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Free Movement, Open Borders, and the Global Gains from Labor Mobility

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Abstract

Straightforward economic arguments point to the potential for large global output gains from the movement of labor from less to more productive locations. Yet the politics of receiving countries seems resistant, characterized rather by efforts to limit migration or to stop it altogether. In this article we examine the foundations of claims of large welfare gains through free mobility, studying implications of liberalizing migration for world welfare under a variety of models, paying attention not only to overall gains but also to how gains are distributed and reviewing attempts to quantify the benefits. We conclude by asking how far considerations beyond economics motivate keenness to impose restrictions on migration.

1. INTRODUCTION

Where someone is born determines their future opportunities and the wealth they can accumulate over their life cycle. This is true for differences both within countries and between countries. To be born in a poorer part of a large country is to begin life with worse economic prospects than someone born in a better-off part.¹ The option to move means that those for whom the potential gain in income exceeds the cost of moving can improve their prospects by relocating. Not only is this a gain in overall output of the country but it is also distributionally positive, because those whom it principally benefits are the poorer individuals in the country.² Similarly, those born in poorer countries face more restricted economic opportunity, have reduced possibilities to enhance their productivity through learning, and obtain lower wages for their work than do those in richer countries. Again, one way for them to improve their situation is to move to richer countries where they can command a higher price for their skills and thus improve their lifetime income and global output. That same movement may also bring benefits and losses to those born in countries where wages are higher, as it increases labor market competition, but it also allows those countries' economies to fill labor demand gaps by drawing on skills and talents not available in the native workforce.

These two situations, however, are not treated similarly. The gains from labor mobility within countries are largely³ unquestioned, whereas free movement of labor between countries is politically controversial. Possibilities of international migration are limited, usually due to immigration restrictions in those countries where the price for labor is high. For these and other reasons, such as high migration costs and credit constraints, only a small fraction of those who could benefit economically from migration do so at any point in their life cycle, and receiving countries therefore only realize a fraction of the potential efficiency gains through migration.

Some therefore argue that "barriers to emigration [may] place one of the fattest of all wedges between humankind's current welfare and its potential welfare" (Clemens 2011, p. 101). Several papers now attempt to quantify the magnitude of these potential gains. Although these are not always as big as those found in the earliest works (e.g., Hamilton & Whalley 1984), the conclusion that migration is generally beneficial and that greater openness would create large global economic gains is more or less universal in academic studies.

To an extent, recognition that barriers to free movement prevent economically beneficial eradication of wasteful geographic inequality in labor productivity is built into economic modelling. Adam Smith [1776 (1976), p. 151] himself noted the cost to preventing free mobility, commenting that the policy of his time "by obstructing the free circulation of labor and stock both from employment to employment, and from place to place, occasions in some cases a very inconvenient inequality in the whole of the advantages and disadvantages of their different employments."

Below, we review the nature of relevant economic models and the basis for claims about the benefits from migration, who are the most likely gainers and losers, and whether the economic changes implied are of a magnitude that it is realistic to expect that any required policy changes can be implemented. We begin in Section 2 by developing the most basic model to illustrate the gains in world output that can be achieved through liberalizing migration and the distributional consequences of mobility.

¹ See recent work by Chetty & Hendren (2018a,b) and Chetty et al. (2018), for example, on the importance of neighborhood in the United States.

² Workers at the destination might face higher competition, and owners of firms may gain from the larger pool of labor from which they can recruit. Interestingly, for migrations within national borders, these gains and the potential losses to nonmigrants often receive little consideration compared to the migrant's chances of personal economic betterment, in stark contrast to international migrations.

³ This is not to say that internal labor mobility is always accepted. The hukou system in China is an obvious current exception (see, e.g., Liu 2005, Song 2014). Ties to land that prohibited free movement of labor within countries were often part of precapitalist economic systems.

