tax differentials and differences in public services are high between the jurisdictions in both countries. For example, someone living in the canton and the city of Zurich who earns a million SFr taxable income per year pays more than three times the amount of taxes to the canton and the local jurisdiction of Zurich than in the community of Freienbach in the canton of Schwyz which is only half an hour away from Zurich. Looking at the evidence from federal states is also useful for an assessment of international fiscal competition because mobility costs are much lower, the lower the government level such that the potential for fiscal competition strongly increases. If fiscal competition turns out to be at least not harmful to economic outcomes of jurisdictions at the lower level of governments, it is probably having similar effects in international terms.

The studies for the U.S. broadly support the migration hypothesis (see Feld 2000 for a survey). They find that tax rate differentials and differences in public services across U.S. states and local jurisdictions – *ceteris paribus* – influence individual residence choices. Welfare payments mainly affect migration of the poor. However, many studies also provide evidence that labor market conditions or the housing market are quantitatively more important than fiscal policy. In addition, the attraction of jurisdictions with favorable public or private infrastructure (in particular health and education) as well as a good quality of the natural environment (parks and other recreation facilities) should not be underestimated. The differences in tax rates and public services at the state or local levels moreover capitalize in housing prices (see Feld and Kirchgässner 1997 and again Feld 2000 for surveys on the U.S. studies). Higher taxes induce – *ceteris paribus* – lower housing prices, while a higher level of public services is associated with higher housing prices. The tax burden is shifted to the immobile factor land.

Similar evidence on fiscally induced migration is found for Switzerland. Frey (1981) reports only a small or no impact of income tax rate differentials on migration between and within Swiss cantons. Feld (2000) finds stronger effects for cantonal immigration between 1980 and 1990, but the results are not very robust to the inclusion of additional influences on migration. In an alternative approach, the impact of income taxes and public services on the distribution of taxpayers in different income classes across the Swiss cantons and local jurisdictions has been investigated. Kirchgässner and Pommerehne (1996) in a cross section analysis for the Swiss cantons in 1987, Pommerehne, Kirchgässner and Feld (1996), Feld (1999, 2000, 2000a), Feld and Kirchgässner (2001) in cross section analysis for the Swiss cantons and for 137 Swiss cities and communities for 1990 as well as Feld and Frey (2000) in a panel data analysis for the cantons between 1981/82 and 1993/94 report a strong impact of income taxes on the distribution of taxpayers. The impact of income tax rate differentials is quantitatively more important in higher than in lower income classes. Tax competition appears to be more intense at the local than at the cantonal level and more important for self-employed than for dependent workers and for retirees. These results on the impact of public finance for the regional distribution of taxpayers is corroborated by the Swiss studies on capitalization of tax

rate differentials in housing prices. Feld and Kirchgässner (1997), Hilber (1998) and Feld (2000) report that the higher income taxes, the lower are dwelling rents of apartments and houses. The income tax burden of high income taxpayers is capitalized more strongly than that of low income people. Welfare does not play any role. All in all, there is strong evidence from the regional level that fiscally induced migration and residence choice takes place. The *migration hypothesis* can thus not be rejected.

### 3.3. Empirical Evidence on Strategic Fiscal Policy

Fiscally induced migration is a necessary condition for the existence of fiscal competition. A sufficient condition is the *strategy hypothesis*: Jurisdictions actually engage in strategic tax setting. How strategic tax setting emerges can be easily illustrated in the following example: In his tax policy, the Austrian finance minister has to consider several requirements many of which are derived from Austrian legislation or from EU law, and others stem from the influence of different interest groups on tax policy. In addition, he has to consider the international development in order to make Austria attractive for investments and locations of firms. If the Slovak Republic decreases its tax rate on individual and personal income to, say, 19 percent, the Austrian finance minister has to take that into account when announcing the next tax reform. Countries apparently look at what happens in other countries, or more generally speaking in other jurisdictions. They identify their competitors and react to their tax rate changes. According to the strategy hypothesis, the correlation between the changes of tax rates in different jurisdictions should be positive, i.e. if a country reduces individual and corporate income tax rates, another country reduces these rates as well.

Evidence on such a strategic tax setting exists, like for the location choice of firms, at all government levels. The first studies have again been conducted for the U.S. states and local jurisdictions (Ladd 1992, Case 1993, Brueckner and Saavedra 2001), but there is meanwhile also evidence on strategic tax setting in Canada (Brett and Pinske 2000 for municipalities and Hayashi and Boadway 2000 for provinces), Belgian communities (Heyndels and Vuchelen 1998), German local jurisdictions (Büttner 1999, 2001), French regions and départements (Feld, Josselin and Rocaboy 2003, Leprince, Madiès and Paty 2003), Italian cities (Bordignon, Cerniglia and Revelli 2003), Spanish local jurisdictions (Solé-Ollé 2003) and Swiss cantons (Feld and Reulier 2001). Most of these studies focus on income, business and property taxation. They find that a reduction of the average tax rates of competitors induces a reduction of tax rates of an observed jurisdiction. Comparable evidence is presented by Figlio, Kolpin and Reid (1999) and Saavedra (2000) on welfare payments in the U.S. Again, reductions in welfare payments on average in competitor jurisdictions induce a reduction of welfare payments in an observed jurisdiction. Moreover, Fredriksson and Millimet (2002) provide evidence on strategic interaction in environmental policy.

