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The importance of government commitment in attracting firms: A dynamic analysis of tax competition in an agglomeration economy

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ABSTRACT

Agglomeration tendencies of industrial firms significantly affect the nature of tax competition. This paper analyzes tax competition between two countries over an infinite time horizon in an economy with trade costs and internationally mobile industrial firms. Most of the previous studies on tax competition in the 'new economic geography' framework employ static models. In this study, two governments dynamically compete with each other to attract firms through their choices of taxes and subsidies. It is shown that the commitment of the governments to their policies is crucial in determining the distribution of firms in the long run. Specifically, if governments find each others' tax policies credible, then one country will attract all the firms when trade costs are low enough to make agglomeration forces dominant. If policies are not credible, both countries may attract an equal share of firms even when trade costs are low, as the lack of commitment by governments acts as a dispersion force.

1. Introduction

Since the 1990s, low corporate tax rates have been a main driver for attracting foreign direct investment (FDI) and thereby promoting economic growth in some European countries such as Luxembourg and Ireland. Ireland is particularly noteworthy, as it drastically reduced its corporate income tax rate from 45% to 12.5% between 1998 and 2003. This rate is much lower than that of other EU15 countries, which was 25% on average in 2012. Due to this reduction, Ireland succeeded in hosting several multinational enterprises including Hewlett–Packard and Intel, and achieved a massive inflow of FDI. The geometric mean of the ratio of the net inflow of FDI to GDP in Ireland was 15.8% from 1998 to 2003, far higher than that of other EU15 countries: 3.3% (data are from UNCTAD). The success of Ireland seems to have fanned the fear of fierce tax competition among European countries, which had led to the international pressure on Ireland to raise its tax rate. France and Germany, for example, have requested Ireland to raise its taxes in return for its bailout rescue since 2010 (see, e.g. Mitchell, 2009; Stewart, 2011). However, Ireland confirmed its commitment to the 12.5% tax rate and has since maintained this rate. Through this commitment, Ireland has tried to establish a reputation that it will continue to keep its tax rate low among rival countries.

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The objective of this paper is to investigate how government commitment affects the location of industrial firms as a result of tax competition. In a symmetric two-country economy with agglomeration forces, I model the strategic interactions between two governments as an infinite-horizon dynamic game. The governments maximize their life-time payoffs through taxes and subsidies while considering the migration process of myopic firms. Assuming that the governments care mostly about future payoffs and that they will agree on Pareto efficient outcomes, I examine two forms of commitment governments may make: full commitment and no commitment. The former corresponds to the open-loop Nash equilibrium while the latter to the Markov-perfect Nash equilibrium. In the full commitment case, both governments announce a tax schedule over the entire horizon at the outset of the game and never change it. In the no commitment case, however, they choose their tax rate at each point in time by observing the current distribution of firms.

The results of tax competition dramatically change depending on whether or not commitment is possible. I find that tax competition with full commitment leads to the core–periphery configuration of firms when trade costs are low enough for the concentration of firms to supply an ample tax base. This result can be explained by the fact that the governments face the situation known as the ‘battle of the sexes’. The dispersed configuration where both the governments share firms evenly is too costly for them because they must provide negative taxes (or subsidies) to prevent firms with strong agglomeration motives from clustering into one country. Of course, the core position where all firms are clustered is the most desirable for both governments. However, the peripheral position where no firms are located is better than the dispersed configuration because the government in the periphery does not have to subsidize firms and avoids the intense competition. Either country may become the core so that self-fulfilling expectations of both governments select the long-run outcome; the country that succeeds in convincing the counterpart will eventually attract all the firms. I also find that tax competition without commitment may result in the dispersed configuration even when trade costs are so low that benefits from agglomeration are large. Compared to the full-commitment case, the governments have more incentive to raise their tax rate because they know that the loss of firms from raising their own tax rate will be partially diminished by the reaction (i.e., tax increase) of the rival. Both governments may set a higher tax rate while sharing firms evenly so that the dispersed pattern may be more desirable than the core status.

With these results, I draw the implication that, in the contemporary environment of deepening economic integration, effective tax competition relies critically on a government's commitment to its policies and its ability to convince foreign rivals that they will be implemented. This may explain the success of Ireland. But, at the same time, I also emphasize the weakness of commitment strategies. Credible policies imply that governments promise to keep their original policies even if they are aware that the policies are no longer optimal. Thus, such rigid policies are vulnerable to unexpected events such as sudden changes in the industrial location or policy changes in foreign rivals. When policymakers decide attitudes toward policies, it is worth recognizing the positive and negative aspects of such rigorous commitment.

1.1. Related literature

This paper draws from the literature on tax competition in an agglomeration economy. The ‘new economic geography’ formulates an imperfect competition trade model with mobile factors and trade costs, which is the so-called ‘core–periphery model’. This model demonstrates that as economic integration proceeds, which is modeled as falling trade costs, internationally mobile firms are more likely to cluster in one country.[2] Based on the core–periphery model, a number of researchers have studied the effects on firm locations of taxes strategically chosen by governments. Earlier contributions include Ludema and Wooton (2000), Kind et al. (2000), Andersson and Forslid (2003), and Baldwin and Krugman (2004). The main findings of the literature on agglomeration and tax competition are the superiority of the core country and a ‘race to the top’ (Baldwin and Krugman, 2004; Borck and Pflüger, 2006, among others); the ability of the core country to charge a higher tax rate, and the inverted U-shaped relationship of the tax differential in terms of trade costs between the core and periphery.[3] For example, Baldwin and Krugman (2004) consider a Stackelberg game played by the core (leader) and peripheral country (follower), and show that, when trade costs are low, the industrial cluster brings about to the core a taxable rent (‘agglomeration rent’). They also show that a decline in trade costs first increases and then decreases the tax gap. Borck and Pflüger (2006) confirm the result in a core–periphery model allowing for partial agglomeration. These results contrast with the conclusion of the standard neoclassical tax competition model that tax competition results in a ‘race to the bottom’.[4] The existence of a taxable agglomeration rent is also supported by some empirical research (e.g., Charlot and Paty, 2007 for French data; Coulibaly, 2008; Brülhart et al., 2012 for Swiss data).

The conclusions of the previous studies crucially depend on the initial industrial locations. To avoid the difficulty of discontinuities in the reaction functions, which is a by-product of the core–periphery model, most existing studies assume that one country is the core from the beginning. Because policy implementation and firm migration are allowed to occur after the announcement of policy in these models, the number of firms located in each country at the beginning of the game plays a decisive role in determining the equilibrium outcome. The advantages of the agglomerated position are thus

[2] See Fujita and Thisse (2013) for a recent survey. Baldwin et al. (2003) focus more on policy issues including tax competition.

[3] Recent studies such as the paper by Ottaviano and Ypersele (2005), which allows for differences in the size of immobile factors, and the paper by Baldwin and Okubo (2014), which introduces firm heterogeneity in productivity, also observe the superiority of the core country.

[4] See Keen and Konrad (2012) for a comprehensive survey on tax competition in the neoclassical framework.