

Migration and the welfare state: The economic power of the non-voter?

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Abstract This paper investigates the impact of emigration on the political choice of the size of the welfare state. Mobility has two countervailing effects: the political participation effect and the tax base effect. With emigration, the composition of the constituency changes. This increases the political influence of the less mobile part of the population. But the new political majority then also has to take into account that emigration reduces tax revenues and thereby affects the feasible set of redistribution policies. We find that the direction of the total effect of migration depends on the initial income distribution in the economy. Our results also contribute to the empirical debate on the validity of the median-voter approach in cross-country studies for explaining the relation between income inequality and redistribution levels.

Keywords Migration · Redistribution · Voting

JEL Classification F22 · H50 · D31 · D72

1 Introduction

One of the big puzzles concerning the political economy of the welfare state is why we only observe systems with limited redistribution although income distributions are usually skewed to the right. The literature on endogenous limits to the size of the welfare state explains this observation by broadly following two lines: The first

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considers the self-interest of poorer citizens, i.e., their expectation of upwards mobility or their consideration of potential reactions of richer citizens. The second category looks at features of the political process such as the under-representation of the poor to explain the outcome of limited redistribution.¹

In our paper, we focus on the first line of research. It has been strongly influenced by Meltzer and Richard (1981) who use the effects of taxation on the labor-leisure choice of citizens in a closed economy to derive a tax base effect that limits redistribution. When voting, citizens rationally take into account that their fellow citizens might substitute labor with leisure as a reaction to higher taxes. A higher tax level can thus reduce the overall tax revenue. Together with the requirement of a balanced budget this creates an upper bound for redistribution policies and constrains the net recipients' demand for a large welfare state. The migration literature has contributed a similar argument within the context of an open economy: As tax increases may prompt net contributors to a redistributive system to leave the jurisdiction, migration leads to a tax base effect similar to the one found by Meltzer and Richard. The net recipients rationally take into account that the proportion of net contributors shrinks with higher tax rates. This limits their demand for more redistribution. Yet, when we consider the effects of migration, the tax base effect is not the only factor that influences the political decision.

The contribution of our paper is to identify two separate effects of mobility on the size of the welfare state within a political economy setup and to analyze their interaction. These are related to the two different roles of citizens: one as taxpayers and the other as voters. First, if taxpayers leave a jurisdiction, migration lets the tax base shrink leading to the tax base effect as described above. Second, with mobility, also the composition of the constituency that decides on redistributive policies changes. As some groups of voters emigrate, the political influence of the less mobile groups in the population increases. This shifts the political majority and therefore the preferred policy of the constituency. For example, if net contributors emigrate disproportionately more, *ceteris paribus*, the political majority prefers a higher level of redistribution. The political participation effect then works in the direction opposite to the tax base effect and increases the equilibrium size of the welfare state. The literature so far has not explicitly discussed the interaction of both effects. In our median-voter model, we investigate how each of them shapes the redistribution outcome in political equilibrium. Thereby, we assess the overall impact of migration on the political choice of the size of the welfare state.

We find that the direction of the total effect of migration depends on the initial income distribution in the economy. The more equal the distribution, the more the political participation effect dominates, while the tax base effect is more important for distributions which are more skewed to the right.

The setup of the paper is as follows: In Section 2, we discuss the related literature. We then set out the basic model in Section 3. In Section 4, we derive the total effect of migration on the size of the welfare state and discuss some examples for illustration. Section 5 concludes.

¹ For a recent overview over these approaches, see Harms and Zink (2003).

2 Related literature

Our paper links migration to the political economy of the welfare state. In a closed economy setting, redistribution is limited by potential tax-avoiding reactions of the net contributors. If voters take this into account, there is an endogenous upper bound on the size of welfare state (Meltzer and Richard, 1981). This holds even more in an open economy setting: Voters understand that high taxes lead to emigration of taxpayers and thereby reduce the tax revenue available for redistribution. Thus, they rationally refrain from demanding excessively high taxes. The total amount of redistribution is reduced by the possibility of migration (see, e.g., Wilson, 1982; Janeba and Raff, 1997, and the survey by Cremer et al., 1996).²

One strand of the migration literature uses a setup with competing jurisdictions or countries. In equilibrium, all citizens are distributed over the jurisdictions without further incentives to migrate. When mobility increases with income, in a setup with systems competition, several jurisdictions compete for the net contributors to the welfare state. Then, the tax base effect leads to a race to the bottom, resulting in the extreme in the abolition of the welfare state (Janeba and Raff, 1997).

This result can be avoided by enlarging the framework in several directions. With interregional transfers, the equilibrium outcome differs from the race to the bottom scenario. Hansen and Kessler (2004) show that when jurisdictions are linked by interregional transfers, redistributive policies can be asymmetric across regions. Interregional transfers act as a substitute for redistributive policies and can thereby restrain migration.

The result is also mitigated whenever mobility costs are considered, either as pecuniary costs or as a non-pecuniary attachment to home (e.g., Haupt and Peters 2003, or Mansoorian and Myers, 1993). In multi-community models with migration costs, we get the well-known stratification result, going back to Tiebout (1956). Citizens with similar preferences for taxes and government spending or public good provision group together in one jurisdiction (see, e.g., Epple and Romer, 1991; Epple, Filimon, and Romer, 1984; Fernandez and Rogerson, 1996, 1997; Glomm and Lagunoff, 1998; Hansen and Kessler, 2001b; or Nechyba 1997). Implicitly, there, citizens anticipate how the political equilibrium in their destination jurisdiction is affected by their migration decision and thus migrate strategically. Hansen and Kessler (2001a) include geographical size constraints into their model.

