

The Effects of Tax Competition

Ioan TALPOȘ

West University of Timișoara
ioan.talpos@rectorat.uvt.ro

Alexandru O. CRĂȘNEAC

West University of Timișoara
alexandru.crasneac@feaa.uvt.ro

Abstract. *Tax competition between governments is a research topic of growing importance in the context of globalization. This subject is particularly important for the European Union, characterized by a high degree of economic integration, single currency and free movement of goods, services, persons and capital. In this paper we define the concept of tax competition and we provide a review of the literature to highlight its potential effects.*

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1. The concept of tax competition

The tax competition literature has developed considerably in the recent years, but there were only a few attempts to define this phenomenon.

Michael Keen (2008), in *The New Palgrave Dictionary of Economics*, defines tax competition as a “*strategic tax-setting in a non-cooperative game between jurisdictions – whether countries or states or provinces within a federation – with each setting some parameters of its tax system in relation to the taxes set by others.*”

In *Encyclopaedia of Tax Policy*, Robert Tannenwald (1999) defines tax competition as explicit or implicit: “*governments engage in explicit tax competition when they enact tax laws and regulations expressly designed to enhance the attractiveness of their jurisdictions to businesses, residents, employees or consumers...(and) ..in implicit tax competition when they modify their pursuit of other tax policy goals-such as equity, neutrality, simplicity, revenue adequacy, or tax exporting, in order to mitigate anti-competitive consequences*”.

Wilson and Wildasin (2004) gave a definition according to the multiple forms of tax competition, form a general broader definition to a narrowest one. *In a broad definition*, tax competition is any form of non-cooperative tax setting by independent governments. *In a narrower definition*, tax competition is any form of non-cooperative tax setting by independent governments and each government’s tax policy influences the allocation of tax revenues across government treasuries. This definition includes vertical tax competition when different levels of government (central, regional, local) impose taxes on the same tax base. According to the *narrowest definition*, tax competition is any form of non-cooperative tax setting by independent governments, under which each government’s policy choices influence the allocation of a mobile tax base among jurisdictions or regions represented by these governments. This definition eliminates vertical tax competition and includes competition for capital, companies, labor and cross border shopping. This form of competition is commonly referred to as the *horizontal tax competition*, because it implies competition between governments at the same level.

Tax competition can take many forms, according to the goals pursued by the authorities, the tax instruments involved, as well as, the hierarchical relations between the public authorities.

According to the objectives pursued by the governments, tax competition takes place for attracting:

- Foreign direct investments;
- Portfolio investments, highly mobile financial capital, essential for financing the local companies and strengthening the local financial markets;

- Internal financial flows within the multinational companies that can be lured to own jurisdictions by attracting those corporate units used for international transfer of profits;
- Cross border shoppers, especially for those products subject to excise taxes, when there are significant differences in the level of those excises;
- High skilled labor, characterized by high mobility.

According to the hierarchical relations between the public authorities involved, we have: *horizontal tax competition*, when the authorities are on the same level of government, and *vertical tax competition*, when public authorities on different levels of government are taxing the same tax base.

According to the tax instruments used by the authorities, we distinguish: competition through *tax rates*, when the authorities set lower tax rates relative to rates charged in other tax jurisdictions; competition through *tax bases*, if the authorities use various facilities for determining tax base (granting deductions, provisions on tax treatment of losses, different ways of recording depreciation); *expenditure competition*, when the authorities compete in providing public goods that increase productivity of businesses (eg, infrastructure, various subsidies) in order to make them choose their own jurisdictions.

Although the tax competition literature has focused mainly on competition between governments to attract capital by lowering tax rates, there are other forms of intergovernmental competition that are not based solely on fiscal variables. Where environmental standards are not regulated at national level, in an attempt to facilitate the location of firms within their jurisdiction, regional or local governments compete with each other by reducing environmental standards (Oates, 2001). Another possible form of competition between governments is by regulating the quality standards of the products manufactured within their jurisdictions. Sinn (1997) argued that governments, acting independently, will set lower quality standards for domestic products, as long as most of the production is exported.

