DISCUSSION PAPER SERIES

No. 2714

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INTERNATIONAL TRADE

Centre for Economic Policy Research

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ISSN 0265-8003

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Discussion Paper No. 2714
February 2001

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CEPR Discussion Paper No. 2714

February 2001

ABSTRACT

The Political Economy of International Migration in a Ricardo-Viner Model*

Determinants of national policies towards immigration are analysed in the context of an economy open to international trade. Arguments for the existence of an 'immigration surplus' are reviewed and followed by an interpretative survey of the principal contributions of the political economy literature, emphasising the role of the determinants of individual preferences in a direct democracy framework. A median voter model is grafted on several variants of a specific-factor open economy model to discuss several recent changes in attitudes towards immigration (a stiffened stance, especially towards the unskilled) and in national policies ('melting pot' *versus* guest worker programmes, coexistence of legal and illegal immigrants, lax enforcement of illegals).

JEL Classification: D72, F22, J61
Keywords: direct democracy, international migration

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* The views are those of the authors, not those of the institutions with which they are affiliated. We thank Sanoussi Bilal and Riccardo Faini for their contributions to joint earlier work drawn upon here. Without wishing to implicate them, we also thank Olivier Cadot, Marcelo Olarreaga and Maurice Schiff for comments on an earlier draft. To appear in S. Djajic (ed.) *International Migration: Trends, Policy and Impact.*

Submitted 22 October 2000

NON-TECHNICAL SUMMARY

Recent trends in attitudes toward immigration point to a sharp stiffening in attitudes. In the EU, a recent poll showed that 54% of French people, 57% of Germans, 51% of Britons, and 64% of Italians believe the number of immigrants to be excessive. This is all the more remarkable, since under current demographic trends the current flow of immigrants to the EU as a whole would have to reach 1.6 million a year to keep its working population stable, and 13.5 million a year to keep the ratio of pensioners to workers steady. And in the US, a country traditionally more open to migration, results of the US National Elections Survey of 1992 in which respondents were asked to reveal their preference over immigration policy on a scale of 1 (increase a lot) to 5 (decrease a lot) produced a mean of 3.6.

Other trends beg explanations as well. First, why is the opposition towards what demographers call ‘primary migration’ remarkably strong? Second, is there a link between the type of immigration and sector of activity? In the US immigration has been of a permanent rather than temporary kind and of a ‘melting pot’ type where the intersectoral pattern of immigrants and natives is similar, while in the EU, where it has been of a ‘guest worker’ type, immigrants are seasonal and concentrated in a few sectors. Third, why have countries been more open to the indirect inflow of factor services embodied in goods and to direct capital flows than to direct inflows of labour, both of which exert a downward pressure on wages?

This Paper provides clues to these questions by relying on variants of a direct democracy Ricardo-Viner model in which the preferences of the electorate are driven by the impact of immigration on native factor market returns. The model has two households (skilled and unskilled), each of which votes on whether to accept a certain amount (small or large) of immigrants. Households also own capital that may be unevenly distributed across households. Immigrants, who may be unskilled or skilled, may also own capital, and in some cases may be confined to certain sectors of activity. The productive sphere assumes a price-taking economy in international markets with two sectors that are either both traded, or with one sector that is non-traded and the other that is a composite price-taking traded sector.

Suppose first that both sectors are traded and that capital is the mobile factor. We show then that an initial opposition by a group to infinitesimal immigration may be softened and even reversed if a substantial immigration flow leads to sufficiently large net gains. Consider then the changes in attitudes that have occurred since the 1950’s and 1960’s when unskilled immigrants were welcomed, and the 1980’s and 1990’s, when they were no longer welcomed. During that time span, the share of unskilled households has markedly declined from, say, being a voting majority to being a minority. Then, the median (native) voter

changes from being in favour of to being against unskilled immigration. If immigrants are skilled, however, and there is a substantial immigration surplus associated with their arrival, it may well be that the majority change leaves unaltered the favourable attitude towards skilled migrants. So this also helps explain the recent application of eligibility criteria like capital and/or skill requirements.

Survey-based data for the US shows that after controlling for gender, age, ideology, and race, less skilled people prefer more restrictive immigration policies. In our framework, such an attitude would be observed if skilled (or unskilled) labour, rather than capital, is the mobile factor. Or alternatively, if capital remains the mobile factor, this outcome would be observed if one introduces inequality in capital ownership among natives, with capital *per capita* of unskilled households being inferior to their share in population, which is a plausible assumption. We also discuss the implications of having capital ownership among immigrants.

We then move on to segregation, which appears not only in the context of illegal immigration, but is observed in many countries even in the case of legal migration. The extent of segregation seems to depend on migration policy: it is more pronounced in countries with a 'guest worker' system than in countries favouring permanent immigration ('melting pot'). We then investigate further the link between migration policy, (incomplete) sectoral segregation, and the political economy of immigration using an efficiency-wage model with dual labour markets where segregation and discrimination against immigrants are a consequence of the fact that migrants face different incentives and legal constraints from natives. On the one hand, migrants are likely to return to their home country (voluntarily or forced by limited work permits). On the other hand, preferential hiring regulations lead to discrimination against immigrants if good jobs are rationed. In this model, since competition ensures that natives and migrants are paid the same wages, discrimination is of the type 'equal pay for equal work, but not equal work'. Hence migrants have smaller chances of finding 'good' jobs than natives and suffer from sectoral segregation.

We then ask if it is more likely that natives will vote in favour of immigration if the government applies a 'guest worker' system, rather than a 'melting pot' policy. We show that natives will favour immigration if it will result in an increase in their probability of getting a primary sector job, and show that such an outcome is more likely if migration policy leads to a high degree of segregation.

1. Introduction

Writing about the economic consequences of immigration in receiving countries from the standpoint of a labour economist, Borjas (1995) speaks of a resulting "immigration surplus" to underline that the benefits created by immigration usually outweigh any efficiency losses for natives in the receiving country. At the same time he notes that the condition for this gain to materialise is that the wages of natives diminish which means that gainful immigration will generate distributional conflicts. Under most scenarios the efficiency gains are small relative to the redistribution of income caused by immigration. Yet, given the overall gains and the means at the disposals of the State to redistribute income, on economic grounds, at least, one might be inclined to expect a more positive attitude towards immigration than those expressed in recent surveys (see below). Bhagwati (1991), also writing from the point of view of receiving countries, but from the standpoint of a trade economist, notes that both politicians and economists in the EU and the US support free trade while advocating restrictions on migrations, and argues that such attitudes can only be the consequence of being inconsistent in the application of utilitarian logic which would lead to the advocacy of the free immigration solution.

Indeed, any stylised description of the recent evolution of trade and migration policies would conclude that the barriers against the free movements of goods have been less intense than the restrictions countries have imposed on the international movement of labour (while policies with regard to the international movement of capital have also been generally more liberal than labour immigration policies). In other words, countries have been more open to the indirect inflow of factor services embodied in goods and to direct capital flows than to direct inflows of labour.

This paper is concerned with the determinants of national policies towards immigration in receiving countries and recognises that immigration policies are the result of the interaction of two factors: (i) standard economic analysis where benevolent policymakers are primarily concerned with efficiency; (ii) the preferences of the

electorate which are driven by the impact of immigration on native factor-market returns. This discussion is largely carried out in terms of a small price-taking economy.

Table 1 gives characteristics of the labour force in a group of industrialised countries: the share of foreigners in the population (table 1a) and comparative education levels (table 1b). The figures in table 1a show that foreigners' share in population has increased recently in most countries. The increase has been particularly strong in traditional "guest-worker" countries (Austria, Germany and Switzerland). Besides the temporary surge following the collapse of socialist regimes in Eastern Europe, the stylised pattern has been little permanent migration flows, with the flows being mostly for temporary migration and mostly concentrated in skilled labour.[1] The figures in table 1b relate to European countries. They show that the share of low education individuals is generally smaller for natives than for immigrants, though the opposite is the case in Spain and Italy.

Going beyond the data in table 1, recent migration trends raise a number of issues. First, why is it that legal immigrants coexist with illegal immigrants who are often all too visible? Second, why is it that the opposition towards what demographers call "primary migration" is remarkably strong[2], even though some small economies like the Netherlands and Ireland have acute labour shortages, and in some larger economies like the UK and Germany steps are currently under way to bring in skilled workers?[3]

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[1] See Zimmermann (1995) for a discussion of the phases of European migration and *The Economist*, May 6-12, 2000, for recent characteristics of immigration in the EU. For the US see Borjas (1994) and Trefler (1998).

