Tax competition and the implications of national tax policy coordination in the presence of fiscal federalism

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ABSTRACT

We consider symmetric two-tier tax competition between leviathans, and tax policy coordination of national governments through merging at the upper tier. We show that, if sufficiently few governments merge, some common implications from the literature on single-tier tax competition no longer apply. First, we find that a merger party earns more tax revenue than a non-merger party. Second, given that the merged jurisdictions are regarded as the national government of a larger country, we establish that per capita tax revenue of the latter government is larger than that of a national government of a small country. Both findings are driven by sufficiently strong cross-tier tax competition of non-merged national governments with lower-tier jurisdictions. We also endogenize the merger decision via the formation of a tax coalition, and show that a stable tax coalition at the upper tier is always larger, and can mitigate tax competition considerably more than a stable tax coalition in the single-tier case.

1. Introduction

A common view in the literature on tax competition is that policy coordination is needed to internalize fiscal externalities between jurisdictions arising from individually optimal taxation, see Zodrow and Mieszkowski (1986), Wilson (1986) and Wildasin (1989). As the intensity of tax competition, and with it, the degree of inefficiency is inversely related to the number of independent jurisdictions, see Hoyt (1991), eliminating tax competition through cooperation between all countries constitutes the Pareto-efficient outcome and is hence a fundamental explanation as to why countries may be willing to coordinate their tax policy.

Given this issue, it should be taken into account that the right to tax is typically not only found at the central national level. In fact, fiscal federalism can be observed where sub-national governments, for instance of states or counties, are endowed with some degree of tax authority, which may be associated with a tax-base overlap originating from governments at different tiers within a federation that rely on the same tax base.[1] Uncoordinated consolidated taxation is then inefficient, not only due to externalities a jurisdiction imposes on other governments horizontally at the same tier, but also vertically on governments at another tier, see e.g. Dahlby (1996), Keen (1998) and Keen and Kotsogiannis (2002). In this decentralized perspective, tax policy coordination is thus also required for Pareto efficiency, and is the main aspect of our discussion.

Without fiscal federalism, and being aware that perfect cooperation is difficult to implement and empirically less relevant, Konrad and Schjelderup (1999) show that the more easily attainable merger of a subset of all countries is also able to reduce inefficiency. The reason is that externalities are internalized among merger parties, and jurisdictions that are not merged, benefit from a cooperation-induced capital inflow and from less intense tax competition. In the presence of fiscal federalism, Breuillé and Zanaj (2013) address the influence of tax coordination via reducing the number of independent upper-tier governments, while leaving the number of lower-tier jurisdictions unchanged.

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[1] Empirically, a tax-base overlap is found, for example, in corporate taxation in Germany, where the Federal Government and communal governments simultaneously impose both a corporate tax ("Körperschaftsteuer") and a local business tax ("Gewerbesteuer") on business profits, see e.g. Wrede (1996). In view of the latter tax, the tax load of a firm results from the federally determined 3.5% of the business tax assessment multiplied by the municipal multiplying factor, which can be set freely by the communes above the threshold of 200%. In the presence of a tax-base overlap, a similar sub-national taxation is found, for instance, in Luxembourg ("impôt commercial") or in France ("Contribution Economique Territoriale" - CET). Further related examples are - at least to some extent - Italy and Hungary, where local administrations are allowed to determine the local income tax freely within a given interval. In Canada, a corporation is subject to both a federal corporate income tax as well as an income tax at the provincial level, the amount of which varies between provinces.

They show that fewer independent governments at the upper tier evoke an inefficiency reduction by raising the consolidated tax rate towards the Pareto efficient level. In their merger approach, Breuillé and Zanaj (2013), however, do not take into account the fact that typically there are some merger parties and some that do not participate. Empirically, for instance, the Council of the European Union (2011) points at the relevance of tax harmonization of all member state governments. The Treaty on the European Union, in turn, incorporates the difficulty of all-embracing policy harmonization and supports so-called enhanced cooperation agreements of only some member states.

We address this aspect and extend the work of Breuillé and Zanaj (2013) by considering that some upper-tier, i.e. national, governments merge, and that those at the lower tier remain independent. We employ a parametric model of symmetric Nash tax competition between several two-tier federations, i.e. countries. In this context, governments at each tier are assumed to behave in a self-serving manner and thus act as leviathans, see Wrede (1996), Wrede (1997) or Keen and Kotsogiannis (2003). From a global perspective, we confirm both the literature on single-tier tax competition, as well as Breuillé and Zanaj (2013), in that tax coordination alleviates tax competition through an increase in the consolidated tax rate, provoking an aggregate tax revenue growth. Moreover, we find that two common implications from the literature on single-tier tax competition do not generally carry over to two-tier tax competition.

The first implication of our results originates, for instance, from Eichner and Pethig (2018) and Itaya et al. (2014), who establish that a merger party on its own gains a strictly lower payoff than a non-merger party, as the latter takes sufficiently strong advantage of the cooperation-induced capital inflow. This does not apply to fiscal federalism if the scale of the upper-tier merger is not excessively high. In this case, a non-merger party still takes advantage of some cooperation-induced capital inflow. However, it also faces tax competition with lower-tier governments, where the corresponding downward pressure on its tax rate is sufficiently strong to dampen the payoff-increasing effect of a larger tax base.