Although the forms of competition between governments are multiple, in this paper we will refer to tax competition only in the narrow sense, the horizontal tax competition, intended to attract high-mobility factors.

2. The negative effects of tax competition

The standard tax competition model

The starting point in modern literature devoted to tax competition is the volume of Wallace Oates (1972), *Fiscal Federalism*, which seeks to provide an explanation for any inefficiencies arising from the fact that local governments are involved in a competition to attract mobile capital. Following this discussion, in the mid 80s were built the first formal models in an attempt to

explain this phenomenon. Among them were John D. Wilson's (1986) model and that developed by George R. Zodrow and Peter Mieszkowski (1986), which became commonly known in literature as "the standard tax competition model".

In the Zodrow-Mieszkowski model, the local governments finance their expenditures using a capital tax (a source based tax), and the result is a reduction of tax rates that lead to underprovision of local public goods. Yet, the model is based on some restrictive assumptions:

- there is a large number of homogenous jurisdictions (cities, regions, counties, states);
- for each of these jurisdictions the after tax return on capital and the tax rates in other jurisdictions are taken as fixed;
- population is fixed in each jurisdiction and the residents have identical tastes and incomes. Therefore, redistributive aspects can be neglected, and the utility function for the residents takes the form:

$$U(C, G) \tag{1}$$

where,

- C – private goods consumption;
- G – public goods consumption.

- a fixed national capital stock that is perfectly mobile across jurisdictions;
- in each jurisdiction companies produce a single representative good using two inputs: one mobile, capital, and one immobile, labor. Once the decision to invest and start production is taken, the good is sold to residents as a final consumption good and to the government as an intermediate consumption good, becoming a public good;
- this public good is consumed only by the local residents, and has no spillover effects to other jurisdictions;
- the local officials act to maximize the welfare of their residents.

In this setting, the local governments must choose the tax rate on capital, t , to maximize the resident's utility, subject to a budget constraint such as:

$$tK(r+t) = G \tag{2}$$

where,

- t – tax rate;
- r – after tax return on capital, which is equal to all jurisdictions because of the capital mobility and treated as fixed for any given jurisdiction;
- $K(r+t)$ - the demand for capital and $r + t$ is the cost of capital.

As more capital is invested in the jurisdiction, its marginal product falls and the marginal product of labor rises. Thus, companies invest up to the point where the marginal product of capital equals its cost, $r + t$. The problem facing local authorities is given by the impossibility of increasing the variable G without an increase in the only one variable available, t . Therefore, the cost of capital rises, causing the demand for capital to shrink by ΔK . Since the after tax return on capital (r) is an exogenous variable, the higher tax rate will not reduce the resident's capital income, but they will pay the tax indirectly through lower wages. Thus, a unit rise in the supply of public goods, G , requires the tax rate to be raised by Δt , to balance the budget, while wage income will fall by $K\Delta t$. This tax increase must be high enough to cover both the marginal cost of G , denoted MC , and to offset the impact of the capital outflow on tax revenue, $t\Delta K$. Therefore, the resulting fall in the immobile factor's income will exceed MC by the amount, $-t\Delta K$. According to Samuelson's rule for optimal provision of public goods, maximum efficiency is achieved when the sum of individuals' willingness to pay for the public goods equals the marginal cost of these goods. In other words, governments will increase tax rates up to the point where marginal benefits of public goods are higher than its costs. In equilibrium, the marginal benefit must equal the marginal cost ($MB=MC$).

In the tax competition setting, for an optimum level of G we have a modified Samuelson rule for public good provision:

$$MB = MC - t \times \Delta K. \quad (3)$$

And since $t\Delta K < 0$, then the marginal benefit must be greater than the marginal cost of G to compensate the capital outflows induced by the increased taxation. In other words, we are dealing not only with the actual cost of producing public goods, but also with an indirect cost to the local economy due to capital outflows directed to other jurisdictions with lower tax rates. Raising t to finance an increase of G in a jurisdiction generates a positive externality on other communities because authorities are concerned only for their own residents. Basically, another jurisdiction j will benefit from this tax increase, with an amount $t_j\Delta K_j$, where t_j is its tax rate, and ΔK_j is the capital inflow that it experiences.

