MIGRATION AND FISCAL COMPETITION WITHIN A UNION

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ABSTRACT

We develop a stylized EU-type model of a union consisting of rich, capital-abundant and high productivity countries, and poor, capital-scarce and low productivity countries. We address two main issues: the efficiency of tax competition and the effect of factor mobility on the size of the welfare state. We identify a fiscal externality which impairs the efficiency of tax competition. We also demonstrate how capital mobility within the union strengthens the competition over migrants from outside of the union.

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1 Introduction

Consider some key features of the 28-country European Union. The Union consists of countries which may all be viewed as welfare states, to some extent or another. The core countries (e.g. Germany, France, the U.K.) may be considered "rich" as they are relatively capital-abundant and highly productive. These countries attract migrants from the rest of the EU (the "poor" countries) with relatively low barriers, following the Schemgen agreement (1995). They are also a destination, with relatively high barriers for migration from developing countries (henceforth: "The rest of the world") which burdens their fiscal systems. The "poor" countries (e.g. East-central European countries) are less capital abundant and less productive. These countries are a source of net-migration to the core "rich" countries. They are not a particularly attractive destination for migration from the rest of the world. They are also recipients of net capital from the core countries, as there are on constraints on capital mobility within the EU following the Single Market Act that went into effect in 1992.

In this paper we aim to examine how the aforementioned features explain in theory the differences in the tax rates, and the generosity of the welfare state, on the one hand, and migration flows, on the other hand, between rich and poor countries. We examine also the role of capital mobility in explaining this differences. Further, we investigate whether fiscal competition within an economic union (of poor and rich countries) is inefficient, relative to fiscal coordination. That is, starting from a competition regime and moving to the coordination regime, a union member is better off; albeit, at the expense of the non-union immigrants.

The organization of the paper is as follows. The next section provides some evidence on the fiscal burden of migration and on tax competition. Section 3 presents the analytical framework. Section 4 set up the tax competition equilibrium model. Section 5 develops the fiscal coordination framework. Section 6 compares the tax competition regime to the coordination regime. Section 7 analyzes the capital mobility effect on migration. Section 8 concludes.

2 Evidence

2.1 Tax Competition

Significant declines in capital tax rates among U.S. states and European countries have been linked to tax competition. Corporate tax rates

among OECD countries also have declined sharply over the past two or three decades (Devereux, Rodoano, and Lockwood, 2008, Figure 1; U.S. Treasury, 2007, Chart 5.1). This has led to deliberations among European Union (EU) officials over the question whether to introduce tax harmonization measures (McLure, 2008).[1]

Altshuler and Goodspeed (2002), Brueckner and Saavedra (2001), Brueckner (2003), Case, Rosen and Hines (1993) bring some inconclusive evidence concerning capital taxation for the "race to the bottom" hypothesis of tax competition. Recently, Chirinko and Wilson (2013) analyze a panel dataset covering the U.S. states for the period 1965 to 2006.[2] Their study focuses on the reaction function of capital tax policy in a given U.S. state to changes in capital tax policy by other US states. They find that aggregate shocks, not tax competition, are driving the non-cyclical movements of capital taxation. They also find that the slope of the reaction function (the equilibrium response of home state to another state tax policy) is negative, contrary to many prior empirical studies of positive reaction functions (the "race-to-the-bottom" hypothesis). Their results suggest that the non-cyclical decline in capital tax rates, among U.S. states, reflects simultaneous responses among states to common shocks, rather than competitive responses to other states' tax policy.

Focusing on highly mobile, highly skilled earners, Kleven et al (2013) provides evidence from Denmark that these earners respond significantly to tax cuts. They found that reducing tax rates over a certain income threshold for high-earning, high skilled migrants increased their number significantly even though the tax rate reduction was limited to three years. The number of highly-skilled migrants with incomes close, but below, the thresholds, did not increase to the same extent. A common drawback of the aforementioned studies is that they focus narrowly on some, but not all, taxes and largely ignore the expenditure side of the fiscal system.

2.2   Fiscal Burden of Migration

In this section we review some relevant evidence on tax competition and on the fiscal burden of migration.

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[1] A comprehensive analysis of alternative locations of consumption taxes , levied on destination or origin, basis is provided by Lockwood (2001). He finds that destination and origin bases are only equivalent in the presence of perfect mobility of factors of production and in the regime of perfect competition".

Lockwood, B.. (2001) "Tax Competition and Tax Co-ordination under Destination and Origin Principles: A Synthesis," Journal of Public Economics,53, 141-162.

[2] Not including Alaska and Hawaii

In 1997 the U.S. National Research Council sponsored a study on the overall fiscal impact of immigration into the U.S.; see Smith and Edmonston (1997). The study looks comprehensively at all layers of government (federal, state, and local), all programs (benefits), and all types of taxes. For each cohort, defined by age of arrival to the U.S., the benefits (cash or in kind) received by migrants over their own lifetimes and the lifetimes of their first-generation descendents were projected. These benefits include Medicare, Medicaid, Supplementary Security Income (SSI), Aid for Families with Dependent Children (AFDC), food stamps, Old Age, Survivors, and Disability Insurance (OASDI), etc. Similarly, taxes paid directly by migrants and the incidence on migrants of other taxes (such as corporate taxes) were also projected for the lifetimes of the migrants and their first-generation descendents. Accordingly, the net fiscal burden was projected and discounted to the present. In this way, the net fiscal burden for each age cohort of migrants was calculated in present value terms. Within each age cohort, these calculations were disaggregated according to three educational levels: Less than high school education, high school education, and more than high school education.

Indeed the findings suggest that migrants with less than high school education are typically a net fiscal burden that can reach as high as approximately US-$100,000 in present value, when the immigrants' age on arrival is between 20–30 years. See also the related analysis of Auerbach and Oreopoulos (1999).

In the first 10 years after the enlargement of the European Union to 27 countries in 2004, only three members of the EU-15 (the UK, Sweden and Ireland) allowed free access for residents of the accession countries to their national labor markets. The other members of the EU-15 took advantage of the clause that allows for restricted labor markets for a transitional period of up to seven years. Focusing on the UK and the 8 accession countries (A8), Dustmann at al (2009) bring evidence of no welfare migration.[3] The average age of the A8 migrants during the period 2004-2008 is 25.8 years, considerably lower than the native U.K. average age (38.7 years). The A8 migrants are also better educated than the native-born. A recent study by Barbone et al (2009), based on the 2006 European Union Survey of Income and Living conditions, finds that migrants from the accession countries constitute only 1-2 percent of the total population in the pre-enlargement EU countries (excluding Germany and Luxemburg); by comparison, about 6 percent of the population in the latter EU countries were born outside the enlarged EU. The small share of migrants from the accession countries is, of course,

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[3] The A8 countries are the first eight accession countries (Czech Republic, Estonia, Hungary, Latvia, Lithuania, Slovenia and Poland).

not surprising in view of the restrictions imposed on migration from the accession countries to the EU-15 before the enlargement and during the transition period after the enlargement. The study shows also that there is, as expected, a positive correlation between the net current taxes (that is, taxes paid less benefits received) of migrants from all source countries and their education level.