Next, we discuss reasons for the geographic differences in factor productivity (wages) that drive migration in such models and summarize estimates of global gains in such simple settings (Section 3). In the sections that follow, we discuss extensions of the basic model and what these imply for quantitative assessments of the gains. We investigate the welfare consequences when labor is heterogeneous and what nontransferability of skills implies for welfare analysis (Section 4), and we explore what the benefits are when there are multiple goods, traded or untraded, and migration can affect market size in sending and receiving countries (Section 5). We introduce a public sector and discuss its interaction with the benefits from free mobility (Section 6).

Despite the large potential economic gains that emerge from many of these studies—“trillion dollar bills on the sidewalk,” as Clemens (2011) puts it—the governments of destination countries persist with restrictions on migration (Ruhs 2013), and these policy choices are widely supported (though also opposed) in those countries. It must be that either belief in the size or relevance of the economic gains is not shared by all or it is outweighed by belief that those gains will be consumed by others and will be offset in importance by losses (either economic or noneconomic) to those with votes to prevent migration. Is it therefore that the economic benefits of free mobility are not quite as straightforward? Or is it that noneconomic factors such as desire for cultural homogeneity, fear of social change, and, at the more extreme end, xenophobic attitudes (see Dustmann & Preston 2007, Card et al. 2012) prevent countries from realizing huge economic efficiency gains? In Section 7 we ask how to reconcile the political reality in most countries with the hypothetical gains from migration established in the literature. Finally, Section 8 provides discussion and conclusion.

2. THE EFFECTS OF LABOR MOBILITY: THE BASE MODEL

2.1. World Output Gains

The most obvious economic benefits to free movement of labor are driven by allowing workers to move from locations where their skills are less productive to locations where they are more productive.⁴ If workers are paid according to the value of what they add to production, and move from locations where they are paid less to locations where they are paid more, then free movement increases the value of global output. If workers move to locations where they are paid the most, then, at least in the absence of externalities, they will allocate themselves across locations so as to maximize the value of global output.

This situation is illustrated in the upper part of **Figure 1**. This useful diagrammatic representation, combining the diagrams for separate countries in Hamilton & Whalley (1984), is used in Bhagwati (1984), Clemens (2011), and Kennan (2016). We suppose two locations, A and B , with homogeneous and inelastically supplied labor inputs, L_A and L_B , which produce single outputs, Q_A and Q_B . There is free movement of goods between the two locations, and output is traded at a common price that we can set as numéraire. Technologies and levels of other factors of production can differ. Price-taking firms demand labor at wages w_A and w_B up to the point that the cost of an additional worker is equal to what is added to the value of output. The figure depicts the value of the marginal product of labor (equal to the wage) at locations A and B on the left and right vertical axis, whereas the horizontal axis carries labor supply. The two downward sloping lines are demand for labor curves, the one for A reading from right to left and the one for B reading from left to right. The width of the box is world labor supply L , equal to the sum of native workforces

⁴Sjaastad (1962, p. 83) considers migration as an “investment increasing the productivity of human resources, an investment which has costs and which also renders returns.” In a Roy model (Roy 1951; see, e.g., Heckman & Honoré 1990 for a formal exposition), these returns consist of differences between countries or regions in skill prices affecting individuals’ productive capacity and in the country-specific return rates to human capital (see Dustmann et al. 2011).