The second implication stems from the literature on asymmetric tax competition, for example Bucovetsky (1991), Bucovetsky (2009) or Wilson (1991), who establish on a per capita basis that the payoff of the government of a smaller country exceeds that of a larger one. In our approach, the merged jurisdictions can be understood as the national government of a comparatively larger country. Then, if not too many governments merge, and hence if the large country is not too large, we show that the per capita payoff of the national government of the large country is higher. The reason is that, due to the size, the national government of the large country exerts more political power and therefore imposes a higher tax rate than the national government of a small country. This results in a capital import in favor of the latter, thus enhancing its upper-tier tax base. However, since the latter government is also confronted with cross-tier tax competition, its tax rate is sufficiently low to render the per capita payoff smaller than that of the larger country's government.

The results of upper-tier political mergers stated above, which contrast considerably to the insights from single-tier tax competition, rely on the assumption of a given merger scale. We therefore also pose the question of whether such mergers materialize endogenously in the first place, and how corresponding results relate to the relevant literature involving single-tier tax competition, such as Eichner and Pethig (2018) and Itaya et al. (2014). Based on the stability concept of d'Aspremont et al. (1983), they consider the formation of stable tax coalitions and show that if a coalition of some national governments is stable, the intensity of tax competition, and with it the inefficiency of non-cooperative tax policy, is reduced at best by no more than 18%, see Eichner and Pethig (2018). Also, it is evident that the relative size of a stable tax coalition in the single-tier setting involves no more than 23% of all national

governments, see Itaya et al. (2014).

We follow Eichner and Pethig (2018) as well as Itaya et al. (2014) and endogenize the upper-tier merger decision by considering the formation of a stable tax coalition, also on the basis of the stability concept of d'Aspremont et al. (1983). We show that a stable coalition at the upper tier generally involves more than 62.5% of all national governments. In particular, by employing a numerical analysis, we establish that stability of a tax coalition requires at least 26 countries and does not depend on the number of lower-tier jurisdictions per country. The analysis furthermore reveals that a stable coalition encompasses at most 89% of all national governments. Hence, it tends to be considerably larger than in the single-tier setting, which is again driven by cross-tier tax competition faced by national governments outside the coalition, which increases the incentive to be part of the coalition. Given the comparatively larger size of a stable coalition at the upper tier, we also show that the efficacy of the corresponding tax coordination, in terms of increasing aggregate tax revenue from the non-cooperative equilibrium towards the level with full cooperation of all governments across all tiers, is also higher than from the single-tier perspective and amounts at best to some 93%. In total, our decentralized setting yields a more optimistic view on the possibility and consequences of imperfect tax policy coordination of national governments, compared to the literature on single-tier tax competition.

The remainder of this paper is structured as follows. The basic model is introduced in Section 2. Section 3 derives the market equilibrium for given tax rates. In Section 4, we present tax-competition equilibria in the case without tax coordination, with full cooperation across tiers and with upper-tier tax coordination through merging. The formation of a stable tax coalition at the upper tier and the corresponding efficacy is addressed in Section 5. Section 6 concludes.

2. The model

The model is based on Wrede (1997) as well as on Breuillé and Zanaj (2013). We consider an economy of $n \geq 3$ countries, where country $i \in N = \{1, \ldots, n\}$ comprises $m > 1$ regions and region $j \in M = \{1, \ldots, m\}$ in country i is referred to as region ij.[2] In region ij, there is a representative resident who is the same in all regions. She is endowed with an exogenously given capital stock $\overline{K} > 0$, which is invested entirely in the global capital market. Also, she owns a representative firm located in the same region (henceforth referred to as firm ij), that produces a numéraire consumption good, being sold on the perfectly competitive world market at a price of one. Production of firm ij requires capital K_{ij}, which is borrowed on the capital market at the interest rate r. The production function is the same for all firms and assumed to be quadratic, since this is the most straightforward approximation of a concave production function. It reads[3]

$$y = \left(a - \frac{b}{2} K_{ij} \right) K_{ij} \quad \text{with} \quad a, b > 0, \ \frac{a}{b} \geq K_{ij} > 0,$$

where a and b represent the productivity of the firm and the decreasing rate of marginal productivity, respectively.

Each country is led by a national government at the upper tier, whereas at the lower tier, each region has its own regional government. Let t_{ij} denote the unit tax on capital levied by the lower-tier government of region ij on firm ij. This tax rate reflects, for instance, the local business tax in Germany (Gewerbesteuer) or in France (CET).[4] Also, let τ_i

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[2] In our framework, a region represents a state, prefecture, county, parish or borough.

[3] A quadratic production function is also necessary to handle the results, which otherwise become intractable, see e.g. Haufler (1997), Grazzini and van Ypersele (2003), Devereux et al. (2008), Bucovetsky (2009), Eichner and Pethig (2015), Eichner and Pethig (2018) as well as Itaya et al. (2014).

[4] See footnote 1 for details.