[2] A poll conducted on behalf of the European Commission shows that a significant majority of those interviewed believe that 'immigrants are too many'. This is particularly true in the four largest European countries, with 54 per cent of Frenchmen, 57 per cent of Germans, 51 per cent of Britons, and 64 per cent of Italians, believing the number of migrants to be excessive. And in the US, results of the US National Elections Survey of 1992 in which respondents were asked to reveal their preference over immigration policy on a scale of 1 (increase a lot) to 5 (decrease a lot) produced a mean of 3.6 and a standard deviation of 1.0 (Scheve and Slaughter (1998)).

[3] The stiffening in attitude towards immigrants in the EU, especially towards low-skill ones, is all the more remarkable since according to the United Nations' Population Division projections based on current trends, the current flow of immigrants in the EU as a whole would have to reach 1.6 million a year to keep its working population stable, and 13.5 million a year to keep the ratio of pensioners to workers steady.

Table 1a: Percent of Total Population

	1987	1997
Austria	4.3	9.1
Belgium	8.7	8.9
France	6.8	6.3
Germany	6.9	9.0
Italy	1.0	2.2
Switzerland	14.9	19.0
UK	3.2	3.6
US	6.2	9.3
Canada	15.4	17.4

Source: SOPEMI (1999)

Note: US and Canada: foreign-born population as a percentage of total population

Table 1b: Education levels in EU countries (1995)

Country	Natives		Immigrants	
	Low	High	Low	High
UK	46.5	18.6	57.9	20.4
France	40.3	16.7	53.3	16.0
Germany	19.1	18.9	46.3	10.7
Austria	31.7	6.4	47.4	8.9
Spain	67.8	14.1	47.0	25.6
Italy	64.2	6.3	53.3	16.0
Denmark	25.4	22.1	31.6	29.0
Belgium	45.3	20.6	52.8	19.5
Sweden	27.2	23.3	30.3	24.9
Netherlands	24.0	18.6	40.2	16.0

Source: Razin, Sadka, Swagel (1998, tab.2)

Notes: Low education is less than first stage of secondary level: high education is completed third schooling level; medium (not shown) is the balance.

Third, is there a link between the type of immigration and sector of activity? In the US it has been of a permanent kind rather than temporary and of a “melting-pot” type where the intersectoral distribution of immigrants and natives is similar, whereas in some EU countries, it has been of a “guest-worker” type, where immigrants are seasonal and concentrated in a few sectors. And fourth, why are countries increasingly resorting to the use of eligibility criteria like capital and/or skill requirements?

Section 2 introduces the standard economic analysis primarily to identify when there is an immigration surplus. The following sections introduce political-economy elements into the analysis. In sections 3, 4 and 5, we use a new specific-factor direct-democracy framework further developed in Grether et al. (2000) to analyse the determinants of attitudes towards immigration. In section 3, we use the model to investigate the conditions under which natives will oppose (be in favour) of certain types of immigration, and how the level of immigration and exogenous changes such as globalisation might alter attitudes. In section 4, we bring a slight modification to the model to show how one may observe simultaneously legal and illegal immigration. In section 5, we develop a dual labour market version to compare the "guest-worker" and melting-pot" immigration systems. Concluding remarks follow in section 6.

2. Is there an immigration surplus?

In the introduction, our allusion to a “surplus” created by immigration referred to an aggregate model with only one good produced (as in the seminal paper by Berry and Soligo (1969)), thereby excluding trade, and more importantly minimising the conflicts and controversies surrounding migration policy. In this section we review briefly the robustness to various modifications in an otherwise standard framework where policy choice is carried out by benevolent policymakers. The usefulness of looking into the robustness of the ‘immigration surplus’ result is that if immigration leads to a welfare loss of natives on efficiency grounds, there is no need to extend the analysis along political economy dimensions to explain the resistance to immigration. First, we look for the robustness of the immigration surplus prediction in trade models and for the presence of distributional conflicts. We then consider extensions.

The impact of immigration in an open economy

In the closed-economy model presented by Borjas (1995), immigration alters factor returns so that benefits outweigh losses resulting from income redistribution effects. In fact, this outcome of redistributive conflict with efficiency gain also describes the effects of immigration in the short-run specific factor model used in sections 3, 4, and 5. Thus, it is legitimate to check the robustness of this result in other international trade models.

Suppose then that the evaluation of the effects of immigration takes place over long periods. Then the long-run condition of zero profits replaces the rents earned by specific factors which are never equalised in the specific-factor model. Let us start with models where immigration takes place in a setting where free entry and exit imply zero long-run profits.

Take first the Heckscher-Ohlin (H-O) model where international trade has a strong disciplining effect on wages. We assume a two country world, where skilled labour, H, and unskilled labour, L, are the two factors entering identical constant returns to scale production functions describing the technology in each of two price-taking sectors. Since, in the absence of transport costs, goods prices will be equalised, unit costs must also be equal, which implies (in the plausible case of no factor intensity reversal) that wages are equalised (Factor Price Equalisation or FPE), with wages entirely determined by world prices and technology parameters. The output mix consists of both products so that the economy is "diversified", and so long as it remains so, immigration will have no effect on factor rewards. Arbitrage via trade in goods will eliminate any incentive to migrate, but, in the absence of trade, as first shown by Mundell (1957), international factor mobility will also exhaust arbitrage gains, so that trade in goods and trade in factors are substitutes.[4] In this world where trade eliminates any incentive to migrate, if

[4] Wong (1995) explores systematically trade models in the presence of factor mobility. Venables (1999) explores the links between trade liberalisation and factor mobility in a family of models. Faini and Grether (1997) and Grether et al. (1999) present models that accommodate the observed asymmetry between trade and migration policies.

migration takes place in a small economy for exogenous reasons, it does not alter factor prices, and there is no "immigration surplus".[5]

The FPE proposition being obviously false, Trefler (1993, 1998) has shown that allowing for differences in productivity between sending and receiving countries leads to a modified FPE proposition where productivity-adjusted wages are the same, which rehabilitates empirically both the H-O and FPE theorems. To draw the welfare implications of this amendment, one must determine migrants' attributes. If productivity is an attribute of the worker (a migrant will have low productivity regardless of where he works), we are back in the previous setting and there are no welfare effects of migration. But if productivity is an attribute of the country (low productivity is then the result of poor policies), migration will raise productivity, and there will be a positive welfare effect from migration.

For large countries like the EU and US, sustained migration, can, in addition, have income distribution effects. Migration of, say skilled workers, can be equivalent to increasing the relative supply of skilled-intensive goods, thereby lowering their relative price along with the wage of skilled workers. Also there is the possibility of a terms-of-trade effect as the relative price of skill-intensive goods is likely to fall.[6]

The terms-of-trade effect of migration is best captured in a Ricardian model, and was explored by Findlay (1982). Consider here a version in which an array of goods are produced with one unit of labour, with sending and receiving countries specialised in the production of different goods. To illustrate the effects of immigration take a three good model in which the destination country produces initially only good 1 so that

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[5] Leamer and Levinsohn (1995) refer to this result as the Factor-Price-Insensitivity (FPI) theorem. However, with more tradable products than factors, we are in the multi-cone setting, so that with sufficiently large immigration shocks, the diversification cone will be altered and factor prices will change. Also, if both countries are in different cones, different goods are produced and trade will not eliminate incentives for factors to migrate.

[6] Kenen (1971) analyses the terms-of-trade effects of migration in a H-O model, but from the standpoint of the source country.

$w/p_1=1/a_1$, and $w/p_i>1/a_i$, i=2,3. With immigration, the equilibrium condition in sector 1 is unaffected but the wage is driven down until $w/p_2=1/a_2$ while in the sending country the wage is bid up until $w^*/p_2=1/a^*_2$ which means, by the likewise equilibrium condition in sector 3 that p_3 has risen in the sending country. It is then clear that real wages per capita, w/p, of natives have fallen in terms of goods 2 and 3. As pointed by Trefler (1998) who develops this case further, what has happened is that by increasing the supply of good 1 and shifting the terms of trade against the host country, immigration serves to reduce the scarcity rents enjoyed by native workers. Thus general equilibrium adjustments result in a **negative** immigration 'surplus'.

