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TAX COMPETITION AND MIGRATION:
THE RACE-TO-THE-BOTTOM HYPOTHESIS REVISITED

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The literature on tax competition with free capital mobility cites several reasons for the race-to-the-bottom hypothesis in the sense that tax competition may yield significantly lower tax rates than tax coordination. With a fixed (exogenously given) population that can move from one fiscal jurisdiction to another, the Tiebout paradigm suggests that tax competition among these jurisdictions yields an efficient outcome, so that there are no gains from tax coordination. The Tiebout paradigm considers the allocation of a given population among competing localities. Our model of international tax-transfer and migration competition among host countries deviates from the Tiebout paradigm in that the total population in the host countries and its skill distribution are endogenously determined through migration of various skills. As a result, competition needs not be efficient. This paper suggests that when a group of host countries faces an upward supply of immigrants, tax competition does not indeed lead to a race to the bottom; competition may lead to higher taxes than coordination.

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Tax Competition and Migration: The Race-to-the-Bottom Hypothesis Revisited*

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Abstract

The literature on tax competition with free capital mobility cites several reasons for the race-to-the-bottom hypothesis in the sense that tax competition may yield significantly lower tax rates than tax coordination. With a fixed (exogenously given) population that can move from one fiscal jurisdiction to another, the Tiebout paradigm suggests that tax competition among these jurisdictions yields an efficient outcome, so that there are no gains from tax coordination. This paper suggests that when a group of host countries faces an upward supply of immigrants, tax competition does not indeed lead to a race to the bottom; competition may lead to higher taxes than coordination.

1 Introduction

In this paper we re-examine the race-to-the-bottom hypothesis when several host countries compete for an upward sloping supply of immigrants from the rest of the world. We assume that there is a large enough number of competing host countries, to allow us to treat each host country as a "perfect competitor".

The rest of the world serves as a reservoir of migrants for the host countries. That is, the rest of the world provides exogenously given, upward sloping, supply curves of unskilled and skilled immigrants to the host countries.

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We address the issue whether tax competition among host countries is inefficient, relative to tax coordination, in the presence of migration. Referring to tax competition among localities in the presence of capital mobility, Oates (1972, p. 143) argues that competition may lead to inefficiently low tax rates (and benefits):

"The result of tax competition may well be a tendency toward less than efficient levels of output of local services. In an attempt to keep taxes low to attract business investment, local officials may hold spending below those levels for which marginal benefits equal marginal costs, particularly for those programs that do not offer direct benefits to local business."

Considering international capital mobility, tax-competition among countries, may lead to inefficiently low tax rates and welfare-state benefits because of three mutually reinforcing factors. First, in order to attract mobile factors or prevent their flight, tax rates on them are reduced. Second, the flight of mobile factors from relatively high tax to relatively low tax countries shrinks the tax base in the relatively high tax country. Third, the flight of the mobile factors from relatively high tax to relatively low tax is presumed to reduce the remuneration of the immobile factors, and, consequently, their contribution to the tax revenue. These reinforcing factors reduce tax revenues and, consequently, the generosity of the welfare state. In our model the mobile factor is labor of various skills.

In this respect, our model is somewhat similar to Tiebout's (1956) framework of competition among localities. Tiebout's model features many "utility-taking" localities, analogous to the perfect competition setup of many "price-taking" agents. Naturally, Tiebout competition yields an efficient outcome.¹

The Tiebout paradigm considers the allocation of a given population among competing localities. Our model of international tax-transfer and migration competition among host countries deviates from the Tiebout paradigm in that the total population in the host countries and its skill distribution are endogenously determined through migration of various skills. As a result, competition needs not be efficient. We therefore

¹See Wilson (1999), and Bovenberg et al (2003), for a comprehensive surveys of theories on tax competition. Razin and Sadka (1991) who consider tax competition among "price taking" small countries, in the presence of capital mobility, show that there are no gains from tax coordination.

Mendoza and Tesar (2005), and Sorensen (2001), calibrate tax competition general equilibrium models to Europe.

study also the policies that ensue through coordination among the host countries and compare them to the competition policies.

Typically, models of tax competition among host countries consider a given system of collective decision making. For instance, many models assume that policy is determined by maximizing some social welfare function. Another possibility is decision by majority voting. In this paper, we adopt the second approach.

The organization of the paper is as follows. Section 2 develop a parsimonious model of tax competition. Section 3 extends the model to allow tax coordination. Section 4 compares (via numerical simulations) the set of policies that ensue under competition and under coordination. Section 5 concludes.