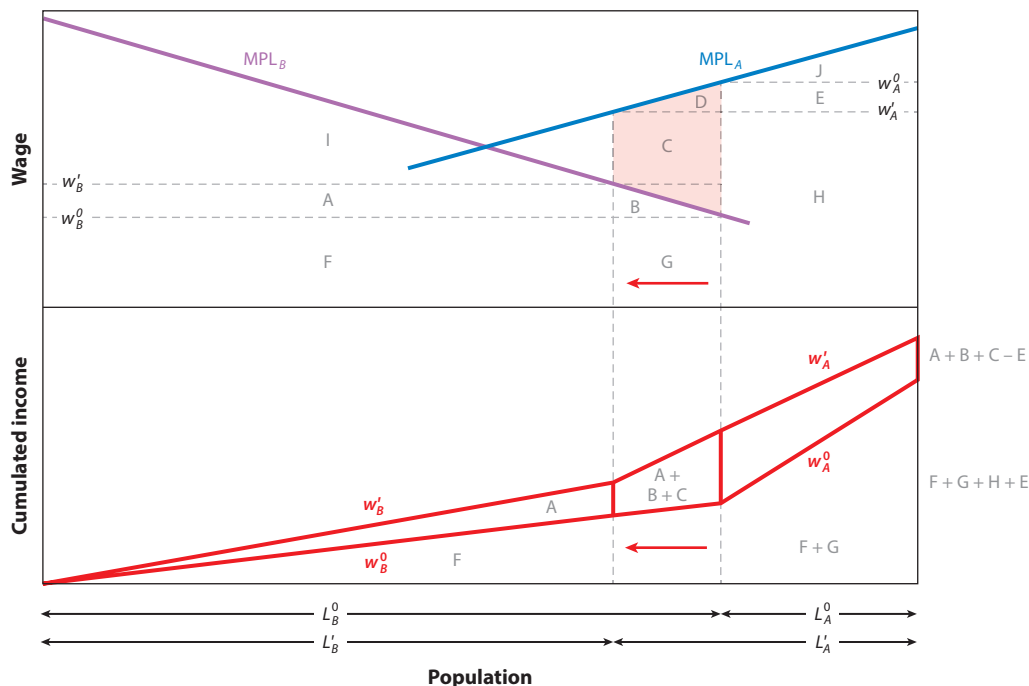


Figure 1

Gains from labor migration. Abbreviations: MPL_A , marginal product of labor at location A ; MPL_B , marginal product of labor at location B .

L_A^0 and L_B^0 at the two locations, and any point along the lower axis represents a split of the world labor force between the two locations.

At the initial split, wages are higher in A than in B at w_A^0 and w_B^0 . Areas under the curves, $\mathcal{E} + \mathcal{H} + \mathcal{J}$ for location A and $\mathcal{A} + \mathcal{B} + \mathcal{F} + \mathcal{G} + \mathcal{I}$ for location B , equal the total value of output. In A , the wage bill is the sum of the areas $\mathcal{E}$ and $\mathcal{H}$, and the remainder of the value of output $\mathcal{J}$ goes to whoever has a claim on the excess, whom for expositional purposes we can call the owners of capital. In B , the wage bill is the sum of the areas $\mathcal{F}$ and $\mathcal{G}$, and the remainder of the value of output $\mathcal{A} + \mathcal{B} + \mathcal{I}$ goes to capital. Movement of $\Delta L = L'_A - L_A^0 = L_B^0 - L'_B$ from B to A , represented by the thick red arrow, raises the wage in B to w'_B and reduces that in A to w'_A . The total gain in world output is given by the two shaded areas $\mathcal{C} + \mathcal{D}$, resulting from the difference between the increase in the value of output in A of $\mathcal{G} + \mathcal{B} + \mathcal{C} + \mathcal{D}$ and the fall in the value of output in B of $\mathcal{G} + \mathcal{B}$.

If world output is all that matters, this might be as much as needs to be said on the economic impact in such a simple setting. However, world output alone does not exhaust all interesting economic effects. Behind it lies a more involved pattern of redistribution between immobile factors, as the movement of labor also leads to redistribution at each location between workers and owners of capital. The growth in labor force employed in A and the fall in B change the marginal products of immobile workers and other immobile factors, moving the economy along the demand for labor curve at each location so that wages rise in B and fall in A .⁵

⁵A large literature studies empirically the impact of immigration on equilibrium wages in receiving countries, treating worker movement as labor supply shocks (Card 1990, 2001; Altonji & Card 1991; Borjas 2003; Ottaviano & Peri 2012; Dustmann et al. 2013, 2017; Llull 2014; Monras 2015; see Dustmann et al. 2016 for

These changes in factor payments⁶ can all be seen in **Figure 1**. Immobile labor at the receiving location A sees a fall in wage receipts from $\mathcal{E} + \mathcal{H}$ to $\mathcal{H}$, while owners of capital see an increase from $\mathcal{J}$ to $\mathcal{J} + \mathcal{E} + \mathcal{D}$. The block $\mathcal{E}$ is redistributed from labor to the owners of capital while there is a net gain of $\mathcal{D}$, the so-called immigration surplus (see Berry & Soligo 1969, Kenen 1971, Borjas 1995). This surplus arises because the labor demand curves slope down, and immigrating labor is therefore paid less than the value of what it adds to production in A .

