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Patriotism, taxation and international mobility*

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Patriotic citizens intrinsically prefer living in their native country compared to living in the Diaspora. In this paper, we analyze the consequences of such a “patriotic lock-in” in a world with international migration and redistributive taxation. One implication is that countries with more patriotic populations are associated with higher redistributive taxes. We then combine ISSP survey data with OECD taxation data and provide empirical evidence supporting this hypothesis. Our results provide a word of caution: the Treasury’s inherent interest in patriotic taxpayers may strengthen the political push for patriotism in an age of globalization and increased mobility.

Keywords: patriotism, international mobility, taxation, redistribution, fiscal competition

JEL classification codes: H20, H73

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1 Introduction

Henry Morgenthau Jr., US Secretary of the Treasury during World War II, instructed Walt Disney to work on an animated movie to make US citizens less reluctant to pay their income taxes. The result was entitled *The New Spirit* and features Donald Duck who is, initially, disinclined to pay income taxes. He then, however, becomes convinced that “Taxes to beat the Axis” is his patriotic duty and happily pays them. Although innovative and ground-breaking, the production of *The New Spirit* is not a unique episode in history. Indeed, the role of patriotism for fiscal policy during war had been acknowledged in the US and UK long before World War II.¹ Likewise, patriotism has recurrently been invoked to mobilize citizens for other contributions such as military service (Levi 1997).

Patriotic sentiments usually run strongest during times of war. Nonetheless, patriotism is unlikely to be important for governments’ (fiscal) policy *only* in times of war. Indeed, moral appeals to “patriotic duty” – such as in *The New Spirit* and its sequel entitled *The Spirit of ’43* – are likely to carry significant weight also in times of peace.² Moreover, they relate to a warm glow from paying taxes,³ which is only one manifestation of a possibly close link between patriotism and personal income taxation. A further potentially important link between patriotism and taxation – and the focus of the current paper – emerges in an international context when taking into consideration fiscal competition between countries and taxpayer mobility. This was already acknowledged by Seligman (1892: 138n):

¹On the role of patriotism for war financing in the UK during World War I, see Stamp (1932). Bank et al. (2008) provide more systematic evidence demonstrating that US tax reforms leading to heavier tax burdens have often been enacted during wartime. Durand (1917: 905) relates this association between war and taxes to patriotism: “One can hardly overestimate the effect of patriotic sentiment during war time as an aid to the fiscal policy of the government. Much heavier taxes can be successfully collected during war than during peace.”

²For instance, tax-paying as a patriotic duty was also an issue in the presidential campaign 2008 (see, e.g., Joe Biden on ABC News, September 22, 2008, and the discussion his statement induced). While the US is currently at war in Iraq and Afghanistan, Biden’s appeal should mainly be seen against the background of the current financial crisis.

³Harbaugh et al. (2007) found evidence from brain scans that paying taxes in laboratory experiments causes physiological rewards, and Konrad and Qari (2009) show that patriotism positively affects citizens’ attitudes toward tax compliance.

It is not always strictly true, as Adam Smith said, that “the proprietor of stock is properly a citizen of the world, and not attached to any particular country”. Feelings of patriotism, of local pride, of desire of proximity to friends, of long custom and old usage sometimes play a considerable role.

To better understand the underlying argument, it is important to define more precisely what we understand by patriotic sentiments. For many, patriotism has become a value-laden concept bearing a strong negative connotation; being linked to nationalism and hostility toward the out-group (e.g., Druckman 1994; Mummendey et al. 2001). This, however, pertains only to what has been termed “blind”, “unquestioning” patriotism, which is to be distinguished from “constructive” patriotism (Schatz et al. 1999: 151). While ‘patriotism’ and ‘nationalism’ thus defined often become closely tied in reality, recent research suggests that, from a theoretical and conceptual point of view, a clear distinction should be made between the two concepts (see Blank and Schmidt 2003; Huddy and Khatib 2007, and references therein). The argument above - and that proposed in the present paper - is based on patriotism understood as “devotion to one’s country” (OED 2003: 2122), and is therefore conceptually distinct from nationalist feelings. In fact, this love and devotion can – pragmatically – be understood as being linked to an intrinsic preference for living in one’s native country, compared to living in the diaspora (all else equal). Patriotism, in other words, is a state of mind that leads individuals to experience a non-monetary benefit (or “patriotic rent”) from residing in their native country.⁴ Patriotic citizens may then be willing to pay higher income taxes in their native land, not only because of patriotic duty (as Donald Duck in *The New Spirit*), but also because they have to pay these taxes in order to reside there. Intuitively, patriotism thus reduces individuals’ propensity to move abroad in response to high marginal taxes and this reduction in the elasticity of the tax base allows governments to adopt higher levels of taxation.

⁴This rent can be one of the underpinnings for location preferences such as “home attachment”, which has been analyzed, e.g., by Mansoorian and Myers (1993). They, however, focus on countries’ incentives for interregional transfers.

This paper has two main contributions. First, theoretically, we formalize Seligman’s (1892) argument about the role of patriotism in the context of fiscal competition, using a simple median voter framework commonly employed in the public choice literature (Holcombe 1989). Specifically, we develop a model of redistributive taxation in the spirit of Meltzer and Richard (1981), enhanced by the possibility of international migration. This allows us to better characterize the exact effects of patriotic feelings in an international context, and derive empirically testable implications. The model shows that, for countries of equal size, an increase in patriotism in one country raises the equilibrium tax rate in that country. The intuition is that patriots’ “patriotic rent” increases their cost of emigration. They might thus refrain from moving abroad under conditions where they would have done so in the absence of their patriotism. Countries can “exploit” this by implementing higher taxes in the equilibrium.⁵

Second, rather than rely on descriptive evidence (see above), we test this prediction using the *International Social Survey Programme National Identity* (2003) study – which includes information on individuals’ patriotism – and matching this dataset with OECD data on tax burdens (across 21 countries in the year 2003). The empirical analysis indicates a strong and robust positive correlation between patriotism and fiscal burdens, even when controlling for other intervening factors and correcting for possible endogeneity. This suggests that the higher shadow cost for patriotic citizens relocating abroad does indeed, as hypothesized by the theory, allow countries to exploit the patriotic feelings of their population through the tax system.

Our analysis contributes to several strands of research. First, a literature starting with Meltzer and Richard (1981) identifies determinants of the amount of redistribution. While Meltzer and Richard (1981) themselves highlight that the efficiency costs of taxation may limit redistribution, later studies in the public choice and political economics tradition

⁵Complementary theoretical analyses linking taxation and “home attachment” can be found in Ogura (2006) for capital income taxes, and Konrad (2008) for labor income taxes.

illustrate that redistribution may be affected by the modes of redistribution available (Lizzeri and Persico 2001), uncertainty and perceptions about social mobility during individuals' lifetime or across generations (Glazer and Konrad 1994; Piketty 1995; Benabou and Ok 2001; Dorsch 2010), the role of redistribution as insurance (Sinn 1995; Moene and Wallerstein 2001), specificity and portability of skills (Iversen and Soskice 2001), demography (Razin et al. 2002), non-monotonicity (Epple and Romano 1996), the existence of power coalitions (Breyer and Ursprung 1998; Iversen and Soskice 2006), proportional representation in political decision making (Austen-Smith 2000; Aidt and Dallal 2008) or the amount of mobilization and political engagement (Solt 2008). Our paper adds the role of patriotism to this list: i.e., patriotism may affect the ability of governments to extract tax revenue and to use that revenue for redistribution in a globalized world.