This literature, however, does not explicitly disentangle the tax base effect and the political participation effect.³ The reason is that most papers analyze the equilibrium *after* migration only. In equilibrium, by definition, no one migrates. This implies of course that the effects of migration on the tax base and on the constituency are already

² An exception is Hindricks (2001) who analyzes the case where the poor are more mobile. He finds that the equilibrium amount of redistribution can increase in this setting. In particular, taxes can be inefficiently high as any improvement of the tax schedule might attract voters with an interest in less redistribution. As lower taxes would shift the political equilibrium towards a smaller welfare state, the current majority tries to avoid this.

³ To the best of our knowledge, the only contribution that explicitly considers the political participation effect is by Lorz and Nastassine (2004). In their citizen-candidate model, more mobile citizens prefer a smaller welfare state. As they are more prone to migrate, they have fewer incentives for political participation. Thus, the political influence is shifted towards the proponents of a larger welfare state.

incorporated in the equilibrium outcome. Stratification then leads to the dominance of either the tax base or the political participation effect. For example, Epple and Romer (1991) find more redistribution, the poorer the jurisdiction. It is not entirely clear, however, how the final level of redistribution in a single jurisdiction is determined by outward mobility of tax payers and voters, compared to the situation *before* migration.

Our model has a different focus: We use a stylized setup where we focus on potential outmigration from a small (high-tax) country with a redistributive welfare state. The environment of that country, the destination of emigration, is assumed to be a large (low-tax) country with a small or no welfare state. From the perspective of the small country, the redistribution policy of the destination country is given. This implies that the potential migrants face a fixed outside option. Moreover, migration behavior in our model is such that we do not get full stratification but have emigrants from all income groups in different proportions. This setup allows us to focus on the effects of outward migration on the tax base and on the composition of the constituency in the small country. In such a framework, also the political participation effect becomes visible.

Similar effects are analyzed in other contexts: Caplin and Nalebuff (1997) model endogenous group formation and policy outcomes. The policy of each institution depends on the composition of their memberships and the memberships depend on the policies of all institutions. Swope and Janeba (2005) apply this approach to the public provision of excludable public goods through user fees. Contrary to tax financing, with user fees low-preference consumers can opt out of the system by not paying the fee. At the same time, they become indifferent with respect to the size of the fee. Fees may rise as a result. This is similar to our setting where opting out is realized by emigration and emigrants refrain from voting. In a different context, Bolton and Roland (1997) derive possible reasons for the breakup of a nation state. The authors identify a political factor, arising due to different political preferences determined by the income composition in the region, and a tax base factor, due to different income distributions across regions. Yet, except for the separation of a whole region, there is no migration.

Our political participation effect could also be implied by strategic considerations of politicians: Incumbents could deliberately use policies that induce emigration of a part of the citizens in order to shape their constituency and ensure reelection. Glaeser and Shleifer (2005) term this the “Curley Effect”, after the Boston mayor James Curley who, in the first half of the last century, ensured his political majority among the poor Irish inhabitants by implementing policies that induced richer citizens to emigrate into the suburbs. The authors show that such a behavior, while successful politically, can result in Pareto inferior economic outcomes.⁴ In this model, we do not consider any strategic behavior of the political leaders. Instead, we use a pure median-voter approach. As some citizens emigrate, the political participation effect shapes the constituency and thus determines the position of the median voter.

⁴ Other examples of such a strategic use of the political participation effect are Detroit’s black mayor Coleman Young, who discriminated against white inhabitants of the city, or the separatist Parti Quebecois, whose election in the 1970s induced out-migration of Non-Quebecians (see Glaeser and Shleifer, 2005; Day and Winer, 2006).

3 The model

In our model, citizens vote on the size of the welfare state, i.e., on the tax level and the associated redistributive transfers. Furthermore, citizens have the possibility to leave the country. We are interested in seeing how the case of a closed economy without migration where all citizens vote and pay taxes compares to the case of an open economy where migrants neither vote nor pay taxes in their country of origin. In this section, we first describe the basic features of our economy. Then, we discuss the voting game on the welfare state for the closed economy setting and the open economy setting with emigration.

3.1 Setup of the model

The welfare state is financed by a proportional wage tax τ . It is determined in the political equilibrium. Redistribution is effectuated via lump-sum transfers T benefiting all citizens.⁵ As we assume a balanced budget, the budget constraint is $T = \tau\bar{y}$ where \bar{y} is the mean income of the population. Given this, the utility of a voter in income group i is defined as

$$u_i = (1 - \tau)y_i + \tau\bar{y} - d\tau^2. \quad (1)$$

Each citizen in income group i receives a gross wage income y_i for supplying inelastically one unit of labor. The citizen pays taxes τy_i and benefits from the lump-sum transfer $\tau\bar{y}$. With $-d\tau^2$ we capture any distortions which arise due to the wage income tax, e.g., the distortions in the labor-leisure choices.

The income distribution in the population is given by the cumulative distribution function $F(y)$ with the continuous density function $f(y)$ for $y \in [0, y_{\max}]$. The mean income \bar{y} is given by $\bar{y} = \int_0^{y_{\max}} yf(y)dy$ and the median income y_m is implicitly defined by $\int_0^{y_m} f(y)dy = \frac{1}{2}$.

Assumption 1. The income distribution is skewed to the right and unimodal. We thus have $y_m < \bar{y}$.

With this assumption, we capture the empirically well-known shape of most real-world income distributions (see, e.g., Burkhauser et al., 1996). It is standard in the migration literature (see, e.g., Hansen and Kessler, 2001a, 2004).

