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The political economy of regional integration projects at borders where poor and rich meet: The role of cross-border shopping and community sorting

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ABSTRACT

At borders between poor and rich countries, huge service price differentials could be exploited to mutual benefit, offering better-paid job opportunities to the poor as well as better shopping opportunities to the rich. However, cross-border shopping is often limited by the substantial transaction costs of crossing the border. Moreover, countries and regions frequently fail to cut these transaction costs even when they have the opportunity to do so. We provide a politico-economic analysis of cross-border integration projects. More specifically, we show how the political outcome depends on (i) intra-country mobility, (ii) decision making and housing ownership regimes, and (iii) federal grants and international border regulations. Our analysis builds on two key characteristics in which individuals differ: interregional mobility and intercultural ability.

1. Motivation

In rich countries, many services are expensive. Yet rich countries frequently border on poor countries, where these same services are much less expensive. A hair cut in a poor country, say, may well cost as little as one fifth of its equivalent in a rich country. Such price disparities provide strong incentives to shop across the border. Cross-border shoppers from the rich country could obtain many services more cheaply, and at the same time service providers from the poor country could sell these services more expensively. Put differently, consumers from the rich border region could benefit from a lower cost of living and workers from the poor border region from a higher income.

While these are large potential benefits, they are also a long way from being fully realised. Transaction costs incurred whenever one crosses a border clearly have a role in this. These transaction costs are endogenous. Governments can almost always reduce transaction costs further. This is certainly true at the regional level where local governments can, e.g., introduce urban cross-border public transport, widen local roads leading up to border controls, publish information on service quality or shopping regulations, etc. Transaction costs are, ultimately, politically determined. From this paper's perspective, the interesting question is *why governments may fail to reduce transaction costs, and thereby may fail to realise the full gains from cross-border shopping.*

We offer a politico-economic analysis of a 'regional integration project' capable of reducing cross-border shopping's transaction costs ('the project' henceforth). This analysis is carried out in a model with two countries, one of them rich and one poor. Each country consists of a border region and an interior region. While imperfectly mobile residents within either country interact through intra-country, interregional migration, residents in the two countries' border regions interact with one another via cross-border trade. As a key assumption of the model, individuals differ with respect to both intra-country mobility and intercultural ability, with the latter capturing the individual's ability to be served by, or serve, individuals whose cultural background is very different from their own. Being less gifted interculturally reduces a rich shopper's potential benefit from crossing the border, or a poor worker's potential benefit from providing services to cross-border shoppers.

As an important application, the paper's border regions may well represent border municipalities. The example of two twin cit-

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ies on the Polish–German border, Słubice and Frankfurt (Oder), may illustrate this paper's regional integration project within an urban context. Since service prices are much lower in Poland than in Germany, a Frankfurt resident might wish to cross the border into Słubice. If a pedestrian, Frankfurt's shopper needs first to cross a long, and often cold and windy, bridge. To ease that shopper's passage, Frankfurt's local government proposed to extend Frankfurt's existing tram network by appending a cross-border line that would run into Słubice. In no way interfering with national or international regulations, this tram was for Frankfurt's voters' to decide on, and to pay for.[1] As it happened, a majority of Frankfurt's voters struck down the project in 2004.

Of course, setting up cross-border public transport has not always failed. Another twin city pair on the Polish–German border, that of Zgorzelec and Görlitz, started to run a cross-border bus as early as 1992. More generally then, the circumstances that shape regional integration projects' political success are likely to vary from one border crossing to the next. To best account for a broad possible variation in circumstances across different border crossings, we allow for (i) different types of housing property rights and (ii) different degrees of centralisation in decision making. First, two housing ownership structures are distinguished. With 'absentee ownership', the housing stock in a country's border region is owned by those native to that country's interior region. With 'native ownership', by contrast, the housing stock in a country's border region is owned by the natives of the border region.

Second, two decision making regimes are distinguished. In the case of 'decentralised decision making', it is the natives of the two countries' border regions who get to vote on the project. If approved, the project then is funded by taxes levied on border region residents only. In the case of 'centralised decision making', by contrast, all of a country's citizens get to vote on the project. Once approved, the project is then financed by taxes levied on both the border region residents and the interior region residents.

Our framework enables us to analyse not just the effects of the various forces that determine the project's political fate. It also permits us to explain the interaction between these forces. Here is an overview of our key results, showing the impact on the political outcome of intra-country mobility, ownership structure, and decision making regime.

First, support for the project among natives of the border regions is stronger with native ownership than with absentee ownership. The project promotes cross-border shopping by cutting transaction costs. In the poor country's border region, for instance, the resulting boost to trade leads to (i) higher wages in the sector providing services to cross-border shoppers as well as to (ii) higher rents due to the induced inflow of workers from the poor country's interior region. With native ownership, the latter capitalisation effect can only benefit border region natives. With absentee ownership, by contrast, this capitalisation effect effectively transfers gains arising from the project to landowners residing outside the border region. Consequently, the capitalisation effect depresses project support within the border region, and can thus act as a barrier to integration.

Second, with absentee ownership, increasing intra-country mobility in one of the two countries further erodes the political support for the project in that country's border region, whereas it strengthens project support in the neighbouring country's border region. Suppose mobility in the poor country rises. More natives of the poor country's interior region with high intercultural ability then find it worthwhile to take advantage of better-paid jobs in the border region sector providing services to cross-border shoppers. This additional inflow curbs the wage in this sector, thus reducing the project benefits accruing to natives of the poor country's border region. Support for the project coming from border region natives consequently falls. At the same time, the additional supply of workers moving from the interior to the border region to provide services to cross-border shoppers reduces the service price rich cross-border shoppers have to pay. This effect, in turn, enhances support for the project in the rich country.

The potential conflict indicated here, i.e., growing mobility in one country depresses support for the project in that country but reinforces support in the other, need not obtain with native ownership. Key again is that benefits from the project are partly capitalised into higher rents. With native ownership, some border region natives find it beneficial to withdraw to the interior region, renting out their border property and cashing in on the increased border region rent. As mobility increases, this group becomes larger, and thus so does support for the project among border region natives.

Third, with absentee ownership, switching from decentralised to centralised decision making depresses support for the project among border region natives. On the one hand, the removal of the regional tax (which finances the project under decentralised decision making) capitalises into higher border region rent, as this removal renders the border region more attractive. Removal of the regional tax thus benefits landowners outside, rather than tax payers within, the border region. On the other hand, the simultaneous introduction of a country-wide tax (which finances the project under centralised decision making) does not capitalise into any rent change anywhere, as it does not alter the relative attractiveness of the country's different regions. The country-wide tax thus is fully born by each tax payer, and hence also by border region natives. As a result, border region natives ultimately face an extra burden when subjected to centralised, rather than to decentralised, decision making.

More generally, we are able to give, and to rank, the number of project supporters across all combinations of ownership structure and decision making regime. In addition, we will argue that relaxing border crossing regulations may be more effective in stimulating border region support for the project than federal grants that reduce regional project costs. Here again we will argue that capitalisation effects are pivotal.

This paper analyses under which circumstances regional integration is likely to emerge, and how (regional) support for an integration project could be encouraged. These issues are of high political importance. For instance, the European Union intends to spend more than 8 billion euros between 2007 and 2013 on stimulating cross-border cooperation, under its 'European Territorial Cooperation Objective'. While funding generally is assigned to diverse purposes, part of this overall funding is clearly directed towards promoting local cross-border trade in services. This paper can shed some light on whether such funding is likely to stimulate, and to be matched by, regional integration policies.

Our analysis connects cross-border shopping to the political economy of local public infrastructure investment, to household sorting, to fiscal federalism, and, in a more figurative sense, to globalisation. We briefly address existing work on these themes. Cross-border shopping is prominent in the literature on tax competition (see, e.g., Kanbur and Keen, 1993 and, more recently, Haufler, 2001, Lucas, 2004; Nielsen, 2001, 2002). In these papers, competing governments strategically set commodity taxes to attract cross-border shoppers and to raise domestic tax revenues. Since in these papers cross-border shopping results from distortionary tax differentials between countries, it is welfare-reducing. In our framework, by contrast, cross-border shopping results from producer price differentials induced by an international productivity differential. Taking advantage of these latter price differentials is generally welfare-enhancing.

However, the extent to which comparative advantage can be fully exploited hinges on the project's political success as well as

[1] Słubice had already welcomed this particular integration project.

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on border region residents' characteristics. In analysing these issues, our paper contributes to the literature on household mobility, public expenditures, and voting (see, e.g., Epple et al., 1984, 1993; Hansen and Kessler, 2001; Kessler and Lülfesmann, 2005; Westhoff, 1979). These papers explore how different household types sort into communities when local voters decide on local expenditures, on public goods, or on redistribution.

While sharing these papers' interest in voting and sorting, our paper introduces a number of novel themes. Chief among them are the ambiguous effect of greater intra-country mobility on project support and the combined impact of housing ownership structures and decision making regimes on the political outcome. A recurrent issue that we explore in this context is whether the capitalisation of project benefits into land rents acts as an obstacle to integration. This paper also suggests a novel criterion according to which households sort, namely the ability to interact with people from a different culture.[2]

The plan of the paper is as follows: Section 2 introduces the basic model, assuming absentee ownership and decentralised decision making. Section 3 gives the details of the 'shopping and migration (ShoMig) equilibrium' obtained for a given state of cross-border integration, and explains how the ShoMig equilibrium varies with intra-country mobility. Section 4 analyses the electorate's vote on the project, and explains how this vote depends on intra-country mobility, international regulations, and federal grants. Section 5 explores how switching from absentee to native ownership affects the key results. Likewise, Section 6 explores how switching from decentralised to centralised decision making acts upon the key results. Section 7 assembles the paper's results into an overall picture. Concluding remarks and suggestions for further research follow in Section 8.

2. Building blocks

We start by presenting the building blocks of our politico-economic model of cross-border integration. Let us first state its basic geographic, technological, individual, and political features.

2.1. Geography and housing

Neighbouring countries Poor P and Rich R consist of one border and interior region each. Poor Border PB and Rich Border RB are the two border regions, adjacent to one another. Their shared boundary is the border between the two countries. Interior regions Poor Interior PI and Rich Interior RI are the two border regions' respective hinterlands.

Individuals are born into one of these four regions. The total number of individuals born into region jk $(j = P, R;\ k = B, I)$ is N_j. That is, country j's two regions jB and jI have equal population size. Each individual always occupies one dwelling of unit size, and hence, initially, the housing stock in region jk is N_j. While housing stocks in border regions jB remain fixed, stocks in interior regions jI may subsequently expand, at constant per unit cost d_j.

The border regions' housing stocks are owned by absentee landlords. More precisely, each Interior native is assumed to own one unit of the fixed housing stock in her country's border region, in addition to the one unit of housing she initially lives in. We refer to this ownership structure as *absentee ownership*, capturing the fact that Border natives are landless tenants.

2.2. Technologies and trade

An industrial good x and a service good y are produced with Ricardian technologies. Labour is perfectly mobile across sectors, and each labour unit employed in sector x (y) produces a_j (b_j) units of good x (y) in j. Workers in Rich are better at producing x than are workers in Poor, i.e., $a_R > a_P$, but are only equally good at providing y, i.e., $b_R = b_P = b$. These assumptions capture the stylised fact that gaps in international productivity are much more pronounced in industry than in services. For convenience, productivities are normalised by putting $b > 1$.

The industrial good x is tradeable and can be shipped at no cost. By contrast, the service good y is not tradeable. Individuals residing in Rich Border, however, are able to buy the service good in nearby Poor Border, and individuals living and working in Poor Border may provide Rich's shoppers with that very service good. Moreover, we assume that Poor Border's service suppliers can choose between serving Poor's shoppers only and serving Rich's shoppers only. Those choosing to do the latter henceforth are 'cross-border sellers'.

2.3. Interregional mobility, intercultural ability, and heterogeneity

Individuals from one country can shop in the other, yet may neither live nor work there. Within either country, each citizen is free to choose the region in which she lives and works. However, this intra-country mobility is imperfect, and varies across individuals. Some individuals are strongly attached to their native region, or find it difficult to integrate into a new environment. Others, by contrast, have only weak links to their home region, or get in touch with people in new places easily. Let m_{jk}^h denote such home attachment's pecuniary equivalent for native h of region jk (see, e.g., Mansoorian and Myers, 1993). We refer to this equivalent as migration costs, representing the costs of moving from one's home region to the other region.

Individuals also differ in their intercultural ability, i.e., their ability to interact with people from the other side of the border. This ability determines the intercultural transaction costs (for short, intercultural costs) of those involved in cross-border selling and shopping. Both sellers and shoppers need to become familiar with a different, potentially conflicting, set of social norms. Moreover, sellers have to adapt their strategies to the needs of customers with a different mother tongue while shoppers need to be aware of different legal rules. Finally, shoppers and sellers alike must tolerate close contact with someone earning a very different income (see the role of status in, e.g., Frank, 1987). Let z_{jk}^h denote the resulting intercultural costs for native h from region jk who cross-border shops or sells. Certainly, the intercultural cost of providing services to, or of being served by, foreigners varies across individuals. Generally, costs are lower for those skilled in languages, and for those better able to blend in.

For analytical convenience, we assume that the characteristics of natives of jk are uniformly distributed, implying joint density $f_j(m_{jk},\ z_{jk}) = (\bar{m}_j\bar{z}_j)^{-1},\ \bar{m}_j,\ \bar{z}_j > 0$.[3] Then, while both of country j's regions jB and jI share the same density, regions from different countries j and i do not necessarily do so. This assumption combines two points. Within a given country, on the one hand, individuals born into one region should, on average, be no different than individuals born into another. Across different countries, on the other hand, costs may well differ, particularly given that serving is quite different from being served. Finally, note that information on f_j is assumed to

[2] Other sorting criteria in the literature include income and preferences for local public goods (see the above literature), race (e.g., Alesina et al., 2004), peer effects (e.g., Calabrese et al., 2005), and pro-social behaviour (Lazear et al., 2006).

[3] Intercultural costs may be negative if individuals enjoy interacting with foreigners. Similarly, individual migration costs may be negative if the alternative region is preferred. For convenience, though, we restrict m_{jk} and z_{jk} to be positive.

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be common knowledge whereas information on individual characteristics is not.

2.4. Voting, integration project, and transaction costs

Residents of Rich Border, and of Rich Border only, may cross-border shop to buy services in nearby Poor Border. In addition to those intercultural costs of interacting with Poor Border's sellers, Rich's cross-border shoppers also incur transaction costs $\theta > 0$. These costs are the pecuniary equivalent of the time spent when travelling, of the time lost at border controls, and of additional transportation costs. Transaction costs are identical for all shoppers.

While border regulations at the international level frame transaction costs θ, nonetheless substantial leeway remains for political action at the regional level. We assume that the regional government can carry out a 'regional integration project' (for short, 'project') that would reduce transaction costs from $\bar{\theta}$ initially down to $\underline{\theta}$. Parameters $\bar{\theta}$ and $\underline{\theta}$ represent exogenous limits to openness, defined by the international cross-border regime. Ultimately it is the project's political success at the regional level that determines whether the border region exploits the available leeway $\bar{\theta} - \underline{\theta}$ through implementing the lower bound $\underline{\theta}$.