2 Analytical Framework of Tax-Migration Competition

Consider n identical host countries engaged in competition over migrants, skilled and unskilled, from the rest of the world.

2.1 Representative Host Country

A representative host country produces a single good by employing two labor inputs, skilled and unskilled, according to a Cobb-Douglas production function,

$$Y = AL_s^\alpha L_u^{1-\alpha}, \quad 0 < \alpha < 1, \quad (1)$$

where, Y is GDP, A denotes a Hicks-neutral productivity parameter, and L_i denotes the input of labor of skill level i , where $i = s, u$ for skilled and unskilled, respectively.

The competitive wages of skilled and unskilled labor are, respectively,

$$\begin{aligned} w_s &= \alpha Y / L_s \\ w_u &= (1 - \alpha) Y / L_u. \end{aligned} \quad (2)$$

Note that the abundance of skilled labor raises the wage of the unskilled, whereas abundance of unskilled labor raises the wage of the skilled.

Aggregate labor supply, for skilled and unskilled workers, respectively, is given by:

$$\begin{aligned} L_s &= (S + m_s) l_s \\ L_u &= (1 - S + m_u) l_u. \end{aligned} \quad (3)$$

There is a continuum of workers, where the number of native-born is normalized to 1; S denotes the share of native born skilled in the total native-born labor supply; m_s denotes the number of skilled migrants; m_u denotes the total number of unskilled migrants; and l_i is the labor supply of an individual with skill level $i \in \{s, u\}$

Total population (native born and migrants) is as follows

$$N = 1 + m_u + m_s. \quad (4)$$

We specify a simple welfare-state system which levies a proportional labor income tax at the rate τ , with the revenues redistributed equally to all residents (native born and migrants alike) as a demogrant, b , per capita. The demogrant may capture not only a cash transfer but also outlays on public services such as education, health, and other provisions, that benefit all workers, regardless of their contribution to the finances of the system. Thus, b is not necessarily a perfect substitute to private consumption.

The government budget constraint is therefore

$$b = \frac{\tau Y}{N}. \quad (5)$$

Note that we assume that migrants are fully entitled to the welfare state system. That is, they pay the tax rate τ and receive the benefit b . The two types of individuals share the same utility function,

$$u = c - \frac{\varepsilon}{1 + \varepsilon} l^{\frac{1+\varepsilon}{\varepsilon}} + \ln(b), \quad (6)$$

where c denotes consumption and $\varepsilon > 0$, in the labor supply elasticity. Note that we interpret b not just as a pure cash transfer, but rather as some public service that creates a utility of $\ln(b)^2$.

The budget constraint of an individual with skill level i is

$$c_i = (1 - \tau) l_i w_i, i \in \{s, u\} \quad (7)$$

Individual utility-maximization yields the following the labor supply equation

$$l_i = ((1 - \tau) w_i)^\varepsilon, i \in \{s, u\} \quad (8)$$

The indirect utility function of an individual of skill level $i \in \{s, u\}$ is given by

²This interpretation of b and the specification of the utility derived from it ensure that everyone, including the rich, opts for some positive level of b and is willing to support some taxation

$$V_i(\tau, b) = \ln(b) + \frac{1}{1 + \varepsilon} ((1 - \tau) w_i)^{1 + \varepsilon}. \quad (9)$$

It is then straightforward to calculate the equilibrium wages for the skilled and unskilled workers, which are given, respectively, by

$$\begin{aligned} w_s &= A (\alpha \delta^\varepsilon \theta^{1 - \alpha})^{\frac{1}{1 + \varepsilon}} \\ w_u &= A ((1 - \alpha) \delta^\varepsilon \theta^{-\alpha})^{\frac{1}{1 + \varepsilon}}, \end{aligned} \quad (10)$$

where $\delta \equiv \alpha^\alpha (1 - \alpha)^{1 - \alpha}$ and $\theta = \frac{1 - S + m_u}{S + m_s}$

In order to ensure that the skilled wage always exceeds the unskilled wage, $w_s > w_u$, we assume that

$$\frac{\alpha(1 - S + m_u)}{(1 - \alpha)(S + m_s)} > 1. \quad (11)$$

2.2 Supply of Migrants

We assume that there is free migration according to an exogenously given upward supply of migrants of each skill type from the rest of the world to all host countries³. Specifically, the number of migrants of each skill type that wish to emigrate to host countries rises with the level of utility (well-being) that they will enjoy in the host countries. A possible interpretation for this upward supply is as follows. For each skill type there is a heterogeneity of some migration cost (due to some individual characteristics such as age, family size, portability of pensions, etc.). This cost generates a heterogeneity of reservation utilities, giving rise to an upward sloping supply of migrants. We denote the supply function of skill $i \in \{s, u\}$ by

$$N_i = f_i(V), \quad (12)$$

where N_i is the number of migrants of skill type $i \in \{s, u\}$ and V is the level of utility enjoyed in the host countries.