What about increasing returns to scale? With external returns to scale, it is intuitive that the immigration surplus result will be restored if one thinks, for example, of opening up new land to cultivation as the prairie in 19th- century US: without immigrants production would have been insufficient to warrant investment in the railways. Trefler (1998) develops such a model and shows that immigration raises the productivity of domestic labour, though there is also a negative terms-of-trade effect so that it is possible that there is an optimal level of immigration beyond which further immigration reduces domestic welfare.[7]

In Europe, closer integration has increased factor mobility and diminished transport costs though, at least compared with the US where up to 20 per cent of families move in any given year, labour mobility is low. Ludema and Wooton (1999) introduce imperfect labour mobility in an economic-geography model à la Krugman (1991). As a result, even though it is again impossible to identify an unequivocal immigration surplus, in this richer model, the cumulative causation process triggered by a reduction in transport costs that is welfare-enhancing for the destination country and potentially immiserising for the sending country, may no longer occur. They show that for sufficiently mobile labour, progressive integration may initially lead to agglomeration, then again to diversification as trade costs are lowered further. Temporary dislocations in the face of

[7] Though in a different context, this result is reminiscent of the discussion on the optimal population size where there are advantages (increasing returns to scale, sharing of public goods) and disadvantages (diminishing factor productivity, congestion effects). See Razin and Sadka (1997).

increased market integration could then be avoided by a temporary restriction on factor movements as for example, in the Europe Agreements, where reduction in barriers to trade take place before migration of people is allowed.

Extensions

Wildasin first (1992, 1994) and subsequently Razin and Sadka (1995) pointed out that immigration will raise the costs of income redistribution if such a 'non-economic' objective is present. This is because factor mobility means that redistributive policies entail interjurisdictional externalities since it is no longer a local public good: redistributive policy from mobile towards fixed factors will be thwarted as mobile factors move (poor flock in and rich leave).

The implications of immigration for the functioning of a welfare system are examined in Razin and Sadka (1999a,b) and Razin, Sadka and Swagel (1998)) in an overlapping generations model where life spans two periods (young contribute to a pays-as-you-go pension scheme, while the old draw a pension). In this framework, even if immigrants are net receivers of the welfare system (in the US, according to calculations by Borjas (1994), foreign-born households are 10 per cent of households receiving assistance but receive 13 per cent of total assistance), so long as immigration (only the young immigrate) has no effect on wages, their arrival provides a positive externality on native population as they make a net contribution to public finances the period they arrive. With immigrants reducing wages upon arrival, the welfare impact becomes ambiguous.

These, and other extensions (such as wage rigidity – see Razin and Sadka (1995)), modify and may reduce the efficiency gains of immigration, potentially pointing towards ambiguous effects of immigration on welfare in a standard optimising framework. This conclusion is also reached when one introduces cultural preferences in the form of social capital into the analysis as in Schiff (1998, 1999). In this case, not considered here, immigration creates a negative externality that reduces welfare.

3. Determinants of Individual Preferences over Immigration Policy

To explore the political economy of immigration policy, we use the specific-factor or Ricardo-Viner model in a direct-democracy framework. The Direct-democracy model is arguably the best-suited framework to represent how preferences over immigration are formed by the population at large. This is due to peoples' perception that absorbing immigrants will be partly via changes in one's wage.[8] Also, its links to the underlying economic model is more transparent than in other political economy approaches like the pressure group model where policy is the result of the maximisation of a welfare function whose weights are often arbitrarily chosen.[9] As to the specific-factor model, its time-frame with short-term rents, also probably corresponds to the time-frame envisaged by many voters when they form an opinion on immigration policy.[10]

Suppose then that every individual (or household) can vote on migration policy (i.e. whether he agrees to accept a given number of immigrants), and that no other issue is on the political agenda. Then preferences are single-peaked and the national stance towards immigration is determined by the median voter. We analyse this institutional setting in the context of a small price-taking open economy. Variations in income determine the attitude towards immigrants. Each native household is endowed with one unit of labour and a certain amount of capital. If immigration lowers his income, he will oppose it.

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[8] Scheve and Slaughter (1999) find that less-skilled workers are significantly more likely to prefer limiting immigrant inflows into the US, and that individuals form their opinions in accord with their interests as labour-force participants. This justifies the approach taken here. Their results also reject the "area analysis" framework used by labour economists according to which immigrants pressure the wages of similarly-skilled natives who reside in gateway communities where immigrants settle, but are in accordance with the "factor proportion analysis" where the pressure on wages is nation-wide, as in the multi-cone H-O and Ricardo-Viner trade models.

[9] For examples of the pressure-group approach, see Buckley (1996) and Mezza and Winden (1996).

[10] Hillman and Weiss (1999b) suggest that voters probably find the H-O model appealing when formulating trade policy since it captures the indirect effect of labour (via embodiment in imports), and the Ricardo-Viner model when formulating immigration policy since immigrants compete directly with domestic labour. Bilal et al. (2000) provide an algebraic treatment of the long-run version of the model presented here with the same two goods and the assumption that the three factors, capital, unskilled labour and skilled labour are mobile across sectors. Benhabib (1996) uses a similar approach in a one-sector economy.

Here we focus on legal immigration and on the effects of capital distribution among natives, and turn to illegal immigration in section 4.

The economy produces two traded goods: X (import-competing) and Y (export-competing), using three factors: unskilled labour (L) which is specific to sector X; skilled labour (H) which is specific to sector Y; and capital (K), which is the mobile factor[11]. Let k_X (k_Y) denote the capital to unskilled (skilled) labour ratio in X (Y). Denote the share of capital used in sector X by $\lambda_K \equiv K_X / \overline{K}$. Let ℓ be the share of unskilled individuals in total population ($\ell \equiv \overline{L}/(\overline{L}+\overline{H})$). Define the index of between-group inequality in capital distribution, τ, as the ratio between capital per capita of unskilled households and the national capital per capita average. Letting K^L denote total ownership of capital of unskilled households, denote by $\theta_L \equiv K^L / \overline{K}$, the unskilled labour's ownership share of capital. Unskilled (skilled) migrants are denoted by M_L (M_H), and μ (γ) is the share of natives in the population of unskilled (skilled) households. Finally, it will prove useful for the graphical presentation to choose units so that population equals the capital stock, with both set equal to unity. The following equations conveniently summarise the notation used in this section :

$$
\begin{aligned}
& k_X \equiv K_X / \overline{L} \;;\; k_Y \equiv K_Y / \overline{H} \;; \\
& \ell \equiv \overline{L}/(\overline{L}+\overline{H}) \;; \\
& \lambda_K \equiv K_X / \overline{K} \;; \\
& \theta_L \equiv K^L / \overline{K} \;; \qquad (1) \\
& \tau \equiv [K^L / \overline{L}]/[\overline{K}/(\overline{L}+\overline{H})] = \theta_L / \ell \;; \\
& \mu \equiv \overline{L}/(\overline{L}+M_L) \text{ or } \gamma \equiv \overline{H}/(\overline{H}+M_H) \;; \\
& \overline{L}+\overline{H} \equiv \overline{K} \equiv 1
\end{aligned}
$$

[11] An alternative would be to consider that skilled labour is the mobile factor; however, besides being less realistic in a two-sector context, this case is less interesting as the pattern of attitudes that emerge is independent of capital distribution (see Bilal et al.(2000)).

In this model, attitudes towards immigration will be determined by the interaction of three elements: (i) the number of migrants; (ii) the capital distribution among natives, and; (iii) the capital endowment of immigrants. We start in section 1 from the simplest case where immigrants bring no capital with them, there are no immigrants initially ($\mu=\gamma=1$) and domestic capital is equally shared among national households ($\theta_L=\ell \Leftrightarrow \tau=1$). We then allow, first for sustained immigration, and second for unequal distribution of capital ownership.

Infinitesimal immigration

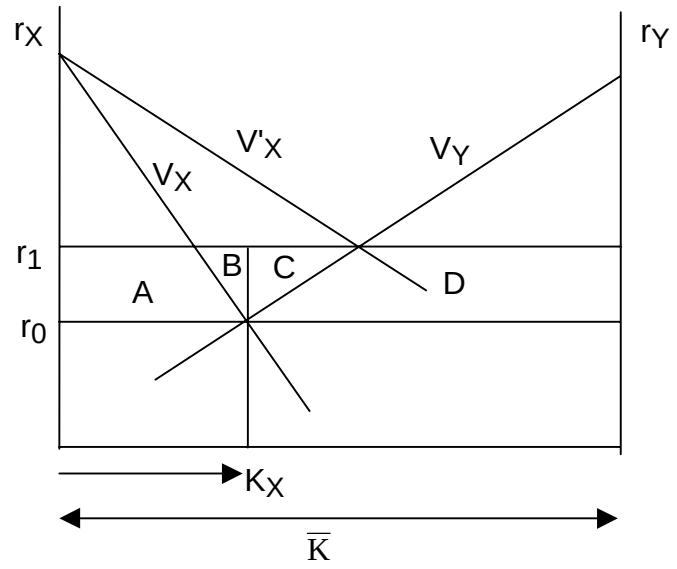
To illustrate the current immigration policy debate in the majority of industrialised countries, we assume that immigrants are unskilled individuals, and that the export-competing sector is capital intensive (i.e. $k_X < k_Y$).