We start by assuming *decentralised decision making*. That is, only the two border regions decide on the project, in two separate referenda. The project is approved if and only if it receives a majority of votes in each border region. Project costs are shared between border regions, with cost shares e_j exogenously given and eventually to be raised as a lump sum in jB. This lump-sum tax t_{jB} is simply equal to

$$t_{jB} = e_j / N_j. \tag{1}$$

2.5. Utility and timing

Each individual inelastically supplies one unit of labour to her region of residence. Also, each individual consumes exactly one unit of services and one unit of housing. Having satisfied her needs for services and housing, an individual enjoys utility from consuming the industrial good while experiencing disutility from migration costs, intercultural costs, and transaction costs (provided these costs actually arise). Employing these costs' respective pecuniary equivalents m^h_{jk}, z^h_{jk}, and θ, and putting the industrial good x as numeraire, individual utility can be expressed as

$$U^h_{Pk} = x^h_{Pk} - \gamma_z z^h_{Pk} - \gamma_m m^h_{Pk} \quad \text{and}$$
$$U^h_{Rk} = x^h_{Rk} - \gamma_z(\theta + z^h_{Rk}) - \gamma_m m^h_{Rk}, \tag{2}$$

where $\gamma_z = 1$ ($\gamma_m = 1$) if native h from region jk cross-border shops or cross-border sells (migrates), and $\gamma_z = 0$ ($\gamma_m = 0$) otherwise.[4]

Individuals make decisions at two stages. At stage 1, both countries' border region natives simultaneously, if separately, vote on the project. At stage 2, all individuals decide on whether to migrate or not, and, should they choose to reside in Poor Border (Rich Border), on whether to become cross-border sellers (cross-border shoppers) or not. Since taxes to finance the project are levied only on those who ultimately reside in the border regions, border region natives can actually escape taxation by leaving for the interior region.[5] Individuals maximise their utility, and are fully aware of how the voting outcome affects all successive location and occupation choices. Finally, all transactions are carried out in perfectly competitive markets.

2.6. Model modifications and discussion of assumptions

We will later analyse how two important modifications of the model affect our conclusions. First, we will explore an alternative ownership regime labelled *native ownership* in Section 5. In this extension we show that housing property rights in the border regions prove to be crucial to our conclusions. And second, we will analyse the important alternative case of *centralised decision making* in Section 6. In many countries, decisions are made at a level higher than that of the regional or municipal level. This is particularly true if integration projects are national, rather than regional, in character, e.g., major bridges across border rivers. We, however, start by assuming decentralised decision making to account for the importance of regional or even municipal decision making at international border crossings.[6] It is also for clarity and ease of exposition that we turn to decentralised decision making first.

As our model is fairly different from existing approaches, some assumptions might call for further discussion. For instance, our assumption that *individual* demand for housing and services is fixed might appear rather restrictive. As discussed below, however, *aggregate* demand for housing in any of the regions is endogenously determined, as is the demand for cross-border services. Similarly, while aggregate labour supply is inelastic, labour supply to the all-important sector of cross-border services is not. Consequently, all the crucial market prices are endogenously determined. Overall, our model permits us to capture key benefits and downsides of regional integration—as mirrored by growing incomes, falling prices, and rising rents—within a tractable model.

3. Cross-border shopping and community sorting

As usual the model is solved by backward induction. In this section we analyse individual choices, community sorting, and cross-border shopping for a given policy $(\theta,\ t_{PB},\ t_{RB})$. We also show how intra-country mobility affects the economic equilibrium. Let us start by considering goods, labour, and property markets. With perfect competition, firms' profits are zero. If we normalise the price of good x to one, then workers employed in j's industrial sector receive a wage w_j equal to a_j.[7] In the presence of intersectoral mobility, so do those of j's workers who provide non-tradeable services y to domestic customers. Then j's services for domestic customers carry a price of $p_j = a_j/b$. Furthermore, domestic services must be more expensive in the richer country: $p_R/p_P = a_R/a_P > 1$.[8]

The service price charged to cross-border shoppers has to exceed the service price applying to Poor's domestic customers, p_P.

[4] There is no need to explicitly integrate housing and the service good into the utility function, given that demand for them is fixed. It is important to note that cross-border shopping nevertheless generates utility because a lower service price enables individuals to consume more of the numeraire good. A similar benefit arises when moving into a region with lower rent. Endogenising the demand for housing and services would reinforce these benefits, but would also substantially complicate the model without changing these latter benefits qualitatively.

[5] This timing is motivated by the observation that typically there is a substantial lapse of time between the political decision to go ahead with the integration project and the subsequent rise in taxes. So the location choice takes place after the political decision is made. We do not consider migration before Border citizens vote on the project. This decision structure captures the fact that individuals are simply born into one of the regions and that a region's native population has a 'head start' regarding local policy choices. For an alternative timing in which location choices are made before the regions go to the polls, see, for instance, Kessler and Lülfesmann (2005).

[6] See the examples on cross-border local public transport in the twin cities Słubice–Frankfurt (Oder) and Zgorzelec–Görlitz mentioned in the introduction.

[7] Recall that labour productivity is independent of output levels and the same in the two regions of each country, and that the industrial good can be shipped at no cost. Then industrial wages are identical across each country's regions even though labour mobility is not perfect.

[8] This result is typically referred to as Balassa–Samuelson Theorem. See Balassa (1964) and Samuelson (1964).

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After all, cross-border sellers need to be compensated for their intercultural costs by receiving higher wages. Let the price of cross-border services be p_C (to be determined below). Then perfect competition implies that the respective employees' pay is tied to $w_C = bp_C$. Finally, perfect competition in the property markets drives Interior rent down to $r_{jI} = d_j$ (whereas Border rent r_{jB} will be determined below). To sum up for later reference,

$$w_j = a_j, \quad p_j = \frac{a_j}{b}, \quad w_C = bp_C, \quad r_{jI} = d_j. \tag{3}$$

As shown by (3), wages in the industrial and domestic service sectors, prices of domestic services and rents in Interior follow directly from Ricardian technologies, perfect competition, intersectoral labour mobility, and abundance of land in Interior. We keep these components of the model simple so that we can focus on the key variables that affect individual utility in the present context: wages and prices in the cross-border service sector and rents in Poor Border and Rich Border. These key variables reflect, as well as shape, interregional migration flows, cross-border services' supply and demand, and the political support for the integration project.

3.1. Optimal location, employment, and shopping

Let us now turn to households' choices. Individuals decide on whether to live in a country's border region or interior region, and on whether to become a cross-border seller (cross-border shopper) or not. We first analyse the choices of individuals in Poor.

3.1.1. Individual choices in poor

Consider a Poor Border native's employment options first. She may either become a cross-border seller (i.e., a supplier of services to cross-border shoppers) or a domestic-type worker (i.e., a supplier of services to domestic customers or industrial worker). Employment as a cross-border seller yields a wage of w_C but entails intercultural costs z_{PB}, whereas employment as a domestic-type worker pays w_P without any further costs. Next consider a Poor Border native's location choices. Continuing on in Poor Border requires r_{PB} in rent and t_{PB} in taxes. In contrast, emigrating to Poor Interior entails migration costs m_{PB} to get to, and paying rent r_{PI} to live in, Poor Interior.

Since only Poor Border employers can offer cross-border services, there are three possible combinations of employment and residential status: the action (PB, PB) refers to staying in Poor Border as a domestic-type worker, the action (PB, RB) refers to staying in Poor Border as a cross-border seller, and the action (PB, PI) refers to emigrating to Poor Interior as a domestic-type worker. The corresponding individual utilities are

$$U_{PB} = \begin{cases} w_P - p_P - r_{PB} - t_{PB} & \text{if } (PB, PB), \\ w_C - p_P - r_{PB} - t_{PB} - z_{PB} & \text{if } (PB, RB), \\ w_P - p_P - r_{PI} - m_{PB} & \text{if } (PB, PI), \end{cases} \tag{4}$$

where service price, rents, wages, and taxes are defined in (1) and (3). (For notational convenience, the individual index h is, and will remain, suppressed.) The last term in the second line and the last term in the third line give the resulting intercultural and migration costs, respectively. The other terms in each line capture the consumption of the industrial good x (see (2)). This consumption is equal to the disposable income after the service good and housing are paid for and after (in Poor Border only) the tax is deducted.

Pairwise comparing the utilities that the individuals derive from the three possible actions gives the indifference loci

$$\tilde{z}_{PB} = w_C - w_P, \tag{5}$$

$$\tilde{m}_{PB} = \Delta r_P + t_{PB}, \tag{6}$$

$$\hat{z}_{PB} = \tilde{z}_{PB} - \tilde{m}_{PB} + m_{PB} = (w_C - w_P) - (\Delta r_P + t_{PB}) + m_{PB}, \tag{7}$$

where $\Delta r_P = r_{PB} - r_{PI}$. The thresholds $\tilde{z}_{PB}$, $\tilde{m}_{PB}$ and $\hat{z}_{PB}$ stand for the critical cost levels that make individuals indifferent between (PB, PB) and (PB, RB), (PB, PB) and (PB, PI), and (PB, RB) and (PB, PI), respectively. They are drawn as dashed lines in Fig. 1, with $j = P$. These loci partition the support of the joint density function f_P into three sets, such that individuals with characteristics in any given one of these sets pick the same optimal action.

An individual prefers (PB, RB) to (PB, PB) if and only if cross-border selling generates a wage gain $w_C - w_P$ that exceeds her intercultural costs z_{PB}. Equivalently, her intercultural costs must fall short of $\tilde{z}_{PB}$ (see (5)). Moreover, she prefers (PB, PI) to (PB, PB) if and only if moving to Poor Interior yields rent and tax savings $\Delta r_P + t_{PB}$ that exceed her migration costs m_{PB}. Equivalently put, her migration costs must be smaller than $\tilde{m}_{PB}$ (see (6)). Finally, she prefers (PB, RB) to (PB, PI) if and only if the wage gain $w_C - w_P$ net of intercultural costs z_{PB} is greater than the rent and tax savings $\Delta r_P + t_{PB}$ net of migration costs m_{PB}; that is, if and only if her intercultural costs z_{PB} fall short of the threshold $\hat{z}_{PB}$ (see (7)).

As a result, Poor Border natives with both high m_{PB} and high z_{PB} stay in Poor Border and remain domestic-type workers. They are associated with the set (PB, PB) in Fig. 1. Poor Border natives with low z_{PB} both in absolute terms and relative to m_{PB} also stay in Poor Border but cross-border sell. They are associated with the set (PB, RB). Finally, Poor Border natives with high to intermediate z_{PB} but low m_{PB} withdraw to Poor Interior and become domestic-type workers there. They are associated with (PB, PI).

Poor Interior natives avail themselves of three actions that closely parallel those open to Poor Border natives. A Poor Interior native may stay at home and become a domestic-type worker (i.e., (PI, PI)). Or, she may move to Poor Border and work as a cross-border seller (i.e., (PI, RB)). Or, she may move to Poor Border and become a domestic-type worker (i.e., (PI, PB)). But note that this latter action is dominated by (PI, PI). Intuitively, a Poor Interior native who moves to Poor Border without intending to cross-border sell does not benefit from, yet still has to pay the premium that others attach to, cross-border selling. The remaining two actions' utilities are

$$U_{PI} = \begin{cases} w_P - p_P + r_{PB} & \text{if } (PI, PI), \\ w_C - p_P + r_{PI} - t_{PB} - m_{PI} - z_{PI} & \text{if } (PI, RB). \end{cases} \tag{8}$$

The last two terms in the second line again capture the intercultural and migration costs while all the other terms represent the income available for good x, and thus the quantity of the numeraire consumed.

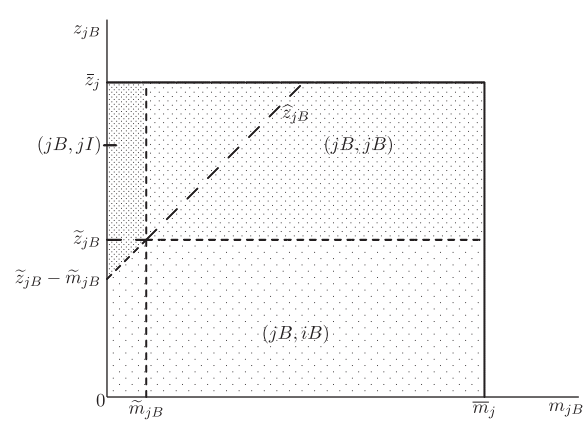

Fig. 1. Border natives by employment and eventual location.

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Comparing the two utilities yields the indifference locus

$$\tilde{z}_{PI} = \tilde{z}_{PB} - \tilde{m}_{PB} - m_{PI} = (w_C - w_P) - (\Delta r_P + t_{PB}) - m_{PI}, \tag{9}$$

which is plotted in Fig. 2, with $j = P$. A Poor Interior native moves to Poor Border to cross-border sell if and only if the excess of wage gain $w_C - w_P$ over rent and tax loss $\Delta r_P + t_{PB}$ is greater than the intercultural and migration costs $z_{PI} + m_{PI}$. That is, this Poor Interior native leaves for Poor Border should the intercultural costs z_{PI} fall short of the threshold $\tilde{z}_{PI}$ (see (9)). Action (PI, RB) is only advantageous to individuals with both low migration costs and low intercultural costs, indicated by Fig. 2's shaded area.

3.1.2. Individual choices in rich

To analyse the choices of Rich natives we only need to modify slightly the preceding arguments. The analogue in Rich of the cross-border sellers in Poor are cross-border shoppers, except that the latter do not benefit from receiving higher incomes, i.e., earning wage w_C rather than w_P, but instead from paying less for services, i.e., from paying transaction cost inclusive price $p_C + \theta$ rather than price p_R. Otherwise, benefits and costs from intra-country migration and cross-border services are *qualitatively* the same, and so, too, are the utilities of Rich Border natives

$$U_{RB} = \begin{cases} w_R - p_R - r_{RB} - t_{RB} & \text{if } (RB, RB), \\ w_R - (p_C + \theta) - r_{RB} - t_{RB} - z_{RB} & \text{if } (RB, PB), \\ w_R - p_R - r_{RI} - m_{RB} & \text{if } (RB, RI), \end{cases} \tag{10}$$

and the corresponding indifference loci

$$\tilde{z}_{RB} = p_R - (p_C + \theta), \quad \tilde{m}_{RB} = \Delta r_R + t_{RB},$$
$$\hat{z}_{RB} = \tilde{z}_{RB} - \tilde{m}_{RB} + m_{RB}. \tag{11}$$

These thresholds separate Rich Border natives who continue to live in Rich Border and buy services at home (RB, RB) from Rich Border natives who remain in Rich Border but cross-border shop (RB, PB) and from Rich Border natives who leave for Rich Interior (RB, RI).