Most notably, such evidence could also be found at the international level. Devereux, Lockwood and Redoano (2001) analyze strategic tax setting for ten OECD countries between 1979 and 1999. They find that there is a positive spatial correlation between statutory corporate income taxes of these countries as well as between their effective average corporate income tax rates. The lower these tax rates in the other nine countries on average is, the lower are the tax rates in the remaining ten country. Besley, Griffith and Klemm (2001) corroborate these

results in a study on corporate income tax ratios (tax revenue in percent of GDP) for 29 OECD countries between 1965 and 1997. Again, a positive spatial correlation of taxes exists. Altshuler and Goodspeed (2002) provide additional evidence on how the U.S. serves as a role model in international tax policy whose tax reforms are imitated by European countries.

On the basis of this evidence, the *strategy hypothesis* cannot be rejected. Fiscal competition exists at the local, regional and international level at different intensities concerning different production factors. It is most intense at the local level in countries with local or regional fiscal autonomy. At the regional level, the intensity is lower compared with the local level, but higher compared to the international level. The evidence provides strong support for the existence of fiscal competition for firms and individual taxpayers and hence for corporate and individual income taxes as well as property taxes (the latter in particular in the U.S.). International evidence on fiscal competition is provided for corporate income taxation, but not for individual income taxation or for public spending.

#### **4. Actual Effects of Fiscal Competition**

Stating that fiscal competition exists does not tell anything about its impact on the supply of public services, the welfare state or economic growth. These three classes of economic outcomes must be considered explicitly. However, no systematic international evidence on the impact of fiscal competition on these economic outcomes exists. The empirical studies have only been conducted for the federal countries Switzerland and the U.S. using regional or local data. What has been said in *Section 3.2* however also holds with respect to economic outcomes: If fiscal competition is more intense at the local or regional level, the hypothesized positive or negative effects should be more easily observed in studies on federal states. In a *„Sinatra-analogy“*, we can state: *„If you can make it there, you can make it anywhere.“*

##### *4.1. Fiscal Competition and the Efficiency of Public Goods' Provision*

To measure economic efficiency in the provision of public goods is not easy. Public services are efficiently provided if the marginal cost of provision is equal to the sum of marginal rates of substitution of users. Though it is not impossible, finding out the marginal cost of provision is difficult, because most statistics on the public sector contain information on expenditure and not on cost. The real difficulty emerges however on the demand side. Consumers have incentives to hide their true willingness to pay for public services in order to get a free ride when they expect to pay actually. Consequently, direct evidence on the impact of fiscal competition on the efficiency of public goods' provision is relatively scarce.

The first evidence stems from a study by Bergstrom, Roberts, Rubinfeld and Shapiro (1988) who directly estimate the equality of marginal costs of provision of public services and the sum of individual marginal willingnesses to pay for public education (that is financed by property taxes in the U.S.). The demand for public services is estimated on the basis of individual survey data. In addition, aggregate data on local jurisdictions is used to assess marginal costs. The authors present evidence that the *efficiency hypothesis* according to which fiscal competition leads to an efficient decentralized provision of public goods cannot be rejected. Hoxby (2000) develops a less ambitious test by comparing the relative efficiency of education

in jurisdictions with a higher and those with a lower intensity of fiscal competition. She presents evidence that the performance of students per input unit is increased by fiscal competition although it leads to significantly less spending per student. There is also evidence for Switzerland that fiscal decentralization is associated with a higher individual satisfaction of citizens with their lives in general (Frey and Stutzer 2000, 2002). Fiscal competition hence appears to increase the efficiency of public education.

In addition, there is a broad discussion in the literature on the impact of fiscal competition on the size of government. According to Brennan and Buchanan (1980), fiscal competition is a means to restrict Leviathan behavior of governments: „*The potential for fiscal exploitation varies inversely with the number of competing governmental units in the inclusive territory.*“ (p. 185). Most studies attempt at testing this hypothesis by looking at the impact of fiscal decentralization on public spending or revenue. There is only mixed evidence on this impact of fiscal decentralization however. Only the more recent evidence by Shadbegian (1999) for the U.S., Schaltegger (2001) and Kirchgässner (2002) for Switzerland and Rodden (2003) in a cross-country study provides unambiguous support for such a relationship. Feld, Kirchgässner and Schaltegger (2003) focus more closely on the transmission channels by which fiscal decentralization in federal states might affect the size of government. They find that a more intense tax competition leads to lower public revenue.