As the immigration surplus is a second-order efficiency gain, it cannot be reaped with marginal (or infinitesimal) immigration. This implies that global national income is unaffected (zero-sum property) and, as a consequence, if one type of household loses (opposes immigration), the other one necessarily wins (favours immigration). Thus, it is sufficient to analyse the attitude of one household category, say unskilled individuals.

The arrival of unskilled migrants will lead to an expansion of sector X that uses them intensively, through an improvement of the marginal productivity of capital ($V_X \rightarrow V_X'$ in figure 1). The real return to both categories of domestic sector- specific labour factors will decrease, while capital remuneration goes up, so it is a priori unclear if unskilled households benefit from immigration. In figure 1, A (D) is the loss of labour income of unskilled (skilled) households and A+B+C+D is the total increase in capital income. As aggregate national income does not change following an infinitesimal inflow of immigrants, the triangular areas B and C are negligible. This means that areas A and A+B are approximately identical, so that unskilled households will be exactly compensated from their labour income loss provided the amount of capital they own (K^L) is equal to the amount of capital which is used in sector X (K_X). In other words, if

K^L_C is the critical amount of capital owned by unskilled natives which leaves them indifferent to immigration, its value is given by $K^L_C=K_X$.

Figure 1: Infinitesimal immigration and factor rewards

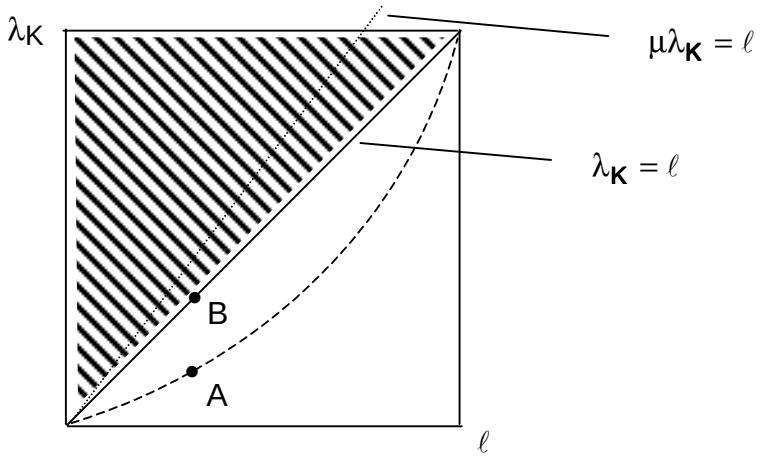


V_X: pre-migration marginal product of capital in sector X
V'_X: post-migration marginal product of capital in sector X
V_Y: marginal product of capital in sector Y

How does the actual capital ownership of unskilled natives compare with this critical amount? With capital evenly distributed among households, the share of capital owned by unskilled households is equal to their share in population (i.e. $\theta_L=\ell$). Indifference towards immigration (i.e. $K^L=K_X$) will arise if the share of capital owned by unskilled labour is equal to the share of capital used in sector X, i.e. if $\theta_L=\lambda_K$. This indifference condition is satisfied along the diagonal of the box represented in figure 2. If $\theta_L=\ell<\lambda_K$, unskilled households own less than the critical amount, and the compensation effect from capital ownership is too weak to compensate for the loss of rents. In other words, unskilled households are, in a sense, "capital-poor": they suffer a net income loss and oppose immigration (this is represented by the dashed area in figure 2). By the same

reasoning, unskilled natives' attitudes are favourable towards immigration for points below the diagonal ($\theta_L = \ell > \lambda_K$).

Figure 2: Attitude of unskilled natives towards immigration



λ_K : share of capital used in sector X
ℓ : share of unskilled individuals in total population

The shaded area indicates an unskilled-labour attitude in opposition towards immigrants

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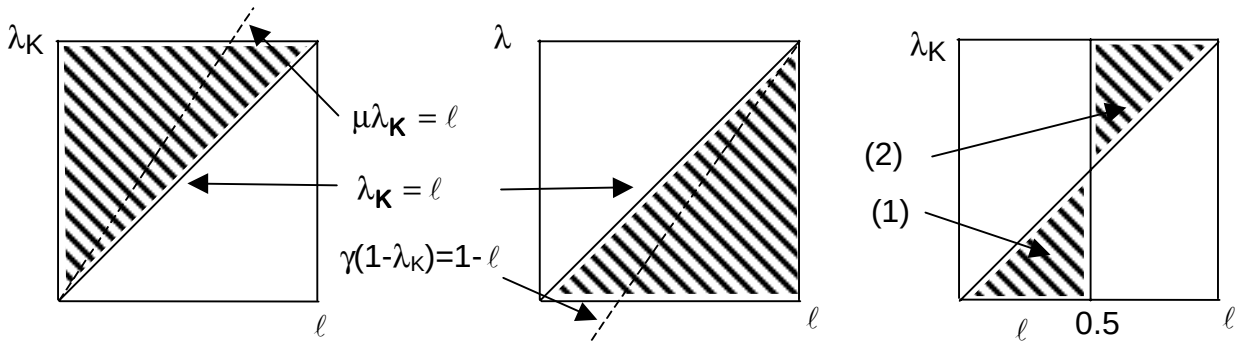
To determine whether unskilled natives will oppose or favour immigration, we need to know whether unskilled labour are 'capital-rich' or 'capital-poor'. Think now of figure 2 as an Edgeworth box which is possible by our choice of units. By the choice of units in equation (1), the share of unskilled labour in total population, ℓ, and the share of capital in sector X, λ_K, are both equal to their respective stocks in the economy, i.e. $\ell = \overline{L}$, $\lambda_K = K_X$, and the choice of units also implies that $\overline{H} = 1 - \ell$ and $K_Y = 1 - \lambda_K$. This means that starting from, say, the SW corner of the box in figure 2, one reads the allocation of unskilled labour to X going to the right along the horizontal axis while, if the NE corner represents the origin for industry Y, one reads the allocation of skilled labour to Y along the horizontal axis going from right to left.

Thus any point in the box corresponds to a given allocation of skilled and unskilled labour and of the mobile capital between the two sectors.

Now, since we assumed that sector X is (unskilled) labour-intensive ($k_X < k_Y$), whatever the allocation of capital, the permissible allocation of unskilled labour and of skilled labour will be below the diagonal. This means that, starting from a point like A (which would be on the dashed contract curve line if the economy were in long-run equilibrium), unskilled natives are necessarily capital-rich (since below the diagonal $k_X < k_Y$ or again $\theta_L = \ell > \lambda_K$) and they favour immigration.

Figure 3: National attitude towards immigration



(a) unskilled households (b) skilled households (c) total population

λ_K : share of capital used in sector X
ℓ : share of unskilled individuals in total population
μ: share of unskilled natives in unskilled population
γ: share of skilled natives in skilled population

Shaded areas indicate an attitude in opposition towards immigrants

---

What about national attitude? Given the zero-sum property of infinitesimal immigration, skilled natives adopt a position which is systematically opposed to that of unskilled natives (apart from the indifference case). This is represented in figure 3(a) and (b), with reversed dashed areas representing opposition to immigration. Combining both boxes

one obtains figure 3(c), representing the national stance towards immigration according to which household group has the majority. For example, suppose that ℓ_0<0.5, then (given that we have also assumed $k_X < k_Y$), the economy is in the shaded area (1) in figure 3(c). In that region, unskilled households are favourable to immigrants, but since they are the minority, the national attitude is one of opposition towards immigrants.[12]

Note that all the previous analysis, which was based on an infinitesimal inflow of unskilled immigrants, remains valid if immigrants are skilled individuals. The reason is that both types of labour are analytically symmetric, and a reinterpretation of figure 1 switching X and Y indices would lead exactly to the same results as far as critical capital ownership is concerned. In other words, figure 3 represents national attitude towards immigration, whatever the immigrants' skills.

In sum, as X is labour intensive and H is the majority group, it turns out that the nation as a whole unequivocally opposes immigration because it leads to a lower income of skilled natives, whose capital ownership is lower than the critical level that would make them indifferent. This result may seem surprising and rather inconsistent with actual immigration policies. In fact, it is highly dependent on the simplifying assumptions that underline the benchmark case which we adopted for expository purposes rather than for their realism. As will be shown below, relaxing these assumptions leads to a richer pattern of possible attitudes that will provide the basis for an interpretative discussion of results.