Hainmeueller and Hiscox (2010), using survey data in the US, find two critical economic concerns that appear to generate anti-immigrant sentiments among voters: concerns about labor-market competition, and concerns about the fiscal burden on public services. Not unexpectedly, employing opinion surveys, Hanson et al (2007) bring evidence that in the United States native residents of states which provide generous benefits- to migrants also prefer to reduce the number of migrants. Furthermore, the opposition is stronger among higher income groups. Similarly, Hanson et al (2009), again employing opinion surveys, find for the United States that native-born residents of states with a high share of unskilled migrants, among the migrants population, prefer to restrict in migration; whereas native-born residents of states with a high share of skilled migrants among the migrant population are less likely to favor restricting migration. Indeed, developed economies do attempt to sort out immigrants by skills (see, for instance, Bhagwati and Gordon (2009)). Australia and Canada employ a point system based on selected immigrants' characteristics. The U.S. employs explicit preference for professional, technical and kindred immigrants under the so-called third-preference quota. Jasso and Rosenzweig (2009) find that both the Australian and American selection mechanisms are effective in sorting out the skilled migrants, and produce essentially similar outcomes despite of their different legal characteristics.[4]

3   Analytical Framework

Suppose there is a continuum of R identical capital-abundant (rich) countries and a countinuum of P identical capital-scarce (poor) countries. We denote by $s = R/P$ the ratio of the number of rich and poor countries. these countries form a union within which migration is free. In addition, these countries are engaged in competition over migrants from the rest of the world. The model incorporates two channels through which native households are effected by migration: the wage channel and the fiscal channel. The former relates to the fact that migration reduces wages. The latter relates to the fact that migrants contribute to the financing of the public good through proportional income taxes

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[4]See also Boeri, Hanson, and McCormick (2002); See also Mayda (2006)

on labor and on capital.[5] With respect to capital mobility within the union we allow for both free and restricted mobility. The baseline model described below considers free capital mobility. In order to elicit the effect of capital mobility on the fiscal system, we consider also a special case of restricted capital mobility.

3.1 Representative Rich Host Country

A representative rich host country produces a single good by employing labor and capital according to a Cobb-Douglas production function,

$$Y_R = A_R K_R^{\beta} L_R^{(1-\beta)}, 0 < \beta < 1, \tag{1}$$

where Y_R is GDP, A_R denotes a Hicks-neutral productivity parameter, L_R denotes the input of labor, K_R denotes the input of capital, β denotes the share of capital and $1 - \beta$ denotes the share of labor.

The competitive wage of labor is,

$$w_R = (1 - \beta)Y_R/L_R \tag{2}$$

There is a continuum of workers, where the number of native-born is normalized to 1; m_R denotes the number of migrants from the rest of the world, M_R denotes immigrants from the poor-host country,[6] and l_R is the individual labor supply. Thus, aggregate labor supply is given by:

$$L_R = (1 + m_R + M_R) \, l_R \tag{3R}$$

Total population is

$$N_R = 1 + m_R + M_R. \tag{4R}$$

The rental price of capital (r_R) equals the marginal productivity of capital, that is:

$$r_R = \beta Y_R/K_R. \tag{5}$$

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[5]There exists a body of literature which emphasizes the importance of both channels. The wage channel is analayzed in, for instance, Ortega (2005) and also partly in Kemnitz (2002). Ortega goes even further than this paper and allows migrants to become part of the electorate in the period after migration has taken place.

[6]We ignore migration within rich-host countries and within poor-host countries, and from rich-host to poor-host countries, as these types of migration will not occur in a symmetric equilibrium.

(We assume for simplicity that capital does not depreciate.) An individual holds a stock of capital, $\bar{K}_R$. An individual can rent her capital either at home or at other union countries. Thus, the total stock of capital owned by residents, $\bar{K}_R$, does not have to equal K_R, the total input of capital, assuming that migrants own no capital. Capital taxation is levied according to the source principle, that is, each country taxes only the capital employed in that country.[7] Denote the net-of-tax rental price of capital in all other (either rich or poor) union countries by $\bar{r}$ (note that with source-based taxation and free capital mobility, the net-of-tax rate price of capital is indeed the same in all countries). Then, the residents of the representative host country must enjoy the same net-of-tax rental price at home, that is:

$$(1 \; \Box \; \tau_{KR})r_R = \bar{r} \tag{6}$$

where τ_{KR} is the tax rate on capital employed by our representative rich country.

We specify a simple welfare state system in which there is a dual tax system: a tax at the rate τ_{LR} on labor income and a tax at the rate τ_{KR} on capital income (we allow for different rates of taxation of labor and capital in order to examine the effects of migration and capital mobility separately on capital and labor taxation). The revenues from all taxes are redistributed equally to all residents, native born and migrants alike, as a uniform transfer, b_R, per capita. This transfer 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_R is not necessarily a perfect substitute to private consumption.

The government budget constraint is given by:

$$b_R = \frac{\tau_{KR}r_R K_R + \tau_{LR}w_R L_R}{N_R}. \tag{7}$$

Note that we assume that immigrants are fully entitled to the welfare state system. That is, they pay the tax rate τ_{LR} on their labor income

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[7]We do not consider residence-based taxation of capital, according to which each country taxes its residents on all the capital they own, irrespective of its location. In this case the capital tax policy does not change the capital tax base. Thus, tax competition over mobile capital does not affect tax policy. We therefore do not consider residence-based taxation. Also, residence-based taxation is not readily enforceable. See Frenkel, Razin and Sadka (1991) for an analysis of various principles of international taxation.

(they own no capital) and receive the benefit b_R. All the individuals (native-born and migrants) have the same preferences. The direct utility function is

$$u_R = c_R \ \square \ \frac{\varepsilon}{1+\varepsilon} l_R^{\frac{1+\varepsilon}{\varepsilon}} + \ln(b_R), \tag{8}$$

where c_R denotes consumption and $\varepsilon > 0$, is the labor supply elasticity. Recall that we interpret b_R not just as a pure cash transfer, but rather as some public service that creates a utility of $\ln(b_R)$.[8]

The budget constraint of a native-born individual is

$$c_R = (1 \ \square \ \tau_{LR}) \, l_R w_R + (1+\bar{r})\bar{K}_R \tag{9}$$

(Note that an individual earns a net-of-tax rental price of $\bar{r}$ on all the stock of capital she owns, no matter in which country it is employed.)