We also add a new aspect to the discussion about the future of the welfare state and redistribution in an international context. Rodrik (1998) argued that welfare state institutions may become more important as countries become more open in a globalizing world (for some recent evidence on the connection between globalization and social spending, see, e.g., Dreher et al. 2008; Potrafke 2009). But, at the same time, policy makers and economists are concerned that migration and international tax competition may erode the financial basis for governmental policy (Weck-Hannemann 2001). That is, while from a welfare point of view mobility has upsides and downsides,⁶ high mobility of highly skilled, high-income earners is likely to have detrimental effects on the amount of fiscal revenue that is available for redistribution (e.g., Feld 2000).⁷ In line with Seligman's

⁶Bhagwati and Dellalgar (1973) and Bhagwati (1976) argued more than 30 years ago that "brain drain" endangers the countries from which this drain originates and argued for a coordinated corrective tax. Justman and Thisse (1997, 2000) maintain that mobility of skilled labor may deprive a country of the fruits of *public* educational investment (thus leading to underinvestment in public education). To the contrary, Andersson and Konrad (2003) point out that the outmigration threat may overcome the problem of time-consistent taxation of the returns to *private* investment in education. Wildasin (2000) – combining both views – claims that international migration can be good or bad for educational investment, depending on the public or private nature of education financing.

⁷This concern has been raised first in the context of capital income taxation. For overviews of this vast literature, see Wilson (1999), Fuest et al. (2005) and Sørensen (2007).

(1892) pioneering conjecture, we argue that patriotism, and the attachment it generates to home, might help prevent a possible “race to the bottom”. Intuitively, patriotism generates a base of loyal citizens that makes the tax base less elastic with respect to tax rate changes, and this leads to a tax competition equilibrium in which taxes may remain high.⁸

Thirdly, our paper links closely to recent attention given to the impact of social identities on economic decision-making (e.g., Akerlof and Kranton 2000; Shayo 2009; Klor and Shayo 2010). While - in line with the approach taken in this literature - social identities enter additively to an individual’s utility function in our theoretical model, we add a new dimension to this research field by regarding how specific social identities may affect individuals’ migration decisions in an international setting - and how this, in turn, affects governments’ taxation decisions.

Finally, while pointing out a potential fiscal benefit of patriotism, our analysis does *not* intend to promote a naïve theory of “patriotism is beautiful”. This would clearly ignore all negative side-effects of patriotic sentiments. Rather, our analysis provides a word of caution: the Treasury’s inherent interest in having patriotic subjects as taxpayers may well strengthen the political push for patriotism - certainly in a world of highly mobile taxpayers and the downward pressure competition for these mobile taxpayers puts on government revenues. Hence, current increases in international mobility may presage further attempts by some countries to strengthen patriotism to levels higher than they would have been in the absence of this fiscal effect.

In the next section the formal framework is outlined. Then, in section 3, we turn to the empirical evaluation of the core predictions about the link between patriotism and

⁸Apart from patriotism and the citizen loyalty it may generate, other elements that cause countervailing forces to the race to the bottom have been identified in theoretical work. Baldwin and Krugman (2004) focus on agglomeration advantages. Hohnhaus, Konrad and Thum (1994) and Zissimos and Wooders (2008) consider aspects of heterogeneity and product differentiation. Our empirical test is independent of these other factors.

taxation. Finally, section 4 brings together the main conclusions and discusses some implications of our findings.

2 The formal framework

We consider a static⁹ game with migration followed by taxation and redistribution.

Suppose there are two countries, A and B . Each country has two political parties denoted as D_K and R_K , for $K \in \{A, B\}$. The sets of individuals born in countries A and B are $I_A = [0, 1 + n_A]$ and $I_B = [0, 1 + n_B]$. In each country, a subset $[0, 1]$ of individuals has low productivity, implying that they earn an income equal to w_L . The remaining individuals are more productive, and earn a gross income equal to $w_H > w_L$. The sizes of the group of individuals with high productivity born in A and B are $n_A < 1/2$ and $n_B < 1/2$, respectively. The incomes w_L and w_H are exogenous and fixed, reflecting, for instance, individuals' marginal productivity in a competitive labor market with constant returns.¹⁰ Individuals also differ in terms of their *patriotism*: each individual obtains a particular (non-monetary) pleasure from residing in his/her native country, compared to living in the respective other country.¹¹ For an individual i born in country K , this pleasure is denoted

⁹Our framework could be embedded into a fully dynamic multi-period supergame with the two-stage game considered here being played in each period: i.e., migration choices followed by taxation choices in each of the periods, with individuals and parties who have an infinite life and maximize discounted present values (or an overlapping generations structure). In the absence of migration costs, the equilibrium we derive below for the static game is also an equilibrium in such a finitely or infinitely repeated game. If there was an infinite number of periods, equilibria other than the one we derive can be supported (e.g., by trigger strategies), and the uniqueness result we have would be lost.

¹⁰We could make w_L and w_H a function of relative scarcity of types, or of other factors of production (such as capital) in the two countries. We refrain from doing so, however, as this would significantly complicate the analysis without affecting our main conclusions.

¹¹One might argue that non-natives may over time develop patriotism toward their new home-country. This is not captured here. This need not be problematic as the destination country moved into is less likely to “re-socialize” individuals into feeling patriotic about it when these individuals’ identities and loyalties are firmly established in the native country (Hooghe 2005; Johnston 2005). Given that scholars studying identity formation and the internalization of norms and loyalties generally agree that “agents’ first and most intensive period of socialization occurs inside the main institutions of state socialization (for example, education systems)” (Johnston 2005: 1026), the development of patriotic feelings may be more difficult for immigrants. This holds especially for those who have spent considerable time in their native country (as relative length of embeddedness within both structures is crucial; see Egeberg 2004).

as $h_K + \eta_i$. It consists of a deterministic and a stochastic component. The deterministic component $h_K \geq 0$ measures the happiness individuals enjoy on average from residing in their native country, and we refer to values h_A and h_B as the *average patriotism rent*. This rent does not need to be the same across both countries. The stochastic component, η_i , is an independent draw from the same distribution for all individuals. We assume that $E(\eta_i) = 0$, and that the distribution is characterized by a cumulative distribution function $G(\eta_i)$ that is continuous on its whole support - given by $[-(w_H + \max\{h_A, h_B\}), w_H]$ - and continuously differentiable on this interval.¹²

In STAGE 1, individuals choose whether to stay in their country of origin or to migrate to the other country. Simplifying, we assume that individuals with low income are immobile, and individuals with high income are perfectly mobile in this stage.¹³ The sets J_A and J_B with measures $1 + \gamma_A$ and $1 + \gamma_B$ describe the post-migration distribution of individuals. Here, $\gamma_A \in [0, n_A + n_B]$ is the size of the population of high income earners who choose to reside in country A , and similarly for γ_B . As there is no other place to go to or to come from, it must be that $\gamma_A + \gamma_B = n_A + n_B$. These population sizes are observed at the end of STAGE 1. Moreover, individuals lose their mobility at the end of this stage.¹⁴

In STAGE 2, a political equilibrium determines taxes and redistribution. The timing with taxation following the migration choices maps the idea that migration decisions are “more long-term” than taxation, but is not essential for the qualitative predictions here. In each

Our assumption might be inappropriate if the country of origin is authoritarian or a “failed state”. Such countries are not included in the empirical analysis.

¹²The random element induces a smooth distribution of patriotism rents, similar to the distribution of home-attachment in Mansoorian and Myers (1993).

¹³The assumption that migration is an option only for high income earners is common in the literature – see, for example, Andersson and Konrad (2003) and Beine et al. (2008) – and builds on findings by, among others, Docquier and Marfouk (2006), that highly educated workers are five to ten times more likely to emigrate. Note also that “welfare tourism” – i.e., migration by the poor for welfare benefits – is probably of only minor concern in the international context analyzed here, as transfer entitlements can be tied to how long a person has resided in the country.

