

Tax competition with heterogeneous firms

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Abstract

A model of tax competition in which firms earn rents is described. The size of these rents, coupled with the degree to which the firms are foreign-owned, determine the equilibrium tax rates. The existence of rents significantly alters some generally accepted results involving the possibility of a Pareto-improving common tax rate and the underprovision of publicly provided goods.

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1. Introduction

The ability of firms to move to other tax jurisdictions places governments in a quandary. The governments want the revenue that can be earned by taxing profits, but they are aware that higher taxes will induce some firms to relocate. An extensive literature has examined the behaviour of competing governments under these circumstances. A standard assumption of this literature is that capital is homogeneous. This paper begins with an alternative assumption, that the capital is embodied in firms and that the firms are intrinsically different.¹ Specifically, each firm's productivity varies across regions, and productivity in a particular region varies across firms. Almost all firms earn rents in equilibrium.² The implications of this assumption are

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¹ Each firm can be imagined to embody one unit of capital, as in Boadway et al. (2004). Their model assumes that the firms are equally productive in all regions but subject to a regional production externality, whereas the current model emphasizes the differences among firms.

² Mansoorian and Myers (1993) consider the problem of rents from a different perspective. They assume that labour is the mobile factor and that workers have different preferences over regions. Here, almost all of the workers earn locational rents.

investigated under two different tax regimes. The first regime is the one used by Hamada (1966) and subsequently employed by a number of others, including Burbidge et al. (1997) and Peralta and van Ypersele (2002). The governments are able to impose both a tax on profits and a lump-sum tax on incomes. Under this regime the governments have two instruments that can be used to meet two objectives: maximizing the economy's resources and allocating these resources between private and publicly provided goods. The second tax regime, found in the survey of Wilson (1999), eliminates the lump-sum tax, so that the governments must compromise between competing ends when they choose their tax rates.

Under both tax systems the profit tax is higher in the presence of heterogeneity. Moreover, the tax rate increases with the extent of foreign ownership, and with a measure (described below) of the degree of heterogeneity. Although the governments choose to tax all rents—that is what their tax instrument allows them to do—they would prefer to tax the rents that accrue to foreigners. An increase in either foreign ownership or firm heterogeneity increases the rents owed to foreigners, inducing the governments to set higher tax rates. Shrinking the degree of firm heterogeneity to zero causes the tax rate to converge to that predicted by the model with homogeneous capital.

These results resemble those obtained in models with mobile *homogeneous* capital when there is a cross-ownership of the *immobile factor* (generally land). In these models, the fixed factor earns rents. Any tax on the mobile factor will be capitalized into the return to the fixed factor. The optimal capital tax will be zero if these land rents can be fully taxed (Huizinga and Bo Nielsen, 1997). If the rents cannot be fully taxed, then foreign ownership of the immobile factor gives governments an incentive to use positive capital tax rates to raise revenue since part of the tax burden falls on nonresidents (Lee, 2003). The greater the degree of foreign ownership, the greater the 'tax-exporting incentive' and the higher the equilibrium capital tax rates. Capital tax policy is affected jointly by the amount of rents and the extent to which these rents accrue to nonresidents. This continues to hold when there is cross-ownership of a *heterogeneous mobile* factor.

A peculiarity of models with homogeneous capital is that, under the Hamada tax system (with returns to the fixed factor completely taxed), there are only two kinds of equilibria: ones in which every government sets its profit tax at zero, and ones in which there is a mixture of positive and negative rates. Both outcomes are inconsistent with casual observation: governments do seem quite prepared to tax profits.³ As well, the nature of these equilibria has a decisive impact on a related issue, the possibility that the adoption of a common tax rate would be Pareto improving. The current view is that a common tax rate would be Pareto improving — but only if the common rate were zero.⁴ Governments might think profits to be a tempting source of revenue, but they would all be better off if they became abstainers. Both of these results are undone by the introduction of heterogeneity. Every tax rate in a symmetric equilibrium is positive, and every tax rate in an equilibrium in which the regions are sufficiently similar is also positive. Furthermore, there is a *range* of Pareto-improving tax rates, and since this range is bounded by the equilibrium tax rates, it is quite possible that every Pareto-improving tax rate is positive.

³ See Devereux et al. (2002) for a review of the use of corporate taxes in the OECD.

⁴ It seems to be common knowledge that, starting from the Nash equilibrium, both regions in a two-region world would benefit if they set their tax rates at zero. Peralta and van Ypersele (2002) attempt to extend this result to an economy with n regions. They consider a policy of setting upper and lower bounds on the tax rates, and show that contracting these bounds can be Pareto-improving. They are unable to show that a common tax rate (i.e., eliminating the gap between the bounds) is Pareto-improving; but details of their proof show that *if* this policy is Pareto-improving, the common tax rate can only be zero.

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