In the theoretical discussion, externalities of fiscal competition are focused. Büttner (2003) reports relatively important fiscal externalities for small communities in Germany. Murdoch, Sandler and Sargent (1997) find evidence on the importance of negative benefit spillovers (sulfur and NO<sub>x</sub> emissions) for 25 European states. As Sørensen (2000, 2004) in his simulation study shows, these fiscal and regional externalities can easily compensate for each other. Parry (2003) corroborates this analysis and also reports relatively low welfare costs of tax competition even excluding tax exporting. Hence the importance of externalities can be questioned. Pommerehne, Feld and Hart (1994), with evidence on local cross-border pollution, and Pommerehne and Krebs (1991), with evidence on spillovers of public services in the canton of Zurich, show how regional externalities are successfully internalized in Coase-like bargaining processes. Swiss federalism is in general characterized by specific inter-jurisdictional compensations for spillovers. Although this leads to high transaction costs it also induces incentive compatibility of public goods' provision. Indeed, Schaltegger (2003) does not find any significant benefit spillovers between Swiss cantons in a panel study for the years 1980 to 1998. All in all, this evidence speaks in favor of fiscal competition. The *efficiency hypothesis* cannot be rejected on the basis of this evidence.

#### 4.2. Fiscal Competition and the Welfare State

What is really surprising is the evidence on the *redistribution hypothesis* in its strong version according to which fiscal competition leads to a collapse of the welfare state. Remember that the supposed mechanism is a fiscally induced migration of the poor to jurisdictions with high transfers and the rich to jurisdictions with low income taxes – keeping all other factors constant that might attract migrants. As discussed in *Section 3.2*, this fiscally induced migration takes place in the U.S. and, to a lesser extent with respect to welfare payments at least, also in Switzerland. There is additional evidence on strategic tax setting in both countries. There is



however no evidence that the welfare state in both countries has collapsed – given national redistribution preferences. This is particularly interesting for Switzerland because of its more pronounced income redistribution.

On the basis of data from 1977, Kirchgässner and Pommerehne (1996) present evidence that two thirds of public income redistribution (without considering social security in that analysis) were conducted by sub-federal jurisdictions. The income distribution was not significantly more unequal for Switzerland in 1977 than in Germany in the beginning of the seventies. Since the seventies, the Swiss income distribution has become more unequal than in other European countries. This development can be attributed to the fact that the ten percent of the population with the highest incomes have more than proportionally gained from income growth between 1977 and 1992. Still, excluding social security, the Swiss public sector redistributes as much income in 1992 as in the end of the seventies. The share of sub-federal jurisdictions from this amount of income redistribution has even increased during the same period (Feld 2000, 2000a). In addition, cantons and local jurisdictions have relied more strongly on taxes than on spending to accomplish income redistribution. Although Feld, Fischer and Kirchgässner (2003) find some evidence that tax competition between cantons is actually leading to less income redistribution, this effect is not robust to the primary distribution of income. The strong *redistribution hypothesis* must therefore be rejected for Switzerland.

It should be noted that the most important differences between fiscal competition in federal states on the one hand and international fiscal competition on the other hand must be attributed to the distribution branch. The Swiss cantons and local jurisdictions as well as the U.S. states and local jurisdictions are indeed embedded in a system where much income redistribution is undertaken by the federal level. The public acceptance of the effects of fiscal competition on the income distribution thus hinges on the fact that there is some redistribution of income at the federal level. In Switzerland, the progressive federal income tax, the source tax on interest income and the pay-as-you-go part of the Swiss pension system are centralized and have a strong redistributive impact. Similarly, the U.S. federal income tax is most important for income redistribution. In addition, both countries had strong residence requirements for longer time periods. As it is well documented by the U.S. studies on migration and welfare (Moffitt, 1992), residential requirements could be crucial for decentralized redistribution to work. Until 1969, the U.S. states imposed residence requirements on potential welfare recipients according to which they could only obtain welfare payments in a state if they had worked at least two years in the same state in which they applied for social welfare. The residence requirement was declared unconstitutional by the Supreme Court in that year. Evidence for a harmful welfare migration has been provided only for the period after that Supreme Court decision. In Switzerland, a citizenship principle existed until 1979 according to which the places of citizenship were responsible for social welfare of their citizens. Citizenship has been inherited. If the place of residence of a welfare recipient was different from the place of citizenship, he could be forced to move back in the place of citizenship or obtained lower transfer payments than he would have received at the place of residence. Finally the Swiss political decision-making process plays a role for income redistribution. Since Swiss cantons to differing degrees enable voters to participate directly in fiscal decision-making by referenda on tax rates, spending or budget deficits, and because institutional competition of direct with rep-

representative democratic cantons induces the latter to deviate not too much from basic redistributive concerns, fiscal competition in Switzerland may not lead to a collapse of the welfare state as well. Actually, tax competition is less pronounced in cantons with a tax referendum than in those without one (Feld 1997).

