



Redistribution and regional development under tax competition

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ARTICLE INFO

Article history:

Received 1 May 2007

Revised 22 April 2008

Available online 9 May 2008

JEL classification:

H2

H5

R13

R58

Keywords:

Regional inequity

Regional development

Public inputs

Transfer policies

Tax competition

ABSTRACT

This paper considers how capital tax competition affects transfer and development policies in the presence of regional income disparity. In each country, development policies determine the number of rich (poor) regions that (do not) engage in production activities, while transfer policies redistribute income between rich and poor regions. The mix of transfer and development policies is inefficient under tax competition: conditional on the equilibrium tax rate, too much revenue is spent on development policies and too little on transfer policies. This analysis of the expenditure mix implies that development policies are used as a means of regional redistribution even if transfer policies are efficient instruments for this purpose. Moreover, it is shown that the overall level of public expenditure may be too high because of the possibility of over-development.

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1. Introduction

In the study of tax competition, substantial attention has been devoted to the consequences of competition for mobile tax bases. Since Wilson (1986) and Zodrow and Mieszkowski (1986), the standard argument in the literature is that mobility of tax bases creates a tendency towards inefficiently low tax rates. Not only does tax competition cause inefficient resource allocations, but also it may be an obstacle to redistribution policies.¹ It has been often argued that, as a result of globalization, intensified tax competition prevents the welfare state from pursuing redistribution goals through welfare programs and income transfers.

Although the previous studies related to mobility and redistribution have mainly focused on interpersonal redistribution, regional inequity is also a matter of concern in many countries and states. With respect to this matter, in addition to regional transfer policies, regional development policies play an important role as a means of encouraging economic activities in depressed regions and reducing regional income disparity. An outstanding example is

development policies in the European Union (EU) as a confederation, which include the structural funds and the cohesion fund; see Farrell (2004) and Jovanovic (2005) for redistributive aspects of the EU regional policies. Fisher and Peters (1998) report that in the United States, the state governments conduct geographically targeted economic development programs for redistributive purposes. By analyzing the productivity of public capital, Yamano and Ohkawara (2000) conclude that in Japan, the regional allocation of public investment has been made to mitigate regional inequity and realize a harmonized economic development.

Given this policy practice, this paper introduces regional development policies into a tax competition model with regional inequity. In the present model, there are a large number of identical countries. Each country consists of many regions that are heterogeneous with respect to a fixed cost of regional development. Public investment is made to cover the development cost. These assumptions of regional heterogeneity and public investment enable me to clarify the relation between regional inequity and development policies in a simple manner. By setting the investment level, each country's government determines the number of active regions (rich regions) where production takes place. Residents in active regions earn income from both an immobile factor and mobile capital. In inactive regions (poor regions) where production does not occur, the immobile factor does not earn income, and residents invest their capital stock in active regions. Given that my attention is focused on persistent regional inequity, it is assumed that resi-

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¹ See Wilson (1999) for a comprehensive view of the tax competition literature. As for the influence of tax competition on redistribution policies, the previous related studies are reviewed and analyzed by Cremer et al. (1996), Cremer and Pestieau (2004) and Razin and Sadka (2005).

dents are immobile across regions.² The governments have access to transfer policies that redistribute income between active and inactive regions. A source-based tax on mobile capital is imposed to finance transfer and development policies. In each country, these policies are set so as to maximize the sum of the utility of residents in all regions (i.e., utilitarian).³

In this model, in the absence of tax competition, the utilitarian governments would achieve perfect regional equity through transfer policies. The number of active regions, which represents the level of development policies, would be chosen so as to maximize national income in each country. However, these first-best policies are not realized when the governments compete for the mobile tax base. Due to the downward pressure on the tax rate, the level of transfer policies is not enough to eliminate regional income disparity. While the constraint of capital-tax financing also decreases the level of development policies, another policy bias is present, which creates an upward pressure on the number of active regions. This bias towards over-development occurs because increasing the number of these productive regions, where business investment is made, raises the capital tax revenue. As a result, tax competition may increase or decrease the level of development policies.

Despite this ambiguity of the level of development policies, a clear-cut result is obtained with respect to the mix of transfer and development policies. An analysis of the impact of uniform policy changes made by all countries from non-cooperative equilibrium shows that, conditional on the equilibrium tax rate, too much revenue is spent on development policies and too little on transfer policies.⁴ When allocating a given tax revenue for redistributive purposes, the governments attach too much importance to reducing the number of poor regions, rather than transferring income from rich to poor regions. By distorting the expenditure mix in this manner, each government expects that the capital stock in its territory can be raised. From the viewpoint of the entire economy, however, this policy-induced capital movement represents a negative fiscal externality on other countries, which causes an inefficient resource allocation. This argument provides a possible explanation of why regional development policies are often used for redistributive purposes even if transfer policies are available. In the present analysis, redistributive regional development is a negative consequence of distorting tax competition.