Individual utility-maximization yields the following labor supply equation

$$l_R = ((1 \ \square \ \tau_{LR}) \, w_R)^\varepsilon \tag{10}$$

The indirect utility function of a native-born individual is given by

$$V_R = \ln(b_R) + \frac{\varepsilon}{1+\varepsilon} \left((1 \ \square \ \bar{\tau}_{LR}) \, w_R \right)^{1+\varepsilon} + (1+\bar{r})\bar{K}_R. \tag{11}$$

3.2   A Representative Poor-Host Country

The description of the poor-host country is similar to that of the rich-host country with a subscript "P" replacing the subscript "R". Also, emigration occurs from the poor-host to the rich-host country in an equilibrium (but not vice versa). The supply of migrants from the poor to the rich country is infinitely elastic. We further assume that workers from the rest of the world emigrate only to the rich-host countries. However, the supply of migrants from the rest of the world to the rich country is not infinitely elastic, due to various natural impediments. We replace equations (3R) and (4R) by, accordingly

$$L_P = (1 + m_P \ \square \ sM_R) \, l_P \tag{3P}$$

and

$$N_P = 1 + m_P \ \square \ sM_R. \tag{4P}$$

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[8]This 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

(Note that there are s rich countries for every poor country.)

The features that render the R countries are the higher endowment of capital and the higher productivity, that is:

$$\bar{K}_R \geq \bar{K}_P \text{ and } A_R \geq A_P \tag{12}$$

Endowed with no capital, the indirect utility function of a migrant is $V_R \ \square \ (1 + \bar{r})\bar{K}_R$.

3.3 Supply of Migrants from the Rest of the World

We assume that there is free migration from the rest of the world (to the rich-host countries) according to an exogenously given upward supply of migrants.[9] Specifically, the number of migrants that wish to emigrate to the rich-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 migration by

$$M = f(V), \tag{13}$$

where M is the number of migrants and V is the level of utility enjoyed in the rich-host counties.

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

Being small enough, each rich-host country takes these cutoff utility levels as given for her. That is, each rich-host country behaves as a "utility - taker", in analogy to the "price taking" behavior of each agent in perfectly competitive market.

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[9]In Razin and Sadka (2010) we consider a host-source country context and endogenise the supply of migrants to a single host country, abstracting from competition among many host countries over the same pool of migrants. Here we consider an exogenous supply of immigrants, as we focus on competition among many host countries.

3.4 Fiscal Policy Choice

In this subsection we describe how governments employ fiscal policy tools, taxes and benefits, in order to enhance the well-being of its native-born constituents.

3.4.1 Rich-Host Country

A representative rich-host country determines its fiscal policy so as to maximize the utility of the native-born (V_R).

That is, the fiscal policy variables, τ_{LR}, τ_{KR} and b_R, are chosen so as to maximize the indirect utility (given in equation (11)), subject to the government budget constraint (given in equation (7)), and to the free migration incentive-compatibility constraints:

$$V_R \,\square\, (1 + \bar{r})\bar{K}_R = \bar{V}, \qquad (14R)$$

and

$$V_R \,\square\, (1 + \bar{r})\bar{K}_R + (1 + \bar{r})\bar{K}_P = \bar{V}_P. \qquad (15R)$$

We denote by $\bar{V}$ the reservation utility-level enjoyed by would-be migrants from the rest of the world. Each rich-host country takes this utility level as given ("utility-taking behavior"). Note that migrants from the rest of the world own no capital. This explains equation (14R).[10] Similarly, we denote the utility level enjoyed by would-be migrants from the poor-host country by $\bar{V}_P$ (also taken as given by the rich-host countries). When a native-born individual of the poor-host country emigrate to the rich-host country, she enjoys utility of $V_R \,\square\, (1+\bar{r})\bar{K}_R + (1+\bar{r})\bar{K}_P$ (see equation (11)). This explains equation (15R).[11]

In determining its policy, the government takes also into account that $w_R, l_R, L_R, r_R, K_R, N_R, Y_R, m_R$ and M_R are determined in equilibrium by equations (1)-(6), (10) and (14R-15R).

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[10]Stricly speaking, the left-hand side of equation (14R) must be smaller than or equal to the right-hand side of this equation, but as this constraint is binding in equilibrium, we wrote it as an equality.

[11]Stricly speaking, the left-hand side of equation (15R) must be smaller than or equal to the right-hand side of this equation, with strict inequality holding only if $M_R = 0$, which is not the case.

Note that in setting its optimal fiscal policy, a representative rich-host country takes also the net of tax return to capital, $\bar{r}$, as given. Denote by an asterisk (*) the levels of the economic variables that ensue with its optimal fiscal policy.

3.4.2 Poor-Host Country

A representative poor-host country similarly determines its fiscal policy so as to maximize the utility of its native-born (V_P). That is, the fiscal policy variables, τ_{LP}, τ_{KP} and b_P, are chosen so as to maximize the

indirect utility (given in equation (11) with the subscript "P" replacing the subscript "R"), subject to the government budget constraint (given in equation (7) with "P" similarly replacing "R"), the free migration incentive-compatibility constraints

$$V_P \ \square \ (1 + \bar{r})\bar{K}_P \le \bar{V}, \tag{14P}$$

and

$$\bar{V}_R \ \square \ (1 + \bar{r})\bar{K}_R + (1 + \bar{r})\bar{K}_P = V_P, \tag{15P}$$

and equations (1)-(6), (10) (with "P" similarly replacing "R"). Again, $\bar{r}, \bar{V}$ and $\bar{V}_P$ are taken as given. Note that constraint (14P) is not binding and holds with a strict inequality.

4 Tax - Competition Equilibrium

Each one of the R (respectively, P) identical rich (poor)-host countries admits m_R^* (respectively, m_P^*) migrants from the rest of the world.[12] Thus, the aggregate demand for migrants from the rest of the world is $Rm_R^* + Pm_P^*$. Therefore, the cutoff utilities enjoyed by migrants from the rest of the world is determined in a Nash-equilibrium, so as to equate supply and demand:[13]

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[12]We consider only an equilibrium with a symmetry within each of the two types of host countries

[13]Because of the constant returns-to-scale assumption, one may think that there is no unique determination of the size of internatinal flows (of labor and capital). But the upward aggregate supply of migrants and the fixed aggregate stock of capital insure uniqueness in equilibrium (like the case of many firms with constant-returns-to-scale technologies in industry equilibrium).

$$Rm_R^* + Pm_P^* = f(\bar{V}), \tag{16}$$

(Note that we have already embedded the market-clearing equation for migrants from the poor-host to the rich-host countries by employing the same symbol (M_R) to denote both the supply and demand of such

migrants.)

In equilibrium, we must further have

$$V_P^* = \bar{V}_P, \tag{17}$$

That is, the (reservation) utility of a native-born in the poor-host country which is taken as given by the rich-host country must indeed be equal to the utility level enjoyed by this individual. Similarly,

$$V_R^* = \bar{V}_R,, \tag{18}$$

That is, the (reservation) utility of a native-born in the rich-host country which is taken as given by the poor-host country must indeed be equal to the utility level enjoyed by this individual.

Also, the world-wide, net-of-tax, rental price of capital, $\bar{r}$, is determined so as to equate world demand for capital, $RK_R^* + PK_P^*$, to world supply, $R\bar{K}_R + P\bar{K}_P$. That is:

$$RK_R^* + PK_P^* = R\bar{K}_R + P\bar{K}_P. \tag{19}$$

5 Fiscal Coordination

So far we assumed that the host countries compete with each other with respect to the volume of migrants from the rest of the world, and for capital. In addition, the rich-host countries compete with each other with respect to migrants from the poor-host countries.