Thus, a government can increase the welfare of its residents at the expense of other jurisdictions by simply reducing the tax rate because it is associated with an influx of capital. But this equilibrium is not stable. If we assume a community A which proceeds in such a manner, it is possible that other community B to do likewise, reducing taxes and public spending to attract capital from A. This will reduce the level of welfare in A, which may react by a successive reduction in taxation to attract back some of the capital. At each

stage in the community that reduces taxation welfare increases to the expense of other communities, causing a worsening global economy because the gained result is less than the losses suffered by other communities. Following successive tax cuts both communities will be worse off since the public goods provision will fall below the optimal level.

The model's result is a phenomenon often called to in the literature as a "race to the bottom", since all capital taxes are abandoned in favor of taxes on immobile factors. Moreover, if there are some restrictions imposed on the maximum level of taxation on immobile factors, the authorities will choose to reduce the level of public services to a sub-optimal level in all jurisdictions.

Starting from the standard tax competition model, the literature has developed numerous extensions obtained by modifying one or more of its assumptions. In the following we will present the most important extensions, highlighting the various negative effects that are likely to occur.

Large jurisdictions

The Zodrow - Mieszkowski model is based on the existence of many small communities, so that none of them can influence the after tax return on capital. Taking into account the possibility of large jurisdictions, then each jurisdiction decision regarding the tax rates may influence the return on capital throughout the economy. In this case there is a Nash-type competition between communities, because each community will make decisions based on the strategies adopted by other communities. The strategic variables may be either tax rates or the public service level, but usually, in the literature, the tax rates are used most often, public services being adjusted to government revenue collected from such taxes. Thus, a community will determine the tax rates based on the tax rates charged in other communities. The after tax return on capital will depend on the chosen tax rates and, at the same time, on the tax rates from the rest of the communities.

$$r = r(t_1, t_2, \dots, t_N), \quad (4)$$

where:

t_1, t_2, \dots, t_N –the tax rates in the N communities.

If a jurisdiction j increases its tax rate by one unit, then the cost of capital, $r + t_j$, increase with $1 + \Delta r$, where $\Delta r < 0$. Thus, the demand for capital, $K(r+t_j)$, will depend less on t_j , comparing to the small jurisdictions case, where r is fixed. We are still facing a positive externality induced by capital outflows due to increased taxation in a jurisdiction, but its level is lower because the increase in t_j is accompanied by a decrease in r . Therefore, we can say that the welfare loss from suboptimal provision of public services is lower than in the case of small communities.

Asymmetric tax competition

The standard tax competition model assumes the existence of many small homogeneous regions. Modifying this assumption, by considering some different regions in terms of size, an “Asymmetric tax competition” is created between large and small regions. Bucovetsky (1991) and Wilson (1991) analyzed the consequences of such competition between the two types of regions, the differentiation between them being made by the number of residents. Larger region has a greater demand for capital and thus an increase in its tax rates will cause a more significant reduction in return on capital after taxation. Consequently, the cost of capital, $r + t$, is less dependent on changes in tax rates for larger regions than in the small regions case.

We can say, therefore, that large jurisdictions are less concerned about capital outflows caused by taxation and thus will set higher taxes. The difference between taxation levels will lead to a relocation of capital from large towards small jurisdictions, explaining the formation of tax havens in small states. Moreover, Wilson (1991) has shown that if the difference between regions is large enough, then the small ones will actually benefit from tax competition. Thus, although tax competition throughout the economy is causing adverse effects, some jurisdictions (the small ones) can actually benefit from it by attracting capital, and hence provide a higher level of public services.

Trade between jurisdictions

In the basic tax competition model the private consumption is aggregated on a single representative good for simplicity reasons, putting into evidence the effects of tax competition on capital allocation decisions between regions. Further, it raises the question of the possibility that production and consumption decisions may be influenced in any way by tax competition.