This paper builds on Keen and Marchand (1997). In their model with public goods and public inputs, tax competition leads to relative-overprovision of public inputs because these inputs attract mobile capital by raising factor productivities. By allowing for regional heterogeneity within countries competing for mobile tax bases, this paper extends their basic argument on the expenditure mix to a study of persistent regional inequity. On the other hand, the implication for the level of public expenditure differs between this paper and the previous studies of tax competition. It has been shown that capital-tax financing causes under-provision of public inputs, as well as public goods, under fairly general specifications of production technology.⁵ In contrast, the possibility of

over-development cannot be dismissed in the present model. This difference is due to the assumption of the fixed cost of development: under this assumption, public investment is modeled as a means of establishing new productive regions. The impact of tax competition on the level of public investment in productive activities depends on how this investment is modeled and specified.

This paper is organized as follows. The model is described in Section 2. Section 3 derives and analyzes the equilibrium conditions for public policies under tax competition. The welfare impact of uniform policy changes from the equilibrium is clarified in Section 4. In Section 5, a comparison with the previous studies of tax competition is drawn. Section 6 gives concluding remarks.

2. The model

Consider an economy with a large number of identical countries. Each country is divided into many regions. There is an immobile (representative) resident in each region. Each resident owns an immobile factor (e.g., land or labor) in his or her region and a fixed amount of mobile capital (\bar{K}). It is assumed that all regions have the same amount of the immobile factor and that all residents have the same utility function. On the other hand, regions are heterogeneous with respect to a fixed cost of development. To conduct production in a region, the regional economy must be developed through public investment. The development cost is given by $c(n)$, where $n \in [0, N]$ is the regional index, and N is the total number of regions in each country. (Because all countries are identical, I will not attach country-specific index to variables.) For analytical convenience, I treat the number of regions as a continuous variable. Regions are ordered such that a larger n means a higher cost; that is, $c'(n) > 0$. By this cost function, I intend to capture the handicap associated with economic development. The difference in the development cost may be due to environmental and geographical conditions or economic conditions, including the quality of the immobile factor. It is assumed that public investment covers the development cost. In regions with higher costs, a larger amount of public investment is required to catch up with low-cost regions. In what follows, focusing on a representative country, the model is described.

Once public investment is made, the number of active regions, where production takes place, is determined.⁶ All active regions are identical in all respects after development. The common technology is given by $F(K)$, where K is the capital stock per active region. To simplify the notation, the immobile factor is omitted from the regional production function. The marginal product of capital is positive and diminishing: $F'(K) > 0 > F''(K)$. Assuming that firms are competitive and that each country's government imposes a source-based capital tax in active regions, profit maximization implies that

$$F'(K) = \rho + t, \quad (1)$$

² The psychic and pecuniary costs of moving could cause immobility. If residents were perfectly mobile across regions or countries, regional inequity might not be a serious policy issue.

³ Although this paper refers to competing jurisdictions as "countries," the relevance of the present theoretical framework is not limited to international tax competition. The present model could also be applied to development policies made by lower-level governments because some of these policies would be addressed towards poor areas within states or even cities.

⁴ Since Wilson's (1986) seminal work, the impact of uniform policy changes has been frequently analyzed in the tax competition literature in order to investigate the nature of non-cooperative equilibrium. Following Keen and Marchand (1997), I use this familiar approach to consider the impact of tax competition on the composition of public expenditure.

⁵ In the tax competition literature, besides Keen and Marchand (1997), there are several studies of public inputs that enter production functions; see, for ex-

ample, Zodrow and Mieszkowski (1986), Noiset (1995), Matsumoto (1998, 2000a, 2000b, 2004, 2007) and Wilson (2005). In particular, Matsumoto's analyses show that under-provision arises as long as production technology exhibits constant returns to scale (CRS) in private factors only or in all factors including public inputs. This result should clearly be distinguished from Dhillon et al. (2007). Although they argue that CRS in all factors is incompatible with one of key assumptions in Zodrow and Mieszkowski (1986, inequality (17)), this incompatibility occurs because capital is the sole private factor. On the other hand, Matsumoto's analyses assume the presence of an immobile factor, as well as mobile capital. In this general case, it is easy to confirm that CRS in all factors, including public inputs, is consistent with (17) in Zodrow and Mieszkowski (1986).

⁶ I assume that public investment is made in regions with relatively low development costs. (This is reasonable from the viewpoint of welfare maximization.) It is also assumed that $c(n)$ becomes very high as n is close to N , so that some regions with very high development costs can never be developed.

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