#### *4.3. Economic Growth, Regional Convergence and Political Innovation*

The impact of fiscal competition on economic growth is even less intensively studied than that on efficiency or income redistribution. There is a more recent literature mainly with cross-country evidence, but also with evidence on Chinese provinces, German or U.S. states that attempts at analyzing whether fiscal decentralization has a positive or negative impact on economic growth. The main disadvantage of the empirical approach in those studies is that fiscal decentralization is almost exclusively measured by the share of spending (or revenue) of lower level jurisdictions from total spending (or revenue). This share is not measuring fiscal autonomy. It could easily be the case that sub-federal jurisdictions spend a relatively large share, but are forced to do so by federal mandates or do not raise funds autonomously to finance that spending such that they depend on the federal government. This holds for example for Mexico (Feld 2003). It is thus not surprising that the existing studies do not find any clear-cut evidence on this relationship (Feld, Zimmermann and Döring 2003). There is one paper in which the impact of tax competition on economic performance is analyzed. Feld, Kirchgässner and Schaltegger (2004) present evidence for the Swiss cantons from 1980 to 1998 that tax competition has not been harmful to economic performance of the cantons. In addition, no evidence on the importance of economies of scale for economic performance is found in that study. The arguments for a merger of cantons are thus not supported by the evidence from this paper. Still no evidence on the impact of fiscal competition on regional convergence exists.

With respect to the impact of fiscal competition on political innovation only evidence from case studies can be found. Feld and Schnellenbach (2004) discuss the diffusion of administration reforms (new public management) at the Swiss local level during the nineties and the welfare reform of the U.S. in 1996. In particular, the latter example has been explicitly conducted with the expectation of the federal government that the states as a laboratory for welfare policies are better suited to find the most reasonable solutions for welfare policy. Although the welfare reform is a success story and the expectations are thus not disappointed, it must be noted that there are still federal mandates aiming at a quality control of these reforms. The U.S. welfare reform is hence not exclusively providing evidence for the success of fiscal competition in inducing political innovation. Much needs to be done to get a more conclusive picture in this area.

### **5. Policy Conclusions**

In policy debates across Europe, tax competition is perceived very skeptical. Most finance ministers would rather harmonize taxes than allow for tax competition. They fear that mobile tax bases will not contribute to the financing of European welfare states anymore. In this paper, the main theoretical arguments are discussed and evaluated as to what impact tax competition has on the provision of public services, on income redistribution by the state and on

economic development. Moreover, the arguments from the theoretical analysis are confronted with the existing empirical evidence. Several conclusions can be drawn from that analysis:

1. It is misleading to talk about tax competition. Taxes are prices for public services and the public insurance provided by welfare states. Governments find themselves in a locational competition of which *fiscal competition* is an important part. It is also misleading to trace the development of statutory or average effective tax rates over time without controlling other factors that affect location or residence choices. Tax ratios computed as tax revenue in percent of GDP are not useful to even measure tax burdens of production factors.
2. The international evidence and the evidence from federal states provides overwhelming evidence that *fiscal competition exists*. Firms' international or regional location choices – *ceteris paribus* – depend on corporate and personal income tax rate differentials and on differences in public services. Taxes also play a significant role for the choice of transfer prices of multinational firms. The higher taxes, the less attractive a jurisdiction is for mobile capital. Residence choices similarly depend on personal income taxes, public infrastructure and welfare payments. The evidence for the latter mainly stems from interregional fiscal competition in federal states. International evidence does not exist. Being aware of fiscally induced migration, governments engage in strategic tax setting and enter a process of tax and welfare competition.
3. The theoretical arguments on the impact of fiscal competition mainly focus on the efficiency of public goods' provision and the sustainability of decentralized income redistribution. While there are contradictory hypotheses on efficiency, fiscal competition is hypothesized to render decentralized income redistribution impossible. The empirical evidence speaks in favor of the *efficiency enhancing effect* of fiscal competition, while the deterioration of income redistribution is not necessarily found. It strongly depends on the rules shaping income redistribution. In particular residence requirements appear to be useful.
4. The impact of fiscal competition on economic growth and regional convergence is neither theoretically nor empirically sufficiently analyzed. It appears that neither fiscal harmonization with intergovernmental grants, nor fiscal competition can have big impacts on convergence or divergence of regions because it more strongly depends on agglomeration economies, economies of scale and transport costs. The few studies undertaken on this relationship indicate that fiscal competition is at least *not harmful for economic performance*.
5. Perhaps the most important effects of fiscal competition stem from the political innovation it induces. Fiscal competition forces governments to find new policy solutions and experiment with them in a decentralized way. The successful policy innovations succeed in a process of imitation and adaptation. Policy innovation means policy reform. Some case studies indicate that the *innovation enhancing effects* of fiscal competition are indeed realistic. Much more research needs to be done in this area. Political reforms are very important for European welfare states.

Is tax competition harmful or useful? After a broad review of the main theoretical arguments and the empirical evidence, the answer is: It is rather useful than harmful. Europe does not need a harmonization of tax or social policy.