¹⁴Mobility is often higher in earlier stages of life (e.g., when deciding where to study or at the beginning of one’s professional career) and, due to high set-up costs, is a more “long-term” decision compared to taxation (which is adjusted more frequently). Similar timing regarding migration and policy choices is adopted, for instance, in Mitsui and Sato (2001).

country ($K \in \{A, B\}$) both parties – D_K and R_K – choose policy platforms (t_K, S_K^H, S_K^L) consisting of a proportional tax rate $t_K \in [0, 1]$ that applies uniformly to all inhabitants, and non-negative subsidies $S_K^H \geq 0$ and $S_K^L \geq 0$, where S_K^H and S_K^L are the amounts paid to high and low productivity residents respectively. We allow for different per-capita subsidies for the two different types of individuals, but require that all individuals with the same gross income receive the same per-capita subsidy. The proposed policy platform has to obey a government budget constraint. Given that gross tax revenue in country K is given by $(w_L + \gamma_K w_H)t_K$ and tax collection has a cost equal to $\frac{t_K^2}{2}(w_L + \gamma_K w_H)$, net tax revenue T_K that is available for redistribution is¹⁵

$$T_K = (t_K - \frac{t_K^2}{2})(w_L + \gamma_K w_H). \quad (1)$$

Hence, a balanced government budget requires

$$S_K^L + S_K^H \gamma_K = (t_K - \frac{t_K^2}{2})(w_L + \gamma_K w_H). \quad (2)$$

Voters observe the policy platform choices of the parties and vote for one or the other platform. We assume sincere voting. The platform that receives the most votes is implemented. In case of a draw, a random device decides on implementation. Once these decisions are made, income accrues, taxes are collected, tax revenue is redistributed according to the policy platform and the game ends.

We now turn to the payoffs of the players. Individuals care about the sum of net income and patriotic rents. The net income of an individual locating in country K is $(1 - t_K)w_L + S_K^L$ if the income of the individual is w_L , and $(1 - t_K)w_H + S_K^H$ if the

¹⁵The cost of taxation may have many possible microeconomic underpinnings. In the simplest case, the cost of taxation may be the physical transaction cost of tax collection or tax compliance. Still, it could also be seen as a shortcut that accounts for an excess burden of taxation. The convexity of this cost in the tax rate is a common and plausible assumption used to describe the excess burden of taxes (e.g., Bolton and Roland 1996: 100).

individual's income is w_H . An individual i born in country A and staying in this country receives in addition a patriotic rent equal to the sum of the deterministic average patriotism rent h_A , and the idiosyncratic component η_i . Note that the overall patriotic rent for i can be negative in country A even though $h_A \geq 0$ if the idiosyncratic component η_i is sufficiently negative. If the individual i is born in A and moves to B , the patriotism rent received is zero. This is a normalization and adopted without loss of generality.¹⁶ The intrinsic patriotic rent for an individual i who is born in B and stays in B is defined analogously as $h_B + \eta_i$. Summarizing, the payoff of an individual i with high income w_H , born in country A ($i \in I_A$) is

$$\begin{aligned} u_i &= (1 - t_A)w_H + S_A^H + h_A + \eta_i & \text{if } i \text{ stays in } A \\ u_i &= (1 - t_B)w_H + S_B^H & \text{if } i \text{ moves to } B. \end{aligned} \quad (3)$$

The payoff for individuals born in country B is defined analogously. The payoff of individuals with low income in country K is

$$u_i = (1 - t_K)w_L + S_K^L + h_K + \eta_i. \quad (4)$$

As individuals with low productivity do not have a residence choice here, they always stay in the country where they were born. They may have a positive or negative patriotic rent from this.

Finally, we assume that all political parties are office motivated. Each party chooses the policy platform that, given the anticipated choice by the competing party in the same country, maximizes the probability of winning a majority of votes. As the median voter theorem will apply in our framework, it is well known that a large class of alternative party

¹⁶For instance, the patriotic rents for living in countries A and B could be $h_A + \alpha_i$ and β_i , respectively, for an individual i born in country A , with stochastic α_i and β_i . In this case, η_i can simply be seen as $\eta_i = \alpha_i - \beta_i$. The absolute levels of α_i and β_i matter for happiness, but the difference is all that matters for the migration decision.

preferences would lead to the same voting equilibrium in STAGE 2. Solving for the subgame perfect equilibrium of this game, we find two main results.

Proposition 1 *A subgame perfect equilibrium exists and is unique.*

A proof is in the appendix. Intuitively, the groups with low productivity choose their optimal income tax rates in each of the two countries. They take into consideration that the share of highly productive individuals in their own country is decreasing in the tax rate in their own, and increasing in the tax rate of the other country. This causes a unique crossing of the reaction functions. Patriotism, and the home attachment (or “lock-in”) it creates, typically leads to strictly positive taxes in the equilibrium. Patriotism weakens the “race to the bottom” in competitive tax setting between countries.

The comparative static properties of this equilibrium yield the main hypothesis of our empirical analysis:

Proposition 2 *Greater patriotism in a country yields a higher equilibrium tax rate in this country and a lower equilibrium tax rate in the other country (i.e., $\frac{dt_A}{dh_A} > 0$, $\frac{dt_B}{dh_B} > 0$, $\frac{dt_A}{dh_B} < 0$ and $\frac{dt_B}{dh_A} < 0$).*

A proof of Proposition 2 is also in the appendix. If country A initially has an indigenous population that is more patriotic on average than the population in country B (i.e., $h_A > h_B$), then, for identical tax rates (i.e., $t_A = t_B$), the mobile high income earners in A are less likely to emigrate than the mobile high income earners from country B . Country A thus ends up with a larger set of high income earners in the post-migration equilibrium than country B ($\gamma_A > \gamma_B$). For the median voter in A , this makes a higher tax rate more desirable than in B . This higher tax has general equilibrium repercussions. As shown in the proof of the proposition, these repercussions are weaker than the primary effect.

Proposition 2 yields our main empirical hypothesis: more patriotism triggers higher tax rates.

3 Empirical analysis

In this section, we exploit data from the 2003 ISSP “National Identity II” survey and the OECD “Benefits and Wages ” database to test our main hypothesis (for a set of 21 countries in the year 2003).¹⁷ The central dependent and independent variables (i.e., tax burden and patriotism respectively) are described in section 3.1, while the empirical approach (and the two levels of aggregation at which we evaluate our central hypothesis) is explained in section 3.2. The ‘baseline’ results are presented in section 3.3, while section 3.4 discusses potential endogeneity issues.

3.1 Data

The *dependent variable*, $Tax_{i,j}$, is defined as gross income minus net income, divided by gross income. As such, it quantifies the income tax burden as the share of gross income paid in income taxes and social security contributions. It is calculated by linking the income level each respondent in the 2003 ISSP survey claims to earn to the income tax rate data in the OECD “Benefits and Wages” study. The latter study provides information on workers’ income tax payments as well as social security contributions levied on employees

¹⁷The countries are: Australia, Austria, Canada, Denmark, Finland, France, (West-)Germany, Hungary, Ireland, Japan, New Zealand, Norway, Poland, Portugal, Slovak Republic, South Korea, Spain, Sweden, Switzerland, the United Kingdom and the United States. The ISSP aims to provide a nationally representative sample of roughly 800 to 1500 respondents in each of these countries (thus providing about 22300 observations as a starting point). Note that the battery of patriotism questions employed in our analysis is available only in the ISSP National Identity surveys conducted in 1995 and 2003, as well as in the corresponding GSS (USA only) and ALLBUS (Germany only) studies. The 1995 income data in the ISSP and the OECD are, however, not sufficiently detailed to allow a reasonable number of observations for this year - leaving us with a single cross-section.

for several benchmark cases depending on household type and income level. More specifically, information regarding the overall income tax burden is provided for 200 levels of income (ranging from 0% to 200% of the average employee's income) for each of the countries surveyed.¹⁸ This thus provides a relatively detailed description of the income tax burden along the income scale, allowing us to match each respondent closely to the tax burden calculated by the OECD for his/her income group and household type.