Parallel to this, immobile labor in B sees wage receipts rise from $\mathcal{F}$ to $\mathcal{A} + \mathcal{F}$, while payments to capital fall from $\mathcal{A} + \mathcal{B} + \mathcal{I}$ to just $\mathcal{I}$. A block $\mathcal{A}$ is in this case transferred from owners of capital to labor, and a surplus of $\mathcal{B}$ is lost as a consequence of emigration (for a different diagrammatic illustration see Kenen 1971). Immigrants themselves see wage payments rise from $\mathcal{G}$ to $\mathcal{G} + \mathcal{B} + \mathcal{C}$, a gain of $\mathcal{B} + \mathcal{C}$. Adding together gains and subtracting losses gives the total gain of $\mathcal{C} + \mathcal{D}$.

2.2. Effects on Social Welfare

Although this simple model and diagram show that migration of labor raises world output, it also shows distributional effects that disadvantage, for instance, workers at the receiving location. If world social welfare is evaluated with indifference to the distribution of income, then the gain in world output is enough to say that labor movement is socially beneficial. However, this gain potentially obscures a pattern of redistribution that needs to be considered if world social welfare is sensitive to distribution.

To draw conclusions on social welfare consequences, therefore, we need to know how the returns to factors are distributed to people. In other words, we need to understand ownership of the rights to factor returns. We can assume that wages are straightforwardly paid to workers, but returns to capital are more problematic (see Berry & Soligo 1969).

Consider some extreme cases. First, suppose ownership of capital at both locations is equally spread across the native workforce, and migrants retain ownership of capital at the location of origin rather than gaining it at the destination. If we begin by thinking about a small change, since migration surpluses $\mathcal{B}$ and $\mathcal{D}$ are negligible in such a case, the redistribution between labor and capital within each country would simply change the way in which income is received by nonmovers. As a small movement would have no impact on immobile workers' total incomes, effects on immobile workers could be neglected and there would be an unambiguous gain in world welfare from the increase in output, which would be captured in higher wages by the migrants (Grubel & Scott 1966).

If there are costs to migration borne by migrants, then these costs straightforwardly count against migration gains. If any of the wage gains are remitted by migrants to nonmovers in the sending country, then this is a progressive transfer of resources that makes the gains even greater from the point of view of any egalitarian social welfare assessment.⁷

a survey). A smaller literature investigates the effects on wages in sending countries (see, e.g., Aydemir & Borjas 2007, Dustmann et al. 2015).

⁶Suppose the production function at each location is $Q_i = F^i(L_i)$, $i = A, B$. For a small movement of labor from B to A , the wage bill in A changes by $F_{LL}^A L_A + F_L^A$, with $F_{LL}^A L_A$ being the decline in wages paid to immobile workers in A and F_L^A being the payment to the immigrating labor. Correspondingly, workers remaining in B enjoy a higher wage bill of $-F_{LL}^B L_B$, while $-F_L^B$ is no longer paid to departing workers. Meanwhile, there is a rise in payments to capital in A of $-F_{LL}^A L_A$, exactly offsetting the fall in the wage bill of immobile workers, and a fall in payments to capital earned in B of $F_{LL}^B L_B$. In this simple world, therefore, migration of workers from B to A leads to an overall gain of world output of $F_L^A(L_A) - F_L^B(L_B)$.

⁷Djajić (1986) draws attention to the importance of remittances to an assessment of welfare effects.

For larger movements of the sort that might be seen under global open borders, it would be necessary to consider the migration surpluses. Workers at A would gain and share among themselves the immigration surplus $\mathcal{D}$ associated with the new arrivals. The loss of the surplus $\mathcal{B}$ would be split among the nonmovers at B and the migrants, while migrants would gain an additional $\mathcal{B} + \mathcal{C}$ in improved wages. So a typical native of A would gain $\mathcal{D}/L_A$, a nonmover at B would lose $\mathcal{B}/L_B$, and a migrant would gain $(\mathcal{B} + \mathcal{C})/\Delta L - \mathcal{B}/L_B$. Because all types of workers enjoy both capital and labor income, it is not obvious which of these groups are best or worse off to begin with, so it is not possible to take distributional analysis much further.