## References

- ALTSHULER, R. and T.J. GOODSPEED (2002), Follow the Leader? Evidence on European and U.S. Tax Competition, Unpublished Manuscript, Hunter College, New York.
- ALTSHULER, R., H. GRUBERT and T.S. NEWLON (2001), Has U.S. Investment Abroad Become More Sensitive to Tax Rates?, in: J.R. HINES (ed.), *International Taxation and Multinational Activity*, University of Chicago Press, Chicago 2001, 9 – 32.
- BALDWIN, R.E. and P. KRUGMAN (2002), Agglomeration, Integration and Tax Harmonization, NBER Working Papers 9290, National Bureau of Economic Research, Cambridge.
- BARTIK, T.J. (1991), The Effects of Property Taxes and Other Local Public Policies on the Intra-metropolitan Pattern of Business Location, in: H.W. HERZOG, JR. and A.M. SCHLOTTMANN (eds.), *Industry Location and Public Policy*, University of Tennessee Press, Knoxville 1991, 57 – 80.
- BERGSTROM, TH.C., J.A. ROBERTS, D.L. RUBINFELD and P. SHAPIRO (1988), A Test for Efficiency in the Supply of Public Education, *Journal of Public Economics* 35, 289 – 307.
- BESLEY, T. and A.C. CASE (1995), Incumbent Behavior: Vote-Seeking, Tax-Setting, and Yardstick Competition, *American Economic Review* 85, 25 – 45.
- BESLEY, T., R. GRIFFITH and A. KLEMM (2001), Empirical Evidence on Fiscal Interdependence in OECD Countries, Unpublished Manuscript, London School of Economics.
- BJORVATN, K. and G. SCHJELDERUP (2002), Tax Competition and International Public Goods, *International Tax and Public Finance* 9, 111 – 120.
- BLACK, D.A. and W.H. HOYT (1989), Bidding for Firms, *American Economic Review* 79, 1249 – 1256.
- BOND, E.W. and L. SAMUELSON (1986), Tax Holidays as Signals, *American Economic Review* 76, 820 – 826.
- BORDIGNON, M., F. CERNIGLIA and F. REVELLI (2003), In Search of Yardstick Competition: A Spatial Analysis of Italian Municipality Property Tax Setting, *Journal of Urban Economics* 54, 199 – 217.
- BRENNAN, G. and J.M. BUCHANAN (1980), *The Power to Tax: Analytical Foundations of a Fiscal Constitution*, Cambridge University Press, Cambridge 1980.
- BRETT, C. and J. PINSKE (2000), The Determinants of Municipal Tax Rates in British Columbia, *Canadian Journal of Economics* 33, 695 – 714.
- BRUECKNER, J.K. and L.A. SAAVEDRA (2001), Do Local Governments Engage in Strategic Property Tax Competition?, *National Tax Journal* 54, 203 – 229.
- BUCHANAN, J.M. (1975), *The Limits of Liberty*, University of Chicago Press, Chicago 1975.
- BÜTTNER, T. (1999), Determinants of Tax Rates in Local Capital Income Taxation: A Theoretical Model and Evidence from Germany, *Finanzarchiv N.F.* 56, 363 – 388.
- BÜTTNER, T. (2001), Local Business Taxation and Competition for Capital: The Choice of the Tax Rate, *Regional Science and Urban Economics* 31, 215 – 245.
- BÜTTNER, T. (2003), Tax Base Effects and Fiscal Externalities of Local Capital Taxation: Evidence from a Panel of German Jurisdictions, *Journal of Urban Economics* 54, 110 – 128.
- CASE, A.C. (1993), Interstate Tax Competition after TRA86, *Journal of Policy Analysis and Management* 12, 136 – 148.