We restrict our sample to those 7427 respondents in the ISSP dataset who are single (note, though, that only 3090 of these provide sufficient information about income and patriotic sentiments), and this for two reasons. First, the ISSP data do not allow a clear portrait of how multi-individual households are constituted (e.g., whether adults in a given household are married, cohabiting, live with their (grand)parents or children is difficult to establish with certainty). This information, however, is crucial to accurately determine the appropriate tax rates in the OECD data, and thus to derive our central tax burden variable. Second, singles are likely to be more mobile and less attached to a country for personal reasons (e.g., married individuals, or individuals taking care of children and/or (grand)parents are more strongly bound to a given country and might 'grow' to love it because of that). Singles thus constitute a 'least-likely' category of individuals vulnerable to exploitation by a national government for patriotic reasons, providing a harsh test for structural effects.

We also - for the time being - exclude 1309 respondents claiming an income below 60% of the average worker's income in their country (bringing the final sample to about 1700 individuals). This, likewise, has two reasons. First, these citizens often have a net wage

¹⁸One could argue that individuals earning the average worker's income (or even twice that amount) are not necessarily the "rich and mobile" for which our theoretical model (implicitly) predicts the strongest effects. Nevertheless, for most countries in our sample, the 90th-percentile of the income distribution corresponds to approximately 1.5 times the average worker's income (Atkinson 2008). Exceptions are Ireland and the US, where the 90th-percentile is at 200% of the average worker's income (Atkinson 2008). Hence, we feel confident that most of the income distribution which is of empirical interest to our model is de facto represented in our sample. We are grateful to Tom Cusack for extensive and fruitful discussions on this point.

exceeding the gross wage (leading to a negative tax burden), making it difficult to interpret their tax “burden”. This lack of tax payments also implies that this group cannot be exploited by the government through higher income taxation related to their (possible) patriotism. Second, net income exceeding gross income indicates that these respondents are likely to be recipients of social welfare benefits. They might prefer higher (income) tax rates to finance redistribution in their favor and become more attached to their country due to the receipt of welfare benefits. This, however, entails a reverse causality argument where high tax rates lead to more patriotism. To prevent this from artificially inflating support for our hypothesis, we exclude this income group in our ‘baseline’ estimations (although, importantly, we return to this exclusion below). We chose a cut-off at 60% to exclude all negative tax burdens from the sample. Still, as this choice is rather arbitrary, we illustrate that imposing a cut-off at 50% or 70% does not affect our main findings.

The *core explanatory variable* of our analysis is the respondent’s patriotism ($Proud_{i,j}$). It is measured relying on a set of questions in the 2003 ISSP “National Identity II” survey probing the respondent’s feelings about his/her country: “How proud are you of [country] in each of the following?” Since this question is specifically asked about the country one resides in at the time of the survey, we exclude all non-nationals from the dataset. Hence, we only regard, say, French citizens living in France and exclude people of non-French nationality interviewed in France. This restriction – which is empirically irrelevant¹⁹ – brings the analysis closer in line with the idea in the theoretical model that non-nationals (are likely to) lack a “patriotism rent” and generates the most accurate representation of how citizens of a given country feel about their own country.²⁰ Note also that articulated patriotism – as measured in surveys – is not necessarily a direct measure of h . Patriotism is

¹⁹Indeed, retaining non-nationals in the sample – based on the idea that people living for a certain period of time in a country that is not their native country may nonetheless develop an attachment to this country (cf. *supra*) – does not affect the qualitative findings of our analysis (available upon request).

²⁰Clearly, this does *not* imply that, say, French citizens need to live in France to be proud of France in certain respects. Yet, French citizens living abroad are not asked about their native country (i.e. France), but about the country they reside in.

sampled among the population that emerges in the post-migration equilibrium. As some individuals with sufficiently negative idiosyncratic patriotism $\eta_i < 0$ will have left the country in equilibrium, average articulated patriotism among the indigenous population in the post-migration equilibrium should be higher than the average patriotism among all individuals who are born and raised in a given country. Nevertheless, for the testable implications of the formal analysis, this is not a problem.²¹

The “proudness”-question mentioned above is raised with respect to ten different social, economic, historical and political characteristics of the country at hand (see Table 1), leading to the question as which of these is most closely connected with the patriotism rent from living in one’s native country. Fortunately, there is a natural solution to this problem. As all ten questions explore one common underlying concept (i.e., patriotic sentiments) and are measured in common units (i.e. a four-point Likert-type scale ranging from “very proud” to “not proud at all”), they satisfy the basic criteria for use in a factor analysis (cf. Kennedy 2005). We therefore combine the answers from all ten questions into a single index through a factor analysis using the principal-factor method as the technique of extraction (with orthogonal varimax rotation; see Kaiser 1958).²² The analysis reveals that the data

²¹More formally, the average patriotism rent among the indigenous population in the post-migration equilibrium is

$$[h_K + E(\eta_i | i \in I_K \cap J_K)] > h_K \text{ for } K \in \{A, B\}.$$

For instance, let $n_A = n_B$. Then, for $h_A > h_B$, we find that $t_A > t_B$ in the equilibrium. This means that, apart from the patriotism rent and in pure income terms, the fiscal conditions in country A for high income earners are less attractive than in country B . Hence, the cut-off $h_A + \eta_i$ of indigenous individuals who stay in A is higher than the cut-off $h_B + \eta_i$ for indigenous individuals in B . Accordingly, $t_A > t_B$ and the differential effects on outmigration in A and in B reinforces the pre-existing differences between the expected patriotism rents of non-migrants in the two countries from $h_A - h_B$ to

$$[h_A + E(\eta_i | I_A \cap J_A)] - [h_B + E(\eta_i | I_B \cap J_B)] > h_A - h_B$$

in the equilibrium. For our estimations, this implies that the coefficient measuring the effect of differences in actual patriotism will be biased downward. Hence, if actual migration changes the measured patriotism in the indigenous population of a country, then this effect biases the empirical test against our hypothesis.

²²Such an analysis allows efficient consolidation of the information from a “large number of possible explanatory variables” into one (or, possibly, multiple) composite indicator(s) (Kennedy 2005: 212) and has been argued to “mitigate the influence of idiosyncratic measurement error within each of the variables (...) [, thereby maximizing] the likelihood of measuring the underlying concept more precisely”

can be summarized by one single strong factor (i.e., only one factor had an eigenvalue larger than one). Using this factor as a measure of proudness becomes the natural choice for quantifying patriotism. Table 1 shows the results for this first principal factor.

[Table 1 about here.]

Table 1 indicates that it is mainly the first four and the last question which load most strongly on the extracted underlying component.²³ For these five questions, the (rotated) factor loading lies well above the critical value of 0.35 suggested by Pennings et al. (1999). The questions regarding scientific and technological achievement as well as armed forces obtain factor loadings that hover around this critical value, while the remaining three questions appear to add little to the underlying component. Intuitively it appears reasonable that these five questions are highly correlated with latent patriotism. For most people, patriotic feelings or pride in one's country are more likely to derive from, say, individuals' perceptions of the country's political influence in the world than its achievement in arts or sports (which may be deemed as more individual, rather than country-level, achievements). Given the coding scheme of the pride questions the extracted patriotism variable increases with patriotic feelings. Hence, support for the main hypothesis would imply a positive coefficient in a regression of tax burden on patriotism.

3.2 Empirical specifications

We evaluate our main hypothesis at two levels of aggregation.

(Coffé and Geys 2005: 490). Note also that the suitability of data for a factor analysis is often measured via the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (which indicates the proportion of variance that is common among the variables included in the analysis). The (normalized) index has values between 0 and 1, with larger values indicating that the data are better suited to factor analysis (Kaiser 1974; Kaiser and Rice 1974). In our case, the KMO-index obtains a value of 0.864.

²³de Figueiredo and Elkins (2003) analyze US data (GSS sample) and report as well that these five questions are strongly correlated with latent patriotism.

First, and possibly most intuitive, we work at the country level. The idea here is that, to the extent that taxation decisions in a given country are influenced by the patriotic nature of its population, the average tax burden should be a reflection of the average level of patriotism. To assess this prediction, we aggregate the patriotism and income tax burden variables described in the previous section across all respondents for each of our 21 countries.²⁴ As such, we derive one patriotism-tax burden combination for each country. As standard regression analysis is unreliable using such a limited number of observations, we rely on a simple graphical representation. That is, we depict the average degree of patriotism (on the horizontal axis) against the tax burden (on the vertical axis) in a simple cross-plot, and expect a positive relation between both variables. Although this analysis admittedly does not allow controlling for possible confounding factors, it does present a general view of the relation between both variables.