[12] Should the unskilled be the majority, then the economy is to the right of the "majority" line, and, since the economy is below the diagonal, the median voter would be favourable to unskilled immigration. And if Y were labour intensive, the economy would be above the diagonal, so that the results, would, once again, be reversed.

Sustained immigration

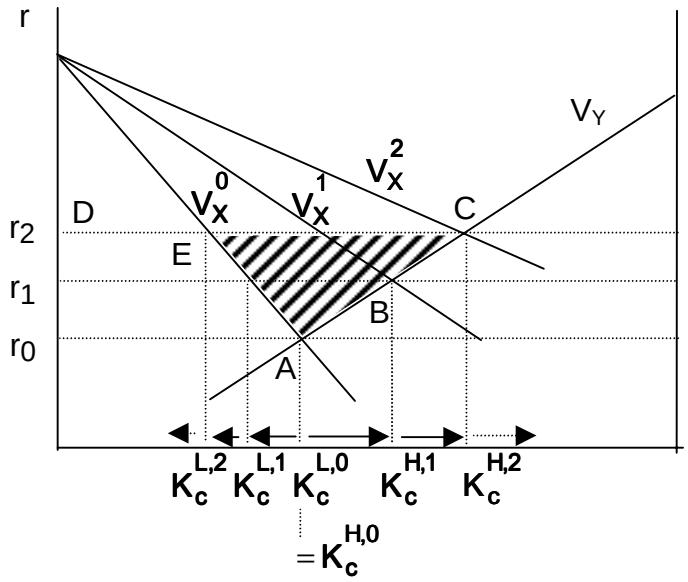
What happens if immigrants keep on flowing in? A quick, though incorrect, reaction would be to conclude that unskilled natives become progressively less prone to immigration because, as the share of capital used in industry X increases with the expansion of this sector, the critical capital ownership of unskilled natives, K_c^L, becomes closer and closer to their effective capital ownership (an upward move from point A in figure 2).

In fact the reverse is true: the critical capital ownership level of unskilled natives actually decreases because, since immigration is no longer infinitesimal, the zero-sum property no longer holds (one is in the "immigration surplus" situation discussed in section 2). Hence, there is an increasing net gain from immigration that accrues to natives, making them more sympathetic towards immigrants. This "immigration surplus" situation is illustrated in figure 4, where the sequential expansion of capital demand from sector X ($V_X^0 \rightarrow V_X^1 \rightarrow V_X^2$) leads to an ever increasing dashed area representing the net gain from immigration. Now, native unskilled households share their loss in rents with unskilled immigrant households.[13]

For skilled households, the critical capital level remains equal to the level of capital used in sector Y, so the analysis of figure 3(b) remains unchanged. For unskilled households, because part of their income loss is now absorbed by the migrants already present, the compensatory requirement in terms of capital ownership is smaller. As illustrated in figure 4, the critical amount of capital that leaves unskilled natives indifferent to immigration ($K_c^{L,2}$=DE) is equal to the amount of capital used in sector X (K_X=DC) times the share of natives in unskilled population, denoted by μ ($\mu \equiv \overline{L} / \overline{L} + M_L$, where M_L is the number of unskilled migrants, with μ=DE/DC at point C of figure 4).

[13] This case also depicts the impact of an infinitesimal increase of unskilled migrants starting from an initial situation (like point B in figure 4) where there are already immigrants in the country.

Figure 4: Sustained immigration



V_X: marginal product of capital in sector X

V_Y: marginal product of capital in sector Y

K_c^v: critical capital ownership of household V (V=L,H)

In terms of figure 2, and provided ℓ is interpreted as the share of unskilled individuals in the voters' (not total) population, this leads to a rotation of the indifference line towards the left, whose expression is now given by $\mu\lambda_K = \ell$. Again, this is because the critical share of capital ownership for unskilled households is now smaller than the actual share of capital used in sector X, thereby decreasing the relative share of shaded areas in figure 2 and 3(a). Thus, an initial opposition may be softened and even reversed if a substantial immigration flow leads to sufficiently large net gains. However, recall that the attitude of skilled households (figure 3(b)) remains unchanged. Thus, in terms of national attitude towards immigration (figure 3(c)), it is only the shaded area (2) whose share would decrease, leaving area (1) unchanged.

As there is now an asymmetry between skilled and unskilled households, the skill level of immigrants matters. If immigrants are skilled individuals, the previous analysis is

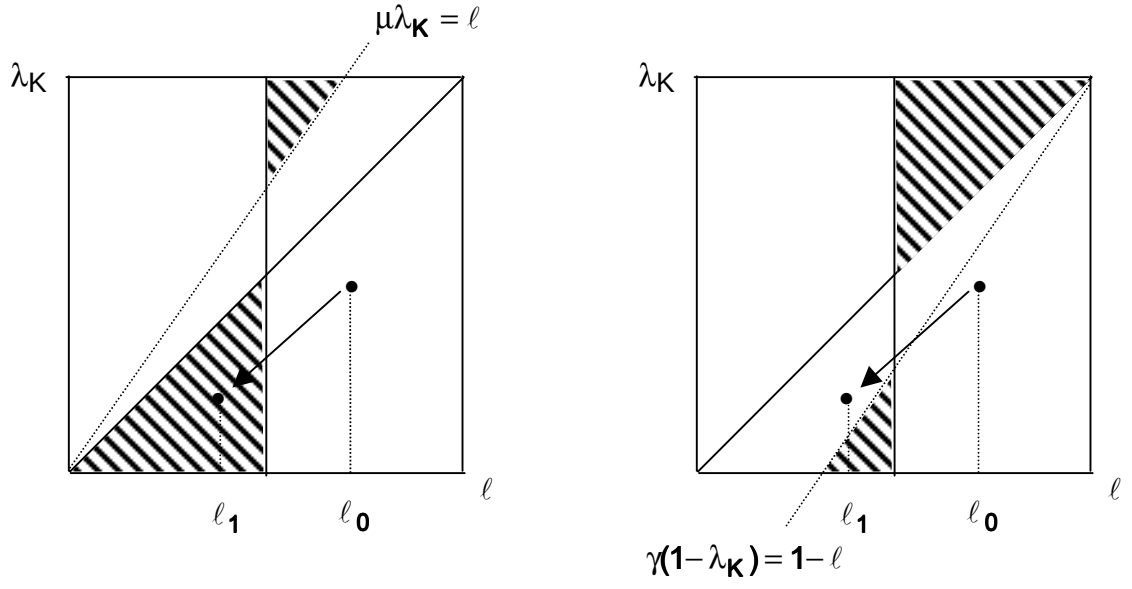
reversed: the indifference condition for unskilled households ($\lambda_K = \ell$) remains unaltered, but skilled natives become more favourable to immigration. In figure 3(b), the indifference line for skilled households is now given by $\gamma(1-\lambda_K)=(1-\ell)$, where γ is the share of skilled natives in skilled population ($\gamma \equiv \overline{H}/(\overline{H} + M_H)$), M_H being the number of skilled migrants). In terms of national attitude (figure 3(c)), area (2) is unchanged but area (1) is reduced.

Concurrently with the changes that have occurred in national attitudes towards immigration since the 50's and 60's when unskilled immigrants were welcomed, and the 80's and 90's when they no longer are welcome, the share of unskilled households has markedly declined. Suppose then, that we apply our framework to a two-period analysis, and assume that $\ell_0 > 0.5 > \ell_1$, so that native unskilled households started as a majority and became a minority (with a corresponding decrease in λ_K). In the presence of sustained migration, as the non-shaded areas in figure 5(a) indicate, the median (native) voter changes from being in favour, to being against, unskilled immigration.[14] However, as depicted by figure 5(b), if immigrants are skilled and there is a substantial immigration surplus associated with their arrival, it may well be that the majority change leaves unaltered the favourable attitude towards skilled migrants.

Although this direct-democracy framework helps to understand why attitudes towards skilled immigrants would be more favourable, it is still one in which unskilled natives (who are, according to our definition, 'capital-rich') favour immigration, the reverse being true for skilled natives. This is particularly hard to reconcile with the survey-based results reported by Scheve and Slaughter (1999). Their econometric evidence using 1992 household survey data shows that, after controlling for gender, age, ideology, race, less-skilled (more-skilled) people prefer more-restrictionist (less-restrictionist) immigration policy. They also report that these results are robust to choice of the skill measure (occupational wage, years of schooling).

[14] If migrants get progressively "assimilated" and vote, then the critical line in figure 5 rotates back to the diagonal, but the changes in attitudes would still be observed if the unskilled changed from majority to minority.