Similarly, Rich Interior natives' utilities

$$U_{RI} = \begin{cases} w_R - p_R + r_{RB} & \text{if } (RI, RI), \\ w_R - (p_C + \theta) + r_{RI} - t_{RB} - m_{RI} - z_{RI} & \text{if } (RI, PB), \end{cases} \tag{12}$$

closely resemble those of Poor Interior natives. The corresponding indifference locus

$$\tilde{z}_{RI} = \tilde{z}_{RB} - \tilde{m}_{RB} - m_{RI} = p_R - (p_C + \theta) - (\Delta r_R + t_{RB}) - m_{RI}, \tag{13}$$

separates those Rich Interior natives who stay in Rich Interior (RI, RI) from those who leave for Rich Border to cross-border shop (RI, PB). Thus, with $j = R$, Figs. 1 and 2 also illustrate the optimal choices in Rich.

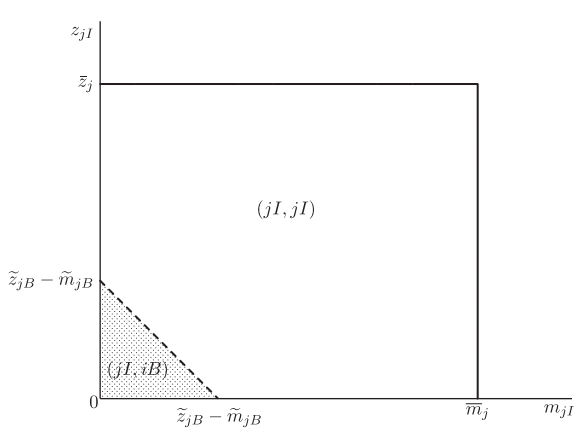

Fig. 2. Interior natives by employment and eventual location.

3.2. Shopping and migration equilibrium

A 'cross-border shopping and migration equilibrium', or ShoMig equilibrium, is the equilibrium obtained for the game's second stage. Specifically, a ShoMig equilibrium requires housing, goods, and service markets to balance, with first stage policy variables $(\theta,\ t_{PB},\ t_{RB})$ given. Since in equilibrium regional housing supply equals regional housing demand, and since housing supply is fixed in the border regions, either region's immigrant inflow must also equal its emigrant outflow. Let M_{jB} denote the number of those moving from jB to jI, and let M_{jI} denote the number of those moving from jI to jB. By inspection of Figs. 1 and 2, $M_{jB} = \tilde{m}_{jB}(\bar{z}_j - \tilde{z}_{jB} + 0.5\tilde{m}_{jB})N_j/(\bar{m}_j\bar{z}_j)$ and $M_{jI} = 0.5(\tilde{z}_{jB} - \tilde{m}_{jB})^2 N_j/(\bar{m}_j\bar{z}_j)$. Then a migration equilibrium requires $M_{jB} = M_{jI}$, yielding

$$\tilde{m}_{jB} = \tilde{z}_{jB}^2/(2\bar{z}_j) \Longleftrightarrow r_{jB} = d_j - t_{jB} + \tilde{z}_{jB}^2/(2\bar{z}_j), \tag{14}$$

where the second equation follows from substituting (3) and (6) into the first. In equilibrium, migration irrevocably ties the additional rent and tax burden in the border regions (equal to $\tilde{m}_{jB}$) to cross-border sellers' wage premium (equal to $\tilde{z}_{PB}$ in Poor Border) or cross-border shoppers' gains (equal to $\tilde{z}_{RB}$ in Rich Border).

Next, let Y_P denote Poor Border's aggregate supply of, and let Y_R denote Rich Border's aggregate demand for, cross-border services. Cross-border sellers include new arrivals in Poor Border, M_{PI}, as well as indigenous Poor Border sellers, denoted C_{PB}. Likewise, cross-border shoppers include new arrivals from Rich Interior, M_{RI}, as well as indigenous Rich Border shoppers, denoted C_{RB}. A shopping equilibrium requires $Y_P = Y_R$, or

$$b(C_{PB} + M_{PI}) = C_{RB} + M_{RI}, \tag{15}$$

with Y denoting equilibrium service consumption, or 'cross-border sales'. (We reserve the convenient term 'sales' for Y, rather than for the frequently implied $p_C Y$.)

Formally, a ShoMig equilibrium is a list of prices $(p_C,\ r_{PB},\ r_{RB})$ and corresponding quantities $(Y,\ C_{jB},\ M_{jB},\ M_{jI})$ that satisfy the-equilibrium conditions set out in (14) and (15) for a given policy $(\theta,\ t_{PB},\ t_{RB})$. Such *a ShoMig equilibrium exists and is unique*, as shown in the working paper version of this paper.[9]

Tracing the impact of regional integration on the ShoMig equilibrium is straightforward. Lower transaction costs θ make cross-border shopping more attractive. More Rich Border natives cross-border shop, and more Rich Interior natives move to Rich Border to join them. This boost in demand drives up the price p_C for cross-border services and the wage w_C for cross-border sellers. In response to higher wages, more Poor Border natives cross-border sell, and more Poor Interior natives move to Poor Border to do the same. The inflow of Poor Interior natives to Poor Border increases Poor Border rent r_{PB}. Similarly, the inflow of Rich Interior natives to Rich Border increases Rich Border rent r_{RB}.

The benefits from the project show up in part in an increase in the wage w_C paid to cross-border sellers as well as in a reduction of the transaction cost inclusive price $p_C + \theta$ charged to cross-border shoppers.[10] In addition, benefits partly are capitalised into higher border region rents r_{PB} and r_{RB}. As we shall see later, this capitalisation effect proves to be crucial to our key results.

[9] See Proposition 1 in Dascher and Haupt (2008).

[10] A cut in transaction costs θ would be absorbed by an equally-sized rise in price p_C if supply were price-inelastic. But since supply is elastic (see (15)), the decline in θ dominates the increase in p_C, and $p_C + \theta$ falls.

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3.3. ShoMig equilibrium and mobility

Intra-country mobility proves to be crucial to our politico-economic analysis, since it shapes the distributional conflicts caused by the integration project. This subsection therefore addresses how migration costs affect the ShoMig equilibrium. More precisely, we analyse the impact of changes in the migration costs' upper bounds $\bar{m}_P$ and $\bar{m}_R$, whereby an increase (decrease) in migration costs $\bar{m}_j$ captures a decrease (increase) in the intra-country mobility of the natives of country j. Our key results are summarised in

Proposition 1 (Interregional mobility and ShoMig equilibrium).

(i) *Service price p_C, wage w_C and rent r_{PB} are increasing (decreasing) in migration costs $\bar{m}_P$ ($\bar{m}_R$), while rent r_{RB} is decreasing (increasing) in migration costs $\bar{m}_P$ ($\bar{m}_R$). Sales Y are decreasing in either migration costs $\bar{m}_P$ and $\bar{m}_R$.*

(ii) *The number of sellers native to Poor Border C_{PB} (shoppers native to Rich Border C_{RB}) is increasing in migration costs $\bar{m}_P$ ($\bar{m}_R$), while the number of sellers native to Poor Interior M_{PI} (shoppers native to Rich Interior M_{RI}) is decreasing in $\bar{m}_P$ ($\bar{m}_R$).*

(iii) *The numbers of shoppers native to Rich Border C_{RB} or Rich Interior M_{RI} (of sellers native to Poor Border C_{PB} or Poor Interior M_{PI}) are decreasing in migration costs $\bar{m}_P$ ($\bar{m}_R$).*

Throughout this paper we relegate proofs to Appendix A, to focus on the economic intuition in the main text. Suppose migration costs $\bar{m}_P$ fall, representing an increase in households' mobility within Poor. (Discussion of a reduction in $\bar{m}_R$ is similar, and therefore is omitted.) More Poor Interior natives now find their individual migration costs sufficiently low to benefit from better-paid employment opportunities in Poor Border's cross-border service sector. They move to Poor Border and become cross-border sellers. Cross-border services' supply expands, making cross-border sales Y go up while driving cross-border services' price p_C and wage w_C down. The lower wage w_C makes Poor Border less attractive and translates into a lower Poor Border rent r_{PB}. By contrast, the lower price p_C makes Rich Border more attractive and translates into a higher Rich Border rent r_{RB} (Proposition 1, Part i).

Straightforward changes in prices and sales conceal an important composition effect. The fall in the price of services, brought about by the extra influx of Poor Interior natives, tends to crowd Poor Border natives out of cross-border selling (Proposition 1, Part ii). Moreover, given that overall sales increase, we can conclude that the number of Poor Interior natives crowding in must certainly be greater than that of Poor Border natives crowded out. This 'composition effect' has no parallel in Rich. In Rich the reduction in the price of cross-border services unambiguously attracts extra cross-border shoppers from both Rich Border and Rich Interior (Proposition 1, Part iii).

4. Voting on the regional integration project

We now proceed to investigate the outcome of the first stage's referendum on the regional integration project. For the time being we assume *decentralised decision making*. That is, only natives of Poor Border and Rich Border vote. Proposition 2 summarises the impact of changes in intra-country mobility on the outcome of the referendum, while Propositions 3 and 4 discuss the influence of international border regulations and federal grants. Finally, Proposition 5 contrasts the effects *on voting* of changes in intra-country mobility and international regulations, with their effects *on welfare*.

We start by analysing the political preferences of the different types of citizens. To highlight our results as clearly as possible we assume that, without project implementation, transaction costs are prohibitive.

Assumption 1. $\bar{\theta} = p_R - p_P$.

That is, without project implementation, no one finds cross-border selling or shopping worthwhile, i.e., $\tilde{z}_{jB} = 0$, and no Interior native moves to Border, i.e., $\tilde{m}_{jB} = 0$. Border rents settle at Interior rents' respective levels: $r_{jB}(\bar{\theta}) = d_j = r_{jI}$, given (14). Consequently, each Border native's utility is simply

$$U_{jB} = w_j - p_j - d_j. \tag{16}$$

4.1. Political preferences

At the game's first stage, Border natives vote on the integration project $(\underline{\theta}, t_{PB}, t_{RB})$. Regional polls take place in Rich Border and Poor Border simultaneously yet separately, with natives of jB voting on $(\underline{\theta}, t_{jB})$. Recall that citizens are fully rational. In particular, when making their decisions at the polls they take into account the impact of the political outcome on the consequent location and occupation choices.[11] Any voter's approval is solely governed by whether the utility attained with the project exceeds the utility without it. So a voter with characteristics (m_{jB}, z_{jB}) compares the utility $U(\underline{\theta}, t_{jB};\ m_{jB}, z_{jB})$ obtained in ShoMig equilibrium for $\theta = \underline{\theta}$ and $t_{jB} \geqslant 0$ (see (4) and (10)), with the utility $U(\bar{\theta}, 0; m_{jB}, z_{jB})$ obtained for $\theta = \bar{\theta}$ and $t_{jB} = 0$ (see (16)).

Comparing these utilities reveals that a Border native votes in favour of the regional integration project if and only if individual intercultural costs fall short of an 'intercultural cost voting threshold'

$$\tilde{z}_{jB}^{DA} = \tilde{z}_{jB} - \tilde{m}_{jB} = \begin{cases} (w_C - w_P) - (\Delta r_P + t_{PB}) & \text{if } j = P, \\ (p_R - p_C - \theta) - (\Delta r_R + t_{RB}) & \text{if } j = R, \end{cases} \tag{17}$$

where superscripts D and A stand for *decentralised decision making* and *absentee ownership*, respectively. This threshold is plotted in Fig. 3.

Consider the trade-offs faced by natives of Poor Border. On the one hand, the regional integration project creates better-paid employment opportunities in the nascent cross-border service sector. On the other hand, the project entails higher rent payments (caused by the influx of Poor Interior natives) and extra taxes (to cover the project costs). Clearly, a necessary condition for benefitting from the integration project is to stay in Poor Border and cross-border sell upon project completion. The group of Poor Border natives satisfying this necessary condition, the 'potential' cross-border sellers, are shown as Fig. 1's set (PB, RB). However, being a cross-border seller is not sufficient for being a beneficiary, and hence supporter, of the project. Even among potential cross-border sellers only those benefit for whom the wage gain net of intercultural costs $w_C - w_P - z_{PB}$ outweighs the additional rent and tax payments $\Delta r_P + t_{PB}$. That is, only voters with intercultural costs below the threshold $\tilde{z}_{PB}^{DA}$ benefit from, and thus vote for, the project.

Similarly, consider the trade-offs Rich Border natives face. A necessary condition to benefit from, and vote for, the project is to become a cross-border shopper. The group of Rich Border natives satisfying this condition, the 'potential' cross-border shoppers, are also shown in Fig. 1, as set (RB, PB). Yet only those cross-border shoppers for whom the fall in service price net of transaction and intercultural costs $p_R - p_C - \theta - z_{RB}$ exceeds the attendant increase in rent and tax payments $\Delta r_R + t_{RB}$ gain from,

[11] This assumption seems to have empirical support. According to Epple et al.'s (2001) analysis of majority rule and Tiebout sorting, models based on sophisticated voting behaviour fit the data better than those based on myopic voting behaviour.

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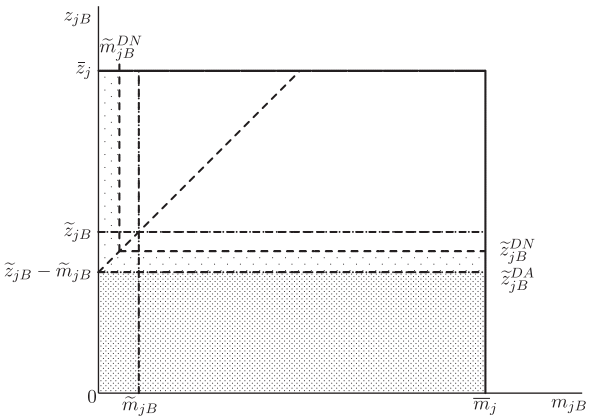

Fig. 3. Housing ownership regime and political support.

and vote for, the project. Equivalently put, in Rich Border, intercultural costs must not exceed the threshold $\tilde{z}_{RB}^{DA}$. We conclude that the share of Border natives endorsing the project is

$$V_{jB}^{DA} = \tilde{z}_{jB}^{DA}/\bar{z}_j. \tag{18}$$

Fig. 3's heavily shaded area contains the characteristics of the project supporters. This figure also illustrates that cross-border shoppers or sellers, C_{jB}, do not necessarily vote for the project. Individuals may prefer cross-border interaction once the project is implemented, where taxes and higher rents have to be paid irrespective of the individuals' actions. Yet these individuals may nonetheless be better off if integration never takes place. In other words, individuals do not reveal having supported the project *ex ante* just because they exploit its opportunities *ex post*.

4.2. Mobility and voting

Greater intra-country mobility allows individuals to sort at lower costs, and hence more effectively, into the two different regions. So one might have expected that increasing mobility also strengthens the support for the integration project. Proposition 2 cautions against this expectation.