Second, we exploit the idea that governments generally impose an overall tax schedule or tax structure, which affects groups of taxpayers differently depending on their income level (and socio-economic characteristics). Hence, an alternative test of our theory exploits aggregates for the 200 different income levels reported in the OECD Benefits and Wages database. Indeed, to the extent that the government defines (or adjusts) the overall tax structure (e.g., its progressivity), the observed average tax burden *of given income groups* will be a reflection of their average patriotic sentiment. Evidently, we do *not* imply here that governments deliberately impose higher taxes on certain income groups depending on their perceived level of patriotism. Such a link between the incidence of income taxes across the income distribution with the incidence of patriotism across the income distribution would be highly implausible. Nonetheless, when more patriotism among high-income earners reduces their international mobility - as argued above - more progressive forms of taxation introduced by the government to exploit this will show up in the distribution of

²⁴Other taxes might play a role as well. Still, income taxes might be particularly important (as illustrated by the choice in *The New Spirit* to focus on income tax payments). Moreover, we have no information on other taxes.

tax burdens across income levels; this provides the cornerstone of our analysis here.

The level of observation in this analysis obviously is no longer the country, but a given income level within a country. That is, we calculate for all individuals in a given income category in a given country, the average level of patriotism. For example, we aggregate the information on all individuals claiming an income between, say, 103.00% and 103.99% of the average workers' income in a given country. The maximum number of observations in the analysis therefore equals the number of countries (21) times the number of income classes (200). However, our sample does not include respondents for all income levels in each country, and the final sample reduces to about 280 observations. As this allows for reliable inference from standard regression estimation techniques, we test our central hypothesis by estimating a regression equation of the following form:

$$Tax_{i,j} = \beta_0 + \beta_1 Proud_{i,j} + \mathbf{x}'_{i,j} \beta_2 + e_{i,j} \quad (5)$$

where $Tax_{i,j}$ represents the average income tax burden faced by income group i in country j , $Proud_{i,j}$ denotes income group i 's average level of patriotism and $\mathbf{x}'_{i,j}$ is a vector of control variables. Essentially, this approach thus exploits the cross-country variation in patriotism for different income brackets (while, as discussed below, controlling for these income brackets in themselves).

Beside the central patriotism variable described in the previous section (aggregated at the income group level), we add a number of control variables to capture the effect of potential mediating factors. First of all, we include each income group i 's position in the income distribution of his/her country ($IncPos_{i,j}$). This designates the percentage of country j 's average wage that this income group i represents. Hence, as the OECD provides detailed data for 200 income levels (see above), $IncPos_{i,j}$ ranges from 0% to 200%. The coefficient estimate is expected to be positive, as higher income leads to higher tax burdens. Further,

we control for a number of country characteristics. First, the country’s unemployment rate ($Unem_j$) is taken from the World Development Indicators. Unemployment increases the need for public spending on unemployment (and, potentially, other social welfare) benefits, and thus is likely to be associated with higher equilibrium tax rates. We include the level of GDP (per capita and in natural logarithms to account for the highly skewed distribution of this variable; GDP_j). Following Wagner’s Law, we expect that the wealth of a country is associated with higher taxes. Inclusion of this variable is also important to account for the relative sizes of countries. We also account for the ideological persuasion of the government ($IDEO_j$) based on the oft-cited idea that left-wing parties favor more government intervention and redistribution than their right-wing counterparts, which is likely to lead to higher tax burdens (e.g., Hibbs 1977). The variable $IDEO_j$ is obtained from the Comparative Political Dataset (Armingeon et al. 2008) and takes on values between 1 and 5, with larger numbers representing more leftist governments. As governments are unable immediately to change fiscal policies to match their ideological preferences, we lag this variable by four years (due to the strong temporal dependence in the series; using slightly shorter or longer lags makes little difference to our findings). Given the coding scheme, we expect this variable to be positively related to the income tax burden. Fourth, we include an index of fiscal decentralization ($DECENTR_j$), measured as the share of total government revenues raised at the national level (likewise taken from the Comparative Political Dataset; Armingeon et al. 2008). The idea here is that if public good provision is decentralized and lower-level governments are fiscally autonomous, the central government itself is in less need of financial resources, allowing income tax rates to be lower.²⁵

Before we turn to the results, it is important to note that, although our dataset pools

²⁵Note that we also evaluated our model at one further level of disaggregation: namely, the individual level. As before, this does *not* imply that tax legislation needs to target specific individuals depending on their level of patriotism, but rather exploits the idea that when patriotism affects the shape of the overall tax structure, it will affect each individual’s tax payment. The results - available upon request - support those of the more aggregated analyses: i.e., the tax structure underlying individuals’ tax burdens is designed (indirectly) to extract patriotic rents.

cross-sections from different countries, we do not include country fixed effects in our estimations. To include country fixed effects would lead to a focus on within-country variation, whereas our model predicts that variation in patriotism is associated with between-country tax differentials (controlling for other factors). Since we use various country variables to control for obvious level differences in the country-specific tax schedules in our sample, one might consider clustering the standard errors at the country level to control for unobserved country characteristics. However, Hubert-White type standard-errors for country-level clusters are inappropriate in our setting, as that correction requires a large number of clusters with relatively few observations in each cluster.²⁶ Our sample is characterized by the opposite tendency: few clusters with numerous observations.

3.3 Results

The results of the country-level analysis are represented in figure 1,

[Figure 1 about here.]

where we show the average degree of patriotism in a given country on the horizontal axis and place the average tax burden of respondents from that country on the vertical axis. We also add a trend-line to the picture to clarify the overall relation between both variables. This simple cross-plot clearly confirms the expected positive relation between the level of patriotism and the level of taxation. Countries where respondents report more pride in their country (i.e., patriotic sentiment) are also those countries that, on average, tend to impose heavier tax burdens on their inhabitants.

²⁶See Wooldridge (2003) and the references therein for studies showing that cluster-robust estimation may fail even when the number of clusters is as large as 40 or 50.

Shifting the analysis to a lower level of aggregation and concentrating on the patriotism-taxation relation using data on 200 income-groups, we find the results presented in Table 2. The first column regresses income group i 's tax burden on its patriotism score (Aver. Proud) controlling only for the relative income position (IncPos).²⁷ The second column adds controls for various country characteristics. The remaining three columns have two purposes. First, by varying the cut-off point for dropping low-income earners, we evaluate the robustness of our findings to this particular choice. Hence, in columns (4) and (5), we report some results using a cut-off of 50% and 70% (rather than 60%, as in the main estimations). Second, varying this cut-off point also allows an empirical assessment of whether the patriotism effect in our dataset is particularly strong for high income groups and/or particularly weak for low income groups (see above). To this end, in column (3), we also add results using only those respondents to the ISSP survey who claim to earn less than 60% of the average worker's income. For these low income people, the theory predicts no relation between patriotism and the tax burden (though, as mentioned, there may be a reverse causality problem here leading to a spurious positive relationship between the two variables; see section 3.1). Hence, comparing columns (2), (3), (4) and (5), we can determine whether the positive association between patriotism and tax burden is stronger for the upper part of the income distribution.

[Table 2 about here.]

Starting discussion of our findings with a brief description of the control variables, we find that – as expected – income groups placed relatively higher in the country's income distribution face a significantly heavier tax burden. Also, in line with the proposition that left-wing governments favor intervention more highly, the tax burden is higher when the government's ideological position (four years ago) was further to the left. The extent of fiscal decentralization, on the other hand, is linked to a lower income tax burden

²⁷Using non-linear forms of individuals' relative income positions does not affect our findings.