There are several forces at play in the tax-competition equilibrium. First, a host country (rich or poor) gains an infra-marginal benefit from each migrant (irrespective from where they come) because of the diminishing marginal production of labor. Presumably, the rich-host country stands to gain more than the poor-host country. Second, a similar infra-

marginal gain holds for the receiving (presumably, the poor) with respect to capital mobility. Third, there is a fiscal leakage of capital tax revenues to the migrants from the rest of the world. These migrants owns no capital and thus pay no capital tax. But they do share with native-born

capital owners the revenues from capital taxation, as they receive the same demogrant. Fourth, as capital moves only in one direction, from the rich-host countries to the poor-host countries, it follows that a poor-host country collects a tax on foreign capital, but pays no demogrants to its native-born individuals who emigrate to the rich-host countries.

An alternative, albeit difficult to sustain, is for all of the host countries to coordinate their fiscal policies.[14] Naturally, this coordination comes at the expense of the migrants from the rest of the
world.

The outcomes of the coordination depends on how the two types of host countries decide to divide between them the gains from the coordination. We consider two extreme cases: (i) All the gains accrue to the rich-host countries; (ii) all the gains accrue to the poor-host countries. All other possibilities are in between.

In coordinated-policy regimes the cutoff utility of migrants from the rest of the world, $\bar{V}$, is also controlled by the host countries, taking into account that migration from the rest of the world takes place according to the migration equations (14R) and (14P). They set also the common net-of-tax rental price of capital, $\bar{r}$, taking into account the capital resource constraint (19).

Case (i): In this case the tax-competition equilibrium utility level of the native-born individual in the poor-host country is taken as given, and the utility level of the native-born individual in the rich-host country is maximized.

Case (ii): In this case the tax-competition equilibrium utility level of the native-born individual in the rich-host country is taken as given, and the utility level of the native-born individual in the poor-host country is maximized.

6 Comparison between Tax Competition and Co-ordination

In this section we compare the tax policies that arise under competition and under coordination. An interesting question is whether competition

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[14]This 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 and tax policy towards the rest of the world (as the U.S.A does).

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 regimes. Furthermore, we consider weather the tax race is different between the Union rich and the Union poor country, and between labor and capital taxation. Given the complexity of these issues, we are able to analyze them only via numerical simulations over a broad range of parameter values. We also provide some insights into the economic forces at play that hinges on some fiscal externalities.[15]

Figure 1-5 depict the results of the numerical simulations. The parameter values chosen are such that migration from the rest of the world goes only to the rich country.[16]

[Figures 1-5 Here]

The qualitative results are similar for case(i) and (ii), and for the sake of brevity, we report only the results of case(i), where the rich country keeps all the gains from coordination. Figure 1-2 depict the tax rates for the rich countries. Somewhat surprisingly for us, the tax rate on capital is higher under competition than under coordination, upsetting the "race-to-the-bottom hypothesis".[17]

The rationale for this result seems to be quite basic: a fiscal externality associated with the volume of migration. There are gains and losses brought about by migration. A rich country has an infra-marginal gain from migration because of the diminishing productivity of labor for a given stock of capital. On the other hand, the native-born population shares with migrants the tax collected from capital income (recall that migrants have no capital): the transfer b that the migrants receive is not financed fully by their labor income tax. That is, the capital tax revenues paid by the native-born population "leak" also to the migrants[18]. Each rich country in a competitive regime evidently balances on the margin the gains and losses from migration. In doing so, each country takes the well-being of the migrants as given. It ignores the fact that a tax-migration policy that admits an extra migrant raises the well-being that must be accorded to migrants by **all** rich countries, in order to elicit the migrant to come in (because of the upward-slopping supply of migrants fro the rest of the world). As a result, it offers migrants too high

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[15]In an Appendix we use a related generic model where the implications of the fiscal externality for tax competition are derived analytically.

[16]Troughout we employ the following parameter values: $A_P = 4; A_R \in [4.7, 5.1]; \beta = 0.33; R = 1; P = 1; f(v) = (V/B)^B; B = 3; \varepsilon = 0.1; \bar{K}_R = 1; \bar{K}_P = 0.5$

[17]See also Razin and Sadka (2012).

[18]Fiscal leakage effects are analyzed in Razin and Sadka (2001), and Razin, Sadka and Suwankiri (2011).

level of b, levies too high tax on capital, and admits too many migrants. Indeed, figure 5 shows that the number of migrants from the rest of the world is higher in the competitive than in the coordinated regime.

Figure 3-4 depict the tax rates for the poor countries. First, all tax rates are the same under competition, and under coordination. This is because there are no fiscal externalities in relation to migration from the rest of the world, as such migration does not exist. As with resect to migration from non Union poor to Union rich countries (and among Union poor and Union rich countries), there is an infinitely-elastic supply of migrants. The absence of upward sloping supply of migrants (unlike the case of migrants from the rest of the world), implies that there are no fiscal externalities.

Comparing figures 1 and 2 with 3 and 4 we see that the tax rates on capital are generally lower in the poor than in the rich countries. The rational for this result is as follows. Note that a poor country in the Union does not receive migrants from the rest of the world. Therefore, unlike the rich country in the Union, it does not have to raise the tax on capital in order to attract migrants by offering them higher social benefits (b). (Recall that a tax on capital is a more effective tool to attract migrants than a tax on labor, because migrants own no capital and therefore are unaffected by a tax on capital.)[19]

7   Capital-Mobility Effects on Migration

The aforementioned analysis suggests that tax competition does not necessarily lead to smaller governments than what ensues under tax coordination. still, the outcome of competition is inefficient in the context of tax competition among localities as Dafes (1972) indeed argues. It should be emphasized nevertheless that we do not question the common wisdom that greater degree of factor mobility (for instance, because of globalization) leads under tax competition to smaller governments, see e.g. Razin and Sadka (2005). But, non of these studies have considered the effects of migration from the rest of the world on tax competition within the union. To see this in a simple way consider only the effect of the mobility of capital on the size of the government.