Proposition 2 (Mobility and voting). *The share of project supporters V_{PB}^{DA} (V_{RB}^{DA}) is increasing in the home country's migration costs $\bar{m}_P$ ($\bar{m}_R$), and decreasing in the neighbouring country's migration costs $\bar{m}_R$ ($\bar{m}_P$).*

Proposition 2's first part states that greater domestic mobility, i.e., lower domestic migration costs, reduces project support among Border natives. Suppose that citizens of Poor become more mobile. With lower migration costs more Poor Interior natives move to Poor Border upon project completion, in order to cross-border sell. The additional immigrants boost cross-border service supply and drive down the wage for cross-border sellers (see Proposition 1). Since those Poor Border natives who eventually cross-border sell upon project completion must expect a lower wage gain, fewer of them now find the project beneficial ex ante. Consequently, project support among Poor Border natives decreases.

Next, suppose that citizens of Rich become more mobile. With lower migration costs more Rich Interior natives move to Rich Border upon project completion and cross-border shop, thereby expanding cross-border services' demand and driving up its price (see Proposition 1). As a result, Rich Border natives who eventually cross-border shop then have to pay a higher service price, too. Their benefits from the project decline, and hence so does the project support among Rich Border natives.

By contrast, Proposition 2's second part argues that greater mobility in country j raises the number of votes for the integration project in neighbouring border region iB. As explored above, greater mobility in Poor increases the supply of cross-border services, causing the service price to turn out to be lower. Rich Border natives who cross-border shop benefit from a lower price, and support the project in greater numbers. Conversely, greater mobility in Rich boosts the demand for cross-border services upon project completion, causing cross-border sellers' wage to settle at a higher level. Poor Border natives who cross-border sell benefit from a higher wage gain, and their project support becomes greater.

Note the potential conflict suggested by Proposition 2. Greater mobility in Poor, say, increases support for the project among Rich Border natives whereas it reduces project support among Poor Border natives. Mobility changes promoting the support for the project in one border region actually erode support in the other. But then, as only a project that both border regions endorse will be implemented, mobilities in the two countries should not be 'too different' if the project is to succeed. For instance, high mobility in Poor joined with low mobility in Rich may well ensure a majority for the project in Rich Border, but it can easily drive support in Poor Border below the 50% threshold. Vice versa, low mobility in Poor joined with high mobility in Rich may result in a majority for the project in Poor Border, but it can drive support in the Rich Border below the 50% threshold. All in all, a similarly immobile population in the two countries may be more conducive to letting the project pass in both regions.

4.3. Complementarity of regional and international policies

Initial transaction costs $\bar{\theta}$ as well as leeway $\bar{\theta} - \underline{\theta}$ are determined by the international border regime, and are not under the control of the governments of Poor Border and Rich Border. In this section we analyse how variations in exogenous policy parameters $\underline{\theta}$ and $\bar{\theta}$, driven by policy changes at the national or international level, affect regional political support for the project. Throughout this analysis, project costs (and thus the tax burden) are held fixed. Our first findings in this context are summarised in

Proposition 3 (International border regulations and voting). *The project supporters' shares V_{PB}^{DA} and V_{RB}^{DA} increase if transaction costs $\underline{\theta}$ or $\bar{\theta}$ fall.*

The response of shares V_{PB}^{DA} and V_{RB}^{DA} to transaction costs $\underline{\theta}$ is not surprising. Intuitively, the more effectively the project lowers transaction costs the broader its political support will be. For example, border crossing regulations regarding public transport could have eased, thus reducing the transaction costs that apply once local authorities have built a tram crossing the border, $\underline{\theta}$. Such a measure at the international level obviously strengthens approval of public transport across the border.

The impact of pre-project transaction costs $\bar{\theta}$ on the project supporters' shares is far less obvious. If central governments cut the transaction costs that apply as long as the project is *not* carried out (i.e., $\bar{\theta}$), support for the integration project increases nonetheless. To understand this conclusion let us consider the group of individuals who become cross-border sellers once the project is carried out yet who nevertheless oppose cross-border integration politically. For these households, the income gain net of intercultural costs cannot compensate for the attendant increase in taxes and rents. However, the lower the option $\bar{\theta}$, the more attractive Poor Border, and thus the higher the rent in Poor Border even if the electorate rejects the project. In other words, option $\bar{\theta}$ becomes less attractive and, consequently, the integration project becomes relatively more attractive. More native cross-border sellers support

integration and the share of votes for the project increases. (A similar line of reasoning can be applied to Rich Border.)

Interestingly, project support increases as transaction costs $\bar{\theta}$ fall even if the 'new' pre-project transaction costs $\bar{\theta}$ are close to $\underline{\theta}$ and project costs are substantial. The resulting tax, however, cannot deter Border natives from favouring the project because again any local tax is fully capitalised into lower rents and thus completely born by absentee landlords. In this sense, project costs are politically irrelevant under absentee ownership. With native ownership, by contrast, they will be important, as explored below.

To summarise, a favourable environment in terms of low $\underline{\theta}$ and $\bar{\theta}$ strengthens local support for the integration project. In contrast, a grant s_j from country j's federal government (or any international institution) designed to partly cover project costs e_j will not do so. This conclusion holds even if, as we shall assume, Border natives do not even contribute to funding this grant.

Proposition 4 (Federal grants and voting). *A grant s_j from j's central government that reduces local project costs to $e_j - s_j$ does not affect the share of the project's supporters V_{jB}^{DA}.*

Again the capitalisation effect is crucial. While a federal grant permits the project's tax burden to fall, this fall in tax is swiftly, and wholly, capitalised into higher rents. Ultimately the grant raises only absentee landlords' incomes, rather than contributing to voters' post-project utility and pre-project support.

Of course, this strong result hinges on our assumption that the supply of land in Border is fixed. However, the crucial point of this section is that there is scope for federal government intervention *even* in the case of inelastic land supply. A federal government can still influence local voting, by manipulating the upper and lower bound of locally achievable transaction costs (see Proposition 3). Most interestingly, reducing post-project transaction costs $\underline{\theta}$ raises the benefits the project generates, but this increase is not fully capitalised into higher rents and transferred to absentee landlords, even with fixed land supply. Hence such a measure strengthens project support—in contrast to a federal grant.

4.4. Voting, welfare, and political failure

In our politico-economic analysis, we explained the effects of changes in intra-country mobility and international regulations on project support. Surely these changes also shape the project's effects on welfare. Welfare effects and politico-economic effects, however, frequently go in opposite directions. As we next show, this also is the case in our model. That is, a change that promotes the project's welfare gains may simultaneously diminish its political support.

Let welfare be defined as aggregate willingness-to-pay for the integration project, with aggregation taking place across all individuals. More precisely, since utility is expressed in units of the numeraire good x (see (2)), individual willingness-to-pay for the project in real terms amounts to $\Delta U(\bar{\theta}, \underline{\theta}, t_{jk};\ m_{jk}, z_{jk}) = U(\underline{\theta}, t_{jk};\ m_{jk}, z_{jk}) - U(\bar{\theta}, 0;\ m_{jk}, z_{jk})$. Then aggregate willingness-to-pay (*AWTP*) is

$$AWTP = \sum_{j\in\{P,R\}} \frac{N_j}{\bar{m}_j \bar{z}_j} \sum_{k\in\{B,I\}} \left(\int_0^{\bar{m}_j} \int_0^{\bar{z}_j} \Delta U(\bar{\theta}, \underline{\theta}, t_{jk}; m_{jk}, z_{jk}) dz_{jk}\, dm_{jk} \right) \tag{19}$$

Building on this definition, Proposition 5 summarises in what way politico-economic effects and welfare effects diverge.

Proposition 5 (Voting versus welfare).

(i) *While the share of project supporters V_{jB}^{DA} is increasing, aggregate willingness-to-pay for the project (i.e., AWTP) is decreasing in migration costs $\bar{m}_j$.*

(ii) *While the share of project supporters V_{jB}^{DA} increases, aggregate willingness-to-pay for the project decreases if initial transaction costs $\bar{\theta}$ fall.*

Both welfare results in Proposition 5 are fairly intuitive.[12] First, more mobile societies are more effective at sorting into the border's proximity those whose intercultural costs are the lowest. Consequently, not only does the trade gain per cross-border sale increase, total cross-border sales increase, too. Both effects contribute to raising aggregate willingness-to-pay. Second, the smaller the transaction costs prevailing even prior to project implementation, the smaller the cut in transaction costs the project achieves, and hence the smaller the aggregate willingness-to-pay for the project.

Confronting these welfare effects with the politico-economic effects derived earlier (Propositions 2 and 3) has rather unpleasant implications. Consider a project that barely receives a majority of votes yet nonetheless enjoys positive *AWTP*.[13] As mobility increases project support melts away even as *AWTP* becomes still greater. Greater mobility, while raising potential welfare gains, also makes realising these potential gains less likely. A similar negative relationship between potential welfare gains and political support is true for a reduction in initial transaction costs. Lower initial transaction costs, while diminishing the project's potential welfare gains, raise its political support. From this perspective, both of the proposition's two parts illustrate ways in which political failure can occur.

5. Ownership structure

Regions and municipalities differ in their housing ownership structures. At some border crossings most housing is owned by absentee landlords, at others most of the residents own the house they live in. We now analyse how the ownership structure shapes our conclusions.

5.1. ShoMig equilibrium and native ownership

So far we have discussed voting in the case of absentee ownership. Now we assume that each individual owns the unit of housing she initially lives in. We refer to this ownership structure as *native ownership*. With native ownership, and in contrast to absentee ownership, Border natives staying in their home region no longer have to pay rent r_{jB} while Border natives emigrating to Interior now receive r_{jB} from renting out their Border plot left behind. Correspondingly, Interior natives remaining in their home region no longer receive r_{jB} from Border tenants while Interior natives moving into Border now have to pay rent r_{jB}. Utility levels of Border (Interior) natives thus increase (decrease) by r_{jB} relative to the case of absentee ownership, no matter what option they choose (see (4), (8), (10) and (12)).

At the same time the ownership structure turns out to be irrelevant to equilibrium prices and quantities. Intuitively, for individual choices it is opportunity costs that matter, rather than property rights. These opportunity costs depend on rent differentials, rather than on who pays or receives rents. For instance, consider the trade-off that a Poor Border native faces when comparing the two alternatives (PB, PB) and (PB, PI) above. With native ownership,

[12] The earlier working paper version contains a proof. See Proposition 4 in Dascher and Haupt (2008).

[13] Dascher and Haupt (2008) show that the *AWTP* of every project that gains a majority at the polls is indeed positive.

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emigration yields r_{PB} from renting out her plot in Poor Border while requiring r_{PI} to be paid for housing in Poor Interior. With absentee ownership, emigration to Poor Interior saves r_{PB} while requiring r_{PI}. Under both regimes the resulting rent differential, and hence the migration cost threshold $\tilde{m}_{PB}$, is the same. More generally, the thresholds $\tilde{z}_{jB}$, $\tilde{m}_{jB}$, $\hat{z}_{jB}$ and $\tilde{z}_{jI}$ do not depend on the ownership structure. Hence neither do the prices (p_C, r_{PB}, r_{RB}) or quantities $(Y, C_{jB}, M_{jB}, M_{jI})$ obtained in ShoMig equilibrium.

5.2. Native ownership and voting

While switching from absentee ownership to native ownership does not alter the ShoMig equilibrium, such switching does affect, via its distributional implications, the voting outcome. Let V_{jB}^{DN} denote the share of project supporters under *native ownership* (hence the superscript N). Using this notation, and focusing on an 'interior' voting equilibrium, we summarise the key additional insights here in

Proposition 6 (Native ownership and voting).

(i) *The share of project supporters is greater with native ownership than with absentee ownership. That is,* $V_{jB}^{DN} > V_{jB}^{DA}$.
(ii) *The share of project supporters* V_{jB}^{DN} *is decreasing (increasing) in migration costs* $\bar{m}_j$ *if the project's tax burden* t_{jB} *is sufficiently small (large).*
(iii) *The share of project supporters* V_{jB}^{DN} *is increasing in the federal grant* s_j.

The economic intuition behind Proposition 6's first part is straightforward enough. The benefits from the project are partly capitalised in higher Border rents. Native ownership ensures that these benefits accrue to Border natives. It thus reinforces the number of votes in favour of the integration project in two ways. First, more Border natives who stay in Border benefit from the project. With native ownership, cross-border sellers' wage gains or cross-border shoppers' shopping bargains are no longer diluted by rising rents. Specifically, the intercultural cost voting threshold for the case of *native ownership* becomes

$$\tilde{z}_{jB}^{DN} = \tilde{z}_{jB}^{DA} + \Delta r_j = \tilde{z}_{jB} - t_{jB} = \begin{cases} (w_C - w_P) - t_{PB} & \text{if } j = P, \\ (p_R - p_C - \theta) - t_{RB} & \text{if } j = R, \end{cases} \tag{20}$$

where $\tilde{z}_{jB}^{DN} > \tilde{z}_{jB}^{DA}$ for $\Delta r_j > 0$, as illustrated in Fig. 3.

Second, which is more interesting, under native ownership some of those Border natives who move to Interior now also support the project. These individuals gain a differential Δr_j as they rent out their property in Border at r_{jB} while having to pay only r_{jI} for housing in Interior. Thus those whose migration costs are $m_{jB} < \Delta r_j$ support, whereas those with costs $m_{jB} \geqslant \Delta r_j$ turn out against, the project. Specifically, the migration cost voting threshold for the case of *native ownership* is

$$\tilde{m}_{jB}^{DN} = \tilde{m}_{jB} - t_{jB} = \Delta r_j, \tag{21}$$

and is also illustrated in Fig. 3.[14] Intuitively, native ownership makes the project palatable to those who can easily cash in on the rent differential. This is reminiscent of Wildasin (1986, 90). Combining (21) with (20) yields the resulting share of project supporters

$$V_{jB}^{DN} = \left[\bar{m}_j \tilde{z}_{jB}^{DN} + \tilde{m}_{jB}^{DN}(\bar{z}_j - \tilde{z}_{jB}^{DN})\right] / (\bar{m}_j \bar{z}_j). \tag{22}$$

Compared with project support under absentee ownership V_{jB}^{DA}, project support now rises by those extra individuals who exhibit characteristics within Fig. 3's lightly shaded area. Most importantly, with native ownership the capitalisation of project gains as higher Border rents no longer acts as a barrier to cross-border integration.

The second part of Proposition 6 states that the negative relationship between mobility and political support true under absentee ownership (see Proposition 2) may actually be the reverse under native ownership. To set the stage for a more detailed discussion of this result, we briefly consider it at its most intuitive. Recall that Border natives support the project for two very different motives. Supporters from one (the 'first') group welcome the project because they themselves want to cross-border trade in order to benefit from a wage gain, whereas supporters from the other (the 'second') group welcome the project because they want to move to Interior in order to cash in on the rent differential. With absentee ownership, the second group has no members. Lower migration costs then merely drive down membership in the first group, as discussed in Section 4. With native ownership, in contrast, lower migration costs not just drive down membership in the first group, they also drive up membership in the second. With greater mobility, more Border natives find that their migration costs fall short of the rent differential they can cash in on, and thus support the project. Which of the two opposing effects dominates ultimately depends on project costs. The second effect dominates the first if the project is inexpensive, and vice versa if the project is very costly.