Alternatively, we could assume that workers receive only wages and returns to capital accrue entirely to a separate class of capitalists. The lower panel of **Figure 1** illustrates the distributional effects on workers using a generalized Lorenz curve representation (Shorrocks 1983). This is a curve plotting cumulative income against share of world population from the poorest to the richest. Because the least well paid are workers in country B both before and after migration, an ordering of the world's workforce by income coincides exactly with the position of workers on the lower axis of the diagram. The generalized Lorenz curve is a useful graphical tool because, as Shorrocks shows, global worker social welfare will increase for all inequality-averse social welfare functions if and only if the generalized Lorenz curve is higher everywhere.⁸

Before migration, the curve has a first section of length L_B^0 and slope w_B^0 and a second section of length L_A^0 and steeper slope w_A^0 . After migration, the first section shortens but gets steeper and therefore lies above the premigration curve. From that point onwards the slope is w_A' , the postmigration wage of workers in A . There is a short section covering the migrating population where that slope is even greater than the premigration slope and where the generalized Lorenz curve pulls away even further from the curve before migration (representing the gains of migrants). Then the remainder of the curve, covering immobile workers in A , has a lower slope than that before migration (representing the wage losses in the receiving country).

As long as the curve ends up at a higher point than it did beforehand, it is unambiguously higher all along and global worker social welfare unquestionably increases. This condition is simply the condition that global workers' income does not fall, which is to say that $\mathcal{A} + \mathcal{B} + \mathcal{C} - \mathcal{E} \geq 0$, or, in other words, that gains to immobile workers in the sending country ($\mathcal{A}$) and to migrants ($\mathcal{B} + \mathcal{C}$) at least match losses to immobile workers in the receiving country ($\mathcal{E}$).

If there were costs of migration borne by migrants, then this would reduce the slope of the section of the postmigration generalized Lorenz curve corresponding to the migrants' incomes, though there would still be a guaranteed case of welfare dominance provided that the total migration costs, say $\mathcal{K}$, were not large enough that $\mathcal{A} + \mathcal{B} + \mathcal{C} - \mathcal{E} - \mathcal{K}$ were negative. Remittances from migrants to nonmovers in the origin country would shift the curve further up and magnify the social welfare gain.

How to incorporate changes in capital owners' incomes into the welfare calculus is less clear. There is a deterioration in the income of capital owners in B and a gain to capital owners in A , involving not only the changing shares of output but also the gains and losses of the immigration surplus. However, we have not specified how capital owners' incomes compare to those of workers or how the incomes of capital owners in one location compare to those in the other, partly because we have not specified how many individuals are in the capitalist class. If capital owners are small in number and sufficiently rich that changes in their incomes can be regarded as of small welfare significance, then considering the effects on workers' welfare might be regarded as the most pressing consideration.

⁸Davies & Wooton (1992) use Lorenz curves to analyze effects on inequality separately for different locations assuming each individual owns only one type of factor.