We assume that would-be migrants are indifferent with respect to the identity of the would-be host country. All they care about is the level of utility they will enjoy. Therefore, in equilibrium, the utility enjoyed by migrants of each skill type is the same in all host countries. Denote this equilibrium cutoff utility level by $\bar{V}_i, i \in \{s, u\}$.

Being small enough, each host country takes these cutoff utility levels as given for her.

³In Razin and Sadka (2010) we endogenise the supply of migrants. Here we consider an exogenous supply of immigrants as we focus on competition among the host countries.

2.3 Fiscal Policy Choice

A representative host country determines its fiscal policy by majority voting among the native born. For concreteness, we describe in details the case where the native-born skilled form the majority, that is $S > 0.5$ (the other case is specified similarly). Thus, the fiscal policy variables, τ and b , are chosen so as to maximize the indirect utility of the skilled (given in equation (9)), subject to the government budget constraint (given in equation (5)), and to the free migration constraints:

$$V_s(\tau, b) = \bar{V}_s, \quad (13)$$

and

$$V_u(\tau, b) = \bar{V}_u, \quad (14)$$

assuming that the migrants have the same preferences as the native-born.

Upon substituting for the wages from equation (10) into the objective function and the constraints, the fiscal policy variables, τ and b , are determined as a solution to the following optimization problem:

Max $\{V_s, V_u, \tau, b, m_s, m_u\} V_s$,
subject to:

$$V_s = (1 - \tau)^{1+\varepsilon} \frac{A^{1+\varepsilon}}{1 + \varepsilon} (\alpha)^{1+\alpha\varepsilon} (1 - \alpha)^{(1-\alpha)\varepsilon} \left(\frac{(1 - S) + m_u}{S + m_s} \right)^{1-\alpha} + \ln(b) \quad (9')$$

$$V_u = (1 - \tau)^{1+\varepsilon} \frac{A^{1+\varepsilon}}{1 + \varepsilon} (\alpha)^{\alpha\varepsilon} (1 - \alpha)^{1+(1-\alpha)\varepsilon} \left(\frac{S + m_s}{(1 - S) + m_u} \right)^{\alpha} + \ln(b) \quad (9'')$$

$$b = \frac{\tau(1 - \tau)^\varepsilon}{1 + m_s + m_u} (\alpha)^{\alpha\varepsilon} (1 - \alpha)^{(1-\alpha)\varepsilon} A^{1+\varepsilon} (S + m_s)^\alpha [(1 - S) + m_u]^{1-\alpha} \quad (5')$$

$$V_s = \bar{V}_s \quad (13')$$

$$V_u = \bar{V}_u, \quad (14')$$

Note that in this optimization, the host country takes the migrant's cutoff utility levels, \bar{V}_s and \bar{V}_u , as given. Denote the solution to this problem by $V_s^*, V_u^*, \tau^*, b^*, m_s^*, m_u^*$.

2.4 Nash-Equilibrium

Each one of n identical host countries admits m_s skilled migrants and m_u unskilled migrants. Thus, the aggregate demand for skilled and unskilled migrants is nm_s^* and nm_u^* . Therefore, the cutoff utilities enjoyed by migrants, \bar{V}_s and \bar{V}_u , are determined in equilibrium, so as to equate supply and demand.

$$nm_s^* = f_s(\bar{V}_s^*), \quad (15)$$

and

$$nm_u^* = f_u(\bar{V}_u^*), \quad (16)$$

where we denote the equilibrium levels of the cutoff abilities by \bar{V}_s^* and \bar{V}_u^* .

