NBER WORKING PAPER SERIES

MIGRATION AND TAX COMPETITION WITHIN A UNION

Assaf Razin
Efraim Sadka

Working Paper 19282
http://www.nber.org/papers/w19282

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
August 2013

Competent research assistance by Ori Katz is gratefully acknowledged. The views expressed herein are those of the authors and do not necessarily reflect the views of the National Bureau of Economic Research.

Migration and Tax Competition within a Union
Assaf Razin and Efraim Sadka
NBER Working Paper No. 19282
August 2013
JEL No. F2,H2

ABSTRACT

We develop a stylised EU-type model of rich capital-abundant (and productive) countries and poor capital-scarce countries in order to explain a key feature of tax policies and inter- and intra-migration flows. We examine how this model can explain 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, within a union and from the rest of the world. An upward-slopping supply of migrants from outside the union and the relatively low endowment of capital of these migrants gives rise to a fiscal externality.

Assaf Razin
Department of Economics
Cornell University
Uris 422
Ithaca, NY 14853
and Cornell University
and also NBER
ar256@cornell.edu

Efraim Sadka
Tel Aviv University
Eitan Berglas School of Economics
P.O.B. 39040
Ramat Aviv, Tel Aviv, 69978, ISRAEL
sadka@post.tau.ac.il

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 with relatively low barriers. They are also a destination, with relatively high barriers for migration, from developing countries (henceforth: "The rest of the world"). The peripheric countries (e.g. Ireland, east-central European countries) are less capital abundant and less productive. These countries are a source of net-migration to the core countries. They are not a prticulary attractive destination for migration from the rest of the world. They are also recipients of net capital from the core countries.

The purpose of this paper is to examine how the aforementioned features can explain 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 core and peripheric countries.

Our stylized view of the EU gives rise to a fiscal externality in the current regime of tax competition within the EU. We further explore how tax coordination within the Union can affect tax policies and migration flows.

2 Evidence

2.1 Fiscal Burden of Migration

To motivate, it is worthwhile to review some evidence on the fiscal aspects of migration and on native born attitudes toward immigration, before we develop the tax competition model.

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 comprehensibly 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).

Following the recent enlargement of the European Union to 27 countries, 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, in the year of the first enlargement, 2004. 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 A8 countries, Dustmann at al (2009) bring evidence of no welfare migration. 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. For instance, the percentage of those The A8 countries are the first eight accession countries (Czech Republic, Estonia, Hungary, Latvia, Lithuania, Slovenia and Poland.) More accurately, the said period extends from the second quarter of 2004 through the first quarter of 2009 that left full-time education at the age of 21 years or later is 35.5 among the A8 migrants, compared to only 17.1 among the U.K. natives. Another indication that the migration is not predominantly driven by welfare motives is the higher employment rate of the A8 migrants (83.1%) relative to the U.K. natives (78.9%). Furthermore, for the same period, the contribution of the A8 migrants to government revenues far exceeded the government expenditures attributed to them. 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, 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 migration6. 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.[1]

2.2 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 whether to impose tax harmonization measures (McLure, 2008).

Altshuler and Goodspeed (2002), Brueckner and Saavedra (2001), Brueckner (2003), Case, Rosen and Hines,(1993) bring some inconclusive evidence for the "race to the bottom" hypothesis of tax competition. Recently, Chirinko and Wilson (2013) analyze a panel dataset covering the 48 contiguous U.S. states for the period 1965 to 2006. Their study

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

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 secular movements in capital taxation. They also find that the slope of the reaction function (the equilibrium response of home state to foreign state tax policy) is negative, contrary to many prior empirical studies of fiscal reaction functions. This seemingly paradoxical result is due to two critical elements – controlling for aggregate shocks and allowing for delayed responses to foreign tax changes. Their results suggest that the secular decline in capital tax rates, among U.S. states, reflects synchronous responses among states to common shocks, rather than competitive responses to other states' tax policy. The negative sign for the slope of the reaction function is "riding on a seesaw" hypothesis rather than "racing to the bottom" hypothesis. That is, tax competition may lead to an increase in the provision of local public goods, and policies aimed at restricting tax competition to stem the tide of declining capital taxation are possibly ineffective.

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 are engaged in competition over migrants from the rest of the world. The model incrporates 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 on labor and on capital.[2]

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,

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

[2]There exists a body of literature which emphasizes the importance of both channels. The wage channel is analayzed in, for instance, Ortega (2005) and olso 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.

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,

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

Aggregate labor supply is given by:

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

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,[3] and l_R is the individual labor supply.