3.2 Voting on the welfare state: No migration

For the political decision on the size of the welfare state, we use the median-voter theorem. It is straightforward to see from the first-order condition of the citizen's

⁵ Outcomes similar to the "Curley Effect" could be generated by considering targeted transfers which could then be used as strategic instruments.

utility maximization

$$\frac{\partial u_i}{\partial \tau} = -y_i + \bar{y} - 2\tau d = 0 \tag{2}$$

with $\frac{\partial^2 u_i}{(\partial \tau)^2} = -2d < 0$ that each citizen of income group i has a unique preferred tax rate τ_i^* . As we rule out negative tax rates, we have

$$\tau_{0,i}^* = \begin{cases} \frac{\bar{y}-y_i}{2d} & \text{for } y_i \leq \bar{y} \\ 0 & \text{for } y_i > \bar{y} \end{cases} \tag{3}$$

where the subscript 0 denotes the case with no migration. In order to be able to use the median-voter theorem, we need that the preferences for τ are monotonic in the citizens' individual incomes y_i . This condition is fulfilled in our model: As we have that $y_m < \bar{y}$, the median must always lie in the part of the income distribution where citizens prefer a positive tax rate. In this part of the population, preferences for the tax rate are strictly monotonically decreasing with income. Thus, the equilibrium tax rate in our economy is the tax rate preferred by the median voter. We can state

Lemma 1. *Without migration, the unique political equilibrium tax rate is τ_0^* where*

$$\tau_0^* = \frac{\bar{y} - y_m}{2d} > 0. \tag{4}$$

Proof: See the discussion above. □

We require that the distortion d is high enough so that we get internal solutions for the tax rate, i.e. $\tau_0^* \leq 1$. In order to assure internal solutions for all cases, it is sufficient to assume:

Assumption 2. $d \geq \frac{y_{\max}}{2}$.

We take τ_0^* as our benchmark for the effects of migration on the size of the welfare state.

3.3 Voting on the welfare state: Migration

We now introduce mobility in our setup. Generally, an open economy will experience both emigration and immigration. In the model, we focus on the effects of *emigration* only.⁶ This is not overly restrictive as explicitly taking immigration into account would reinforce the effects we show (see our discussion in Section 4).

With this model, we focus exclusively on the effects of emigration in *one* country. Therefore, we model the recipient country of our emigrants as simply as possible. Let

⁶ For a model studying the political economy effects of immigration only, see Mazza and Van Winden (1996).

us assume that there is a similar redistributive system also in the destination country. The tax rate is τ^F and exogenously given. We focus on the case where the recipient country displays a smaller welfare state than the country of origin, i.e. $\tau^F < \tau$. Let us further assume that all individuals receive the same gross wages in both countries. In addition, each individual j in group i has an individual-specific component ε_{ij} added additively to her utility in the destination country. It is known to the individual before the migration decision is taken.⁷ For each income group y_i , ε_{ij} is distributed over \mathbb{R} with density $g(\varepsilon)$ and the cumulative distribution function $G(\varepsilon)$.⁸ Its mean is given by $\alpha = \int \varepsilon g(\varepsilon) d\varepsilon$. We do not have to specify variance and skewness of $g(\varepsilon)$, as we have the same distribution for each income group of citizens.

Those citizens who do not emigrate remain part of the redistributive system in their country of origin. In addition to their net income $y_i(1 - \tau)$, they receive a lump-sum transfer $\tau \bar{y}_\alpha$. \bar{y}_α is the mean income after emigration. Those citizens who emigrate become part of the foreign welfare state. Their net income is $y_i(1 - \tau^F)$ and they receive a lump-sum transfer $\tau^F \bar{y}_\alpha^F$.

Citizens reach their individual emigration decision by considering the new redistributive system in the country of origin and in the destination country after emigration, taking the new mean incomes \bar{y}_α as well as \bar{y}_α^F as given. For given tax rates τ and τ^F , individuals then emigrate if and only if

$$y_i(1 - \tau^F) + \tau^F \bar{y}_\alpha^F - d\tau^F + \varepsilon_{ij} > y_i(1 - \tau) + \tau \bar{y}_\alpha - d\tau. \tag{5}$$

For each income group y_i , there is thus an ε_i^* such that

$$\varepsilon_i^* = -y_i(\tau - \tau^F) + \tau \bar{y}_\alpha - \tau^F \bar{y}_\alpha^F - d(\tau - \tau^F). \tag{6}$$

Individuals with $\varepsilon_{ij} > \varepsilon_i^*$ emigrate and those with $\varepsilon_{ij} < \varepsilon_i^*$ stay in the home country. Of those $f(y_i)$ individuals with income y_i , $(1 - G(\varepsilon_i^*)) f(y_i)$ leave the country and $G(\varepsilon_i^*) f(y_i)$ decide not to migrate.

When we increase the mean α , keeping the variance constant, more citizens will emigrate in each income group. The reason is that the individual-specific components ε_{ij} of the citizens are then on average higher, i.e., such that emigration leads to a higher income for more citizens. We can thus use α to capture the general migration propensity in the population.⁹ Formally,

$$\frac{\partial(1 - G(\varepsilon_i^*))}{\partial \alpha} > 0. \tag{7}$$

⁷ For example, ε_{ij} can be related to language skills in particular and communication skills in general with respect to different cultural environments.

⁸ Equally, we could use distributions with a bounded support, i.e., $\underline{\varepsilon}$ and $\bar{\varepsilon}$, where $\underline{\varepsilon} \in]-\infty, 0]$ and $\bar{\varepsilon} \in [0, +\infty[$ and make additional assumptions to ensure some minimal and maximal emigration.

⁹ The shape (variance and/or skewness) of the distribution of the individual-specific components ε_{ij} would be another way to capture the migration propensity in the population. If, for each income group, the mass of citizens shifts in such a way that more citizens have individual-specific components ε_{ij} above the emigration threshold, the overall propensity to emigrate is increased.

If we compare different income groups we find that with $\tau > \tau^F$ higher income groups are more prone to emigrate than lower income groups. The cutoff level ε_i^* is the smaller, the higher the income y_i

$$\frac{\partial \varepsilon_i^*}{\partial y_i} = -(\tau - \tau^F) < 0. \tag{8}$$

It will turn out to be useful to see how the effect of the income changes with a change in the respective tax rates. We have

$$\frac{\partial^2(\varepsilon_i^*)}{\partial y_i \partial \tau} = -1; \quad \frac{\partial^2(\varepsilon_i^*)}{\partial y_i \partial \tau^F} = 1. \tag{9}$$

Thus, we have that an increase in the domestic tax rate increases emigration more for higher income groups than for lower ones, while a higher foreign tax rate attracts more citizens from lower income groups.