3 Fiscal Coordination

So far we assumed that the host countries compete with each other with respect to the volume and the skill-composition of migrants. Presumably, an unskilled median voter opts to admit only skilled migrants, for two reasons: First, such migrants are net contributors to the finance of the welfare state, that is the tax that each one pays (namely, $\tau w_s l_s$) exceeds the benefit she receives (namely, b). Second, skilled migrants raises the wage of the unskilled. On the other hand, a skilled median voter may opt for both types of migrants. Unskilled migration raises the wage of the skilled but imposes a fiscal burden on the welfare state. Skilled migration lowers the wage of the skilled but contributes positively to the finance of the welfare state. The volume and skill-composition of migration to each one of the n identical host countries are determined in a general, uncoordinated competitive equilibrium.

An alternative, albeit difficult to sustain, is for the host countries to coordinate their fiscal policy so as to maximize the utility of their decisive median voter⁴. Naturally, this coordination comes at the expense of the migrants.

⁴This coordination is among the host countries only, unlike some other coordination arrangements (such as under the auspices of the WTO) that refer to both exports and imports of goods and services. The coordination discussed here may be relevant to unions of countries with independent tax policies such as the EU which can coordinate a uniform migration policy towards the rest of the world (as the U.S.A does).

In a coordinated-policy regime the cutoff utilities, \bar{V}_s and \bar{V}_u , are also controlled by the host countries. Formally, an optimally coordinated policy is a solution to the following maximization problem (for the case where the median voter is a skilled individual):

Max $_{\{V_s, V_u, \tau, b, m_s, m_u, \bar{V}_s, \bar{V}_u\}}$ V_s
 subject to the same constraints as in the competitive case (namely, equations (9'), (9''), (5'), (13') and (14')), and the migration equations (15) and (16).

We denote the solution by $V_s^{**}, V_u^{**}, \tau^{**}, b^{**}, m_s^{**}, m_u^{**}, \bar{V}_s^{**}, \bar{V}_u^{**}$.

4 Competition vs. Coordination: Is There a Race to the Bottom?

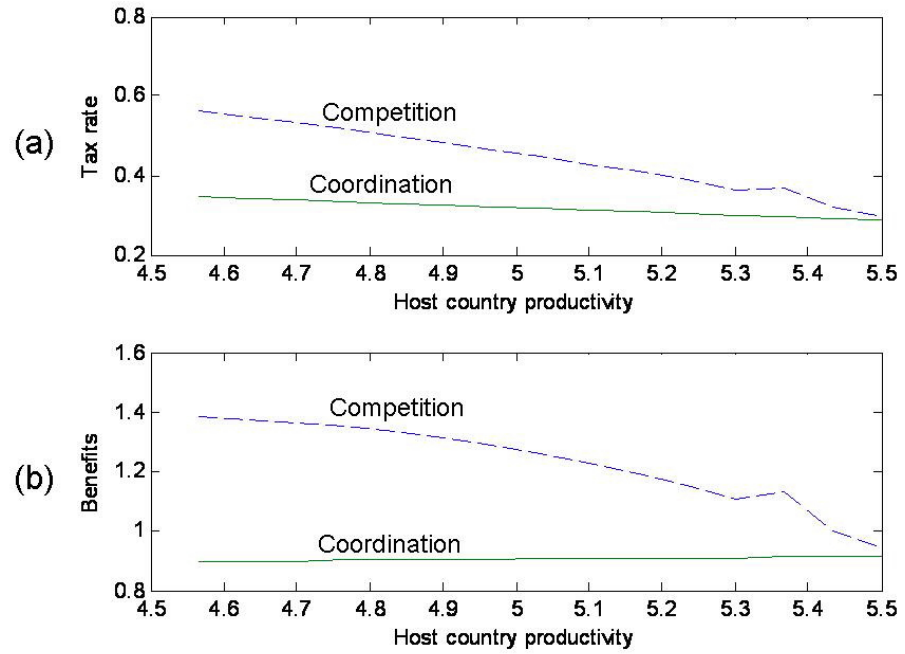
Evidently, coordination can only improve the well-being of the skilled which is in power (recall that we consider for concreteness the case $S > 0.5$) compared to its well-being under competition. This improvement is enjoyed also by the skilled migrants, because they share the same utility level as the native-born.

In this section we compare also the tax policies that arise under competition and under coordination. Specifically, we ask whether competition can lead to "a race to the bottom" in the sense that it yields lower tax rates and welfare-state benefits, relative to the coordination regime. We carry this comparison via numerical simulations.

Figure 1 (a) depicts the tax rates under competition and under coordination (for various levels of the productivity parameter A). We can clearly see that competition yields higher, not lower, tax rates than coordination, contrary to the race-to-the-bottom hypothesis. Figure 1 (b) shows that benefits in the coordination regime are lower than under the competition regime. Figure 1 (c) shows that the number of skilled migrants is higher under coordination than under competition.