(supporting the idea that central governments in such a setting need fewer resources from, among others, income taxation). GDP and unemployment show the expected positive relation to the tax burden, but remain statistically insignificant at conventional levels.

Turning to our central patriotism variable, we find strong and consistent support for our main proposition. The estimations (columns (1)-(2) in Table 2) show that patriotism is positively associated with the income tax burden, even after controlling for relative income positions. The point estimates are very similar in both baseline estimations, indicating that this result is robust to adding additional country-level explanatory variables. This evidence is strongly in line with the theoretical hypothesis. It suggests that countries are able to exploit the patriotic feelings of their populations by levying higher taxes. Remember, moreover, that our findings are based only on individuals who are single (whose propensity to move arguably is greatest) and that actual migration biases the empirical test against our hypothesis (see above). Hence, our estimates could be seen as a conservative estimate of the true effect.

The remaining columns in Table 2 furthermore illustrate that our findings are robust to the cut-off we employ for including low-income earners in the dataset. Moreover, the patriotism variable has a positive sign, but fails to reach statistical significance at conventional levels, in the model using only the low-income subsample of our population (i.e., 192 observations). This supports the theoretical prediction that for these low income people no relation between patriotism and the tax burden exists (despite a potential reverse causality problem that would inflate the positive relationship between the two variables).

3.4 Robustness analysis: Reverse causality?

A high (income) tax burden may correspond to extensive (or high-quality) public goods provision, which might lead citizens to like their country better and, hence, to be more

patriotic. While such a reverse-causality argument may hold regarding questions about pride in certain aspects of their country (such as the social security system or fair and equal treatment of individuals), it is much harder to maintain for other proudness questions (such as a country's economic achievements or political influence in the world). Nonetheless, this section takes this potential reverse causality argument seriously and employs an instrumental variables (IV) approach to evaluate to what extent it might affect our results.

Finding a suitable instrument for patriotism is not straightforward. One could think of medals won in Olympic Games or victories in wars, but while the former caters only to one very specific aspect of possible patriotic sentiment (and one that does not appear to matter very much in our data, cf. Table 1), the latter is hard to operationalize (especially as most countries in our sample have not experienced any major conflicts since WWII; and even in that global conflict winners and losers are sometimes hard to determine accurately). We instrument our measure of patriotism with the country's number of neighbors. This builds on the idea that citizens of countries with fewer neighbors might be less susceptible to patriotic feelings (while there is, a priori, no reason to believe that the number of neighbors is related to tax burdens). This would follow from social identity and self-categorization theory's notion that social identification not only involves being part of a given social group (i.e., one's nation), but also that there is an "outgroup" one can differentiate or distance oneself from (e.g., Tajfel and Turner 1979; Turner et al. 1987; Shayo 2009). The presence of more different outgroups might therefore strengthen attachment or commitment to the own group. The coefficient estimate for this instrument in the first stage regressions is precisely estimated and statistically different from zero at the 5 % level (see column (2) of Table 3). Its sign suggests that a larger number of bordering countries is indeed associated with more patriotism. Column (1) of Table 3 shows the results from the second-stage regressions.

[Table 3 about here.]

The results reveal that the relation between patriotism and tax burdens remains qualitatively similar. That is, the coefficient estimate retains its positive sign and statistical significance at conventional levels. While the estimated coefficient of patriotism becomes larger (suggesting there is some downward bias in the OLS estimations), the IV estimations confirm the results presented in the baseline estimation.²⁸

4 Conclusion

There is by now an extensive literature on nationalist movements and national identities. While, as argued above, nationalism and patriotism should be clearly distinguished, this literature is interesting nonetheless as it has brought forward a wide range of arguments as to why such identities develop (or are developed). These include cultivation of the identity for itself (e.g., Anderson 1991) or to delineate the boundaries of the nation as autonomous and distinguishable relative to others (e.g., Prizel 1998). Our analysis suggests one further reason to develop such identities, or, at least, an important side-effect of developing such identities: to provide a supportive base for the welfare state and intra-state redistribution. Piecemeal evidence on a number of countries suggests that countries indeed actively use their education system for teaching their young generations patriotism and for incubating emotions and values such as “loving your own country”.²⁹ Of course, such policies may be

²⁸Further robustness checks with respect to the measurement of the dependent variable, the importance of specific countries as well as an analysis at the individual (see also footnote 25) were also performed. Our results are robust to such alternative specifications (see Qari et al. 2009 for details).

²⁹There are a number of examples. Newspaper reports some years back show that educational reforms have been discussed or implemented in Japan (*The Economist* 19/12/06) and Poland (*Neue Züricher Zeitung*, 11/6/2006), by which patriotism receives more emphasis at school. Maosen (1990) reports that inculcating patriotism was and is an aim of the education policy in China both in imperial and communist times up to today. In the former German Democratic Republic, “loving the German Democratic Republic” was the first law for their youth organizations. Even democratic countries like the United States have a tradition of instilling patriotism at an early stage of life. An example for this is the Boy Scouts Charter (chapter 3) which states that “...to teach them patriotism, courage, self-reliance and kindred virtues, using the methods which are now in common use by BoyScouts” comprise one of its main educational objectives. See also Lott (1990) who argues that instilling political views is one reason for the public provision of schooling.

pursued for many purposes. We have shown that, once these preferences exist, they can be, and seemingly are, instrumentalized for fiscal policy.

We do not intend to ignore the (possibly numerous) negative side-effects of patriotic sentiments, and we do not promote a naïve theory of “patriotism is beautiful”. Hence, the policy implication of our findings is not to say: ‘let’s make our children good patriots’. Nonetheless, it is important to stress that the Treasury’s inherent interest in having patriotic subjects as taxpayers may make the political push for patriotism in a country stronger than it would be without this fiscal effect. That is, there might exist an ‘unholy alliance’ between the “Chauvinists” in a country and those who would like to stabilize tax revenue in a world of growing mobility (and tax competition).³⁰ Whether or not patriotism is, overall, a rather undesirable and dangerous feeling, our findings help understand certain developments in various countries’ national educational policies (both along the historical dimension and across different types of governance regimes; see above). Further, they suggest that current increases in international mobility, downward pressures on government revenues, and governments’ greater needs for funding of the welfare state in a globalized world (or simply revenues needed to service increased government debt) make the fiscal motivation to invest in patriotism more important. This suggests that we might well observe a further strengthening of patriotism/nationalism.

³⁰Evidently, alternative strategies can be imagined through which governments can fight tax base flight and/or tax cheating. Krishna and Slemrod (2003), for example, point to the importance of tax system marketing in this respect. Moreover, from a long-run perspective, attracting highly qualified foreign workers may be as important for fiscal purposes as the ability to keep inhabitants as citizens at home by investing in patriotism. Though reasonably beyond the scope of this paper, it would be interesting for future analyses to test such hypotheses.

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Appendix

We prove Propositions 1 and 2 in this Appendix.

Proof of Proposition 1. We turn to an analysis of subgame perfect equilibrium and solve by backward induction. Consider STAGE 2. At this stage (γ_A, γ_B) is given. For given γ_K in country K , the voting game has a unique Condorcet winner with $S_K^H = 0$, $S_K^L = T_K(t_K^*)$ and

$$t_K^*(\gamma_K) = \gamma_K \frac{w_H}{w_L + \gamma_K w_H}. \quad (6)$$

To confirm this, first note that the individuals with low income constitute a majority and have the same preferences regarding combinations of (t_K, S_K^L, S_K^H) .³¹ For any given t_K , individuals with low productivity prefer the smallest possible transfer to individuals with high productivity. Hence, $S_k^H = 0$ and $S_K^L = T_K(t_K)$ describes their most preferred transfers

³¹Recall that we assume $n_A + n_B < 1$. If $n_A + n_B > 1$, self-sorting may occur in the equilibrium in the simple framework chosen here. Similarly, if the low income individuals can also migrate, the existence of a pure strategy equilibrium may become an issue. However, our assumptions match well with a more general, but more cumbersome, framework in which the migration costs of individuals are drawn from a random distribution. In such a setting, only a few high income earners will be fully mobile, while many have intermediate, high or even prohibitive costs of migration. If so, the median voter in both countries has low income, which is what is really needed for the qualitative results we find.

for any given tax rate.³² Moreover, it can be confirmed that (6) is the unique maximum of

$$u_i = (1 - t_K)w_L + (t_K - \frac{t_K^2}{2})(w_L + \gamma_K w_H) + h_K + \eta_i \quad (7)$$

and that $t_K^*(\gamma_K) \in (0, 1)$. Hence, $(t_K, S_K^L, S_K^H) = (t_K^*(\gamma_K), T_K(t_K^*), 0)$ constitutes the unique equilibrium in STAGE 2 in each country.