For our analysis, it is convenient to summarize the emigration behavior in a general migration function.

Lemma 2. *The share of citizens who emigrate is given by $E(\alpha, \tau, \tau^F, y)$. The proportion of emigrants increases with the overall propensity to migrate α and the income y , $\frac{\partial E}{\partial \alpha} > 0, \frac{\partial E}{\partial y} > 0$. Furthermore, the proportion of citizens who emigrate in reaction to a domestic tax increase or a foreign tax decrease is the higher, the higher the income group, i.e. $\frac{\partial^2 E}{\partial y \partial \tau} > 0$ and $\frac{\partial^2 E}{\partial y \partial \tau^F} < 0$.*

Proof: The proof follows immediately from the discussion above (see (7), (8) and (9)). □

Our emigration function $E(\cdot)$ is bounded from below and above, i.e. $0 \leq E(\cdot) \leq 1$. That the rich are more prone to migrate than the poor is supported by a number of empirical studies that document a positive correlation between the propensity to migrate and the education level of individuals where the education level can be taken as a proxy for lifetime income.¹⁰ This is true in particular if the destination country has a smaller or, in the extreme, no welfare state.

The migration behavior as described by $E(\cdot)$ leads to a change in the income distribution in the population of the home country. With migration, the income density changes to

$$f_\alpha(y) = f(y)(1 - E(\cdot)). \tag{10}$$

The ratio of poor to rich increases as disproportionately more rich than poor citizens emigrate. The after-emigration mass of the population is given by

$$F_\alpha(y_{\max}) = \int_0^{y_{\max}} f_\alpha(y)dy = \int_0^{y_{\max}} f(y)(1 - E(\cdot))dy < F(y_{\max}) = 1.$$

¹⁰ See, for example, for the issue of internal migration, Greenwood (1997) for the USA, Ledent (1990) for Canada, or Carillo and Marselli (2003) for the case of Italy.

3.4 Voting on the welfare state: Two effects of migration

With our emigration function $E(\alpha, \tau, \tau^F, y)$, the proportion of citizens who stay in the country depends on the tax rate τ that is chosen in the political equilibrium. Thus, there is an interaction between the migration decision and the voting decision. We assume a simultaneous time structure as it best captures the interdependencies between migration and voting.

With mobility, each citizen has to reach two decisions at the same time: the voting decision and the decision whether or not to emigrate. After the voting game and emigration, the new tax policy is implemented, the transfers are paid out and the individual utilities realize. Citizens choose whether to emigrate based on perfect foresight of the outcome of the political process (after emigration); they then emigrate before the vote. Each citizen is able to derive which income group the new median voter will belong to and can thus calculate the equilibrium outcome for the welfare state. From the point of view of each individual citizen, the election outcome is thus given.¹¹ We can also think of our simultaneous time structure as the steady state of a dynamic process with alternating emigration and voting. Note further that whether migration occurs before or after voting is unimportant. In the first case, emigrants will not vote as they have already left the country. In the second case, those who anticipate that they will emigrate will not vote as they are not affected by the new tax rate.¹²

Migration has potentially two effects, the tax base effect and the political participation effect. We will discuss the total effect of migration in the next section. In this section, we use a thought experiment in order to disentangle the two effects. This means that we consider first the tax base effect and second the political participation effect in isolation.

3.4.1 The tax base effect

When emigrants stop paying taxes, mobility reduces the total tax revenue in the home country. We call this effect the tax base effect. With migration, the mean income \bar{y} changes and is now given by $\bar{y}_\alpha = \frac{1}{n} \int_0^{y_{\max}} y f_\alpha(y) dy$ where $n = \int_0^{y_{\max}} f_\alpha(y) dy = F_\alpha(y_{\max}) < 1$ denotes the number of non-migrants and serves as normalization to get probability interpretations.

Lemma 3. *For the migration function $E(\cdot)$, the tax base effect of emigration always leads to a reduction of the mean income, i.e., $\bar{y}_\alpha < \bar{y}$, and thus for a given tax rate τ reduces the per capita lump-sum transfers in the economy, i.e., $T^\alpha < T$.*

¹¹ As she is only one member of an income group, her individual emigration decision will leave the overall voting outcome unaffected. This is true even for the median voter as we have many citizens of mass $f(y^m)$.

¹² Alternatively, potential emigrants could participate in the vote with emigration taking place after the vote. In this case, voters would realize that different tax rates would be associated with different residential populations, and they would take this relation into account when voting. This might add a strategic dimension to the voting decision. However, an outcome which differs from our setting would require coordination among voters.

Proof: See the appendix. □

To analyze in isolation how the tax base effect changes the equilibrium tax rate, we assume that citizens have the right to vote in their home country independently from their place of residence, i.e., there is no political participation effect. For this hypothetical case, we assume that their preferences are the same as in the absence of migration. Reasons for this could be that the emigrants still feel an attachment to home or plan to return to their country of origin in the future. Thus, the identity and the income y_m of the median voter do not change with emigration.

The equilibrium tax rate in this case is

$$\tau_t^* = \begin{cases} \frac{\bar{y}_\alpha - y_m}{2d} & \text{for } y_m \leq \bar{y}_\alpha \\ 0 & \text{for } y_m > \bar{y}_\alpha \end{cases} \tag{11}$$

where the subscript t indicates that only the tax base effect is present. Note that we did not impose any restrictions on the migration function $E(\cdot)$ that would guarantee that the median voter y_m always lies in the interval $[0, \bar{y}_\alpha]$. Thus, it is not excluded that the tax rate preferred by the median voter is zero.

