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A note on tax competition in the presence of agglomeration economies

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Abstract

This paper analyzes tax competition in the presence of agglomeration effects. The obtained results are then compared to the results of the traditional model, without agglomeration effects. As is well known, the presence of a fiscal externality affects the provision of the public good in the standard competitive model of tax competition. In the model with agglomeration effects, in addition to this externality, a new effect shows up. This effect reflects heightened government concern about capital flight, which depresses firm productivity by limiting external economies of scale. As a result, capital tax rates end up being lower than in the case where agglomeration effects are not present, worsening the underprovision of the public good. This conclusion holds in both the competitive and strategic versions of the model.

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1. Introduction

Economic activities tend to concentrate in a small number of places (typically in cities), and agglomeration economies are one force behind this concentration. Given their importance, it is interesting to consider the effect of agglomeration economies on fiscal

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competition between jurisdictions.¹ The purpose of the present paper is to incorporate agglomeration economies in the analysis of tax competition between jurisdictions, comparing the obtained results to the case where agglomeration economies are not present.²

Economic agglomerations are created by the presence of both technological and pecuniary externalities.³ Technological externalities capture non-market interactions that directly affect the utility of an individual or the production function of a firm. On the other hand, pecuniary externalities are those that arise by economic interactions that take place through the market mechanisms via the mediation of prices. Pecuniary effects reduce the cost of inputs without affecting the productivity of the inputs.

Following [Chipman \(1970\)](#), technological externalities have been considered in various models of city formation. In these models, firms are assumed to have a production function that exhibits external increasing returns to scale. [Arnott \(1979\)](#) and [Henderson \(1974, 1988\)](#) are some of the theoretical models that use this specification to show the importance of agglomeration effects in city formation and in the choice of optimal city sizes. Empirical studies also use Chipman's approach to focus on city and industry size as determinants of productivity, and on technological spillovers as a source of agglomeration economies. [Moomaw \(1981\)](#) estimated the effect of city population on productivity, while [Henderson \(1986\)](#) found that industry size in a city has a positive effect on productivity of firms.

The new economic geography literature, following [Dixit and Stiglitz \(1977\)](#), uses the monopolistic competition framework to study agglomeration with internal increasing returns. In this type of model pecuniary externalities are formulated as explicit market mechanisms. Models that focus on city formation using this approach are [Abdel-Rahman \(1988\)](#) and [Fujita \(1988\)](#). This approach is also used to analyze differences across regions, with [Krugman \(1991\)](#) being the main reference for this type of model.

Following [Krugman \(1991\)](#), recent papers are starting to focus on the taxation of mobile factors in economies where agglomeration economies are present, firms face monopolistic competition, and trade is allowed. These models conclude that agglomeration creates rents for the mobile factor that can be taxed, increasing the equilibrium tax rates. For analysis of this kind of model, see [Baldwin and Krugman \(2004\)](#), [Andersson and Forslid \(2003\)](#), and [Kind et al. \(1998\)](#). A key feature of these models is that production, due to demand and supply linkages, agglomerates in a region, tending to get stuck there. Then the mobile factor, being locked in by the existence of an industrial cluster, may not respond to marginal changes in tax rates. This result differs with the standard tax competition framework, where marginal changes in tax rates lead to a marginal movement of factors.⁴

Traditional tax competition models assume two factors of production: labor, which is immobile, and capital, which is mobile. Firms face perfect competition, there are no transportation costs, and there is no trade between regions. Under this setup, tax competition

¹ For a survey of the literature that analyzes the formation of economic agglomerations, see [Fujita and Thisse \(2000\)](#).

² The model in this paper draws on an idea of [Garcia-Milà and McGuire \(2001\)](#), who analyzed the effects of agglomeration economies in the tax competition model of [Oates and Schwab \(1991\)](#). They are not responsible, of course, for any shortcomings in the analysis.

³ This terminology follows [Scitovsky's \(1954\)](#) classification.

⁴ The paper follows the standard tax competition model as originated by [Zodrow and Mieszkowski \(1986\)](#) and [Wilson \(1986\)](#).

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