Let us now explore the role of migration costs in more detail. We distinguish between two cases. Suppose first that the project is free so that taxes are zero. Then voting thresholds $\tilde{m}_{jB}^{DN}$ and $\tilde{z}_{jB}^{DN}$ reduce to $\tilde{m}_{jB}$ and $\tilde{z}_{jB}$, respectively. All Border natives eventually involved in cross-border trade in services or Border–Interior migration also benefit from the project, either by gains from trade or by cashing in on rent differentials. More compactly, supporters coincide with cross-border traders. (See Fig. 3 and recall that each Border native emigrating is replaced by a cross-border trading Interior native.) Thus supporters' numbers are Y in Rich, and Y/b in Poor. Now, since sales Y are decreasing with migration costs $\bar{m}_j$ (see Proposition 1, Part i), then so are the number of supporters. In fact, the supporters' ranks are decreasing with $\bar{m}_j$ even if taxes t_{jB} are strictly positive as long as these taxes remain sufficiently small.

Alternatively suppose that taxes are 'large'. We distinguish between the effect of large taxes on project support from those leaving for Interior and on project support from those staying behind to cross-border sell or shop. First, note that taxes levied on Border residents are completely born by landowners, as the supply of land is fixed in Border. Higher taxes completely capitalise into lower Border rent and, hence, into a smaller interregional rent differential (see (6) and (14)). For sufficiently large t_{jB}, the interregional rent differential thus vanishes, resulting in $\Delta r_j = 0$. Then, with no rent differential left, no longer can a Border native leaving for Interior gainfully rent out the property left behind. She turns against the project, implying $\tilde{m}_{jB}^{DN} = 0$.

Similarly, and second, support for the project from those staying in Border also fades away with rising taxes. For sufficiently large t_{jB}, and thus $\Delta r_j = 0$, the intercultural cost voting thresholds with native and absentee ownership, $\tilde{z}_{jB}^{DN}$ and $\tilde{z}_{jB}^{DA}$, coincide (see (17) and (20)). But with $\tilde{m}_{jB}^{DN} = 0$ and $\tilde{z}_{jB}^{DN} = \tilde{z}_{jB}^{DA}$ we are, in terms of political support, effectively back in the case of absentee ownership. Thus our earlier insight of project support V_{jB} increasing with $\bar{m}_j$ (see Proposition 2) directly carries over from absentee to native ownership. Put differently, if taxes are too large, then even native ownership cannot prevent approval from falling as mobility rises.

[14] To avoid tedious discussions of boundary solutions, we focus on an interior solution, i.e., $\Delta r_j > 0$ and thus $\tilde{m}_{jB}^{DN} > 0$. A sufficient condition for such an outcome is that the tax t_{jB} does not exceed $\tilde{z}_{jB}^2/2\bar{z}_j$, a term that is independent of tax t_{jB} (see Lemma 4 in Appendix A).

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The third part of Proposition 6 once more underlines that our previous results crucially depend on the housing ownership structure. With native ownership, a federal grant reinforces project support, rather than failing to raise it as with absentee ownership (see Proposition 4). This is for two reasons. First, a federal grant softens the local tax burden. With native ownership, this direct effect serves those Border natives well who stay put in order to cross-border trade. And second, a federal grant entirely capitalises into higher rent, as discussed. With native ownership, this indirect effect benefits those Border natives who decide to leave, permitting them to obtain a greater rental for the property left behind. Consequently, project support is unambiguously greater.

6. Centralised decision making

So far we have assumed that only Poor Border and Rich Border decide on, and pay for, the regional integration project (but we have allowed for federal grants to co-finance the project). We have referred to this setting as *decentralised decision making*. In many countries, however, even projects which are rather regional in scope, such as local public transport, are both centrally decided on and centrally funded. For this reason we now turn to *centralised decision making*.

6.1. ShoMig equilibrium and centralised decision making

To capture *centralised decision making*, we assume that both Border and Interior natives now vote on the project. Only if a majority in each country endorse the project will it be implemented. Each country's cost share will subsequently be covered by a *country-wide* lump-sum tax

$$t_j^C = e_j/2N_j = t_{jB}/2. \tag{23}$$

For given project costs e_j, the 'new' tax t_j^C is, of course, lower than its 'old' counterpart t_{jB} (see (1)), for the simple reason that the very same financial burden now is shared among a larger population.

Let us briefly discuss how replacing the 'old' financial arrangement by the 'new' one affects the ShoMig equilibrium obtained once the project is implemented. On the one hand, scrapping the old regional tax t_{jB} increases Border rent r_{jB} by exactly t_{jB}, or e_j/N_j. Once more this reflects the fact that landlords completely bear a Border specific tax, and thus also completely enjoy the benefit linked to its reduction. Thus threshold $\tilde{m}_{jB}$ does not change. Neither do any of the other thresholds $\tilde{z}_{jB}$, $\hat{z}_{jB}$ and $\tilde{z}_{jI}$. Nor does a ShoMig equilibrium's service price p_C or quantities $(Y, C_{jB}, M_{jB}, M_{jI})$.

On the other hand, the new country-wide tax obviously reduces individuals' utilities evenly by t_j^C, irrespectively of their decisions on whether to move or cross-border trade (see (4), (8), (10) and (12)). Again, thresholds $\tilde{m}_{jB}, \tilde{z}_{jB}, \hat{z}_{jB}$ and $\tilde{z}_{jI}$ do not change, and again the ShoMig equilibrium remains unaffected. To summarise, the only difference between the ShoMig equilibrium obtained for the new country-wide tax t_j^C and that obtained with the old regional tax t_{jB} is the increase in Border rent by t_{jB}.

6.2. Absentee ownership and country-wide voting

Having analysed the impact of the new financial arrangement on the ShoMig equilibrium, we next discuss the outcome of country-wide voting, and contrast it with that of regional voting. We start by considering the case of *centralised decision making and absentee ownership*, as indicated by superscripts *C* and *A*.

Proposition 7 (Absentee ownership and centralised decision making).

(i) *With absentee ownership, the share of Border natives supporting the regional integration project is greater under decentralised decision making than under centralised decision making. That is,* $V_{jB}^{DA} > V_{jB}^{CA}$.
(ii) *With absentee ownership, all Interior natives support the project. That is,* $V_{jI}^{CA} = 1$.

Surprisingly, when switching from decentralised to centralised decision making, project support among cross-border sellers (shoppers) native to Poor Border (Rich Border) actually declines even though the financial burden now is shouldered by Interior residents, too. The reason is that Border natives actually suffer from replacing the regional tax by a country-wide one. For those who stay in Border, the savings tied to discarding the regional tax t_{jB} are exactly offset by the resulting rise in Border rent r_{jB}, as explained above. In addition, these individuals now have to pay the 'new' country-wide tax t_j^C. Taken together, these developments make them worse off by t_j^C. Project support among Border natives falls accordingly.[15]

Unlike Border natives, Interior natives indiscriminately benefit from, and hence support, the project. Interior natives benefit either through higher rent income or through taking advantage of cross-border selling or shopping. Surprisingly, project gains are even greater under centralised decision making even though Interior residents now also have to contribute to the project's funding. For those Interior natives remaining in Interior, post-project rental income increases by an extra t_{jB}, which is more than the extra tax t_j^C. Also, Interior natives who move to Border gain further from now merely paying t_j^C, being less than the previous t_{jB}.

6.3. Native ownership and country-wide voting

As we have already seen, the ownership structure can substantially influence the voting outcome. Thus, we next analyse the combination of *centralised decision making* and *native ownership*, as indicated by superscripts *C* and *N*. Our conclusions will once more be set against the outcomes observed under decentralised decision making.

Proposition 8 (Native ownership and centralised decision making).

(i) *With native ownership, the share of Border natives supporting the regional integration project is greater under centralised decision making than under decentralised decision making. That is,* $V_{jB}^{CN} > V_{jB}^{DN}$.
(ii) *With native ownership, only a proper subset of those Interior natives moving into Poor Border (Rich Border) in order to cross-border sell (cross-border shop) support the project. All other Interior natives oppose it.*

Border natives who stay put are better off under centralised than under decentralised decision making because centralisation shrinks their tax bill, from t_{jB} to t_j^C. Likewise, Border natives who leave for Interior are also better off under centralised decision making. With central financing instead of regional, the rent they obtain from renting their Border property to incoming Interior natives increases by t_{jB}, which more than compensates them for the

[15] In comparison to decentralised decision making, those Border natives who move to Interior also lose out, given that now they have to contribute t_j^C to the project even if they emigrate.

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country-wide tax t_j^C they now have to pay even in Interior. Consequently, under centralised decision making, more Border natives endorse the project.

With native ownership, Interior natives who move to Border and become cross-border sellers or shoppers can indeed reap the project's benefits. Yet only those among them whose wage gain $w_C - w_P$ or expenditure saving $p_R - (p_C + \theta)$ net of the rent differential Δr_j exceeds their migration and intercultural costs $m_{jI} + z_{jI}$ by more than the country-wide tax t_j^C can ultimately gain from, and hence support, the project. All other Interior natives oppose the project, to avoid t_j^C.

6.4. Mobility and country-wide voting

The previous discussion of the effect of intra-country mobility on voting assumed that decision making was decentralised. We now complete this discussion by exploring how mobility affects voting if decision making is centralised.

Proposition 9 (*Mobility and centralised decision making*).

(i) *With absentee ownership, the share of Border project supporters V_{jB}^{CA} is increasing in migration costs $\bar{m}_j$, while the share of Interior project supporters V_{jI}^{CA} is constant in $\bar{m}_j$.*
(ii) *With native ownership, both Border and Interior project supporters' shares V_{jB}^{CN} and V_{jI}^{CN} are decreasing (increasing) in migration costs $\bar{m}_j$ if the project's tax burden t_P^C is sufficiently small (large).*

The first part of Proposition 9 addresses centralised decision making in the case of absentee ownership. Its results largely parallel Proposition 2. Greater mobility reduces Border natives' support for the project without regard to whether decision making is centralised or decentralised. The reasons for the decline in support are the same under both decision making regimes, and were discussed in detail in the context of decentralised decision making. In addition, the first part of Proposition 9 also emphasises that variations in mobility do not affect Interior natives' project support at all, for the simple reason that this support is total anyway.

The second part of Proposition 9 turns to the analysis of centralised decision making in the case of native ownership. We find that V_{jB}^{CN} and V_{jI}^{CN} depend on migration costs $\bar{m}_j$ in much the same way as does V_{jB}^{DN} (see Proposition 6, Part ii). This similarity is particularly apparent when comparing the response of V_{jB}^{CN} with respect to changes in migration costs $\bar{m}_j$ to that of V_{jB}^{DN}. The reasons for the increase, or decrease, in project support are again the same under both decision making regimes, and were explored in detail in the earlier context of decentralised decision making.

To better see the similarity between the response of V_{jI}^{CN} to changes in migration costs $\bar{m}_j$ and that of V_{jB}^{DN}, we first consider the extreme case where project costs and thus tax t_j^C are zero. Then all M_{jI} Interior natives eventually engaged in cross-border trade benefit from the project, and therefore approve the project. Since their number M_{jI} declines as migration costs $\bar{m}_j$ rise (see Proposition 1, Part ii), supporter share V_{jI}^{CN} falls accordingly. This is true even for a positive but sufficiently low tax.

Alternatively, consider the other extreme of very high project costs where, initially, the tax t_j^C absorbs the project's entire gross gain, as captured by wage gain $w_C - w_P$ in Poor or expenditure saving $p_R - p_C - \theta$ in Rich. In this extreme case, no Interior native can hope to benefit from cross-border trading. Next, consider an increase in $\bar{m}_j$. This increase lifts country j's gross gain, for instance by raising wage w_C in the case of Poor (see Proposition 1, Part i), making the project newly beneficial to at least some of its Interior natives. Given a sufficiently large tax, hence, supporters' share V_{jI}^{CN} increases with migration costs $\bar{m}_j$.

7. Comparison and discussion

We now connect our results and draw an overall picture. Let us first compare the shares of Border natives rallying round the project under the various ownership structures and decision making regimes. Jointly, Propositions 6–8 imply the following clear ranking:

$$V_{jB}^{CN} > V_{jB}^{DN} > V_{jB}^{DA} > V_{jB}^{CA}. \tag{24}$$

This ordering reveals the following features. First, project support is always greater with native than with absentee ownership, no matter whether decision making is centralised or decentralised. Recall that project benefits are partly capitalised in higher Border rents. With absentee ownership, these rent gains are transferred to Interior landlords, depressing project support among Border natives. With native ownership, in contrast, these rent gains accrue to Border natives, fostering project support among them.

Second, the ranking of project support under the two decision making regimes is inconclusive. Recall that switching from decentralised to centralised decision making lowers the tax on Border residents but raises the tax on Interior residents and drives up Border rents. As discussed in Section 6, the rise in rent exceeds the change in the tax burden in absolute values. With native ownership, switching from decentralised to centralised decision making increases the project benefit to Border natives, because either they stay put and pay lower taxes or they move to Interior and cash in on higher Border rents. Consequently, project support among Border natives increases (see Proposition 8, Part i). With absentee ownership, in contrast, switching to centralised decision making decreases the project benefit to Border natives, because either they stay put and pay higher rents, or they move to Interior and must pay the country-wide tax. Consequently, project support among Border natives declines (see Proposition 7, Part i).

Let us next consider Interior natives. Naturally, Interior natives' political preferences only matter in the case of centralised decision making. Here Propositions 7 and 8 imply

$$V_{jI}^{CA} > V_{jI}^{CN}. \tag{25}$$

Unsurprisingly, project support in Interior is stronger under absentee ownership than under native ownership. With absentee ownership, Interior natives benefit from an increase in Border rents whereas with native ownership, Interior natives cannot benefit from this capitalisation of project gains into Border rents.

As our analysis shows, the ownership regime and degree of centralisation can work against project approval. Moreover, rising intra-country mobility can further depress popular support. From an intuitive perspective, this must come as a surprise. After all, the initial spatial allocation assigns far too many individuals to the 'wrong' region. Initially, many individuals endowed with large intercultural costs happen to be natives of Border, while many individuals endowed with low intercultural costs are born in Interior. In this context, greater mobility promises to overcome this misallocation, promoting the overall gains to be had from the project (see Proposition 5). So one might expect that rising mobility between Border and Interior boosts the support the project can muster.

However, this expectation is not generally justified. In the case of absentee ownership greater mobility in fact *reduces* the number of votes behind the project, irrespective of the degree of centralisation (see Propositions 2 and 9). Nor is this expectation even justified if ownership is native. Irrespective of the degree of centralisation, rising mobility will reinforce project support only if ownership is native *and* taxes are sufficiently low (see Propositions 6 and 9).