- DEVEREUX, M.P. and H. FREEMAN (1995), The Impact of Tax on Foreign Direct Investment: Empirical Evidence and the Implications for Tax Integration Schemes, *International Tax and Public Finance* 2, 85 – 106.
- DEVEREUX, M.P. and R. GRIFFITH (1998), Taxes and the Location of Production: Evidence from a Panel of US Multinationals, *Journal of Public Economics* 68, 335 – 367.
- DEVEREUX, M.P., R. GRIFFITH and A. KLEMM (2002), Corporate Income Tax Reforms and International Tax Competition, *Economic Policy* 35, 449 – 495.
- DEVEREUX, M.P., B. LOCKWOOD and M. REDOANO (2001), Do Countries Compete over Corporate Tax Rates?, Unpublished Manuscript, University of Warwick.
- DOYLE, C. and S. VAN WIJNBERGEN (1994), Taxation of Foreign Multinationals: A Sequential Bargaining Approach to Tax Holidays, *International Tax and Public Finance* 1, 211 – 225.
- EUROPEAN COMMISSION (1997), Mitteilungen der Kommission an den Rat und das Europäische Parlament, Maßnahmenpaket zur Bekämpfung des schädlichen Steuerwettbewerbs in der Europäischen Union, Ratsdokument Nr. 11577/97 vom 5. November 1997.
- EUROPEAN COMMISSION (2001), *Company Taxation in the Internal Market*, European Commission, Brussels.
- FELD, L.P. (1997), Exit, Voice and Income Taxes: The Loyalty of Voters, *European Journal of Political Economy* 13, 455 – 478.
- FELD, L.P. (1999), Allocative and Distributive Effects of Tax Competition: An Empirical Analysis for Switzerland, *Aussenwirtschaft* 54, 503 – 528.
- FELD, L.P. (2000), *Steuerwettbewerb und seine Auswirkungen auf Allokation und Distribution: Ein Überblick und eine empirische Analyse für die Schweiz*, Mohr Siebeck, Tübingen 2000.
- FELD, L.P. (2000a), Tax Competition and Income Redistribution: An Empirical Analysis for Switzerland, *Public Choice* 105, 125 – 164.
- FELD, L.P. (2002), Swiss Bank Secrecy and International Taxation, *Tax Notes International* 27 (10), 1179 – 1184.
- FELD, L.P. (2003), Fiscal Federalism and Political Decision Structures, in: R. BLINDENBACHER and A. KOLLER (ed.), *Federalism in a Changing World – Learning from Each Other: Scientific Background, Proceedings and Plenaries of the International Conference on Federalism 2002*, McGill-Queens University Press, Montreal et al. 2003, 461 – 470.
- FELD, L.P. and B.S. FREY (2000), *Die Auswirkungen des kantonalen Steuerwettbewerbs auf den Kanton Zürich: Möglichkeiten einer rationalen Reform*, Consulting Report to the Cantonal Tax Administration of the Canton of Zurich, December 2000.
- FELD, L.P. and G. KIRCHGÄSSNER (1997), Die Kapitalisierung von Steuern und öffentlichen Leistungen in den Mietzinsen: Eine empirische Überprüfung der Tiebout-Hypothese für die Schweiz, in: H. SCHMID and T. SLEMBECK (eds.), *Finanz- und Wirtschaftspolitik in Theorie und Praxis*, Haupt, Bern et al. 1997, 64 – 92.
- FELD, L.P. and G. KIRCHGÄSSNER (2001), Income Tax Competition at the State and Local Level in Switzerland, *Regional Science and Urban Economics* 31, 181 – 213.
- FELD, L.P. and G. KIRCHGÄSSNER (2003), The Impact of Corporate and Personal Income Taxes on the Location of Firms and on Employment: Some Panel Evidence for the Swiss Cantons, *Journal of Public Economics* 87, 129 – 155.
- FELD, L.P. and E. REULIER (2001), Strategic Tax Competition in Switzerland: Evidence from a Panel of the Swiss Cantons, Unpublished Manuscript, University of St. Gallen.
- FELD, L.P. and J. SCHNELLENBACH (2004), Begünstigt fiskalischer Wettbewerb die Politikinnovation und -diffusion? Theoretische Anmerkungen und erste Befunde aus Fallstudien, forthcoming in: CH.A. and ST. SCHALTEGGER (eds.), *Perspektiven der Schweizer Wirtschaftspolitik*, Haupt, Bern 2004.