For this purpose we compare the models with perfect capital mobility employed so far with the extreme case of no capital mobility at all. In

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[19]Indeed, even when we allowed the same capital endowment of capital and productivity for the rich and the poor countries, still there is a lower tax on capital in the poor country than in the rich country, as long as we administratively allow only the rich country to admit migrants from the rest of the world.

this case, each country will have its own interest rate (r_R or r_P). That is, equation (6) does no longer hold. Equation (9) becomes:

$$c_R = (1 - \tau_{LR})\, l_R w_R + [1 - (1 - \tau_{KR})r_R]\bar{K}_R \qquad (9')$$

Similarly, equation (11) becomes:

$$V_R = \ln(b_R) + \frac{1}{1+\varepsilon}\left((1 - \tau_{LR})\, w_R\right)^{1+\varepsilon} + [1 - (1 - \tau_{KR})r_R]\bar{K}_R. \qquad (11')$$

Equations (14R) and (15R) become, respectively:

$$V_R - [1 - (1 - \tau_{KR})r_R]\bar{K}_R = \bar{V}, \qquad (14R')$$

and

$$V_R - [1 - (1 - \tau_{KR})r_R]\bar{K}_R + [1 - (1 - \tau_{KP})r_R]\bar{K}_P = \bar{V}_P. \qquad (15R')$$

Similarly, equation (14P) and (15P) become, respectively:

$$V_P - [1 - (1 - \tau_{KP})r_R]\bar{K}_P \leq \bar{V}, \qquad (14P')$$

and

$$\bar{V}_R - [1 - (1 - \tau_{KR})r_R]\bar{K}_R + [1 - (1 - \tau_{KP})r_R]\bar{K}_P = V_P, \qquad (15P')$$

Equation (19) which is the Union-wide market-clearing equation for capital is no longer valid. Instead, each country ha its own market clearing equation, that is:

$$K_R = \bar{K}_R \text{ and } K_P = \bar{K}_P. \qquad (19')$$

We now simulate with the same parameter values as before the tax competition and tax coordination regime for the capital immobility case. We compare the values of the fiscal policy tools in this case (i.e., no capital mobility) with the capital mobility case.

[Figure 6-10 Here]

Of particular interest is the effect of capital mobility on the degree of competition within the union over immigrants. Two tax instruments

16

are available in order to attract immigrants from the rest of the world: labor or capital taxes. Recall that immigrants pay the labor tax because they bring in their labor skills, but they do not pay the capital tax, because they bring with them no capital. Indeed, as figures 7, 9, and 10 demonstrate, the tax on labor is lower and migration flows are larger in the regime of capital mobility, compared with the no-capital mobility regime. To compensate for the loss in tax revenue from the fall in the labor tax rate, the rich country raises the tax on capital when capital is mobile; see figure 6.

8   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.[20] This paper provides some support to the Tiebout hypothesis, in an economy where immigration from outside is allowed. But the Tiebout framework does not recognizes externalities. Our approach suggests that when a union of heterogenous countries (as, for example, the EU) faces an upward supply of immigrants, tax competition may lead to higher taxes than coordination, because of a fiscal externality. Each rich country in a competitive regime evidently balances on the margin the gains and losses from migration. In doing so, each country takes the well-being of the migrants as given. It ignores the fact that a tax-migration policy that admits an extra migrant raises the well-being that must be accorded to migrants by **all** rich countries, in order to elicit the migrant to come in (because of the upward-slopping supply of migrants fro the rest of the world). As a result, it offers migrants too high level of b, levies too high tax on capital, and admits too many migrants. Indeed, figure 3 shows that the number of migrants from the rest of the world is higher in the competitive than in the coordinated regime. The externality (fiscal leakage) causes tax rates (on both labor and capital), and the volume of migration (of both skill types), to be higher in the competitive regime than in the coordinated regime. The fiscal externality is therefore based on an upward slopping supply of migrants from the rest of the world and a relatively low endowment of capital of the migrants. Tax coordination within the Union internalize this externality with lower taxation on

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[20]See Tiebout (1956).

capital and more intensive migration flaws.

9   Appendix

In order to shed some light on the analytics of the results consider a very simple model with only one type of migrants and suppose that the government owns all the capital. Note that the transfer (b) depends on the labor tax (τ) and the number of migrants (m). Denote then the indirect utility function by $v(\tau, m)$. In a competitive (uncoordinated) regime each government solves the following optimization problem:

$\max_{\{\tau,m\}} v(\tau, m)$

s.t.

$v(\tau, m) \geq \bar{v}$

where $\bar{v}$ is the utility level that must be enjoyed by the migrants and is considered to be exogenously given by each government. At equilibrium, we have $nm = f(\bar{v})$, where f is the supply function of migrants. Thus, a competitive (uncoordinated) equilibrium is given by:

$$v_\tau + \lambda v_\tau = 0 \tag{A1}$$

$$v_m + \lambda v_m = 0 \tag{A2}$$

$$\bar{v} = g(nm) \tag{A3}$$

where λ is the Lagrange multiplier and g is the inverse of f. Note that there is an upward sloping supply of migrants, so that $g' > 0$. Note also that (A1) and (A2) imply that

$$v_\tau = v_m = 0 \tag{A4}$$

In a coordinated regime, the optimal policy is a solution to the following regime:

$\max_{\{\tau,m\}} v(\tau, m)$

s.t.

$v(\tau, m) \geq g(nm)$

Thus, the optimal policy is characterised by

$$v_\tau + \theta v_\tau = 0 \tag{A5}$$

$$v_m + \theta v_m \ \Box \ \theta n g_n = 0 \tag{A6}$$

18

We can then conclude that

$$v_\tau = 0 \tag{A7}$$

$$v_m > 0 \tag{A8}$$

(Recall that $g_n > 0$)

Denote the competitive equilibrium levels of τ and m by τ^* and m^*, respectively. At m^*, we have $v_m = 0$ (see equation (A4)). Suppose that v first rises with m until it peaks at the competitive level of m (which is m^*), and then declines. Hence, $v_m > 0$ for $m \leq m^*$. Therefore, it follows from (A8) that the coordinated level of m is m^*. That is, there are fewer migrants in the coordinated regime than in the competitive (unregulated) regime.

Moving from the coordinated to the competitive regime presumably lowers v_τ. This is because m is higher in the competition regime and hence, due to the "fiscal leakage" effect, v_τ falls below zero. In order to set v_τ back to zero at the competitive regime, τ must fall if $v_{\tau\tau}$ is negative. In this case, the tax rate is lower in the competitive than in the coordinated regime.

10 References

References

[1] Altshuler, Rosanne, and Timothy J. Goodspeed. (2002). "*Follow the Leader? Evidence on European and U.S. Tax Competition.*" CUNY Working Paper.

[2] Auerbach, A. and P. Oreopoulos (1999), "*Analyzing the Economic Impact of U.S. Immigration,*" American Economic Review Papers and Proceedings, 89(2), 176-180.

[3] Barbone, Luca, Bontch-Osmolovsky, Misha and Salman Zaidi (2009), "*The Foreign-Born Population in the European Union and its Contribution to National Tax and Benefit Systems*" Policy Research Working Paper, the World Bank (April).

[4] Bhagwati, Jagdish and Gordon Hanson (2009), editors, "*Skilled Immigration Today: Prospects, Problems and Policies*", Oxford University Press.

[5] Boeri, T., Hanson, G. H., & McCormick, B. (Eds.). (2002). "*Immigration Policy and the Welfare System: A Report for the Fondazione Rodolfo Debenedetti*". Oxford University Press.

[6] Brueckner, Jan K., and Luz A. Saavedra. (2001). "D*o Local Governments Engage In Strategic Property-Tax Competition?*" National Tax Journal, 54(2): 203–29..

[7] Brueckner, Jan K. (2003). "*Strategic Interaction Among Governments: An Overview of Empirical Studies.*" International Regional Science Review, 26(2): 175–88.

[8] Case, Anne C., Harvey S. Rosen, and James R. Hines, Jr. (1993). "Budget Spillovers and Policy Interdependence: Evidence From the States." Journal of Public Economics, 52(3): 285–307.