Turning to STAGE 1, now consider migration choices. Individuals anticipate the shares of highly productive individuals in the migration equilibrium and the tax rates (6) that are induced by these shares. The payoff to a highly productive individual that chooses to reside in country K is

$$u_H = \begin{cases} (1 - \gamma_K \frac{w_H}{w_L + \gamma_K w_H})w_H + h_K + \eta_i & \text{if } i \in I_K \\ (1 - \gamma_K \frac{w_H}{w_L + \gamma_K w_H})w_H & \text{if } i \notin I_K \end{cases} \quad (8)$$

The payoffs in the two lines of (8) refer to whether i was born in K or not. An individual i born in A will stay in A if $(1 - \gamma_A \frac{w_H}{w_L + \gamma_A w_H})w_H + h_A + \eta_i > (1 - \gamma_B \frac{w_H}{w_L + \gamma_B w_H})w_H$. This condition can be solved for the critical η_i that makes i indifferent between staying and moving, which is denoted as

$$\eta_A \equiv (\gamma_A \frac{w_H}{w_L + \gamma_A w_H} - \gamma_B \frac{w_H}{w_L + \gamma_B w_H})w_H - h_A. \quad (9)$$

Accordingly, assuming subgame perfect equilibrium play, the set of highly productive individuals who are born in A and migrate to B is

$$n_A G(\Delta_t w_H - h_A), \text{ with } \Delta_t \equiv \gamma_A \frac{w_H}{w_L + \gamma_A w_H} - \gamma_B \frac{w_H}{w_L + \gamma_B w_H}. \quad (10)$$

³²We require uniform treatment of all individuals regarding the tax rate, and uniform redistribution among groups that are homogeneous regarding their productivities or skills. As is known from Epple and Romano (1996) and the work they inspired, assumptions about feasible redistribution are important for the types of redistribution policies that emerge in the equilibrium.

Recall that $G(\cdot)$ denotes the cumulative distribution function of the random component η of patriotism. Similarly, the size of the set of high income earners from B who migrate to A is

$$n_B G((-\Delta_t)w_H - h_B). \quad (11)$$

Migration choices based on anticipated taxes hence determine the sizes of the sets of (post-migration) high income earners in the two countries as

$$\begin{aligned} \gamma_A &= n_A (1 - G(\Delta_t w_H - h_A)) + n_B G((-\Delta_t)w_H - h_B) \\ \gamma_B &= n_A G(\Delta_t w_H - h_A) + n_B (1 - G((-\Delta_t)w_H - h_B)) . \end{aligned} \quad (12)$$

Each individual need not consider the change of γ_A or γ_B from her own migration choice here, because each individual has a measure of zero.

For existence of an equilibrium in Proposition 1 note that (6) establishes a one-to-one relationship between t_K and γ_K . Replacing Δ_t with the equilibrium value $(t_A^*(\gamma_A) - t_B^*(\gamma_B))$ in the subgame perfect equilibrium for given γ_A and γ_B turns (12) into a system of two equations with two unknowns: γ_A and γ_B , viz.

$$\begin{aligned} \gamma_A(\gamma_A, \gamma_B) &= \begin{cases} n_A \left(1 - G\left(\frac{w_L w_H^2 (\gamma_A - \gamma_B)}{(w_L + \gamma_A w_H)(w_L + \gamma_B w_H)} - h_A\right) \right) \\ + n_B G\left(\frac{w_L w_H^2 (\gamma_B - \gamma_A)}{(w_L + \gamma_A w_H)(w_L + \gamma_B w_H)} - h_B\right) \end{cases} \\ \gamma_B(\gamma_A, \gamma_B) &= \begin{cases} n_A G\left(\frac{w_L w_H^2 (\gamma_A - \gamma_B)}{(w_L + \gamma_A w_H)(w_L + \gamma_B w_H)} - h_A\right) \\ + n_B \left(1 - G\left(\frac{w_L w_H^2 (\gamma_B - \gamma_A)}{(w_L + \gamma_A w_H)(w_L + \gamma_B w_H)} - h_B\right) \right) \end{cases} \end{aligned} \quad (13)$$

The existence and uniqueness of a subgame perfect equilibrium is reduced to the question of whether this system has a unique solution. To consider this, note that (13) describes a self-mapping $g : \Gamma \rightarrow \Gamma$ for

$$\Gamma \equiv \{(x, y) \mid x \in [0, n_A + n_B], y \in [0, n_A + n_B], x + y = n_A + n_B\} \quad (14)$$

The pair $(\gamma_A, \gamma_B) \in \Gamma$ by definition. Moreover, $(\gamma_A(\gamma_A, \gamma_B), \gamma_B(\gamma_A, \gamma_B)) \in \Gamma$, as $\gamma_K(\gamma_A, \gamma_B) \in [0, n_A + n_B]$ and $\gamma_A(\gamma_A, \gamma_B) + \gamma_B(\gamma_A, \gamma_B) = n_A + n_B$ by (13). The mapping g is continuous (by using the continuity of G). Moreover, Γ as defined in (14) is a compact and convex set. Hence, Brouwer's fixed point theorem can be applied to confirm that this mapping has a fixed point (γ_A^*, γ_B^*) . This fixed point characterizes the post-migration shares of highly productive individuals in the two countries in an equilibrium.

It remains to confirm that this solution is unique. Note that the functional relationship $\gamma_A(\gamma_B)$ in the first equation in (13) determines a slope

$$\frac{d\gamma_A}{d\gamma_B} = \frac{\left(n_A G'_A \frac{w_L w_H^2}{(w_L + \gamma_B w_H)^2} + n_B G'_B \frac{w_L w_H^2}{(w_L + \gamma_B w_H)^2} \right)}{\left(1 + n_A G'_A \frac{w_L w_H^2}{(w_L + \gamma_A w_H)^2} + n_B G'_B \frac{w_L w_H^2}{(w_L + \gamma_A w_H)^2} \right)}, \quad (15)$$

where

$$G'_A \equiv \frac{\partial G(\eta)}{\partial \eta} \text{ at } \eta = \eta_A \text{ and } G'_B \equiv \frac{\partial G(\eta)}{\partial \eta} \text{ at } \eta = \eta_B .$$

This slope is positive and smaller than 1. Similarly, the second equation reveals a slope $\frac{d\gamma_B}{d\gamma_A}$ that is positive throughout but smaller than 1. Accordingly, these two functions can intersect only once. ■

Proof of Proposition 2. Using (6) to replace γ_A and γ_B in (12) yields a system of equations that determines the equilibrium tax rates as functions of $n_A, n_B, w_H, w_L, h_A, h_B$ and $G(\eta)$:

$$\begin{aligned} \frac{t_A w_L}{w_H(1-t_A)} &= n_A (1 - G((t_A - t_B)w_H - h_A)) + n_B G((t_B - t_A)w_H - h_B) \\ \frac{t_B w_L}{w_H(1-t_B)} &= n_A G((t_A - t_B)w_H - h_A) + n_B (1 - G((t_B - t_A)w_H - h_B)) \end{aligned} \quad (16)$$