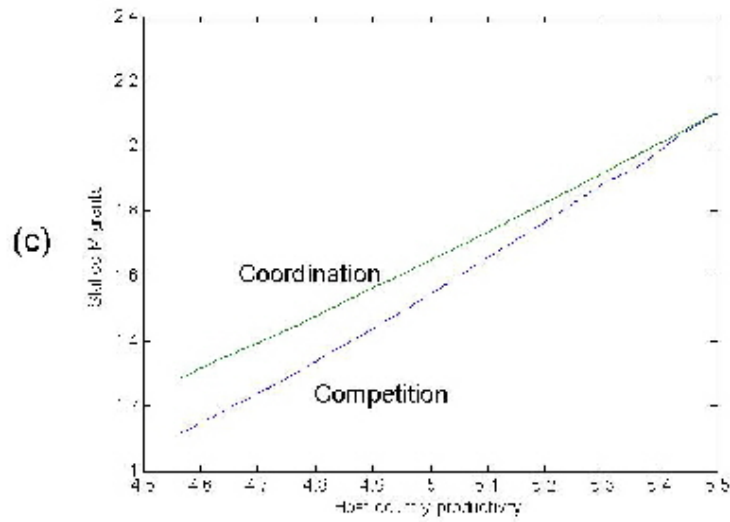
Similar results were obtained in the case where the unskilled form the majority, that is: Tax rates and benefits are lower and the number of unskilled migrants is higher under coordination than under competition.

1ab



1.jpg

1c



2.jpg
Figure 1: Competition vs. Coordination: Tax Rates, Benefits, and Skilled Migration

Notes: The parameter values are:

$$S = 0.6$$

$$\alpha = 0.7$$

$$\varepsilon = 0.1$$

$$n=1$$

migrants supply is specified as $f_u(V) = f_s(V) = 1.2V^{1.5}$

The rationale for this unconventional results is as follows. Suppose we start from the coordinated regime and consider what a single host country opts to do if it is no longer abides by coordination; and assuming, in the spirit of Nash equilibrium, that no other country changes its policy. One way to improve the welfare of the skilled ruling majority is to adopt a policy that reduces the number of the competing skilled migrants and thereby raises the skilled wage. Raising the tax rate can squeeze out skilled migrants. True, this may reduce the disposable skilled wage, and the benefits; but this apparently of a second-order magnitude at the point of coordinated policy that internalized this effect. When all host countries raise their tax rates as they opt out coordination, the end result is lower utilities (due to the distorting effect of taxes), too few skilled migrants, and lower benefits.

5 Conclusion

The literature on tax competition with free capital mobility cites several reasons for the race-to-the-bottom hypothesis in the sense that tax competition may yield significantly lower tax rates than tax coordination. With a fixed (exogenously given) population that can move from one fiscal jurisdiction to another, the Tiebout paradigm suggests that tax competition among these jurisdictions yields an efficient outcome, so that there are no gains from tax coordination. This chapter provides some support to the Tiebout hypothesis. It suggests that when a group of host countries faces an upward supply of immigrants, tax competition does not indeed lead to a race to the bottom; competition may lead to higher taxes than coordination.

6 References

References

- [1] Bovenberg , Lans, Sijbern Cnossen and Ruud de Mooij, "Introduction: Tax Coordination, in the European Union," *International Tax and Public Finance*, 10, 619–624, 2003

- [2] Mendoza, Enrique and Linda Tesar (2005), "Why Hasn't Tax Competition Triggered a Race To The Bottom? Some Quantitative Lessons from the EU", *Journal of Monetary Economics*, 52 (1), 163-204
- [3] Oates, Wallace E. (1972), *Fiscal Federalism*. New York: Harcourt Brace Jovanovich.
- [4] Razin, Assaf and Efraim Sadka (1991), "International Tax Competition and Gains from Tax Harmonization", *Economics Letters* 37, 69-76.
- [5] Razin, Assaf and Efraim Sadka (2010), "Fiscal and Migration Competition", NBER working paper 16224.
- [6] Sørensen, Peter Birch 2001. "Tax coordination in the European Union: What are the issues? University of Copenhagen, mimeo.
- [7] Tiebout, Charles, "A Pure Theory of Local Expenditures," *Journal of Political Economy*, 64, 1956.