Figure 5: Population shares in the presence of sustained migration



(a) unskilled immigrants

(b) skilled immigrants

λ_K : share of capital used in sector X
ℓ : share of unskilled individuals in total population
μ: share of unskilled natives in unskilled population
γ: share of skilled natives in skilled population

Shaded areas indicate an attitude in opposition towards immigrants

A straightforward extension to accommodate this result would be to assume that skilled (or unskilled) labour, rather than capital, is the mobile factor. In this case, every native would be opposed (favourable) to immigrants who (do not) share his skill level, irrespectively of capital ownership. An alternative is to introduce inequality in capital ownership among natives, as we do in the next section.

Unequal capital distribution across households

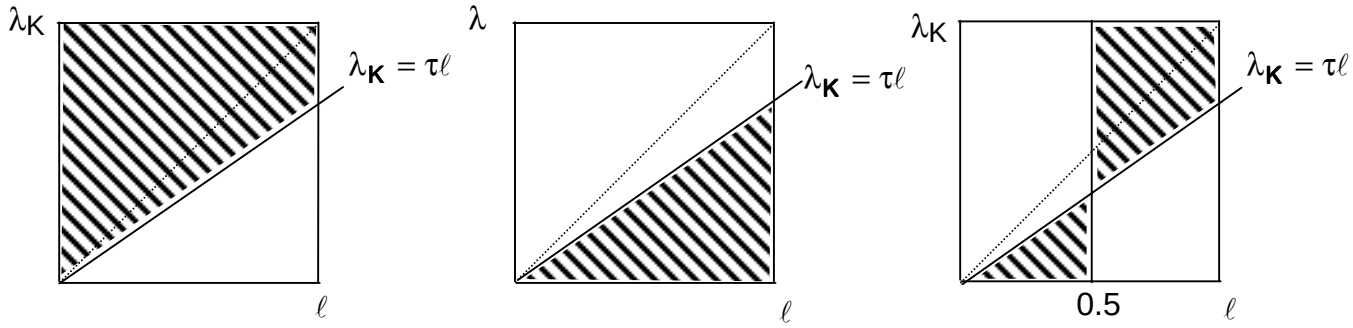
Relax now the assumption of equal capital ownership share among national households. We shall consider the case where capital is evenly distributed within each household group but capital per capita is different across groups (i.e there is "between" inequality)[15]. Now the value of the index of between-group inequality, τ, defined in equation (1) is given by $\tau = \theta_L / \ell$ and $\tau < 1$, under the plausible assumption that the per capita capital ownership of unskilled households is inferior to their share in total population. Recall that the definition of a 'capital rich' ('capital poor') unskilled household is one for which $\theta_L > \lambda_K$, ($\theta_L < \lambda_K$), so that the indifference line is now given by $\tau \ell = \lambda_K$.

Figure 6 draws the plausible case where $\tau < 1$, so that the indifference line ($\lambda_K = \tau \ell$) has rotated clockwise with respect to figure 3 ($\tau = 1$). This leads to an increase of the area where unskilled (skilled) households are opposed (favourable) to immigrants, an intuitive result as between inequality has lowered the capital ownership of unskilled households. In the limiting case where unskilled natives do not own any capital ($\tau = 0$), they become unambiguously opposed to immigration, while skilled natives systematically favour it, a result more consistent with the empirical evidence.

For the whole country, in figure 6(c), there is a net increase in the total shaded area (opposition to immigration). This suggests, in a probabilistic approach to reflect ignorance about the economy's parameter values, rising opposition towards immigration. Again, if one interprets these results in the light of the increased income inequality in the US (and to some extent in other receiving countries), the framework can help explain how the recent increase in income inequality is accompanied by a stiffening attitude towards unskilled immigration.

[15] The case where capital is unevenly distributed within groups but the average capital per capita is identical between groups (within inequality) is treated in Grether et al (2000) who also use a Beta distribution to examine numerically the case where capital ownership distribution is skewed to the left within each household group. The simulations reveal an "opposition cone" along the diagonal of figure 3(c), whose width depends on the skewness of the capital within each group.

Figure 6: Inequality in capital distribution between households



(a) unskilled households (b) skilled households (c) total population

λ_K : share of capital used in sector X
ℓ : share of unskilled individuals in total population
τ: index of between-group inequality in capital distribution

Shaded areas indicate an attitude in opposition to immigrants

Another source of opposition towards immigration may come from globalisation, reflected in an increase in the relative price of the exporting sector. Assume that the price of good Y increases or, alternatively, that a neutral technical progress in the same sector increases the marginal productivity of capital in the exporting sector. How would this affect the attitude towards immigrants? In itself, the shock would alter factor rewards (along the usual lines in the Ricardo-Viner model) but in fact the only thing that matters as far as households' attitudes are concerned is the impact on the critical capital ownership levels. And the answer is straightforward: as the exporting sector expands, so does the share of capital used in sector Y. This means that skilled households face a higher critical capital level, the reverse being true for unskilled households. Thus, starting from an initial national indifference towards immigration (i.e. relaxing the assumption of differences in capital intensity between sectors for ease of exposition), like point B in figure 2, we move downwards, making skilled households capital-poor and generating an opposition towards immigration since they are assumed to be the majority.

How are these results affected when immigrants also own capital? The basic difference with the previous analysis is that national factor rewards react both to the change in labour endowment and to the change in the capital stock. As both effects work in opposite directions, there is scope for a capital "compensation effect" on the immigrants' side, which might lead to a reversal of the net impact of immigration on factor rewards. It can be shown that the critical capital ownership level of immigrants is exactly the same as that of the native unskilled in the benchmark case. If immigrants own more capital than this critical level, they become "capital-rich" and attitudes towards immigration are reversed. This may explain why capital requirements are a critical factor in the immigration policy of certain countries.

In sum, the Ricardo-Viner model provides a useful framework to analyse the changing pattern of attitudes towards legal immigration identified in industrialised countries. On the one hand, the loss of majority by unskilled natives is likely to have led to a reversal of national attitude from one of acceptation to one of opposition towards immigration. On the other hand, this stiffening of attitudes towards immigrants may have been exacerbated by globalisation or by an increasing inequality of capital distribution among natives. At the same time, a relaxation of this anti-immigrants stance can be obtained imposing capital requirements on immigrants which, by the way, is being increasingly observed across receiving countries. Moreover, opposition towards skilled immigrants is less strong, particularly if the "immigration surplus" is large. In the next section, we show how a slight modification to the model makes it useful to examine the political economy of illegal immigration.

4. Why illegal migrants?

The Ricardo-Viner framework can be extended to the analysis of illegal immigration. Following Hillman and Weiss (1999a), we assume now that there is only one type of labour (L), which is the mobile factor, and two types of sector-specific capital (K_X,K_Y). There are two classes of households, "workers" each owning one unit of labour, and "capitalists" each owning one unit of either type of capital. Immigrants do not bring any capital with them. There are more workers than capitalists so the median voter is a worker.

Traded goods only

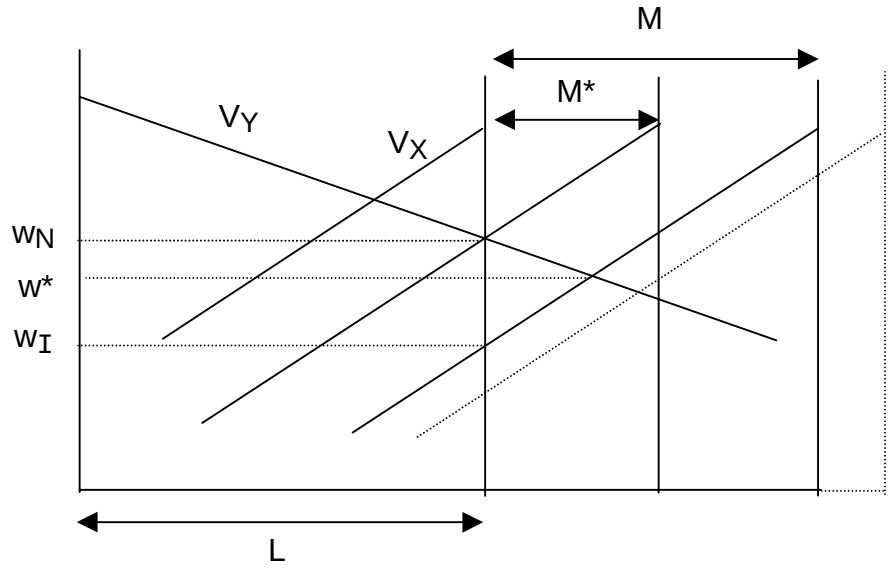
Start with the case where both goods are traded, and illegal immigrants are confined to one sector (illegal Mexicans in California employed in the garment and citrus fruit industries). Immigration, which brings down real wages, should never be observed, as it will be opposed by a majority of voters. However, illegal immigration may occur, and will be welcomed by capitalists. Suppose illegal immigration took place in the past, so that we start from an initial situation where there is already a substantial number of illegal immigrants in the country.[16] Moreover we assume that all illegal immigrants have been confined in sector X by an exogenous segregation process, which has displaced all native workers to sector Y.