Proposition 1. *When all citizens vote, the tax base effect of migration strictly reduces the equilibrium tax rate, i.e., $\tau_t^* < \tau_0^*$.*

Proof: The result follows from (4) and (11) together with Lemma 3. □

For the net contributors, emigration serves as a way to evade the tax. For the net recipients, it is thus optimal to restrain themselves and demand a lower tax rate than in the case without migration. We thus always get a reduction of the tax rate. With this, we replicate the standard result in the literature, namely, that the tax base effect reduces the equilibrium tax rate and the size of the welfare state. However, emigration has a second effect, which is to shift the position of the median voter. We consider that in the following.

3.4.2 The political participation effect

The second effect of migration concerns the political participation of emigrants. Once they leave the country, emigrants no longer vote there. For example, when citizens move from one jurisdiction to another inside a federal state they automatically receive the franchise in their jurisdiction of destination. Also, emigrants might lose the incentives to vote as they have no stakes in the politics of their country of origin even though they would still retain voting rights as long as they did not change their nationality.

Emigration changes the composition of the constituency and thus the position of the median voter. The median income for the case with migration $y_{m,\alpha}$ is now implicitly given by $\int_0^{y_{m,\alpha}} f_\alpha(y)dy = \int_0^{y_{m,\alpha}} f(y)(1 - E(\cdot))dy = \frac{1}{2}F_\alpha(y_{\max})$.

Lemma 4. *For the migration function $E(\cdot)$, the political participation effect of emigration always leads to a reduction of the median income, i.e., $y_{m,\alpha} < y_m$.*

Proof: See the appendix. □

To analyze the outcome for the tax rate when only the political participation effect is present, we assume that all non-migrants and all emigrants pay taxes, i.e., there is no tax-base effect. The equilibrium tax rate in this case is

$$\tau_p^* = \frac{\bar{y} - y_{m,\alpha}}{2d} > 0 \tag{12}$$

where the subscript p denotes the presence of the political participation effect only. As with Lemma 4, the income of the new median voter is always left of the mean income, the median voter will always prefer a strictly positive tax rate.

Proposition 2. *When all citizens pay taxes, the political participation effect of migration strictly increases the equilibrium tax rate, i.e., $\tau_p^* > \tau_0^*$.*

Proof: The result follows from (4) and (12) together with Lemma 4. □

Due to the political participation effect, the composition of the constituency is changed. The median income shifts to the left. *Ceteris paribus*, the new median voter thus prefers a larger size of the welfare state.

4 Results: Comparison of the equilibrium tax rates

4.1 The total effect of migration

So far, we have seen that with emigration both the mean income and the position of the median voter change as described in Lemmas 3 and 4.

The equilibrium in our model is defined as a pair of a tax rate and a median voter where the tax rate is the preferred tax rate of the median voter and the median voter is the median of the after-emigration population given the tax rate. Formally, we have $\tau_{ip}^* = \tau_{ip}^*(y_{m,\alpha}(\tau_{ip}^*))$ where

$$\tau_{ip}^* = \frac{\bar{y}_\alpha - y_{m,\alpha}}{2d}. \tag{13}$$

with $\bar{y}_\alpha = \bar{y}_\alpha(\tau_{ip}^*)$ and $y_{m,\alpha} = y_{m,\alpha}(\tau_{ip}^*)$ due to simultaneous voting and emigration.

Note that, as our emigration function is such that disproportionately more citizens with higher incomes emigrate, also the after-emigration median will always have a lower income than the after-emigration mean income, i.e., $y_{m,\alpha} < \bar{y}_\alpha$.

The total effect of emigration is ambiguous. In all cases, migration shifts the mean income as well as the income of the median voter downwards. We can state

Proposition 3. *The change from a closed to an open economy with emigration leads to a larger welfare state, $\tau_{ip}^* > \tau_0^*$, if and only if the political participation effect dominates the tax base effect, i.e., $\bar{y}_\alpha - y_{m,\alpha} > \bar{y} - y_m$.*

Similarly, in an already open economy, emigration increases the size of the welfare state, i.e., $\frac{d\tau^*}{d\alpha} > 0$, if the direct effects of emigration on the median income are absolutely larger than on the mean income

$$\underbrace{\frac{\partial \bar{y}_\alpha}{\partial \alpha}}_{<0} - \underbrace{\frac{\partial y_{m,\alpha}}{\partial \alpha}}_{<0} > 0 \tag{14}$$

when we assume that $2d > \frac{\partial \bar{y}_\alpha}{\partial \tau} - \frac{\partial y_{m,\alpha}}{\partial \tau}$.

Proof: See the appendix. □

Under the above condition, the political participation effect dominates. Intuitively, even though the new median voter takes into account that emigration reduces the tax base with an increasing tax rate, she is sufficiently poor (or the change of the tax base is sufficiently small) to still demand a tax rate that is higher. The tax base effect, however, dominates for the opposite case, namely if the mean income is relatively more affected than the median income. Then, the (slightly) poorer median voter is in favor of a smaller welfare state and thus a smaller tax rate to avoid a large reduction of the tax base.

To see how a marginal increase in openness affects the size of the welfare state, we look at a marginal change of α , keeping the variance of the individual-specific components ε_{ij} constant. A marginal increase of α means that the destination country becomes more attractive for all income groups, for example, as citizens acquire more language skills. The first term, $\frac{\partial \bar{y}_\alpha}{\partial \alpha} < 0$, captures the fact that a larger propensity to emigrate in the population reduces the mean income; a similar explanation holds for the second term, $\frac{\partial y_{m,\alpha}}{\partial \alpha} < 0$. In order to see when (14) implies that the political participation effect dominates— analogously to the discrete case, recall that $d \geq \frac{y_{\max}}{2}$ according to Assumption 2 while $\frac{\partial \bar{y}_\alpha}{\partial \tau} < 0$ and $\frac{\partial y_{m,\alpha}}{\partial \tau} < 0$ as detailed in the appendix. Taken together, this allows evaluating the likelihood that the condition for a marginal increase in openness in Proposition 3 holds.