Wilson (1987) developed an extension of the standard model by introducing a system with many regions and two private goods, one capital intensive, and the other labor-intensive. Under a free trade between regions, although regions are initially identical, they will choose different levels of taxation, and those with lower taxes will specialize in production of capital intensive goods, while those with higher taxes will specialize in labor-intensive goods. Basically, some regions will choose to compete to attract capital intensive industries, their residents enjoying higher incomes, but fewer public services and others will keep taxes at a higher level, attracting labor intensive industries and residents will benefit from higher public services, but residents' income will be reduced. Since residents are considered identical (have the same utility function given by the ratio of public goods and private consumption), this situation makes them adjust this ratio according to the type of region they belong. Thus, production and consumption

decisions are decisively influenced by the promoted tax policies, which is another distortion attributable tax competition

Labor mobility

The standard tax competition model assumes a fixed population in each tax jurisdiction, involving individuals unable to move from one jurisdiction to another. Thus, the basic model and the extensions discussed so far are suitable to study the effects of tax competition between countries, where individual mobility is seriously limited by restrictions on migration, political, cultural and religious or other barriers. In modern economies, however, the population is not stationary, especially in the European Union, where one of the four fundamental freedoms is freedom of movement of persons. For this reason, we think it is useful to discuss an extension of the basic model that takes into account the mobility of individuals.

Such an approach was made by Brueckner (2000) who assumed that individuals vary in preferences over public goods, and they can choose both the community where to invest and the community where they want to live. Assuming that public goods are not subjecte of economies of scale, so their cost per capita does not decrease as the community's population grows, individuals will adopt a Tiebout-type behavior, choosing to settle in the community that offers the desired level of public services. Unfortunately, different capital income taxes between communities continue to generate a positive externality, influencing investment decisions, and leading to a suboptimal provision of public goods. Moreover, individuals who have a lower demand for public goods will even benefit from tax competition to the detriment of others.

Income redistribution

The tax competition literature is focused on models in which public expenditure is targeted exclusively to the provision of public goods. In reality, however, a large proportion of public expenditure of the states, and in particular the European Union Member States, is intended to grant financial transfers to the benefit of certain social categories. Moreover, the theory of public finance identified the need for state intervention in the redistribution of income and wealth to ensure social equity, giving substance to the redistribution function.

Orientation of public spending for social transfers has important implications when analyzing the effects of tax competition. As noted, tax competition leads to under taxation of important sources of revenue when the tax base mobility is high. Depending on the composition of public expenditure by governments, this may limit the social transfers, hampering the achievement of redistributive function of the states. Sinn (1994) studied this issue at EU level, indicating that increased competition among states to attract mobile

capital will limit the capacity of Member States to maintain their current high level of social transfers. He considers necessary to establish a central authority responsible for the EU redistributive policies so that Europe “should not be forced to give up its social achievements” (Sinn, 1990, p.502).

Income redistribution problem is of great concern in the European Union because, according to the theory of fiscal federalism, the responsibility for redistribution function must rest with the central authorities and at the moment the EU budget dimension is not a suitable to allow this.

The magnitude of the negative effects of tax competition

Given the distortions caused by tax competition it raises the question of calculating the magnitude of these negative effects. This is because those effects can be either insignificant and require no concern from the authorities or they can be significant and cooperation between governments is needed in order to implement some tax harmonization measures. While measuring the welfare loss attributable to tax competition is very difficult empirical task, in literature there were several attempts in this direction.

Wildasin (1989) attempted to quantify the inefficiencies attributable to tax competition through a model derived from the basic model. He showed that the tendency of under-providing public goods can be offset by providing subsidies for each jurisdiction by the authorities located on a higher level of government. Wildasin estimated that in the United States, without taking into account the current budgetary transfer system, the subsidy required is a substantial, around 40%, and the cumulative cost of the loss of efficiency due to suboptimal local public provision is the order of 8% of total public expenditure. However, if one takes into account the budgetary transfer system, these estimates are significantly reduced: the level of subsidies required is 10%, with an aggregate cost of loss of efficiency in public resource allocation of only 0.6% of total government expenditure.