[9] Chirinko, Robert S., and Daniel J. Wilson (2013), "*Tax Competition among U.S. States: Racing to the Bottom or Riding on a Seesaw?*", Federal Reserve Bank of San Francisco, Working Paper Series.

[10] Devereux, Michael P., Ben Lockwood, and Michela Redoano. (2008). "*Do Countries Compete Over Corporate Tax Rates?*" Journal of Public Economics, 92(5-6): 1210-1235.

[11] Dustmann, C., Frattini, T. & Halls, C. (2009), "*Assessing the Fiscal Costs and Benefits of A8 Migration to the UK*", CReAM Discussion Paper No. 18/09

[12] Frenkel, J. A., Razin, A., & Sadka, E. (1991). "*International taxation in an integrated world.*" The MIT Press.

[13] Hainmueller, Jens, and Michael J. Hiscox (2010), "*Attitudes toward Highly Skilled and Low-skilled Immigration: Evidence from a Survey*

Experiment" American Political Science Review, 104, no 1, February, 61-84.

[14] Hanson, Gordon, Scheve, Kenneth, and Matthew J. Slaughter (2009) *"Individual Preferences over High-Skilled Immigration in the United States,"* in Bhagwati, Jagdish and Gordon Hanson, editors, Skilled Immigration Today: Prospects, Problems and Policies, Oxford University Press.

[15] Hanson, Gordon, Scheve Kenneth and Matthew J. Slaughter (2007), "*Public Finance and Individual Preferences over Globalization Strategies*" Economics and Politics, 19(1), March, 1-33

[16] Jasso, Guillermina and Mark R. Rosenzweig (2009) "*Selection Criteria and the Skill Composition of Immigrants: A Comparative Analysis of Australian and U.S. Employment Immigration,*" in Bhagwati, Jagdish and Gordon Hanson, editors, Skilled Immigration Today: Prospects, Problems and Policies, Oxford University Press.

[17] Kemnitz, A. (2002), "*On the political economy of low-skilled immigration and the welfare state*", International Tax and Public Finance 9, 423 - 434.

[18] Kleven, H. J., Landais, C., Saez, E., & Schultz, E. A. (2013). "*Migration and Wage Effects of Taxing Top Earners: Evidence from the Foreigners' Tax Scheme in Denmark*" CEPR Discussion Paper Series No. 9410.

[19] Mayda, A. M. (2006). "*Who is against immigration? A cross-country investigation of individual attitudes toward immigrants.*" The Review of Economics and Statistics, 88(3), 510-530.

[20] McLure, Charles E., Jr. (2008). "*Harmonizing Corporate Income Taxes in the European Community: Rationale and Implications.*" In Tax Policy and the Economy, Volume 22, ed. James Poterba, 151-195. Chicago: University of Chicago Press (for the NBER).

[21] Mendoza, Enrique G., and Linda L. Tesar, (2005). "*Why Hasn't Tax Competition Triggered a Race to the Bottom? Some Quantitative Lessons from the EU.*" Journal of Monetary Economics, 52: 163-204.

[22] Oates, Wallace E. (1972). "*Fiscal Federalism.*" New York: Harcourt Brace.

[23] Ortega, F. (2005), "*Immigration Quotas and Skill Upgrading,*" Journal of Public Economics, 89(9-10), 1841-1863.

[24] Razin, Assaf and Efraim Sadka (2001), "*Labor, Capital and Finance: International Flows*", Cambridge University Press

[25] Razin, Assaf and Efraim Sadka (2005). "*The decline of the welfare state: demography and globalization.*" MIT Press.

[26] Razin, Assaf and Efraim Sadka (2010), "*Fiscal and Migration Competition*", NBER working paper 16224.

[27] Razin, Assaf and Efraim Sadka (2010), "*Tax competition and Migration: the Race-to-the-Bottom Hypothesis Revisited*", CESifo Economic Studies, 164-180.

[28] Razin, Assaf, Efraim Sadka, Ben Suwankiri (2011), "*Migration and the Welfare State: Political-Economy Policy Formation,*" MIT Press.

[29] Smith, James P. and Barry Edmonston, editors, (1997), "*The New Americans: Economic, Demographic and Fiscal Effects of Immigration*", National Academy Press, Washington, D.C

[30] Tiebout, Charles (1956), "*A Pure Theory of Local Expenditures,*" Journal of Political Economy, 64.

[31] U.S. Department of the Treasury. (2007). "*Treasury Conference on Business Taxation and Global Competitiveness: Background Paper.*" Washington, DC: U.S. Department of the Treasury.

Figure 1: Rich Country Capital Tax Rates: Competition vs. Coordination (Case I)
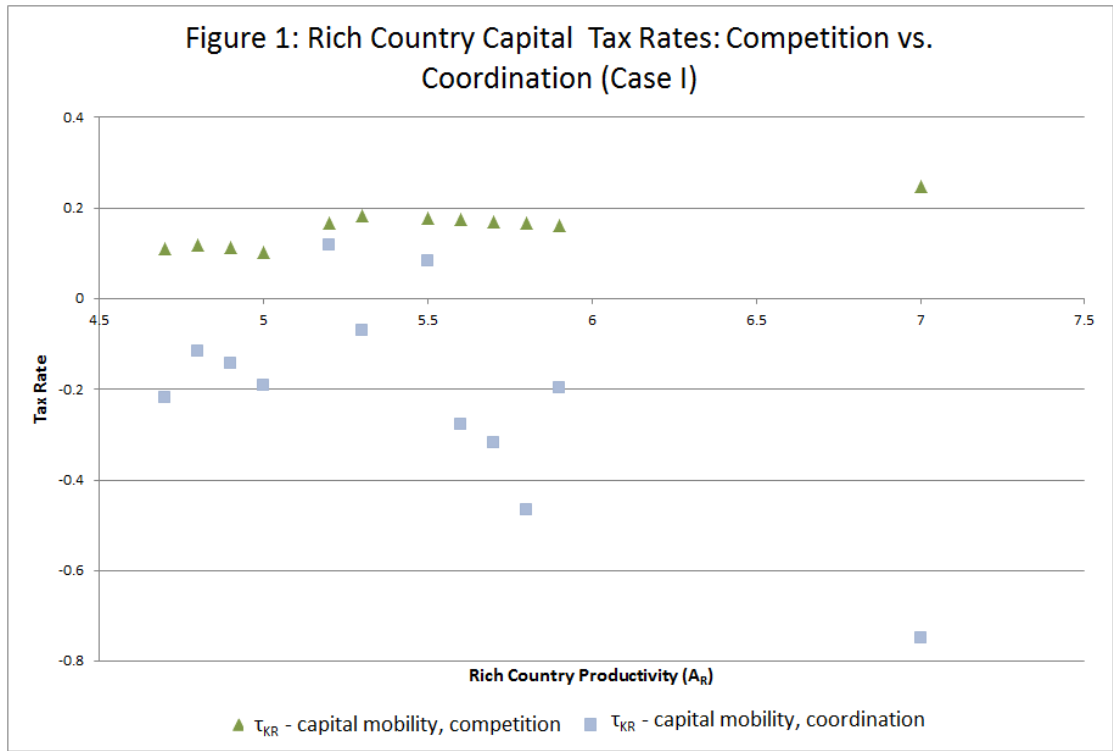
▲ τ_{KR} - capital mobility, competition   ■ τ_{KR} - capital mobility, coordination