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When complemented by federal grants, decentralised decision making settles in somewhere between the purely centralised and the purely decentralised case. As it turns out, a federal grant raises support for the project with native ownership only (see Propositions 4 and 6). The federal grant thus widens the gap between vote shares V_{jB}^{DN} and V_{jB}^{DA}.

With absentee ownership, project support in Border increases if either boundary $\underline{\theta}$ or boundary $\bar{\theta}$ falls (see Proposition 3). As a consequence, liberalising international border regulations by implementing a lower $\bar{\theta}$ might trigger accompanying measures at the regional level, ultimately leading to transaction costs $\underline{\theta}$. We observe a 'multiplier effect'.

We emphasise that the model's four region setup is indispensable to our analysis. This is most evident in the case of absentee ownership and zero project costs. Even when the project does not cause any tax burden at all Border natives may still lose from integration, given that the project-induced inflow of Interior natives drives up Border rent. Thus, connecting a country's border region to its interior region via interregional mobility and endowing each region with a local property market crucially shape the distributional conflicts. This feature distinguishes our approach from traditional trade liberalisation models. (Recall that in our setting trade in the tradeable good is already free.)

Some qualifications to our results should be discussed. First, we have contrasted two extreme ownership structures, absentee ownership and native ownership. In reality some border region plots will be owned by absentee landlords, others by Border natives. The 'true' scenario thus certainly falls in between our two extreme cases, thereby giving rise to the wide range of political preferences present in both border and interior regions.

Second, the assumption of fixed land supply in border regions exaggerates the relevance of the housing ownership structure. Fixed land supply obviously overstates the price changes following variations in land demand. Allowing for land development in border regions would soften the effects associated with rents. However, allowing for land development in border regions would not completely eliminate the fundamental importance of housing ownership.

8. Concluding remarks

We have carried out a politico-economic analysis of a cross-border regional integration project. Our framework accounts for the fact that individuals differ in their intercultural ability and intra-country mobility. Our conclusions, as summarised in the previous section, show how the political outcome depends on intra-country mobility, on the decision making regime, on the housing ownership structure, and on federal grants and international regulations. It is these key factors that fundamentally shape the distribution of cross-border integration's benefits and costs between individuals and regions within either country.

Land markets are crucial to our analysis. However, similar conclusions may result from models that focus on labour markets, say, and ignore land markets. Consider, for instance, workers in the rich country's service sector. As soon as we allow for frictions in the labour markets, these workers potentially suffer from tougher competition from service providers in Poor Border. While some of the service providers in Rich Border are mobile between sectors and can easily ply their skills in the industrial sector too, others are immobile and cannot use their specific skills in the industrial sector. Workers differ in their intersectoral mobility as they differ in their intra-country mobility in the current model. Those who are intersectorally immobile are particularly hit by the downturn in the service sector in Rich Border, and oppose any integration project. In contrast, individuals who are highly mobile between sectors, or work in the industrial sector from the outset, and who greatly benefit from cross-border shopping (due to low intercultural costs) support the project. Intersectoral mobility and intercultural ability may shape project support in such a modified framework as strongly as intra-country mobility and intercultural ability do in the current setting. We leave the details for future research.

Throughout the paper our focus has been on cross-border shopping in its narrow sense. But many features we have discussed may be important in other contexts, too, for instance in connection with the *maquiladora* industries strung along the US–Mexican border. Of course, in the case of the *maquiladoras*, it is US firms located in the proximity of the border, not consumers, that 'cross-border shop', by sourcing out the production of labour-intensive intermediate goods to the Mexican side of the border where wages are lower (see, e.g., Grunwald, 1985; Hanson, 1996, 2001; Bergin et al., 2009).

Since we focus on the role of intercultural ability and intercultural contacts in services, our approach could also be fruitfully applied to analysing tourism. Projects to develop tourist spots yield better-paid jobs for those workers who enjoy interacting with foreigners. But they also drive up rents in these tourist spots. Individuals with low intercultural costs can be expected to flock into tourist areas, thereby crowding out others with high intercultural costs, etc. The similarities between promoting cross-border shopping and tourism are obviously striking. Again, we leave the details for further research.

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Appendix A

The appendix proves all propositions in the text (with the exception of Proposition 5, which is proven in Dascher and Haupt (2008, Proposition 4 therein)). Auxiliary results are stated as Lemmas 1–4. We give the Lemmas first, and proceed with the proofs of the propositions then.

Lemma 1. *$\tilde{z}_{PB} - \tilde{m}_{PB}$ is increasing in p_C, and $\tilde{z}_{RB} - \tilde{m}_{RB}$ is decreasing in $p_C + \theta$.*

Proof of Lemma 1. We only show the Lemma's first part. The proof of its second part is similar. Using (14) we may rewrite $\tilde{z}_{PB} - \tilde{m}_{PB}$ as:

$$\tilde{z}_{PB} - \tilde{m}_{PB} = \tilde{z}_{PB}(2\bar{z}_P - \tilde{z}_{PB})\frac{1}{2\bar{z}_P}$$

Pick two different levels of $\tilde{z}_{PB}$, i.e., $\tilde{z}'_{PB} < \tilde{z}''_{PB}$. Then

$$0 < (\tilde{z}''_{PB} - \tilde{z}'_{PB})(2\bar{z}_P - \tilde{z}'_{PB} - \tilde{z}''_{PB})$$
$$\iff \tilde{z}'_{PB}(\tilde{z}''_{PB} - \tilde{z}'_{PB}) < (\tilde{z}''_{PB} - \tilde{z}'_{PB})(2\bar{z}_P - \tilde{z}''_{PB})$$
$$\iff \tilde{z}'_{PB}(2\bar{z}_P - \tilde{z}'_{PB})/2\bar{z}_P < \tilde{z}''_{PB}(2\bar{z}_P - \tilde{z}''_{PB})/2\bar{z}_P$$

The third inequality follows from adding $\tilde{z}'_{PB}(2\bar{z}_P - \tilde{z}''_{PB})$ to both sides of the second, and dividing through by $2\bar{z}_P$. We conclude that $\tilde{z}_{PB} - \tilde{m}_{PB}$ is increasing (i.e., strictly increasing) in $\tilde{z}_{PB}$. Since $\tilde{z}_{PB}$ is increasing in p_C (see (5) and (3)), $\tilde{z}_{PB} - \tilde{m}_{PB}$ is increasing in p_C. □

Lemma 2. *Excess demand for cross-border services, E, is decreasing in p_C, decreasing in θ, and increasing in $\bar{m}_P$.*

Proof of Lemma 2. By inspection of Fig. 1,

$$Y_P(p_C, \bar{m}_P) = [\bar{m}_P\tilde{z}_{PB} + (\bar{z}_P - \tilde{z}_{PB})\tilde{m}_{PB}]\frac{bN_P}{\bar{z}_P\bar{m}_P} \tag{26}$$

$$Y_R(p_C, \theta, \bar{m}_R) = [\bar{m}_R\tilde{z}_{RB} + (\bar{z}_R - \tilde{z}_{RB})\tilde{m}_{RB}]\frac{N_R}{\bar{z}_R\bar{m}_R} \tag{27}$$

Define excess demand as

$$E(p_C, \theta, \bar{m}_P, \bar{m}_R) \equiv Y_R(p_C, \theta, \bar{m}_R) - Y_P(p_C, \bar{m}_P) \tag{28}$$

Since $\tilde{z}_{PB}$ and $\tilde{m}_{PB}$ are increasing in p_C (see (5) and (14)), point $(\tilde{m}_{PB}, \tilde{z}_{PB})$ also is increasing in p_C, in the natural order of $\mathscr{R}^2$. Clearly, Y_P is then increasing in p_C. Similarly, since $\tilde{z}_{RB}$ and $\tilde{m}_{RB}$ are decreasing (i.e., strictly decreasing) in $(p_C + \theta)$ (see (11) and (14)), point $(\tilde{m}_{RB}, \tilde{z}_{RB})$ is decreasing in $(p_C + \theta)$. Clearly, Y_R is then decreasing in $(p_C + \theta)$, and hence in p_C and θ.

Since both $-Y_P$ and Y_R are decreasing in p_C, excess demand E as the sum of two decreasing functions also is decreasing in p_C. Since Y_R is decreasing in θ, E also is decreasing in θ. And since $-Y_P$ is increasing in $\bar{m}_P$ for given p_C (see (26)), so is E. □

Lemma 3. *The equilibrium cross-border service price p_C is decreasing in θ.*

Proof of Lemma 3. Assume that the equilibrium price p_C is not decreasing in θ. I.e., assume that there exist two different transaction costs $\theta' < \theta''$ with corresponding equilibrium prices $p'_C \leqslant p''_C$. Note first that $0 = E(p''_C, \theta'')$, by definition. Next, $E(p''_C, \theta'') < E(p''_C, \theta')$, given that E is decreasing in θ (Lemma 2). And, $E(p''_C, \theta') \leqslant E(p'_C, \theta')$ given that E is decreasing in p_C (again, Lemma 2). Joining (in)equalities yields $0 < E(p'_C, \theta')$. But then p'_C is not the equilibrium price for θ'. This is a contradiction. □

Lemma 4. *Cross-border service price p_C, intercultural cost threshold $\tilde{z}_{jB}$ and migration cost threshold $\tilde{m}_{jB}$ all are constant in taxes t_{PB} and t_{RB}. Instead, increases (reductions) in t_{jB} are exclusively, and wholly, capitalised into equal-sized reductions (increases) in Δr_j. Also, rent differential Δr_j is non-negative after project implementation if $t_{jB} \leqslant \tilde{z}^2_{jB}/(2\bar{z}_j)$ holds.*

Proof of Lemma 4. By virtue of (14), replace $\tilde{m}_{jB}$ on the r.h.s. of (26) and (27) by $[\tilde{z}_{jB}]^2/2\bar{z}_j$. Both service supply and service demand thus are functions of $\tilde{z}_{PB}$ and $\tilde{z}_{RB}$. Since $\tilde{z}_{PB}$ and $\tilde{z}_{RB}$ themselves are functions of p_C (see (5)), service supply and demand depend on p_C and exogenous parameters $\bar{m}_j$, $\bar{z}_j$, N_j, θ and b, but not on taxes t_{jB}. This reveals that p_C must be constant in taxes t_{PB} and t_{RB}, and hence so must $\tilde{z}_{jB}$ and $\tilde{m}_{jB}$. Further, note that if $\tilde{m}_{jB} = \Delta r_j + t_{jB}$ is constant in tax t_{jB}, then any increase in t_{jB} must exclusively, and wholly, capitalise into an equal-sized reduction in Δr_j. Finally, migration equilibrium (14) directly implies $\Delta r_j \geqslant 0$ if $t_{jB} \leqslant \tilde{z}^2_{jB}/(2\bar{z}_j)$.

Proof of Proposition 1 (*Interregional mobility and ShoMig equilibrium*). We focus on comparative statics with respect to $\bar{m}_P$. The proof of comparative statics properties with respect to $\bar{m}_R$ is similar.

Part (i):(a) Assume that the equilibrium price p_C is not increasing in $\bar{m}_P$. That is, assume that there exist two different migration costs $\bar{m}'_P < \bar{m}''_P$ with corresponding equilibrium prices $p'_C \geqslant p''_C$. Note first that $0 = E(p''_C, \bar{m}''_P)$ by definition. Next, $E(p''_C, \bar{m}''_P) > E(p''_C, \bar{m}'_P)$, given that E is increasing in $\bar{m}_P$ (Lemma 2). And, $E(p''_C, \bar{m}'_P) \geqslant E(p'_C, \bar{m}'_P)$, given that E is decreasing in p_C (Lemma 2). Joining (in)equalities yields $0 > E(p'_C, \bar{m}'_P)$. Hence p'_C is not the equilibrium price given $\bar{m}'_P$. This is a contradiction.

(b) Wage w_C is increasing in p_C, by inspection of (3). Since p_C is increasing in $\bar{m}_P$ (see (a)), w_C is increasing in $\bar{m}_P$.

(c) Equilibrium demand Y_R is decreasing in p_C (Proof of Lemma 2). Since p_C is increasing in $\bar{m}_P$ (see (a)), Y_R is decreasing in $\bar{m}_P$. But then equilibrium supply Y_P, and hence cross-border equilibrium sales Y, are also decreasing in $\bar{m}_P$.

(d) Poor Border rent r_{PB} is increasing in w_C, by inspection of (14) joint with (5). Since w_C is increasing in $\bar{m}_P$ (see (b)), r_{PB} is also increasing in $\bar{m}_P$.

(e) Rich Border rent r_{RB} is decreasing in p_C, by inspection of (14) joint with (11). Since p_C is increasing in $\bar{m}_P$ (see (a)), r_{RB} is decreasing in $\bar{m}_P$.

Part (ii): (a) Consider the intersection of the $\tilde{z}_{PB}$-line with the z-axis first, i.e., $\tilde{z}_{PB}$. Since $\tilde{z}_{PB}$ is increasing in p_C (see (5)), and since p_C is increasing in $\bar{m}_P$ (Part (i), (a)), $\tilde{z}_{PB}$ is increasing in $\bar{m}_P$. Consider next the intersection of the $\tilde{z}_{PB}$-line with the z-axis, i.e., $\tilde{z}_{PB} - \tilde{m}_{PB}$. Suppose $\bar{m}'_P < \bar{m}''_P$. We distinguish between two cases. In the first case $\tilde{z}''_{PB} - \tilde{m}''_{PB} \geqslant \tilde{z}'_{PB}$. Then $C''_{PB} > C'_{PB}$ is obvious. In the second case, where $\tilde{z}''_{PB} - \tilde{m}''_{PB} < \tilde{z}'_{PB}$, this inequality is somewhat less obvious. However,

$$\begin{aligned}
C'_{PB} &= \left[\tilde{z}'_{PB}\bar{m}'_P - 0.5(\tilde{m}'_{PB})^2\right]\frac{N_P}{\bar{m}'_P\bar{z}_P} \\
&< \left[\tilde{z}'_{PB}\bar{m}''_P - 0.5(\tilde{m}'_{PB})^2\right]\frac{N_P}{\bar{m}''_P\bar{z}_P} \\
&< \left[\tilde{z}'_{PB}\bar{m}''_P - 0.5(\tilde{z}'_{PB} - (\tilde{z}''_{PB} - \tilde{m}''_{PB}))^2\right]\frac{N_P}{\bar{m}''_P\bar{z}_P} \\
&< \left[\tilde{z}''_{PB}\bar{m}''_P - 0.5(\tilde{z}''_{PB} - (\tilde{z}''_{PB} - \tilde{m}''_{PB}))^2\right]\frac{N_P}{\bar{m}''_P\bar{z}_P} \\
&= \left[\tilde{z}''_{PB}\bar{m}''_P - 0.5(\tilde{m}''_{PB})^2\right]\frac{N_P}{\bar{m}''_P\bar{z}_P} = C''_{PB}
\end{aligned}$$

The second inequality follows from the first by the fact that $\tilde{z}'_{PB} - (\tilde{z}''_{PB} - \tilde{m}''_{PB}) < \tilde{m}'_{PB}$, as apparent from Fig. 4. The third inequality follows from the second by comparison of the corresponding areas in Fig. 4. We conclude that C_{PB} is increasing in $\bar{m}_P$.