Total population is

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

The rental price of capital is given by the marginal productivity condition:

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

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 the other host 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, according to which each country taxes only the capital employed in that country.[4] Denote the net-of-tax rental price of capital in all other (either rich or poor) host countries by $\bar{r}$ (note that with source-based taxation and free capital mobility,

[3] 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.

[4] 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.

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:

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

where τ_{KR} is the tax rate on capital employed by our representative host 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 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 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 (they own no capital) and receive the benefit b. The direct utility function is

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

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 $\ln(b_R)$.[5]

The budget constraint of a native-born individual is

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

[5]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 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

$$l_R = \left(\left(1 - \tau_{LR}\right) w_R\right)^{\varepsilon} \tag{10}$$

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

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

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" replaces 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 wold 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 natural impediment. We replace equations (3R) and (4R) by, accordingly

$$L_P = \left(1 + m_P - sM_R\right) l_P \tag{3P}$$

and

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

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

We further naturally assume that the capital-abundant country is the richer country, that is

$$\bar{K}_R > \bar{K}_P. \tag{12}$$

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.[6] Specifically, the number of migrants that wish to emigrate

[6] In Razin and Sadka (2010) we consider a host-source country contest 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.

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.

3.4 Fiscal Policy Choice

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:

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

and

$$V_R - (1+\bar{r})\bar{K}_R + (1+\bar{r})\bar{K}_P = \bar{V}_P, \tag{15}$$

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 (14). 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 $V_R - (1+\bar{r})\bar{K}_R + (1+\bar{r})\bar{K}_P$ (see equation (11)). This rexplains equation (15).[7]

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-15).

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

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

and

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

and equations (1)-(6), (10) (with "P" similarly replacing "R"). Again, $\bar{r}, \bar{V}$ and $\bar{V}_P$ are taken as given.

[7] Stricly speaking, the left-hand side of equation (15) must be smaller than or equal to the right-hand side, with strict inequality holding only if $M_R = 0$.

3.5 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.[8] 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:[9]

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

(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

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

and

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

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.

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:

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

There are several forces at play in the competition. First, a host country (rich or poor) gains an infra-marginal benefit ftom each migrant

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

[9] Because of the constant returns-to-scale assumption, one may think that there is no unique determination of the size of internatinal floes (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 constan-returns-to-scale technologies in industry equilibrium).

(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.

4 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.

An alternative, albeit difficult to sustain, is for the host countries to coordinate their fiscal policies.[10] 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).

[10] 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).

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.

In thie section we compare the tax policies that arise under competition and under coordination. An interesting question is 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 regimes. Furthermore, we consider wether 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 analyse 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. In an Appendix we use a related generic model where the implications of the fiscal externality for tax competition are derived analytically.

Figure 1-3 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.[11] We employ superscripts "comp" and "coor" to denote the value of a variable in the competitive and coordination regime, respectively.

[Figures 1-3 Here]

The qualititive results are similar for case(i) and (ii), and fo the sake of brevity, we report only the results of case(i), where the rich country keeps all the gains from coordination. Second, and somewhat surprisingly for us, the tax rate on capital is higher under competition than under coordination, upsetting the "race-to-the-bottom hypothesis".[12]

The rationale for this result seems to be quite basic: a fiscal externalitiy 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

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

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

migrants have no capital): the transfer b that the migrants receive in 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[13]. 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.

Figure 2 depicts 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 slopping supply of migrants (unlike the case of migrants from the rest of the world), implies that there are no fiscal externalities.

Comparing figures 2 and 3 we see that the tax rates on capital are generally lower in the poor then in the rich countries. The rational for this result is as follows. Note that a poor country in the Union does not recieve 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.)[14]

Figure 3 demostraits that there is no difference in the poor-rich migration with the Union between the competition and coordination regime. Indeed, we attribute this to the perfectly elastic poor-rich migration supply which eliminates the fiscal externality that we identify in the context of migration from the rest of the world.

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

[14]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.

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.[15] This paper provides some support to the Tiebout hypothesis. 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 suply of migrants from the rest of the world and a relatively low endoement of capital of the migrants. Tax coordination within athe Union internalize this externality with lower taxation on capital and more intensive migration flaws.

[15] See Tiebout (1956).

6 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

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

$$v_m + \theta v_m - \theta g' n = 0 \tag{A6}$$

We can then conclude that

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

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

(Recall that $g' > 0$)

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 hance, 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.

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

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

[7] 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.

[8] 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.

[9] 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.

[10] 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

[11] 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.