Figure 2: Rich Country Labor Tax Rates: Competition vs. Coordination (Case I)

● τ_{LR} - capital mobility, competition   ✳ τ_{LR} - capital mobility, coordination

Figure 3: Poor Country Capital Tax Rates: Competition vs. Coordination (Case I)
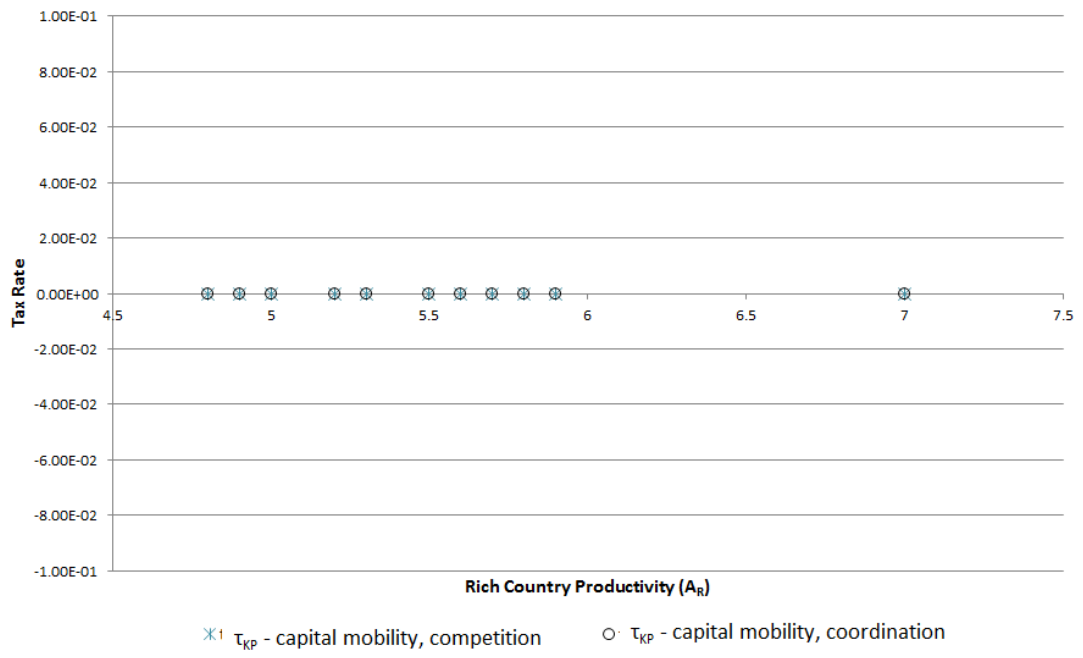

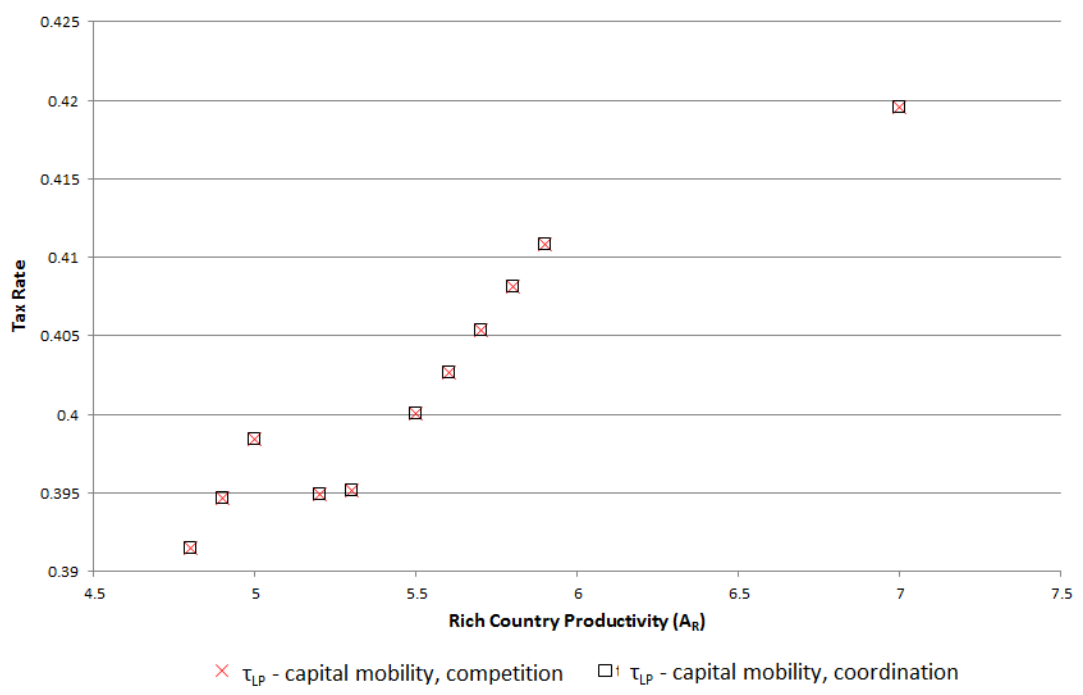Figure 4: Poor Country Labor Tax Rates: Competition vs. Coordination (Case I)

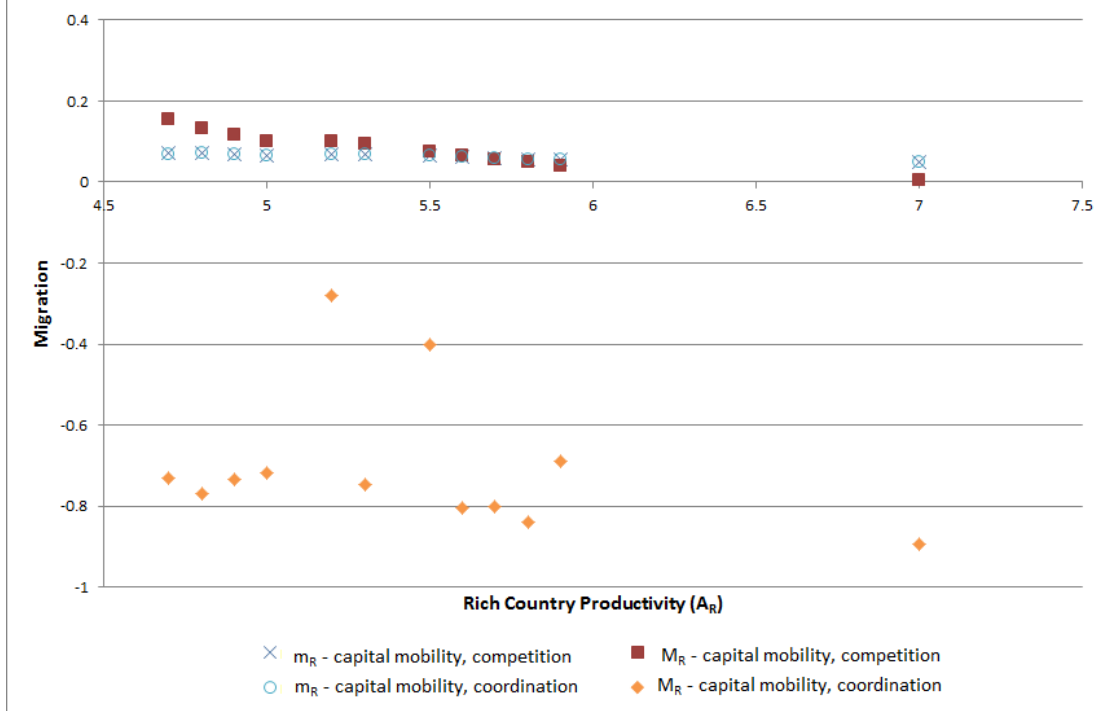Figure 5: Migration Flows: Competition vs. Coordination (Case I)