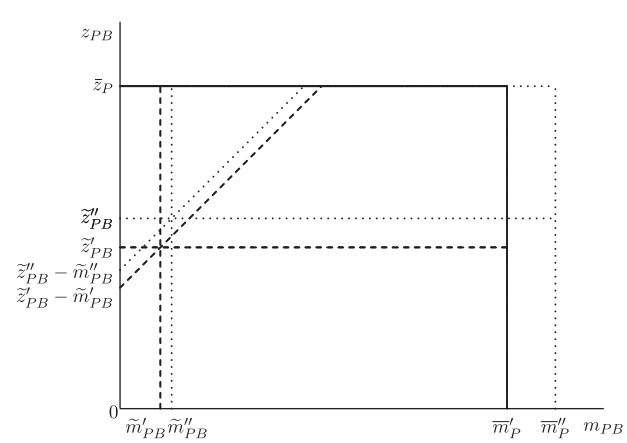

Fig. 4. An increase in migration costs in poor.

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(b) Since cross-border sales Y_P and hence the total number of cross-border sellers Y_P/b are decreasing in $\bar{m}_P$ (Part (i), (c)), and since C_{PB} is increasing in $\bar{m}_P$ (see (a)), $M_{PI} = Y_P/b - C_{PB}$ as the sum of two decreasing functions, Y_P/b and $-C_{PB}$, must be decreasing in $\bar{m}_P$.

Part (iii): (a) Recall that $\tilde{z}_{RB}$ and $\tilde{z}_{RB} - \tilde{m}_{RB}$ are both decreasing in p_C (see (11) and Lemma 1). Hence C_{RB} is decreasing in p_C. Since p_C is increasing in $\bar{m}_P$ (Part (i), (a)), C_{RB} is decreasing in $\bar{m}_P$.

(b) Note that $M_{RI} = 0.5\,(\tilde{z}_{RB} - \tilde{m}_{RB})^2$. Since M_{RI} is increasing in $\tilde{z}_{RB} - \tilde{m}_{RB}$, since $\tilde{z}_{RB} - \tilde{m}_{RB}$ is decreasing in p_C (Lemma 1), and since p_C is increasing in $\bar{m}_P$ (Part (i), (a)), M_{RI} is decreasing in $\bar{m}_P$. □

Proof of Proposition 2 (*Mobility and voting*). Recall that $\tilde{z}^{DA}_{PB} = \tilde{z}_{PB} - \tilde{m}_{PB}$ (see (17)). Since $\tilde{z}_{PB} - \tilde{m}_{PB}$ is increasing in p_C (Lemma 1), and since p_C is increasing in $\bar{m}_P$ (Proposition 1, Part (i)), $\tilde{z}^{DA}_{PB}$ is increasing in $\bar{m}_P$. But then $V^{DA}_{PB} = \tilde{z}^{DA}_{PB}/\bar{z}_P$ is increasing in $\bar{m}_P$. Similar reasoning applies to the response of V^{DA}_{RB} to a change in $\bar{m}_R$.

Next, since $\tilde{z}^{DA}_{PB} = \tilde{z}_{PB} - \tilde{m}_{PB}$ is increasing in p_C (Lemma 1) and since p_C is decreasing in $\bar{m}_R$ (Proposition 1, Part (i)), $\tilde{z}^{DA}_{PB}$ is decreasing in $\bar{m}_R$. We conclude that V^{DA}_{PB} is decreasing in $\bar{m}_R$. A similar argument applies to the response of V^{DA}_{RB} to a change in $\bar{m}_P$. □

Proof of Proposition 3 (*International border regulations and voting*). Recall that $\tilde{z}^{DA}_{PB} = \tilde{z}_{PB} - \tilde{m}_{PB}$ (see (17)). Since $\tilde{z}_{PB} - \tilde{m}_{PB}$ is increasing in p_C (Lemma 1), and since p_C is decreasing in $\underline{\theta}$ (Lemma 3), then $\tilde{z}^{DA}_{PB}$ is decreasing in $\underline{\theta}$. Thus, $V^{DA}_{PB} = \tilde{z}^{DA}_{PB}/\bar{z}_P$ is decreasing in $\underline{\theta}$. Similar reasoning applies to the response of V^{DA}_{RB} to a change in $\underline{\theta}$. □

Next we turn to V^{DA}_{PB}'s dependence on $\bar{\theta}$. Relaxing Assumption 1 we assume now that, failing project implementation, transaction costs are $\bar{\theta}' < p_R - p_P$. Let variables' equilibrium values obtained for $\theta = \bar{\theta}'$ be indexed by one prime, and variables' equilibrium values obtained for $\theta = \underline{\theta}$ by two primes. E.g., w'_C is the equilibrium wage of cross-border sellers for initial transaction cost $\bar{\theta}'$, while w''_C is the respective wage for post-project transaction cost $\underline{\theta}$. (Consequently, $\tilde{z}'_{PB} = w'_C - w_P$, $\tilde{z}''_{PB} = w''_C - w_P$ etc.) We first analyse who supports a project that reduces transaction costs from $\bar{\theta}'$ to $\underline{\theta}$. Then we compare the supporters' share in this case with the share that would result if transaction costs fell from $\bar{\theta} = p_R - p_P$ to $\underline{\theta}$. Again the focus is on Poor, but the same line of reasoning can be applied to analyse the situation in Rich.

(a) Only individuals who cross-border sell for $\theta = \underline{\theta}$ might support the project that cuts transaction costs from $\bar{\theta}'$ to $\underline{\theta}$. These individuals, who choose (PB, RB) for $\theta = \underline{\theta}$, can be subdivided into three groups, depending on their optimal choice for $\theta = \bar{\theta}' < p_R - p_P$. We analyse the support for the project within each of these three groups in turn.

Group 1: *Households who choose* (PB, RB) for $\theta = \bar{\theta}'$ and (PB, RB) for $\theta = \underline{\theta}$ (types with $z_{PB} \leqslant \tilde{z}'_{PB}$ and $z_{PB} \leqslant \tilde{z}'_{PB} - \tilde{m}'_{PB} + m_{PB} = \hat{z}'_{PB}$). The integration project's benefit for a household of this group is

$$\begin{aligned}\Delta U|_{Group1} &= w''_C - w'_C - \left(r''_{PB} + t''_{PB} - r'_{PB}\right)\\ &= w''_C - w_P - \left(w'_C - w_P\right) - \left[r''_{PB} - d_P + t''_{PB} - \left(r'_{PB} - d_P\right)\right]\\ &= \tilde{z}''_{PB} - \tilde{m}''_{PB} - \left(\tilde{z}'_{PB} - \tilde{m}'_{PB}\right),\end{aligned} \tag{29}$$

where we used (5) and (6). The following reasoning uses the fact that $\tilde{m}_{PB} = \Delta r_P + t_{PB} = \tilde{z}^2_{PB}/2\bar{z}_P$ only depends on p_C, which in turn is independent of t_{PB} (Lemma 4). Thus, neither $\tilde{m}_{PB}$ nor $\tilde{z}_{PB} - \tilde{m}_{PB}$ is affected by t_{PB}. Since $\tilde{z}_{PB} - \tilde{m}_{PB}$ is increasing in p_C (Lemma 1) and p_C is decreasing in θ (Lemma 3), $\tilde{z}_{PB} - \tilde{m}_{PB}$ is decreasing in θ. Thus, $\tilde{z}''_{PB} - \tilde{m}''_{PB} > \tilde{z}'_{PB} - \tilde{m}'_{PB}$ and $\Delta U|_{Group1} > 0$. Consequently, all households that already cross-border sell at $\theta = \bar{\theta}'$ and continue to cross border sell at $\theta = \underline{\theta}$ support the project.

Group 2: Households that choose (PB, PI) for $\theta = \bar{\theta}'$ and (PB, RB) for $\theta = \underline{\theta}$ (types with $m_{PB} \leqslant \tilde{m}'_{PB}$, $z_{PB} > \tilde{z}''_{PB} - \tilde{m}'_{PB} + m_{PB}$ and $z_{PB} \leqslant \tilde{z}''_{PB} - \tilde{m}''_{PB} + m_{PB}$). Each of this group's household benefit from the project is

$$\begin{aligned}\Delta U|_{Group2} &= w''_C - w_P - z_{PB} - \left(r''_{PB} + t_{PB} - d_P - m_{PB}\right)\\ &= \tilde{z}''_{PB} - \tilde{m}''_{PB} - (z_{PB} - m_{PB}) \geqslant 0,\end{aligned} \tag{30}$$

where $\Delta U|_{Group2} \geqslant 0$ directly follows from the group's characteristic $z_{PB} \leqslant \tilde{z}''_{PB} - \tilde{m}''_{PB} + m_{PB}$. Thus all households that migrate to Interior for $\theta = \bar{\theta}'$ and cross-border sell for $\theta = \underline{\theta}$ support the project.

Group 3: Households that choose (PB, PB) for $\theta = \bar{\theta}'$ and (PB, RB) for $\theta = \underline{\theta}$ (types with $z_{PB} > \tilde{z}'_{PB}$, $m_{PB} > \tilde{m}'_{PB}$, $z_{PB} \leqslant \tilde{z}''_{PB} - \tilde{m}''_{PB} + m_{PB}$, and $z_{PB} \leqslant \tilde{z}''_{PB}$). Following the arguments above, a household in this group experiences a benefit of

$$\begin{aligned}\Delta U|_{Group3} &= w''_C - w_P - z_{PB} - \left(r''_{PB} + t_{PB} - r'_{PB}\right)\\ &= \tilde{z}''_{PB} - \tilde{m}''_{PB} - (z_{PB} - \tilde{m}'_{PB}).\end{aligned}$$

This expression is positive, i.e., $\Delta U|_{Group3} \geqslant 0$, if $z_{PB} \leqslant \tilde{z}''_{PB} - \tilde{m}''_{PB} + \tilde{m}'_{PB} =: (\tilde{z}^{DA}_{PB})''$ holds. Since $(\tilde{z}^{DA}_{PB})'' \in (\tilde{z}'_{PB}, \tilde{z}''_{PB})$, some but not all of the households of group 3 support the project.

(b) To sum up, in the case of $\bar{\theta}' < p_R - p_P$, the project is supported by all households with $z_{PB} \leqslant \tilde{z}''_{PB} - \tilde{m}''_{PB} + m_{PB}$ and $z_{PB} \leqslant \tilde{z}''_{PB} - \tilde{m}''_{PB} + \tilde{m}'_{PB}$. The set of supporters contains all households of groups 1 and 2 and some households of group 3. By contrast, in the case of $\bar{\theta} = p_R - p_P$, support merely comes from those households that satisfy $z_{PB} \leqslant \tilde{z}''_{PB} - \tilde{m}''_{PB} = \tilde{z}^{DA}_{PB}$ (see (17)). Thus, support is unequivocally smaller in the case of $\bar{\theta} = p_R - p_P$ than in the case of $\bar{\theta}' < p_R - p_P$. □

Proof of Proposition 4 (*Federal grants and voting*). Note that neither $\tilde{z}_{jB}$ nor $\tilde{m}_{jB}$ vary with tax t_{jB} (Lemma 4). But then neither $\tilde{z}^{DA}_{jB} = \tilde{z}_{jB} - \tilde{m}_{jB}$ nor $V^{DA}_{jB} = \tilde{z}^{DA}_{jB}/\bar{z}_j$ do. That is, V^{DA}_{jB} does not respond to any grant induced reduction in tax. □

Proof of Proposition 6 (*Native ownership and voting*). **Part (i)**: With absentee ownership, the share of the integration project's supporters simply is $V^{DA}_{jB} = \tilde{z}^{DA}_{jB}/\bar{z}_j$ (for $\tilde{z}^{DA}_{jB}$, see (17)). With native ownership, and following Fig. 3, the share of supporters becomes

$$V^{DN}_{jB} = \frac{\tilde{z}^{DN}_{jB}}{\bar{z}_j} + \frac{\tilde{m}^{DN}_{jB}(\bar{z}_j - \tilde{z}^{DN}_{jB})}{\bar{m}_j \bar{z}_j}, \tag{31}$$

where $\tilde{z}^{DN}_{jB}$ and $\tilde{m}^{DN}_{jB}$ are defined in (20) and (21), respectively. Since $\tilde{z}^{DN}_{jB} > \tilde{z}^{DA}_{jB}$ (see (20)) and $\tilde{m}^{DN}_{jB} > 0$ (see (21)) hold, $V^{DN}_{jB} > V^{DA}_{jB}$ results (see also Footnote 14). □

Part (ii):

(a) First consider polar case $t_{PB} = 0$. Note that then $\tilde{z}^{DN}_{PB} = \tilde{z}_{PB}$ (see (20)) and $\tilde{m}^{DN}_{PB} = \tilde{m}_{PB}$ (see (21)). But then $V^{DN}_{PB} = C_{PB} + M_{PB} = Y/b$. Since Y is decreasing in $\bar{m}_P$ (Proposition 1, Part (i), (c)), V^{DN}_{PB} is decreasing in $\bar{m}_P$.

(b) Now consider the general case with taxes non-negative. Suppose $\bar{m}'_P < \bar{m}''_P$. Define the increment in Poor Border votes due to the increase in Poor's migration costs as $\Delta V^{DN}_{PB}(\bar{m}'_P, \bar{m}''_P, t_{PB}) = V^{DN}_{PB}(\bar{m}''_P, t_{PB}) - V^{DN}_{PB}(\bar{m}'_P, t_{PB})$. Also, label the thresholds implied by $\bar{m}'_P$ and t_{PB} ($\bar{m}''_P$ and t_{PB}) as $\tilde{m}'_{PB}, \tilde{z}'_{PB}$, etc. ($\tilde{m}''_{PB}, \tilde{z}''_{PB}$, etc.). Recall first that $\Delta V^{DN}_{PB}(\bar{m}'_P, \bar{m}''_P, 0) < 0$ (see (a)). Next we show that $\Delta V^{DN}_{PB}(\bar{m}'_P, \bar{m}''_P, (\tilde{z}'_{PB})^2/(2\bar{z}_P)) > 0$.