The system of equations (16) determines the equilibrium tax rates in the unique subgame perfect equilibrium. Totally differentiating (16) with respect to t_A, t_B, h_A and h_B yields

the following system of equations:

$$\begin{aligned} & \begin{bmatrix} -X - \Omega_A & X \\ X & -X - \Omega_B \end{bmatrix} \begin{pmatrix} dt_A \\ dt_B \end{pmatrix} \\ &= - \begin{pmatrix} n_A G'_A \\ -n_A G'_A \end{pmatrix} dh_A - \begin{pmatrix} -n_B G'_B \\ n_B G'_B \end{pmatrix} dh_B, \end{aligned} \quad (17)$$

with

$$\begin{aligned} X &\equiv n_A G'_A w_H + n_B G'_B w_H > 0 \\ \Omega_A &\equiv \frac{\partial(\frac{t_A w_L}{w_H(1-t_A)})}{\partial t_A} = \frac{w_L}{w_H(1-t_A)^2} > 0 \\ \Omega_B &\equiv \frac{\partial(\frac{t_B w_L}{w_H(1-t_B)})}{\partial t_B} = \frac{w_L}{w_H(1-t_B)^2} > 0. \end{aligned} \quad (18)$$

From here, we can analyze the comparative statics. We find that

$$\begin{aligned} \frac{dt_A}{dh_A} &= \frac{\begin{vmatrix} -(n_A G'_A) & X \\ n_A G'_A & -X - \Omega_B \end{vmatrix}}{\begin{vmatrix} -X - \Omega_A & X \\ X & -X - \Omega_B \end{vmatrix}} \\ &= \frac{[(n_A G'_A)(X + \Omega_B) - n_A G'_A X]}{(X + \Omega_A)(X + \Omega_B) - X^2} \\ &= \frac{n_A G'_A \Omega_B}{(X + \Omega_A)(X + \Omega_B) - X^2} > 0 \end{aligned} \quad (19)$$

The positive sign is obtained as follows. The denominator is positive, as both X and Ω_B

are positive, and the numerator is also positive. Similarly,

$$\begin{aligned}
\frac{dt_B}{dh_A} &= \frac{\begin{vmatrix} -X - \Omega_A & (-n_A G'_A) \\ X & n_A G'_A \end{vmatrix}}{\begin{vmatrix} -X - \Omega_A & X \\ X & -X - \Omega_B \end{vmatrix}} \\
&= \frac{[(n_A G'_A)(-X - \Omega_A) - (-n_A G'_A)X]}{(X + \Omega_A)(X + \Omega_B) - X^2} \\
&= \frac{-n_A G'_A \Omega_A}{(X + \Omega_A)(X + \Omega_B) - X^2} < 0.
\end{aligned} \tag{20}$$

Again, the denominator is positive. The numerator is negative, explaining the negative sign. Given the signs of these expressions, it follows that

$$\frac{d(t_A - t_B)}{dh_A} > 0. \tag{21}$$

As $t_A = t_B$ in the equilibrium for $n_A = n_B$, this completes the proof of Proposition 2. ■

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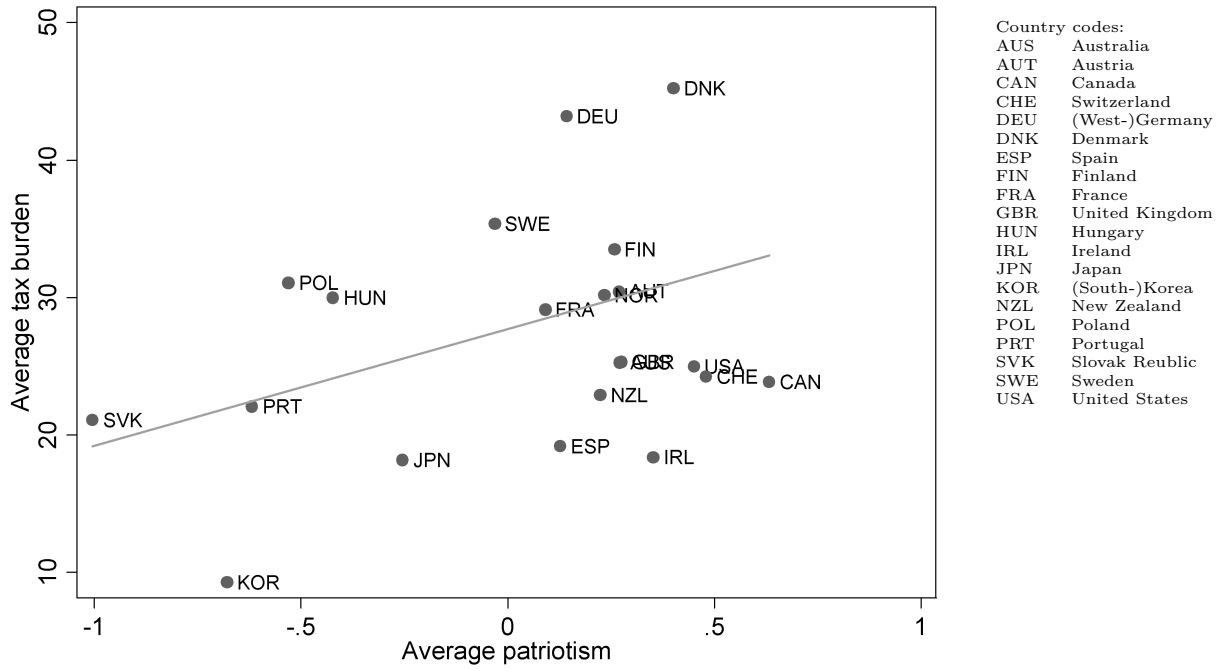
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Figures

Figure 1: Tax burden and patriotism across countries



Tables

Table 1: Patriotism factor analysis ($N = 5023$)

	Rotated Factor Loadings
The way democracy works	.68244177
Its political influence in the world	.60596827
economic achievements	.62622493
Its social security system	.62780228
Its scientific and technological achievements	.35983848
Its achievements in sports	.11578783
Its achievements in the arts and literature	.16349948
armed forces	.3408436
Its history	.15194136
Its fair and equal treatment of all groups in society	.53190732
Eigenvalue: 2.211	
Variance explained: 69.47%	

Table 2: Main Results

	(1)	(2)	(3)	(4)	(5)
	$\geq 60\%$	$\geq 60\%$	$\leq 60\%$	$\geq 50\%$	$\geq 70\%$
IncPos	0.0849*** (7.62)	0.0862*** (9.75)	9.056*** (4.80)	0.0935*** (11.30)	0.0858*** (8.59)
GDP		0.595 (0.75)	-93.63* (-2.17)	0.988 (1.39)	0.382 (0.38)
Unem		0.0952 (0.73)	0.0988 (0.01)	0.165 (1.41)	0.0621 (0.39)
IDEO		3.182*** (9.86)	-6.628 (-0.39)	3.153*** (10.51)	3.199*** (9.34)
Decentr		-0.0547* (-2.36)	2.172 (1.05)	-0.0631** (-2.92)	-0.0602* (-2.36)
Aver. Proud	3.568*** (5.35)	1.892** (3.00)	151.8 (1.17)	1.569** (2.60)	1.696* (2.36)
Constant	19.66*** (16.85)	8.179 (0.93)	421.0 (1.64)	3.316 (0.42)	10.89 (0.96)
<i>N</i>	292	282	192	323	243

t statistics in parentheses

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3: Instrumental Variable Regression Results

	(1)	(2)
	Tax Burden	Proud
IncPos	0.00730 (0.13)	0.00169* (2.41)
GDP	-18.22* (-2.01)	0.416*** (5.83)
Unem	1.517+ (1.74)	-0.0237* (-2.14)
IDEO	4.057** (2.95)	-0.0325 (-1.49)
Decentr	0.216 (1.24)	-0.00203 (-0.80)
Proud	56.20* (2.41)	
Number of borders		0.0379* (2.35)
Constant	170.8* (2.07)	-4.002*** (-4.59)
<i>N</i>	282	282

t statistics in parentheses

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$