

A bargaining model of tax competition[☆]

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Abstract

This paper develops a model in which competing governments offer financial incentives to induce individual firms to locate within their jurisdictions. Equilibrium is described under three specifications of the supplementary taxes. There is no misallocation of capital under two of these specifications, and there might or might not be capital misallocation under the third. This result contrasts strongly with that of the standard tax competition model, which does not allow governments to treat firms individually. That model finds that competition among governments almost always leads to capital misallocation.

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1. Introduction

The tax competition literature assumes that the economy is divided into autonomous regions, and that capital can move freely between the regions. Its objective is to determine the rates at which the regions will tax profits, and the impact of the profits tax on resource allocation. It finds that the tax rates generally vary across regions, and that the variation in tax rates leads to an inefficient allocation of capital: the low tax regions use too much capital and the high tax regions use too little (see Wilson, 1999). A limitation of this literature is that it assumes that a government can only attract capital by reducing the rate at which it taxes profits. In reality governments attach so much importance to new capital investment that they will often make substantial financial concessions to get it. Table 1 shows the concessions recently given to Asian auto makers building assembly plants in North America. These concessions have been as high as 30% of the new investment.

If competition among governments is to be properly understood, the focus must be on the overall financial package and the way in which that package varies from firm to firm. A model of this sort is described here. A key element of the model is that capital is embodied in heterogeneous firms. Each firm is mobile, and each firm's productivity varies from region to region. The firms differ in the way that their productivity varies across regions. Each firm receives an offer from the government of every region, and locates in the region in which its after-tax profits would be highest. The government uses its tax revenue to provide a public good to the region's citizens.

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Table 1
 Assembly plants built by Asian auto makers in North America since 1998

Company	Location	Investment	Government aid	Annual output
Honda	Lincoln, AL	825	248	270
Hyundai	Montgomery, AL	1000	252	300
Nissan	Canton, MS	1400	360	400
Toyota	Princeton, IN	1900	117	400
Toyota	San Antonio, TX	800	133	150
Toyota	Woodstock, ON	625	100	100

Source: *The Globe and Mail*, Toronto, 1 July 2005. Investment and aid are in millions of US dollars; output is in thousands of vehicles.

Casual observation shows that governments are prepared to negotiate with some firms but not with others, so this model is an abstraction. The standard tax competition model, in which no-one gets a special deal, is also an abstraction. Our view is that these two models constitute polar cases in the study of tax competition. Reality lies somewhere between them, but only one of the two poles has been carefully studied. Our hope is that models like this one will ultimately lead to a more balanced view of tax competition.

Our basic model assumes that each government can levy a tax on the profits of firms located within its jurisdiction, and that the government can also levy a lump-sum tax on the incomes of the citizenry. Under these assumptions, the standard tax competition model predicts optimal public goods provision but misallocation of capital. This finding was first presented by Hamada (1966). Hamada's model has been expanded in many different ways, but its core result has remained largely unchanged. The bargaining model, by contrast, predicts both optimal public goods provision and optimal allocation of capital. The resource misallocation that has been the focus of the tax competition literature is simply not there.

Since the existence of such a broadly based lump-sum tax might be viewed with some scepticism, we consider two alternative assumptions. The first is that the lump-sum tax strikes only wages. Capital is again correctly allocated, but optimal provision of the public good is no longer guaranteed. Public goods are optimally provided if the constraint on lump-sum taxation is not binding, and they are underprovided if it is binding. The second is Wilson's (1999) assumption that the profits tax is the only tax.¹ Wilson shows that, under this assumption, the standard tax competition model predicts both underprovision of the public good and misallocation of capital. The bargaining model is more agnostic. There is underprovision and capital misallocation if the typical firm's gross profits would not fall greatly if it moved from its best location to its second-best location, and there is optimal provision and optimal capital allocation if this move would cause the typical firm's gross profits to fall dramatically.

An important feature of these results is that they are derived from a general equilibrium model, and hence can be directly compared to those of the standard fixed-rate model of tax competition. A number of earlier papers have offered explanations of the tax breaks given to mobile firms, but these papers have described the negotiations between a single firm and one or two governments. Doyle and van Wijnbergen (1994) examine the intertemporal structure of a firm's tax payments. They note that a mobile firm has greater bargaining power than a firm that has already incurred the sunk costs associated with locating in a particular region. They argue that mobile firms will use their extra bargaining power to extract concessions. Bond and Samuelson (1986) present an alternative explanation of the same phenomenon: a region can offer a tax holiday to a mobile firm to signal that firms that locate there experience high productivity. The firm will willingly pay higher tax rates in later periods because it is very productive, and these high tax rates allow the government to recover the cost of the initial tax holiday. A low-productivity region could not offer the same incentive: firms that located there would relocate when they found that they had low productivity, so the region would be unable to recover the cost of the tax holiday. King et al. (1993) allow the firm to negotiate simultaneously with two governments, and add a stochastic element to the regional productivities. Black and Hoyt (1989) take an altogether different approach, arguing that subsidies to mobile firms can undo the distortionary effects of average cost pricing of publicly provided services.

¹ Our assumption is actually slightly different from Wilson's, in that we assume that a government that raises too much revenue through the profits tax can return the excess revenue to the citizens through a negative lump-sum tax. Wilson requires an exact match between revenue and public goods expenditure.

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