Which effect dominates then depends on how migration influences the skewness of the income distribution. Whenever the income distribution becomes more skewed to the right, the size of the welfare state increases. For a given emigration function, this means that the outcome is determined by the shape of the initial income distribution. We discuss examples in the next subsection.

A similar result can be obtained with a marginal decrease of the foreign tax rate. Here, however, the destination country becomes more attractive only for some income groups for a change of the foreign tax rate τ^F . For a given α , a lower foreign tax rate induces more of the net contributors in the home country to emigrate while some of the net recipients now abstain from migrating.

Note that our model would yield identical results for the case of a disproportionate immigration of the poor. As soon as the immigrants become part of the redistributive system and members of the political constituency, such an immigration reduces the mean income and shifts the median income to the left. This corresponds to our result from Proposition 3. Allowing both for emigration and immigration would amplify the tax base and the participation effect: Emigration of the rich and immigration of the poor, both triggered by a large welfare state, reduces the average tax revenues. Likewise,

the median voter becomes poorer because both richer voters leave and poorer voters join the political constituency.

We can identify the conditions under which one of the two effects dominates by looking at specific functional forms. We will do this in the next subsection.

4.2 Examples

Here, we introduce specific functions for the income distribution and the emigration behavior. We assume that income is uniformly distributed with a mass point at $y = 0$, i.e. more specifically

$$f(y) = \beta \text{ if } 0 < y \leq 1 \text{ and } F(0) = 1 - \beta \tag{15}$$

where we have normalized y such that $y_{\max} = 1$. Without migration, we therefore get for the mean income

$$\bar{y} = \int_0^1 yf(y)dy = \int_0^1 \beta y dy = \left[\beta \frac{y^2}{2} \right]_0^1 = \frac{\beta}{2} \tag{16}$$

and for the median income

$$y_m = \begin{cases} 1 - \frac{1}{2\beta} & \text{for } \beta \geq 0.5 \\ 0 & \text{for } \beta < 0.5 \end{cases} \tag{17}$$

We see that $y_m < \bar{y}$ for $0 < \beta < 1$. This specification corresponds to Assumption 1. Moreover, we assume the migration function

$$E = \alpha \frac{\tau}{\tau^F} y. \tag{18}$$

Emigration increases with the overall propensity to migrate α and the income y , $\frac{\partial E}{\partial \alpha} > 0$, $\frac{\partial E}{\partial y} > 0$ (cf. Lemma 2). In addition, the proportion of citizens who emigrate is the higher, the higher is the domestic tax rate relative to the foreign tax rate. As the relative tax effect is weighted with the individual income, the effect is stronger for high-income individuals than for low-income individuals. This is a simplified way of stating that with a higher ratio of domestic to foreign tax rates, net contributors will leave the country in larger numbers, while net recipients will emigrate in fewer numbers.

With these specifications and for $\alpha > 0$, the mean income can then be expressed as

$$\bar{y}^\alpha = \frac{1}{n} \int_0^1 yf^\alpha(y)dy = \frac{1}{n} \int_0^1 yf(y)(1 - E(\cdot))dy = \frac{\frac{\beta}{2} - \frac{\beta\alpha\tau}{3\tau^F}}{1 - \frac{\beta\alpha\tau}{2\tau^F}} < \bar{y} \tag{19}$$

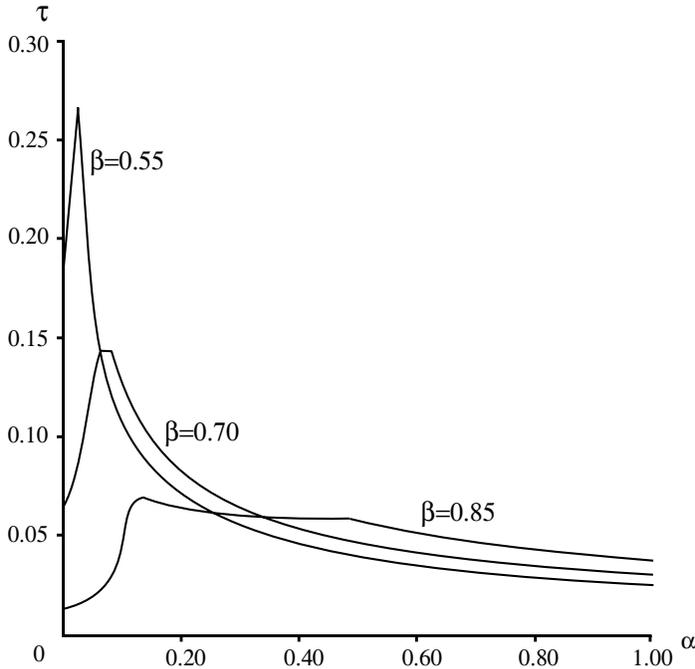


Fig. 1 Variation of β

while the median income is defined by¹³

$$(1 - \beta) + \int_0^{y_m^\alpha} f^\alpha(y)dy = \frac{1}{2}F^\alpha(1)$$

$$\Leftrightarrow y_m^\alpha = \frac{2\beta\tau^F - \sqrt{4\beta^2\tau^{F^2} + 2(\beta\alpha\tau)^2 + 4\beta\alpha\tau\tau^F(1 - 2\beta)}}{2\beta\alpha\tau}$$
(20)

with y_m^α bounded from below, i.e. $y_m^\alpha \geq 0$ similarly to (17). Note that (19) and (20) give us the mean and the median income respectively as functions of τ . Thus, we get for the equilibrium tax rate for the case where tax base effect and political participation effect are present

$$\tau_{ip}^* = \frac{\bar{y}^\alpha(\tau_{ip}^*) - y_m^\alpha(\tau_{ip}^*)}{2d}$$
(21)

Solving (21) for τ_{ip}^* allows us to perform comparative statics analyses.