- FELD, L.P., J. FISCHER and G. KIRCHGÄSSNER (2003), The Effect of Direct Democracy on Income Redistribution: Evidence for Switzerland, Unpublished Manuscript, Philipps-University Marburg.
- FELD, L.P., J.-M. JOSSELIN and Y. ROCABOY (2003), Tax Mimicking Among Regional Jurisdictions, in: A. MARCIANO and J.-M. JOSSELIN (eds.), *From Economic to Legal Competition: New Perspectives on Law and Institutions in Europe*, Edward Elgar, Cheltenham 2003, 105 – 119.
- FELD, L.P., G. KIRCHGÄSSNER and CH.A. SCHALTEGGER (2003), Decentralized Taxation and the Size of Government: Evidence from Swiss State and Local Governments, CESifo Working Paper No. 1087, December 2003.
- FELD, L.P., G. KIRCHGÄSSNER and CH.A. SCHALTEGGER (2004), Fiscal Federalism and Economic Performance: Evidence from Swiss Cantons, Unpublished Manuscript, Philipps-University of Marburg.
- FELD, L.P., H. ZIMMERMANN and TH. DÖRING (2003), Föderalismus, Dezentralität und Wirtschaftswachstum, *Vierteljahreshefte zur Wirtschaftsforschung* 72, 361 – 377.
- FIGLIO, D.N., V.W. KOLPIN and W.E. REID (1999), Do States Play Welfare Games?, *Journal of Urban Economics* 46, 437 – 454.
- FREDRIKSSON, P.G. and D.L. MILLIMET (2002), Strategic Interaction and the Determination of Environmental Policy across U.S. States', *Journal of Urban Economics* 51, 101 – 122.
- FREY, B.S. and A. STUTZER (2000), Happiness, Economy and Institutions, *Economic Journal* 110, 818 – 838.
- FREY, B.S. and A. STUTZER (2002), *Happiness and Economics*, Princeton University Press, Princeton/Oxford 2002.
- GRUBERT, H. and J. MUTTI (1991), Taxes, Tariffs and Transfer Pricing in Multinational Corporate Decision Making, *Review of Economics and Statistics* 73, 285 – 293.
- GRUBERT, H. and J. MUTTI (2000), Do Taxes Influence Where U.S. Corporations Invest?, *National Tax Journal* 53, 825 – 839.
- GRUBERT, H. and J. SLEMROD (1998), The Effect of Taxes on Investment and Income Shifting to Puerto Rico, *Review of Economics and Statistics* 80, 365 – 373.
- HAYASHI, M. and R. BOADWAY (2000), An Empirical Analysis of Intergovernmental Tax Interaction: The Case of Business Income Taxes in Canada, *Canadian Journal of Economics* 34, 481 – 503.
- HEYNDELS, B. and J. VUCHELEN (1998), Tax Mimicking among Belgian Municipalities, *National Tax Journal* 51, 89 – 101.
- HILBER, CH. (1998), *Auswirkungen staatlicher Massnahmen auf die Bodenpreise: Eine theoretische und empirische Analyse der Kapitalisierung*, Rüegger, Chur ad Zürich 1998.
- HINES, J.R. (1996), Altered States: Taxes and the Location of Foreign Direct Investment in America, *American Economic Review* 86, 1076 – 1094.
- HINES, J.R. (1997), Tax Policy and the Activities of Multinational Corporations, in: A.J. AUERBACH (ed.), *Fiscal Policy: Lessons from Economic Research*, MIT Press, Cambridge 1997, 401 – 445.
- HINES, J.R. and E.M. RICE (1994), Fiscal Paradise: Foreign Tax Havens and American Business, *Quarterly Journal of Economics* 109, 149 – 182.
- HOXBY, C.M. (2000), Does Competition among Public Schools Benefit Students and Taxpayers?, *American Economic Review* 90, 1209 – 1238.
- HUIZINGA, H. and S.B. NIELSEN (1997), Capital Income and Profit Taxation with Foreign Ownership of Firms, *Journal of International Economics* 42, 149 – 165.
- INMAN, R.P. and D.L. RUBINFELD (1997), Rethinking Federalism, *Journal of Economic Perspectives* 11 (4), 43 – 64.
- JANEBA, E. (2000), Tax Competition when Governments Lack Commitment: Excess Capacity as a Countervailing Threat, *American Economic Review* 90, 1508 – 1519.

- JANEBA, E. (2002), Attracting FDI in a Politically Risky World, *International Economic Review* 43, 1127 – 1155.
- KEEN, M. and M. MARCHAND (1997), Fiscal Competition and the Pattern of Public Spending, *Journal of Public Economics* 66 (1997), S. 33 – 53.
- KERBER, W. (1998), Zum Problem einer Wettbewerbsordnung für den Systemwettbewerb, *Jahrbuch für Neue Politische Ökonomie* 17, 199 – 230.
- KIND, H.J., K.H.M. KNARVIK and G. SCHJELDERUP (2000), Competing for Capital in a Lumpy World, *Journal of Public Economics* 78, 253 – 274.
- KIRCHGÄSSNER, G. (2002), Föderalismus und Staatsquote, in: U. WAGSCHAL and H. RENTSCH (eds.), *Der Preis des Föderalismus*, Orell Füssli, Zürich 2002, 71 – 91.
- KIRCHGÄSSNER, G. and W.W. POMMEREHNE (1996), Tax Harmonization and Tax Competition in the European Union: Lessons from Switzerland, *Journal of Public Economics* 60, 351 – 371.
- LADD, H.F. (1992), Mimicking of Local Tax Burdens among Neighboring Counties, *Public Finance Quarterly* 20, 450 – 467.
- LEPRINCE, M., T. MADIÈS and S. PATY (2003), Interactions fiscales horizontales et verticales: Un test sur données départementales, Unpublished Manuscript, University of Lille.
- LUDEMA, R.D. and I. WOOTON (2000), Economic Geography and the Fiscal Effects of Economic Integration, *Journal of International Economics* 52, 331 – 357.
- MINTZ, J. and M. SMART (2004), Income Shifting, Investment, and Tax Competition: Theory and Evidence from Provincial Taxation in Canada, *Journal of Public Economics* 88, 1149 – 1168.
- MOFFITT, R. (1992), Incentive Effects of the U.S. Welfare System: A Review, *Journal of Economic Literature* 30, 1 – 61.
- MURDOCH, J.C., T. SANDLER and K. SARGENT (1997), A Tale of Two Collectives: Sulphur and Nitrogen Oxides Emission Reduction in Europe, *Economica* 64, 281 – 301.
- NEWMAN, R.J. and D.H. SULLIVAN (1988), Econometric Analysis of Business Tax Impacts on Industrial Location: What Do We Know, and How Do We Know It?, *Journal of Urban Economics* 23, 215 – 234.
- NOISET, L. (2003), Is It Tax Competition or Tax Exporting, *Journal of Urban Economics* 54, 639 – 647.
- OATES, W.E. (1972), *Fiscal Federalism*, Harcourt/Brace/Jovanovich, New York 1972.
- OATES, W.E. (1999), An Essay on Fiscal Federalism, *Journal of Economic Literature* 37, 1120 – 1149.
- OECD (1998), *Harmful Tax Competition*, OECD, Paris 1998.
- OLSON, M. (1969), The Principle of ‘Fiscal Equivalence’: The Division of Responsibilities among Different Levels of Government, *American Economic Review* 59 (2), 479 – 487.
- PARRY, I.W.H. (2003), How Large Are the Welfare Costs of Tax Competition?, *Journal of Urban Economics* 54, 39 – 60.
- POMMEREHNE, W.W. and S. KREBS (1991), Fiscal Interaction of Central Cities and Suburbs: The Case of Zurich, *Urban Studies* 28, 783 – 801.
- POMMEREHNE, W.W., L.P. FELD and A. HART (1994), Voluntary Provision of a Public Good: Results from a Real World Experiment, *Kyklos* 47, 505 – 518.
- POMMEREHNE, W.W., G. KIRCHGÄSSNER and L.P. FELD (1996), Tax Harmonization and Tax Competition at State-Local Levels: Lessons from Switzerland, in: G. POLA, R. LEVAGGI and G. FRANCE (eds.), *Developments in Local Government Finance: Theory and Policy*, Edward Elgar, Cheltenham 1996, 292 – 330.
- RODDEN, J. (2003), Reviving Leviathan: Fiscal Federalism and the Growth of Government, mimeo, Department of Political Science, MIT, Cambridge.