[12] 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.

[13] 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

[14] 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.

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

[16] 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).

[17] 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.

[18] 417–26.

[19] Oates, Wallace E. 1972. Fiscal Federalism. New York: Harcourt Brace.

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

[21] Razin, Assaf an Efraim Sadka (2001), "Labor, Capital and Finance: International Flows", Cmbridge University Press

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

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

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

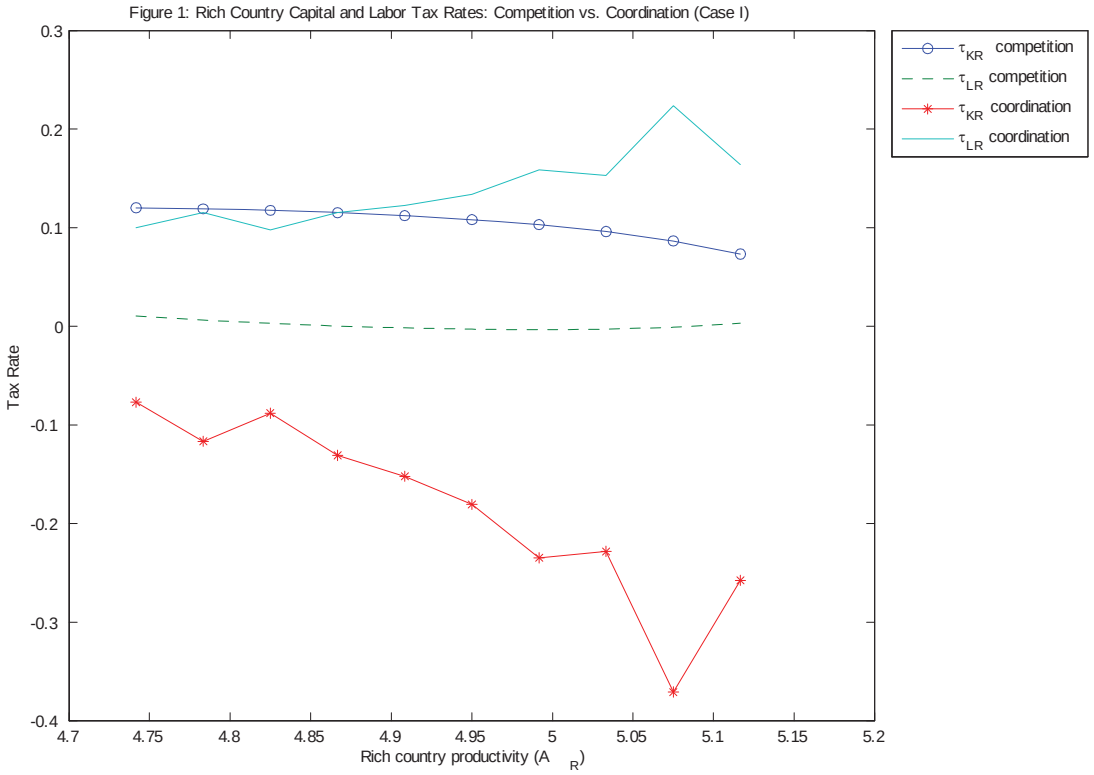
[25] Smith, James P. and Barry Edmouston, editors, (1997), *The New Americans: Economic, Demographic and Fiscal Effects of Immigration*, National Academy Press, Washington, D.C

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

[27] 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.