We first look at cases where $\beta > 0.5$, i.e. where, without migration, the median is not a member of the lowest income group. Figure 1 displays the effect of higher values of α on τ for different values of β of the initial income distribution where we have set $\tau^F = 0.01$ and $d = 0.5$. Two remarks are in order here: First, note that given our

¹³ The other solution is not compatible with a distribution function which is skewed to the right.

emigration function (18), we have to separately look at two different cases: As long as $\alpha \frac{\tau}{\tau^F} < 1$, there are members of all income groups present in the home country after emigration. This corresponds to the rising part of all three graphs and is based on (19) and (20). For $\alpha \frac{\tau}{\tau^F} > 1$, some income groups will completely emigrate which requires to adjust the upper bound in the integrals in (19) and (20) accordingly. This is taken into account in the slightly decreasing (middle) part of the graphs for $\beta = 0.70$ and $\beta = 0.85$. Second, we have to consider that migration shifts the income of the median voter to the left. The part to the right of the kink captures the case where $y_m^\alpha = 0$. It is not surprising that for β close to 0.5, little migration is sufficient for this to be the case while with a higher β , more migration is needed. Whenever this point is reached, the argumentation follows the one for the case where $\beta \leq 0.5$ (see below).

We find that for α close to zero, i.e. for economies which are rather closed, a (slight) increase in α leads to higher τ . This indicates that the political participation effect dominates in these cases: Despite the fact that a tax increase leads to a (slightly) reduced tax base, the poorer median voter demands a higher tax rate in equilibrium. For higher values of α , the tax base effect becomes more important overtaking the political participation effect: Even though the median voter is poorer, she prefers a lower tax rate due to the negative effects of more migration on the tax base. The higher β , i.e. the closer the income distribution is to a uniform distribution, the larger is the interval where the political participation effect dominates.

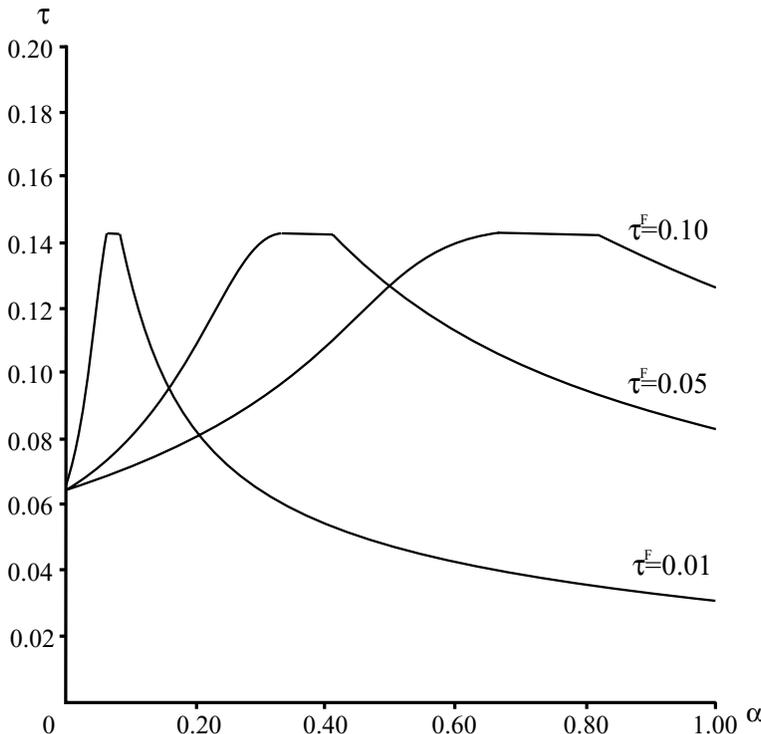


Fig. 2 Variation of τ^F

Second, we consider the cases where $\beta \leq 0.5$. These cases are special in the sense that the median voter is always a member of the lowest income group with $y_{low} = 0$. That the tax base effect dominates here is straightforward: Let us denote the mean income of the higher-income individuals by y_{high} . The mean income for the total population then lies between y_{low} and y_{high} . With emigration where disproportionately more rich than poor citizens emigrate, the median income remains at y_{low} . The mean income is, however, reduced. Thus, we have that migration shifts the mean income more than the median income. This implies—according to Proposition 3—that the tax base effect dominates the political participation effect and that migration *reduces* the size of the welfare state.

It is also interesting to look at changes of the foreign tax rate. Figure 2 shows the effect of higher values of τ^F on τ for $\beta = 0.7$ and $d = 0.5$. With a higher foreign tax rate, the foreign country becomes less attractive. The highest income group reacts most strongly to this by emigrating proportionally less compared to those around the mean income. This increases the skewness of the income distribution and thus the range for which the political participation effect dominates.

5 Conclusions

We can sum up our main results by relating them to the title of our paper. The economic power of the non-voters, i.e., the emigrants, drives the tax rate down because of the tax base effect. This is, however, partially or totally counteracted by the political power of those who stay in the country. Generally, the effect of migration on the size of the welfare state is ambiguous.

We have seen that the initial income distribution is essential for the direction of the total effect of migration. The political participation effect is relatively more important compared to the tax base effect in more equal distributions than in distributions which are more skewed to the right.

Interestingly, the result also helps us to understand the current behavior of companies and the often observed reaction of governments. In recent years, companies have quite often threatened to move abroad as a reaction to high tax burdens to exert pressure on politicians. Our model shows one reason why such a threat can be successful, even though it does not consider any lobbying activities: When companies move abroad, they will usually cease to pay taxes in their country of origin (unless they only set up foreign subsidiaries). Thus, with the “emigration” of companies, we have a—very often substantial—reduction of the tax base. On the other hand, as most employees usually do not follow, the political participation effect is rather weak.¹⁴ In this case, the tax base effect clearly dominates. Our model thus predicts that an increased mobility of companies leads to a reduction in the size of the welfare state—either via lower corporate tax rates or via specific targeted subsidies benefiting these companies. This is a development that we can observe in many industrialized countries today.