- ROSE-ACKERMAN, S. (1980), Risk-Taking and Reelection: Does Federalism Promote Innovation?, *Journal of Legal Studies* 9, 593 – 616.
- SAAVEDRA, L.A. (2000), A Model of Welfare Competition with Evidence from AFDC, *Journal of Urban Economics* 47, 248 – 279.
- SALMON, P. (2003), Assigning Powers in the European Union in the Light of Yardstick Competition among Governments, *Jahrbuch für Neue Politische Ökonomie* 22, 197 – 216.
- SCHALTEGGER, CH.A. (2001), The Effects of Federalism and Democracy on the Size of Government: Evidence from Swiss Sub-national Jurisdictions, *ifo Studien* 47 (2001), 145 – 162.
- SCHALTEGGER, CH.A. (2003), Zum Problem räumlicher Nutzen-Spillover zentralörtlicher Leistungen: Einige empirische Ergebnisse aus dem Schweizer Föderalismus, *Jahrbücher für Nationalökonomie und Statistik* 223, 159 – 175.
- SCHNELLENBACH, J. (2004), *Dezentrale Finanzpolitik und Modellunsicherheit*, Mohr Siebeck, Tübingen 2004.
- SHADBEGIAN, R.J. (1999), Fiscal Federalism, Collusion, and Government Size: Evidence from the States, *Public Finance Review* 27, 262 – 281.
- SINN, H.-W. (2003), *The New Systems Competition*, Blackwell, Oxford 2003.
- SMITH, A. (1776), *An Inquiry into the Nature and Causes of the Wealth of Nations*, London 1776.
- SOLÉ-OLLÉ, A. (2003), Electoral Accountability and Tax Mimicking: The Effects of Electoral Margins, Coalition Government and Ideology, *European Journal of Political Economy* 19, 685 – 713.
- SØRENSEN, P.B. (2000), The Case for International Tax Coordination Reconsidered, *Economic Policy* 31, 431 – 472.
- SØRENSEN, P.B. (2004), International Tax Coordination: Regionalism versus Globalism, *Journal of Public Economics* 88, 1187 – 1214.
- STIGLER, G.J. (1957), The Tenable Range of Functions of Local Government, in: U.S. CONGRESS, JOINT ECONOMIC COMMITTEE (ed.), *Federal Expenditure Policy for Economic Growth and Stability*, Washington, D.C. 1957, 213 – 219.
- SWENSON, D.L. (2001), Tax Reforms and Evidence of Transfer Pricing, *National Tax Journal* 54, 7 – 25.
- TIEBOUT, CH.M. (1956), A Pure Theory of Local Expenditures, *Journal of Political Economy* 64, 416 – 424.
- WASYLENKO, M.J. (1991), Empirical Evidence on Interregional Business Location Decisions and the Role of Fiscal Incentives in Economic Development, in: H.W. HERZOG, JR. and A.M. SCHLOTTMANN (eds.), *Industry Location and Public Policy*, University of Tennessee Press, Knoxville 1991, 13 – 30.
- WILSON, J.D. (1986), A Theory of Interregional Tax Competition, *Journal of Urban Economics* 19, 296 – 315.
- ZODROW, G.R. and P. MIESZKOWSKI (1986), Pigou, Tiebout, Property Taxation, and the Underprovision of Local Public Goods, *Journal of Urban Economics* 19, 356 – 370.