This situation is depicted by figure 7, where the number of illegal immigrants (M) is larger than the critical amount of immigrants that displaces the last native worker from sector X to sector Y (M>M*). This means that native labour has become specific to sector Y and that the wage rate of natives (w_N) is higher than the wage rate of immigrants (w_I). In this case, as shown by Djajic (1997), native workers are

[16] This corresponds to the case analysed by Hillman and Weiss who also assume that undesired (from the point of view of the median voter) illegal immigration has taken place. It is a shortcoming of the median voter framework that it is unsuitable to explain why illegal immigrants would have entered in the first place. A more appropriate framework is the pressure group model (see Hanson and Spilimbergo (1999b)) where industries that benefit from illegals make contributions in return for lower levels of enforcement while groups that oppose immigration, say unions (and perhaps other groups) make contributions for higher enforcement levels.

"immunised" against additional illegal immigration. Indeed, any additional increase of the immigrant population (represented by the dotted lines in figure 7) is Pareto improving for natives as it will depress the immigrants' wage while increasing the real return to K_Y and leaving unchanged both w_N and the real return to K_X.

Figure 7: Illegal immigration (labour is the mobile factor)



V_X: marginal product of labour in sector X
V_Y: marginal product of labour in sector Y
L: number of native workers
M: number of immigrants
M*: number of immigrants such that all natives are excluded from sector X.

What if immigration policy is now put up to vote? If mass expulsion is not an option, the median voter will prefer to keep immigrants illegal rather than an amnesty that would allow immigrants to enter sector Y and would bring down his wage to w*. Moreover, a vote on additional illegal immigration would be positive as it would increase capital remuneration in sector Y while leaving indifferent native workers and sector X capitalists.

Non-traded sector

This illustrates the case where immigrants are confined to the lodging, restaurant and domestic help activities, as is the case in European countries with guest-worker systems. Provided that preferences are the same across household groups, the previous conclusion is reinforced if one of the two sectors produces non-traded goods. Suppose it is sector X, where illegal immigration is frequently observed, and start again from an initial situation where all natives are employed in sector Y (now the composite traded good). With respect to the analysis of figure 7, the additional consequence of allowing more illegal immigration would be a decrease in the relative price of non-traded goods (there is an increase in the relative supply of non-traded goods while the relative demand is unchanged provided immigrants share a common consumption pattern with natives). This leaves every household better off than in the traded-goods case, generating a clear majority in favour of additional illegal immigration.[17]

The predictions here, according to which one would not vote to legalise illegal immigrants and where illegality permits the selective enforcement of restrictive immigration laws which confine immigrants to sectors where the median voter benefits from their presence, are supported by recent evidence. Hanson and Spillimbergo (1999a) show that illegal immigration between Mexico and the US responds to wage differences. In further work (Hanson and Spillimbergo (1999b)), they show that border enforcement efforts can be explained by the clashes in lobbying activities between sectors that use illegals intensively (apparel, fruits, lodging and restaurants) who lobby for lax enforcement and labour unions that oppose lax enforcement. They also point out that inefficient enforcement mix (at the border rather than the interior) is chosen for political economy reasons though officially it is to avoid to "injure directly parties".

[17] See Djajic (1997). This is all the more likely if one makes the assumption as do Hillman and Weiss (1999a), that domestic (and legal immigrant) households have stronger preferences for non-traded goods than illegal immigrant households.

5. Dual labour markets and "guest-worker" migration

Segregation appears not only in the context of illegal immigration, but is observed in many countries even in the case of legal migration. The extent of segregation seems to depend on migration policy: it is more pronounced in countries with a "guest-worker" system than in countries favouring permanent immigration ("melting-pot").[18] Furthermore, table 1 shows that among European countries, those with a "guest-worker" system (Germany, Austria, Switzerland) have experienced the greatest increases in the share of foreigners. From the viewpoint of political economy, one might therefore conjecture that the probability that immigration is accepted by natives depends on the type of immigration policy and thus on the extent of segregation it generates.

In the preceding section, we assumed complete sectoral segregation between natives and illegal immigrants. Here we investigate further the link between migration policy, (incomplete) sectoral segregation, and the political economy of immigration. To analyse this issue, we use an efficiency-wage model of a dual labour market with "good" and "bad" jobs. In this model, segregation and discrimination against immigrants are a consequence of the fact that migrants face different incentives and legal constraints than natives. On the one hand, migrants are likely to return to their home country (voluntarily or forced by limited work permits). On the other hand, preferential hiring regulations lead to discrimination against immigrants if good jobs are rationed.

We continue with the Ricardo-Viner small-country model with both goods traded, capital being the specific factor. Each native worker owns some quantity of capital, which is paid at the average return of the two sectors. The dual labour market is modelled in a standard efficiency-wage framework following Shapiro and Stiglitz (1984) and Bulow and Summers (1986). Work conditions in the primary and the secondary sectors are not identical. The primary sector, Y, offers good working conditions. By assumption, workers in this sector cannot be perfectly monitored. Thus

[18] Zimmermann (1994) shows that in "guest-worker" countries like Germany and Switzerland, immigrants are heavily represented in construction and manufacturing, as opposed to the United States, where the sectoral distributions of natives and immigrants are very similar.

firms prefer to pay wages above market-clearing levels in order to induce workers to supply effort. As a consequence, jobs are rationed in the primary sector and workers are queuing up for them. However, they can always find jobs in the secondary sector, X. These jobs are much less attractive and consist of repetitive tasks that can be easily monitored at negligible cost. The wage rate is set competitively in this sector. There is no unemployment.[19] First, we develop the model to show how the equilibrium is affected by an inflow of migrants, and second, we ask what type of system ("melting-pot" or "guest-worker") will be preferred by natives.

Segregation and discrimination in the efficiency wage model

Workers are assumed to be risk-neutral and to have identical instantaneous utility functions. Worker i holds a certain amount of capital k_i, and his indirect utility function is given by:

$$U = w + r_K k_i - e \qquad (2)$$

where w is the wage, r_K is the average return to capital in the two sectors and e denotes effort. The variable e can take two values: 0 if the worker does not make any effort (i.e. if he "shirks"), and e>0 if he does not shirk. Workers are assumed to maximise expected utility over their infinite life horizon, using discount rate r.

Consider first the situation of natives. The problem of a worker in the primary sector who has to decide whether to shirk or not, can be analysed by relating the utility levels that he can attain in the two cases. Let U_Y^s (U_Y^n) denote the expected present value of utility of a shirking (non-shirking) worker holding a primary-sector job. Let V_X denote the expected utility of a secondary-sector job. To relate these situations, the asset-equation approach introduced by Shapiro and Stiglitz (1984) is followed. A worker who

[19] For the effects of immigration in efficiency-wage models with unemployment, see Müller (2000) and Epstein and Hillman (2000), where the natives' willingness to exert effort increases with the number of immigrants.