In a more recent study, Parry (2003) has made an analysis that calculated the cumulative impact of various economic effects of tax competition. He found that the welfare losses attributable to tax competition are quite modest, less than 3% of all capital taxes or 0.15% - 0.45% of GDP. This result is valid if it is assumed that public officials are only concerned about the welfare of the citizens. Moreover, considering the possibility of governments adopting a “Leviathan” behavior, these effects can easily turn into positive effects.

In an attempt to quantify the potential benefits of tax harmonization process at EU level, Sørensen (2001) developed a model and showed that the volume of each country's public services will not reduce, but instead will decrease public expenditures for redistribution. Thus, Sørensen simulated various types of cooperation between governments, such as coordination of

fiscal policies, implement a minimum tax rate on capital income, or even full harmonization of the corporate income taxes. The results of these forms of cooperation between governments, expressed by the gain of wealth, have proved positive, but their size was extremely small, the order of 0.16 to 0.35% of GDP. Moreover, lower mobility of capital between the EU and the rest of the world leads to these results. If, however, one would consider perfect capital mobility at the global level the gain brought by the coordination of fiscal policies in the European Union would fall significantly, up to 0.075% of GDP. He also demonstrated that high heterogeneity of preferences between states regarding the degree of income redistribution, differences in productivity and the share of assets owned by foreigners would have a major influence on the distribution of these benefits. Thus, tax harmonization is expected to face strong political opposition due to uneven distribution of benefits that would result.

3. The positive effects of tax competition

All the aspects discussed before highlight the negative effects of tax competition. However, all these models are based on a large number of restrictive assumptions, some unrealistic, and not considering the possibility that the public authorities to pursue their own interest in the policies they promote. Subsequently, we will try to identify any positive effects of competition between governments and to describe specific situations when tax competition could prove to be a factor for improving public sector efficiency.

Tax exporting

The theory of fiscal federalism has identified numerous instances in which taxes imposed in a community are ultimately paid by residents of other communities, phenomenon called “tax exporting”. Even the possibility that a jurisdiction’s government taxing the capital income of nonresident investors may also be considered a transfer of tax burden. Thus, the local government imposing taxes which are susceptible to the phenomenon of exporting will tend to oversize the volume of local public services provided since the consumers will perceive that they have a lower cost (Zodrow, 2003).

As globalization process is evolving and thus increase the share of assets held by non-residents, this issue becomes relevant in the international context. Thus, the possibility of passing the tax burden to non-residents may result in unjustified increase in public expenditure. In this case, competition between governments to attract mobile factors can have a positive impact by limiting these trends. Therefore, we can argue that in economies where a large proportion of assets are held by non-residents tax competition has greater potential to produce beneficial effects.

The agglomeration economies

In modern economies there is a phenomenon of concentrating production in certain geographical areas. This is highlighted by the center-periphery models, where due to “congestion” is reached the concentration of industrial production in some developed countries (“core countries”), whose citizens enjoy a high volume of public goods and taxes supported by the residents are high. These higher taxes are justified, because in those countries also the possibilities of investing are greater than in the peripheral countries.

Baldwin and Krugman (2004) showed that tax harmonization by adopting a common tax rate will affect at least one of the two types of countries. Moreover, choosing a common tax rates between the high levels of developed countries and smaller levels in peripheral countries will affect both countries. The less developed would lose their tax advantages in attracting foreign investments and the industrialized (core countries) would have to reduce the public services volume. One possible solution to prevent amplification of tax competition between governments would be adoption of a minimum level of tax rates, regardless how low that level would be. This would represent a Pareto improvement because the industrialized countries would benefit without undermining the position of peripheral countries.

The impact on public sector dimension

Probably the most important positive implication of tax competition is given by its impact on public sector size. This line of research in the tax competition literature has its origins in public choice theory, developed during the '60s, following the contributions of James Buchanan, Gordon Tullock, William Niskanen and Geoffrey Brennan.