× m_R - capital mobility, competition
○ m_R - capital mobility, coordination
■ M_R - capital mobility, competition
◆ M_R - capital mobility, coordination

Figure 6: Rich Country Capital Tax Rates: Capital mobility vs. No capital mobility

▲ τ_{KR} - capital mobility, competition   ◆ τ_{KR} - no capital mobility, competition
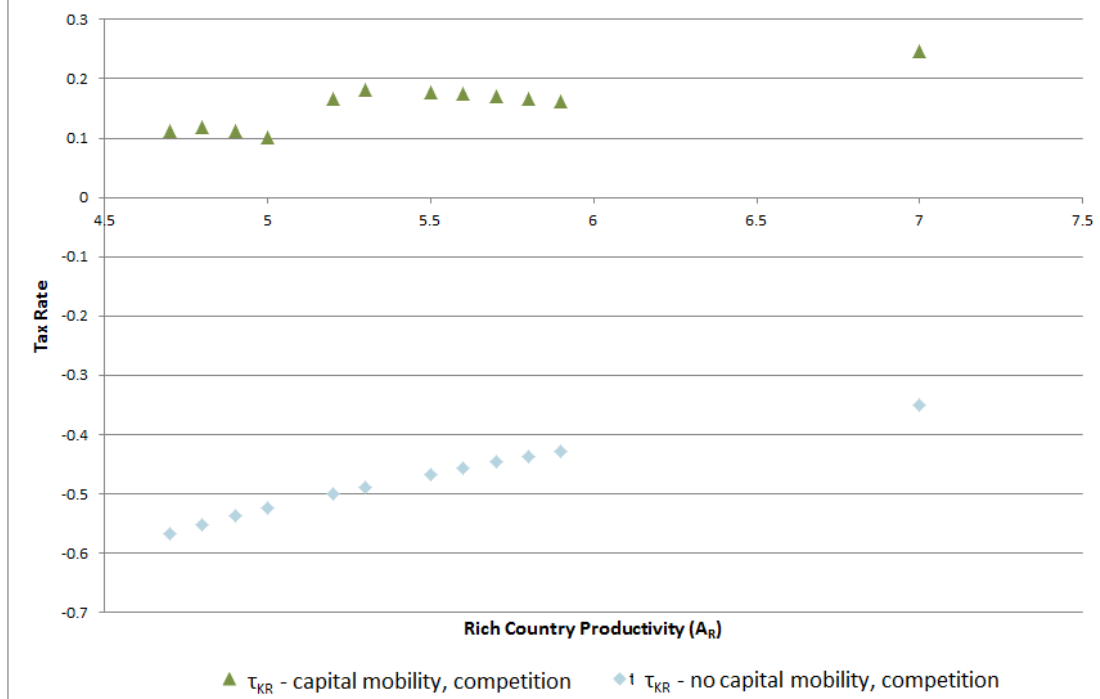
Figure 7: Rich Country Labor Tax Rates:
Capital mobility vs. No capital mobility

$\times$ τ_{LR} - capital mobility, competition   ● τ_{LR} - no capital mobility, competition

Figure 8: Poor Country Capital Tax Rates:
Capital mobility vs. No capital mobility

△ τ_{KP} - capital mobility, competition $\times$ τ_{KP} - no capital mobility, competition

Figure 9: Poor Country Labor Tax Rates:
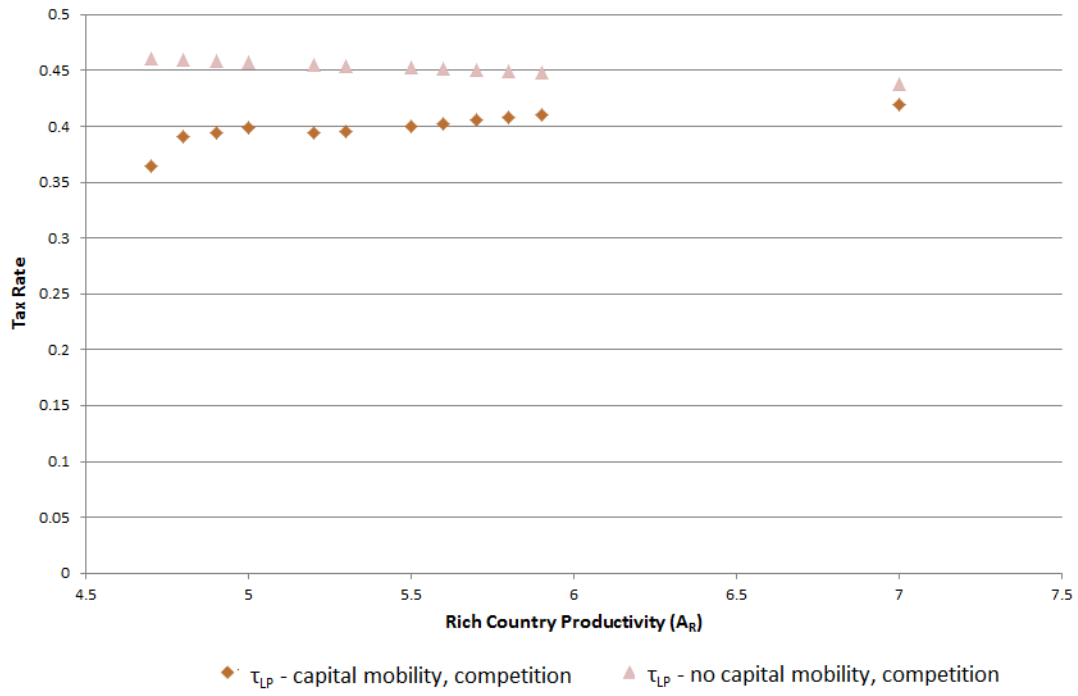Capital mobility vs. No capital mobility

Figure 10: Migration Flows:
Capital mobility vs. No capital mobility