Our analysis also contributes to the empirical debate on the validity of the median-voter approach for explaining the relation between income inequality and redistribution

¹⁴ If some of the employees become unemployed, the median income might be reduced by a small extent, but much less than in the case of emigration by citizens.

levels. Resting on cross-country evidence, this literature has not found convincing support for the hypothesis that a more skewed income distribution leads to more redistribution (Perotti, 1996; Lindert, 1996; Milanovic, 2000). From this, the authors conclude that the median-voter approach is not appropriate to explain redistribution outcomes and argue that other features of the political process have to be added. We have shown, however, that this positive relation—countries with more inequality possessing a larger welfare state—can only be expected if the tax base in these countries is comparably inelastic and thus, consequently, if the political participation effect dominates. If the tax base, however, does react to changes of the tax level, e.g., via migration in more open economies, the political participation effect is counteracted by the tax base effect. Then, the relative strength of the two effects matters in these countries. The inclusion of a country’s openness in empirical studies might therefore provide additional insights and might in particular show a way of how the median-voter approach may be reconciled with the data.

Appendix

Proof of Lemma 3

Proof: The mean income of the after-emigration population is given by

$$\begin{aligned} \bar{y}_\alpha &= \frac{1}{n} \int_0^{y_{\max}} yf(y)(1 - E(\cdot))dy = \frac{1}{n} \left[\int_0^{y_{\max}} yf(y)dy - \int_0^{y_{\max}} yf(y)E(\cdot)dy \right] \\ &= \frac{\bar{y} - \int_0^{y_{\max}} yf(y)E(\cdot)dy}{\int_0^{y_{\max}} f(y)(1 - E(\cdot))dy}. \end{aligned}$$

For $\bar{y}_\alpha < \bar{y}$, this means that

$$\frac{\bar{y} - \int_0^{y_{\max}} yf(y)E(\cdot)dy}{\int_0^{y_{\max}} f(y)(1 - E(\cdot))dy} < \bar{y},$$

or

$$\bar{y} - \int_0^{y_{\max}} yf(y)E(\cdot)dy < \bar{y} \int_0^{y_{\max}} f(y)(1 - E(\cdot))dy$$

and

$$\int_0^{y_{\max}} yf(y)E(\cdot)dy > \int_0^{y_{\max}} \bar{y}f(y)E(\cdot)dy$$

For $\frac{\partial E}{\partial y} > 0$, this must always be true. When disproportionately more rich citizens emigrate, the mean income of the emigrating population must be larger (left-hand side) than when all income groups emigrate proportionally to their initial weights in the population such that the average income of the migrants is equal to the no-

emigration mean income \bar{y} (right-hand side). We thus have $\bar{y}_\alpha < \bar{y}$. For a given tax rate τ , this yields $T^\alpha = \tau \bar{y}_\alpha < T = \tau \bar{y}$. □

Proof of Lemma 4

Proof: We have to show that with migration, the mass of the non-emigrating citizens to the left of the original median without migration, y_m , relatively increases, while the mass of citizens to the right of y_m relatively decreases. This means we need

$$\int_0^{y_m} f(y)(1 - E(\cdot))dy > \int_{y_m}^{y_{max}} f(y)(1 - E(\cdot))dy$$

or

$$\int_0^{y_m} f(y)E(\cdot)dy < \int_{y_m}^{y_{max}} f(y)E(\cdot)dy.$$

The last inequality says that the mass of the emigrating citizens to the left of y_m has to be smaller than the mass of the emigrating citizens to the right of y_m . This is trivially the case here as we have constructed the migration function such that $\frac{\partial E}{\partial y} > 0$. The loss of citizens due to migration to the right of the median is thus larger than to the left. It has thus to hold for the new median that $y_{m,\alpha} < y_m$ in order to achieve the balance □

Proof of Proposition 3

Proof: Take the total derivative $\frac{d\tau_p^*}{d\alpha} = \frac{\frac{\partial \bar{y}_\alpha}{\partial \alpha} - \frac{\partial y_{m,\alpha}}{\partial \alpha}}{(2d) - \frac{\partial \bar{y}_\alpha}{\partial \tau} + \frac{\partial y_{m,\alpha}}{\partial \tau}}$. We know from Lemma 2 that $\frac{\partial E}{\partial \alpha} > 0$ and $\frac{\partial E}{\partial y} > 0$. Therefore, also with a marginal increase of the migration propensity α , mean and median income must be reduced. We thus get that $\frac{\partial \bar{y}_\alpha}{\partial \alpha} < 0$, and $\frac{\partial y_{m,\alpha}}{\partial \alpha} < 0$. $\frac{\partial \bar{y}_\alpha}{\partial \tau}$ and $\frac{\partial y_{m,\alpha}}{\partial \tau}$ show the effect of a change in the equilibrium tax rate on the after-emigration mean and median income. We know that higher income groups are more prone to emigrate. $\frac{\partial^2 E}{\partial y \partial \tau} > 0$ in Lemma 2 tells us that this income effect is reinforced with an increase in the income tax level. Thus, mean and median income are reduced by a tax increase, i.e., $\frac{\partial \bar{y}_\alpha}{\partial \tau} < 0$ and $\frac{\partial y_{m,\alpha}}{\partial \tau} < 0$.

For $\frac{d\tau_p^*}{d\alpha} > 0$, the nominator and the denominator both need to have the same sign. When we assume that $2d > \frac{\partial \bar{y}_\alpha}{\partial \tau} - \frac{\partial y_{m,\alpha}}{\partial \tau}$, it follows that $\frac{d\tau_p^*}{d\alpha} > 0 \iff \frac{\partial \bar{y}_\alpha}{\partial \alpha} - \frac{\partial y_{m,\alpha}}{\partial \alpha} > 0$. □

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