and tax competition within a union Figure

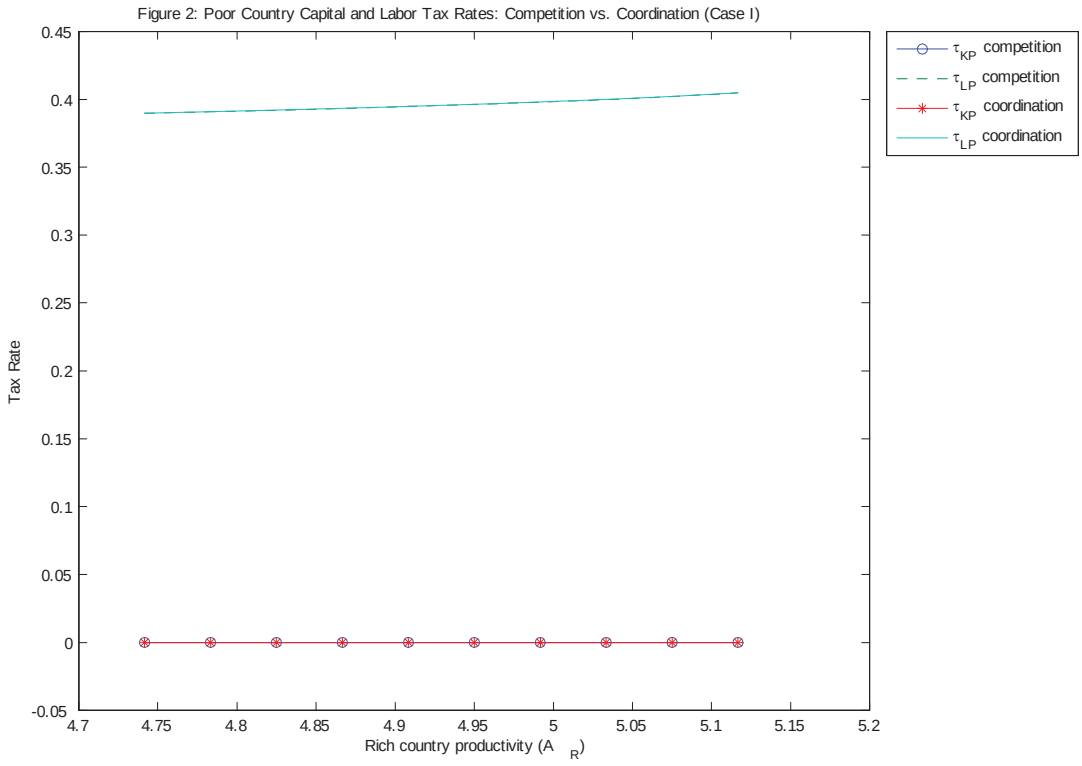
1



1.*pdf*

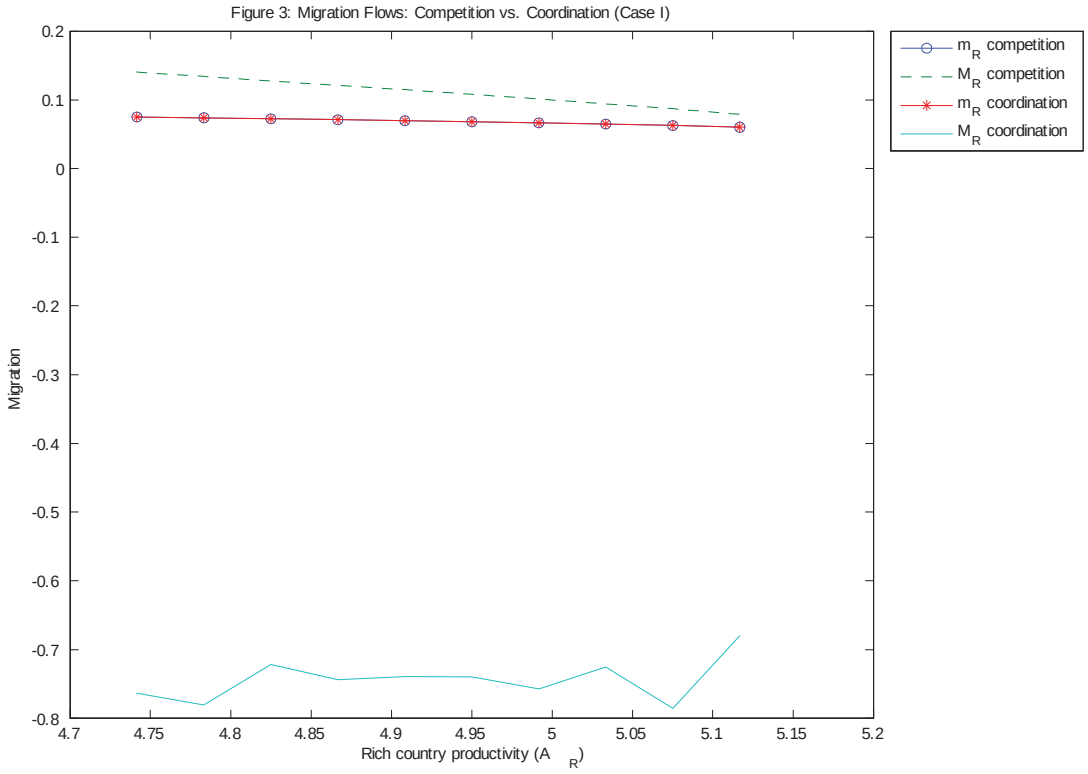
and tax competition within a union Figure

2



2.*pdf*

and tax competition within a union Figure 3



3.*pdf*