shirks faces a probability d per unit time of being discovered and fired. Moreover, there is an exogenous probability q per unit time for each primary-sector job to end; in that case the worker takes up a job in the secondary sector. If a worker has a job in the primary sector, he receives wage w_Y. He earns the following return, according to whether he shirks or not:

$$rU_Y^n = w_Y + r_K k_i - e - q(U_Y^n - U_X) \quad (3)$$

$$rU_Y^s = w_Y + r_K k_i - (q+d)(U_Y^s - U_X) \quad (4)$$

A worker in the primary-sector does not shirk if $U_Y^n \geq U_Y^s$. At equilibrium, there is no shirking and this condition holds with equality since there is no reason for a primary-sector firm to pay a higher wage. Using equations (3) and (4), the no-shirking condition can be rewritten as follows:

$$d(U_Y^n - U_X) = e \quad (5)$$

The return to a job in the secondary sector is equal to:

$$rU_X = w_X + r_K k_i - e + \alpha(U_Y - U_X) \quad (6)$$

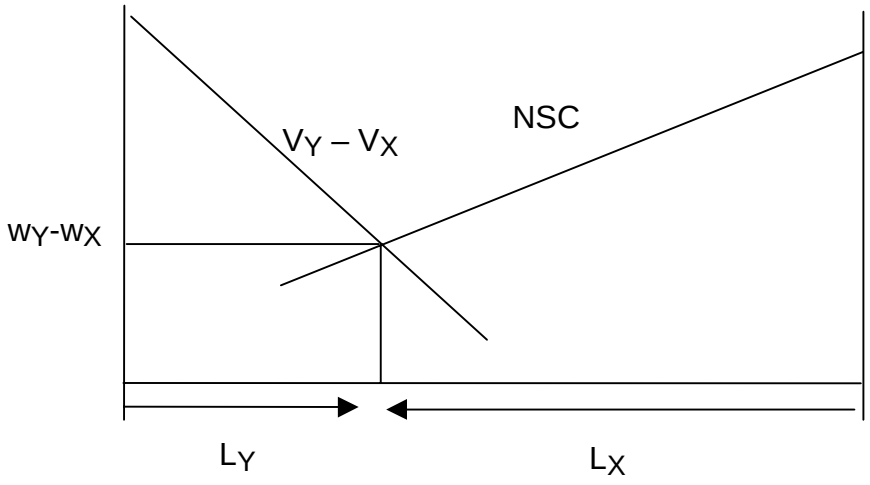
where α is the probability of moving from a secondary-sector job to a primary-sector job.

In a steady-state equilibrium, the flow out of the primary sector is qL_Y, where L_Y is native employment in the primary sector. The flow into the primary sector is $\alpha(L-L_Y)$, where L is total native employment. At equilibrium, these two must be equal. Thus, for natives α is given by $qL_Y/(L-L_Y)$. Using (3) and (6), the no-shirking condition (5) becomes:

$$w_Y - w_X = \frac{e}{d}\left(r + \frac{qL}{L - L_Y}\right) \qquad (7)$$

At equilibrium, the wage rate is equal to the marginal product of labour in each sector. Labour market equilibrium is depicted in figure 8. The upward-sloping curve is the natives' no-shirking condition (7), and the downward-sloping curve represents the difference between marginal products of labour in the two sectors. The intersection determines the equilibrium wage differential and native employment in both sectors. Note that the employment of immigrants is considered exogenous in this figure, and that the equilibrium in the dual labour-market is inefficient. The distortion could be corrected by subsidising primary-sector (high-income) employment. Since such a measure would meet with strong political opposition, because of its anti-egalitarian implications, we assume that it is not realised.

Figure 8: Equilibrium in the Dual Labour Market



NSC: non-shirking constraint of natives
V_X: marginal product of labour in sector X (secondary sector)
V_Y: marginal product of labour in sector Y (primary sector)

The welfare outcome of immigration obviously depends on the migrants' incentives and on migration policy. Indeed, a distinctive characteristic of immigrants is their probability of return.[20] Therefore, even if migrants are identical to natives in all other respects, their incentive not to shirk is influenced by the probability of return to their home country. Moreover, the return probability is influenced by various aspects of migration policy, such as the existence of temporary work permits, or the government's attitude towards social and economic integration of immigrants. Other legal dimensions of migration policy are equally important. In most countries, migrants are granted equal rights in the host country's labour market only after a certain period of stay. Firms are compelled to prefer natives and "old" migrants over "new" migrants in their hiring decision.

All these factors contribute to segregation and thus discrimination against migrants. Since competition ensures that natives and migrants are paid the same wages, discrimination is of the type "equal pay for equal work, but not equal work". Hence migrants have smaller chances of finding "good" jobs than natives and suffer from sectoral segregation. The extent of segregation which results from these differences in incentives can be summarised by the following equation relating the migrants' chances of being employed in the primary sector to that of the natives:[21]

$$\frac{L_Y^*}{L^*} = (1-\xi)\frac{L_Y}{L}; \quad 0 < \xi \leq 1 \qquad (8)$$

where an asterisk on a variable denotes an immigrant and ξ measures the extent of segregation.

[20] In 1995, average return rates ranged from 1.5 per cent for Netherlands to 7.8 per cent for Germany, though much higher return rates are attained for particular groups (25.6 per cent return rates for Polish immigrants in Germany) of for certain legal categories (10.3 per cent for holders of annual work permits in Switzerland).

[21] Equation (8) can be considered as a reduced form. The exact relation between segregation, discrimination and structural parameters (such as the return probability) is derived in Müller (forthcoming).

The choice of migration policy

Is it more likely that natives will vote in favour of immigration if the government applies a "guest-worker" system, rather than a "melting-pot" policy? To analyse this issue, assume that capital is distributed unequally among native workers. Consider a worker (indexed by i) holding k_i units of capital. Immigration entails an identical change in his steady-state utility, whether he works in the primary or the secondary sector. Indeed, differentiating equations (3) and (5) yields:

$$dU_Y = dU_X = (1/r)(dw_Y + k_i dr_K) \qquad (9)$$

How does the critical level of capital, k_i^c (at which a native is indifferent towards immigration, i.e. $dU_X=dU_Y=0$) depend on migration policy? Consider first, as a benchmark case, the standard Ricardo-Viner model without dual labour markets. Here the critical level of capital is given by the total per capita stock of capital, $(K_X + K_Y)/L$. By contrast, the "zero-sum" property of (infinitesimal) immigration is not preserved in the dual-labour-market model, as the equilibrium is inefficient. Immigration has a positive (negative) first-order effect on the natives' aggregate welfare if native employment in the primary-sector, L_Y, increases (decreases).[22] As a consequence, the critical level of capital is inferior (superior) to the per capita average capital stock, if native primary-sector employment increases (decreases) with immigration.

Thus the reaction of native primary-sector employment is crucial for the political economy of immigration. Immigration does not shift the natives' no-shirking constraint (NSC). Therefore the question whether L_Y increases with immigration reduces to whether the marginal-labour-product curve shifts upwards in figure 8. In Müller (forthcoming), it is shown that this is more likely to happen if migration policy leads to a high degree of segregation, ξ.

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[22] To see this, consider the variation of aggregate native welfare: $L_X\, dU_X + L_Y\, dU_Y =$ $(1/r)\, L_X\, (dw_Y - dw_X) = [(1/r)\, (w_Y - w_X) - (e/d)]\, dL_Y$, where the expression between brackets is positive.

It is instructive to consider the special case of a "guest-worker" system where segregation is maximised (ξ=1). As immigrants "push" natives towards the primary sector, the marginal-labour-product curve shifts to the right, and L_Y increases unambiguously with immigration. The critical level of capital is equal to:

$$k_i^c = \frac{K_X + K_Y}{L_Y + L_X[1+\eta_Y/\varepsilon_Y]} \qquad (10)$$

where η_Y is the absolute value of the inverse labour demand elasticity in the primary sector and ε_Y is the elasticity of the wage with respect to the primary-sector employment along the no-shirking constraint. Thus the "guest-worker" system implies a critical level of capital which is lower than the average capital per capita, since $k_i^c < (K_X + K_Y)/L$. If the distribution of capital is symmetric (or if the median capital level is not too far below the average), the median voter will therefore be in favour of immigration.

By contrast, with a non-discriminatory "melting-pot" policy (ξ=0), it is likely that the critical capital level exceeds the average per capita capital stock. In that case (and if the median capital level is not greater than the average), the majority of natives will vote against immigration.

Including the gain of secondary-sector workers, $(U_Y - U_X)\, dL_Y = (e/d)\, dL_Y$, does not change this qualitative result.

6. Conclusions

This paper has presented an overview of the determinants of migration policies in industrial countries. It has argued that overall, migration probably yields efficiency gains for natives (i.e. an immigration surplus), and an overall welfare gain, if compensation policies can be put in place. We have argued that it is a useful way to view immigration policies as largely determined by the electorate at large in representative democracies, as would be the case in a direct democracy, because of the strong positions taken by politicians and the electorate at large.

Using the direct-democracy framework in several variants of a specific-factors model, we have shown how it can help interpret several stylized facts about recent immigration policies: stiffened stance towards immigration of unskilled; coexistence of legals and illegals; lax enforcement towards illegals; a preference for 'guest-worker' programs; and a shift towards eligibility criteria included in immigration decisions.

While going beyond the framework of market-determined outcomes, and of policies determined by benevolent policymakers, the approach has remained grounded in the standard trade models. This has enabled us to relate trade and migration policies, as they are in policy and political debates. As a result, several aspects of migration policies, such as the determination of refugee policies towards asylum claims, have been left out. Neither have the links between foreign direct investment, trade policy and migration policy been examined.

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