Note first that the borderline tax $t_{PB} = (\tilde{z}'_{PB})^2/(2\bar{z}_P)$ implies $\Delta r_P = 0$ (see (14)). Consequently, $(\tilde{m}^{DN}_{PB})' = 0$ (see (21)). Then, using (31), the increment in Poor Border's vote share for the project $\Delta V^{DN}_{PB}(\bar{m}'_P, \bar{m}''_P, (\tilde{z}'_{PB})^2/(2\bar{z}_P)) = V^{DN}_{PB}(\bar{m}''_P, (\tilde{z}'_{PB})^2/(2\bar{z}_P)) - V^{DN}_{PB}(\bar{m}'_P, (\tilde{z}'_{PB})^2/(2\bar{z}_P))$ boils down to

$$\Delta V_{PB}^{DN}\left(\bar{m}_P', \bar{m}_P'', \frac{(\tilde{z}_{PB}')^2}{2\bar{z}_P}\right) = \frac{(\tilde{z}_{PB}^{DN})'' - (\tilde{z}_{PB}^{DN})'}{\bar{z}_P} + \frac{(\tilde{m}_{PB}^{DN})''\left[\bar{z}_P - (\tilde{z}_{PB}^{DN})''\right]}{\bar{m}_P''\bar{z}_P}, \tag{32}$$

which is positive. The first term on the r.h.s. is positive because $(\tilde{z}_{PB}^{DN})'' > (\tilde{z}_{PB}^{DN})'$. After all, $\tilde{z}_{PB}^{DN}$ is increasing in $\tilde{z}_{PB}$ (see (20)), which in turn is increasing in $\bar{m}_P$ (Proof of Proposition 1, Part (ii)). The second term is positive, too. Recall that $\tilde{m}_{PB}^{DN}$ is increasing in Δr_j (see (21)), which in turn increases with $\bar{m}_P$ (Proposition 1, Part (i)), leading to $(\tilde{m}_{PB}^{DN})'' > (\tilde{m}_{PB}^{DN})' = 0$.

(c) To complete the proof, note that $\Delta V_{PB}^{DN}(\bar{m}_P', \bar{m}_P'', t_{PB})$ is a continuous function of t_{PB} on $[0, (\tilde{z}_{PB}')^2/(2\bar{z}_P)]$. Consider the set of taxes t_{PB} for which $\Delta V_{PB}^{DN}(\bar{m}_P', \bar{m}_P'', t_{PB})$ equals zero. As a consequence of the intermediate value theorem, and since $\Delta V_{PB}^{DN}(\bar{m}_P', \bar{m}_P'', 0) < 0$ and $\Delta V_{PB}^{DN}(\bar{m}_P', \bar{m}_P'', (\tilde{z}_{PB}')^2/(2\bar{z}_P)) > 0$, this set is non-empty. Consider the smallest tax and the largest tax from this set, and label them t_{PB}^{cv1} and t_{PB}^{cv2}, respectively. These taxes are from the open interval $(0, (\tilde{z}_{PB}')^2/(2\bar{z}_P))$. Given these taxes, we have (i) $\Delta V_{PB}^{DN}(\bar{m}_P', \bar{m}_P'', t_{PB}) < 0$ for all $t_{PB} \in [0, t_{PB}^{cv1})$ and (ii) $\Delta V_{PB}^{DN}(\bar{m}_P', \bar{m}_P'', t_{PB}) > 0$ for all $t_{PB} \in (t_{PB}^{cv2}, (\tilde{z}_{PB}')^2/(2\bar{z}_P)]$. A similar line of reasoning applies to the response of V_{RB} to a change in $\bar{m}_R$.

Part (iii): Note that $\tilde{z}_{jB}$ is constant in t_{jB} because p_C is (Lemma 4). But then $\tilde{z}_{jB}^{DN} = \tilde{z}_{jB} - t_{jB}$ is decreasing in t_{jB}. Moreover, $\tilde{m}_{jB}^{DN} = \Delta r_j$ is decreasing in t_{jB} because Δr_j is (Lemma 4). To summarise, supporters' numbers are decreasing in t_{jB}. But then they are increasing in grant s_j. □

Proof of Proposition 7 (*Absentee ownership and centralised decision making*). **Part (i)**: We focus on Poor first. (a) Switching to centralised decision making entails substituting a regional tax, t_{PB}, by a national tax, t_P^C. Divide this institutional change into two steps. As first step, abandon Border tax t_{PB}. This leaves p_C, $\tilde{z}_{PB}$, and $\tilde{m}_{PB}$ unchanged, given that the Border tax reduction is perfectly offset by the concomitant Border rent increase (Lemma 4). As second step, introduce national tax t_P^C. Since this affects utilities evenly (see (4), (8), (10) and (12)), not only are p_C, $\tilde{z}_{PB}$, and $\tilde{m}_{PB}$ unaffected; rent r_{PB} also is. To sum the two steps up, replacing Border tax t_{PB} by the lower national tax t_P^C has no effect on p_C, w_C, $\tilde{z}_{PB}$ and $\tilde{m}_{PB}$. But it does increase Border rent r_{PB}, by t_{PB}. Cast in terms of the interregional rent differential Δr_P, this translates into

$$\Delta r_P^{CA} = \Delta r_P^{DA} + t_{PB}. \tag{33}$$

(b) As in the case of decentralised decision making, only Border natives who become cross-border sellers upon project completion (those who choose (PB, RB)) can possibly benefit from the project. But even a cross-border seller only supports the project if and only if her wage gain $w_C - w_P$ exceeds the sum of the country-wide tax t_P^C, rent increase Δr_P^{CA}, and intercultural cost z_{PB}. Equivalently, and making use of (5), the intercultural cost voting threshold now becomes

$$\begin{aligned}\tilde{z}_{PB}^{CA} &= \tilde{z}_{PB} - t_P^C - \Delta r_P^{CA} = \tilde{z}_{PB} - t_P^C - (\Delta r_P^{DA} + t_{PB}) \\ &= \tilde{z}_{PB}^{DA} - t_P^C < \tilde{z}_{PB}^{DA},\end{aligned} \tag{34}$$

where the second equality follows from making use of (33), and where the third equality appeals to (17). Overall, the share of supporters recedes from $V_{PB}^{DA} = \tilde{z}_{PB}^{DA}/\bar{z}_P$ to $V_{PB}^{CA} = \tilde{z}_{PB}^{CA}/\bar{z}_P = (\tilde{z}_{PB}^{DA} - t_P^C)/\bar{z}_P$, by $t_P^C/\bar{z}_P$. Discussing the response of V_{RB} to changing the decision regime in Rich is similar. □

Part (ii): Under centralised decision making, all Interior natives gain from the regional integration project. First, those Interior natives who choose to stay upon project completion (those who choose (jI, jI)) benefit from higher Border rent income. Note that $\Delta r_j^{CA} > t_{jB} = 2t_j^C$ or $\Delta r_j^{CA} > t_j^C$, when invoking (23) and (33). These Interior natives' rent income gains exceed the additional taxation involved (see Footnote 14). And second, those Interior natives who choose to leave for Border upon project completion (those who choose (jI, iB)) do so voluntarily. Since these could always mimic the behaviour of those who simply gain by staying behind, they reveal being even better off by moving into Border. To summarise, all Interior natives gain from, and hence vote for, the integration project. □

Proof of Proposition 8 (*Native ownership and centralised decision making*). **Part (i)**: We focus on Poor first. (a) Switching to centralised decision making entails substituting the regional tax t_{PB} by the national tax t_P^C. Following an argument akin to that in Proposition 7's Part (i), Border rent rises by just the value of the regional tax dropped. In terms of the interregional rent differential we may write

$$\Delta r_P^{CN} = \Delta r_P^{DN} + t_{PB}. \tag{35}$$

(b) As in the case of decentralised decision making, only Border natives who choose to cross-border shop (who choose (PB, RB)) or who choose to leave (who choose (PB, PI)) can benefit from, and vote for, the project. First, a Border native who chooses (PB, RB) supports the project if and only if her wage gain $w_C - w_P$ exceeds the country-wide tax t_j^C and intercultural costs z_{PB}. Therefore, the new intercultural cost voting threshold becomes

$$\tilde{z}_{PB}^{CN} = \tilde{z}_{PB} - t_P^C > \tilde{z}_{PB} - t_{PB} = \tilde{z}_{PB}^{DN}, \tag{36}$$

where use has been made of (20) and (23). And second, a Border native who chooses to emigrate (who chooses (PB, PI)) votes for the project if and only if the gain in rent income Δr_P^{CN} exceeds t_P^C and migration costs m_{PB}. Put differently, migration costs must fall short of migration cost voting threshold

$$\tilde{m}_{PB}^{CN} = \Delta r_P^{CN} - t_P^C = \Delta r_P^{DN} + t_{PB} - t_P^C > \tilde{m}_{PB}^{DN}, \tag{37}$$

after joining (21), (23) and (35). To summarise, both $\tilde{z}_{PB}^{CN} > \tilde{z}_{PB}^{DN}$ and $\tilde{m}_{PB}^{CN} > \tilde{m}_{PB}^{DN}$. But then $V_{PB}^{CN} > V_{PB}^{DN}$. Discussing the response of V_{RB} to changing the decision regime in Rich is similar. □

Part (ii): Again we focus on Poor. Interior natives who choose to stay (who choose (PI, PI)) upon project completion do not benefit from, yet have to contribute towards, the integration project. So they oppose the project. Only Interior natives who choose to move into Border (who choose (PI, RB)) upon project completion can possibly benefit from, and hence support, the project. Clearly, future cross-border sellers exhibit intercultural costs short of cross-border selling threshold $\tilde{z}_{PI} = \tilde{z}_{PB} - \Delta r_P^{CN} - m_{PI}$. Now, only a subset of these will endorse the integration project. Only those for whom the wage gain $w_C - w_P$ exceeds the sum of rent differential Δr_P^{CN}, country-wide tax t_P^C as well as cultural-migration costs $z_{PI} + m_{PI}$ will vote for the project. Put differently, Interior natives ultimately turning cross-border seller vote for the project if and only if their intercultural costs fall short of intercultural cost voting threshold

$$\tilde{z}_{PI}^{CN} = \tilde{z}_{PB} - \Delta r_P^{CN} - t_P^C - m_{PI} = \tilde{z}_{PI} - t_P^C < \tilde{z}_{PI}. \tag{38}$$

Showing that not all of Rich's Interior natives support the integration project follows similar reasoning.

Proof of Proposition 9 (*Mobility and centralised decision making*). **Part (i)**: We focus on Poor first. Consolidating equalities in (34) shows that $\tilde{z}_{PB}^{CA} = \tilde{z}_{PB}^{DA} - t_P^C$. Since $\tilde{z}_{PB}^{DA}$ is increasing in $\bar{m}_P$ (Proof of Proposition 2), then so are $\tilde{z}_{PB}^{CA}$ and $V_{PB}^{CA} = \tilde{z}_{PB}^{CA}/\bar{z}_P$. Moreover, recalling that $V_{PI}^{CA} = 1$ (Proposition 7, Part (ii)) proves that V_{PI}^{CA} is constant with respect to $\bar{m}_P$. Proving similar effects of $\bar{m}_R$ on V_{RB}^{CA} and V_{RI}^{CA} is straightforward. □

Part (ii): We focus on Poor first. To start, we observe that the relationship between V_{PB}^{CN} and $\bar{m}_P$ exhibits the same characteristics as that between V_{PB}^{DN} and $\bar{m}_P$. It can be proven along lines similar to the Proof of Proposition 6, Part (ii). Therefore we omit this proof, which can be obtained on request. We now proceed to show the key feature of the relationship between V_{PI}^{CN} and $\bar{m}_P$.

(a) First, consider polar case $t_P^C = 0$. Given (38), then $\tilde{z}_{PI}^{CN} = \tilde{z}_{PI}$ and thus $V_{PI}^{CN} = M_{PI}/N_P$. (Recall that tax t_P^C does not affect any variables of the ShoMig equilibrium.) Since M_{PI} is decreasing in $\bar{m}_P$ (Proposition 1, Part (ii)), so is V_{PI}^{CN}.

(b) Now consider the general case with t_P^C non-negative. Label the variables that pertain to ShoMig equilibrium obtained for $\bar{m}'_P$ ($\bar{m}''_P$) as $\tilde{z}'_{PB}, (\Delta r_P^{CN})'$, etc. ($\tilde{z}''_{PB}, (\Delta r_P^{CN})''$, etc.) and recall that $\tilde{z}_{PB}$ and Δr_P^{CI} are independent of t_P^C (Proof of Proposition 7, Part (i), (a)). Now suppose that t_P^C attains just $\tilde{z}'_{PB} - (\Delta r_P^{CN})'$. By the first equality in (38), then $(\tilde{z}_{PI}^{CN})' = -m_{PI}$. And, $V_{PI}^{CN}(\bar{m}'_P, t_P^C)$ reduces to $V_{PI}^{CN}(\bar{m}'_P, \tilde{z}'_{PB} - (\Delta r_P^{CN})') = 0$.

However, $\tilde{z}_{PB} - \Delta r_P^{CN}$ is increasing in p_C (in the spirit of Lemma 1), which itself is increasing in $\bar{m}_P$ (Proposition 1, Part (i)). Thus, for $\bar{m}'_P < \bar{m}''_P$ we observe

$$-m_{PI} = \tilde{z}'_{PB} - (\Delta r_P^{CN})' - t_P^C - m_{PI} < \tilde{z}''_{PB} - (\Delta r_P^{CN})'' - t_P^C - m_{PI} = (\tilde{z}_{PI}^{CN})'', \tag{39}$$

where the first equality holds by this paragraph's choice of t_P^C and where the second equality follows from the definition of $\tilde{z}_{PI}^{CN}$. Of course, now, $(\tilde{z}_{PI}^{CN})'' > 0$ for $m_{PI} = 0$. Moreover, surely $(\tilde{z}_{PI}^{CN})'' > 0$ for m_{PI} sufficiently close to zero. Hence $V_{PI}^{CN}(\bar{m}''_P, \tilde{z}'_{PB} - \tilde{m}'_{PB}) > 0$.

(c) Finally, define the increment in Poor Interior votes, $\Delta V_{PI}^{CN}(\bar{m}'_P, \bar{m}''_P, t_P^C)$, as the difference $V_{PI}^{CN}(\bar{m}''_P, t_P^C) - V_{PI}^{CN}(\bar{m}'_P, t_P^C)$. On the one hand, $\Delta V_{PI}^{CN}(\bar{m}'_P, \bar{m}''_P, 0) < 0$ (see (a)). On the other hand, $\Delta V_{PI}^{CN}(\bar{m}'_P, \bar{m}''_P, \tilde{z}'_{PB} - (\Delta r_P^{CN})') > 0$ (see (b)).

Reasoning along the lines of the Proof of Proposition 6, Part (ii), paragraph (c), leads to (i) $\Delta V_{PI}^{CN}(\bar{m}'_P, \bar{m}''_P, t_P^C) < 0$ for all $t_P^C \in [0, (t_P^C)^{cv1})$ and (ii) $\Delta V_{PI}^{CN}(\bar{m}'_P, \bar{m}''_P, t_P^C) > 0$ for all $t_P^C \in ((t_P^C)^{cv2}, \tilde{z}'_{PB} - (\Delta r_P^{CN})']$, with critical values $(t_P^C)^{cv1}$ and $(t_P^C)^{cv2}$ to be found in $(0, \tilde{z}'_{PB} - (\Delta r_P^{CN})')$. Proofs of results pertaining to Rich are similar. □

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