One of the fundamental tenets of public choice theory is related to the natural tendency of the public sector to increase. Analyzing the action taken by governments in the same manner as they are considered actions taken by individuals, these theorists have shown that governments are formed by people who themselves have their own interests, and they will pursue them using public positions held. Thus, the public authorities actions are not necessarily driven by measures designed to maximize the welfare of citizens, but rather to maximize their personal welfare. Therefore, those responsible for public decisions will continually seek to maximize the size of public budgets in order to achieve personal objectives such as: increased power, influence, more subordinates, higher wages, to reward interest groups that funded election campaigns. In this way, the public sector is compared to a “leviathan”, which always seeks to increase its size by maximizing revenue collected from the private sector. Buchanan and Brennan (1980) argue that competition between governments, just as competition from the

private sector, is limiting the ability of the monopoly (in the case represented by the state), to strengthen its control over the economy.

This skeptical view on the role of public sector in the economy which favors tax competition has gained ground in recent years. The idea that the existence of tax competition has positive effects on the efficiency in the public sector is based, among others, on the argument that public sector representatives (politicians and bureaucrats) are able to allocate public funds in ways that represent a “government waste” from the society’s point of view. In this context, tax competition is able to limit this tendency of channeling public resources in favor of interest groups, acting just as a constraint from the electorate.

The first theoretical approaches in order to identify the positive effects of tax competition in leviathan type models were built in the second half of the '90s. These include models developed by Edwards and Keen (1996), Rauscher (1998) and, more recently, Wilson (2005), Eggert and Sørensen (2008) or Janeba and Schjelderup (2009). All these models consider that governments act partially in favor of interest groups and are allocating public expenditure for the benefit of the whole society as well. The various results identify the potential for tax competition to limit public sector expansion, but citizens' welfare implications are not very conclusive.

In the Edwards and Keen (1996) model of total public expenditure only a part is used to provide public goods that benefit all citizens, the rest being directed in favor of interest groups, representing a true “government waste”. In this framework, using a model derived from the standard model, they reported two adverse effects of tax competition on the welfare of citizens. On the one hand, there is welfare improvement by reducing government waste and, on the other hand, is the tendency of underprovision of public goods. They show that up to the point where the elasticity of tax base is less than the fraction of wasted public funds (marginal propensity of governments to waste public resources), tax competition is beneficial. Long-term implications of the Edwards-Keen model is particularly interesting in the context of increasing international economic integration, as it increases the mobility of taxable bases, and hence its elasticity on the tax rates, reducing the potential benefits of tax competition, unless the fraction of the public funds wasted increases.

Eggert and Sørensen (2008) have developed a model in which politicians raise their political capital by increasing public sector wages unjustified. Outcome of tax competition is indeed the reduction of these inefficient public spending, up to their complete elimination, but, at the same time, there is a tendency of underprovision of public goods. They concluded that institutional and policy reforms, however, would be a straightforward solution to counter this phenomenon.

In conclusion, we can admit that while tax competition certainly limits expansionist tendencies of the public sector, citizens' welfare implications are not clearly outlined in the literature. It is possible that the reductions in public expenditure to operate in those areas without sufficient political support rather than in those areas where most waste is generated. Moreover, politicians are likely to disregard this constraint on the revenue side, public expenditure continuing to grow, with disastrous effects on the budget deficit. However, given the imperfections of the democratic system in which citizens have relatively limited possibilities to choose, tax competition remains a method, even indirect, to promote efficiency in the public sector.

4. Conclusions

The tax competition literature does not offer a clear solution on the implications of this phenomenon. On the one hand, tax competition leads to reduction of taxes levied on mobile factors and to a decline in the volume of public services and, on the other hand, it increases the efficiency of public funds. The basic model and some extensions emphasize various negative effects associated with competition between governments, suggesting the need for budget transfers that could offset these effects. This is of particular importance for the EU because the size of the EU budget is currently not suitable to allow the granting of such transfers. For this reason, harmonization of direct taxes, and especially those levied on capital income, could prove beneficial solution. However, several studies have attempted to determine the magnitude of undesirable effects attributable to tax competition and have concluded that they are insignificant for citizens' welfare. Moreover, tax harmonization benefits would be modest and the uneven distribution of these benefits among states could lead to a strong political opposition on the harmonization process. The tax competition literature does not provide, however, a solution on the net impact of these presumed effects. It is very difficult to predict which of these effects are dominant, and which are more likely to occur.

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