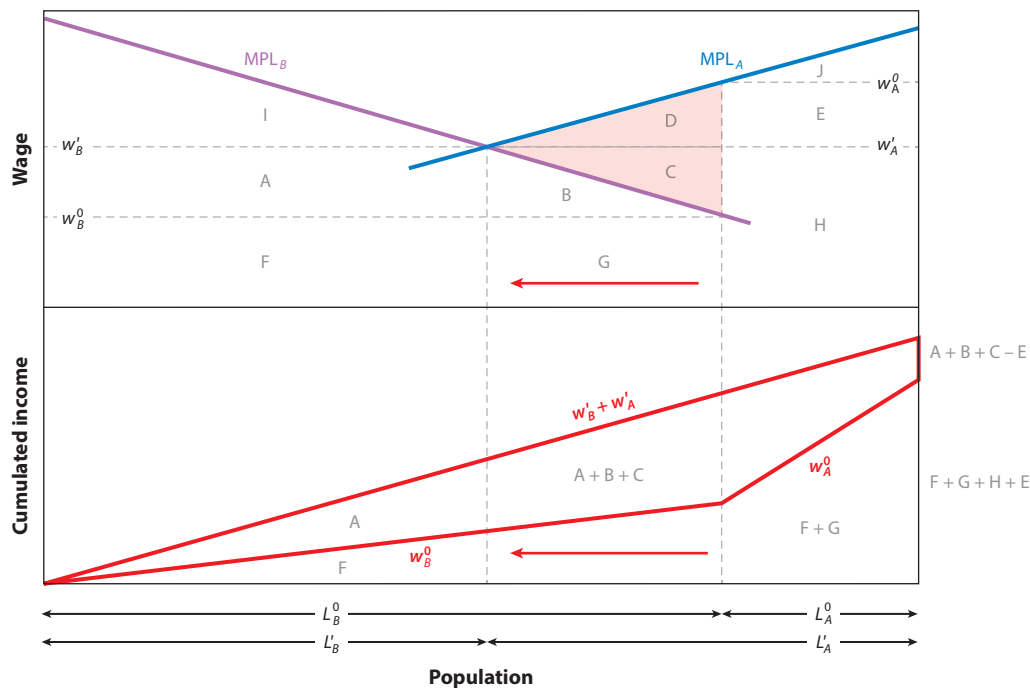


Figure 2

Gains to free movement. Abbreviations: MPL_A , marginal product of labor at location A ; MPL_B , marginal product of labor at location B .

2.3. Assessing the Effects of Free Movement

Free movement of labor means no restriction on the right of workers to move between locations for employment or on the right of potential employers to recruit between locations. If locations are within the same country, then free movement is simply absence of restrictions on internal geographic labor mobility. If the locations are thought of as different countries within a region with political and cultural links, then free movement might be part of a geographically limited political project to reduce the economic significance of borders, as in the case, for example, of free movement within the European Union or other economic areas. If the locations are thought of as all countries, then free movement can be identified with the more radical idea of global open borders.

If workers have no reason to prefer one location over the other except for wages receivable and there are no costs to migration itself, migration under free movement should continue until wages are equated at the two locations. This means that marginal products will be equated. This is, of course, a necessary condition for maximization of global output. Free movement ensures productive efficiency by directing labor where it is most productive. Such an idealized situation is illustrated in **Figure 2**, in which migration is pushed to the point where inequality of wages is eliminated and the global generalized Lorenz curve for workers is a straight line.

If, on the other hand, workers are not indifferent to location, because of cultural preference for their society of origin or because there is a cost to migration, then marginal product will stop short of being equated at the two locations. Nonetheless, whatever movement of labor does happen will still be productively beneficial.

This is the simplest economic case for allowing free movement, similar to that underlying many simulations from Hamilton & Whalley (1984) onward. It facilitates productive efficiency

by allowing labor to move to where it is most economically valued. Furthermore, the case extends naturally, without the point needing to be belabored, to that in which labor is heterogeneous, with skills of different types moving to where they are most needed. As explained below, this can lead to very large estimates of potential gains, driven by very large international differences in wages. However, this scenario ignores multiple complexities associated with questions about the nature of production, the possible effects on movement of other considerations inimical to productive signals, and so on.

This simple model has been extended in succeeding literature in various directions. In these works, output can be a single good as above (Hamilton & Whalley 1984; Moses & Letnes 2004, 2005; Klein & Ventura 2007, 2009) or it can be many goods (Walmsley & Winters 2005; Iranzo & Peri 2009; Kennan 2013, 2016; di Giovanni et al. 2015). Goods can be costlessly traded (Kennan 2013, 2016), traded with costs (Iranzo & Peri 2009, Aubry et al. 2016), or not traded at all (di Giovanni et al. 2015). The market for those goods can be competitive or not (Iranzo & Peri 2009, di Giovanni et al. 2015, Aubry et al. 2016). Labor can be of a single type (Hamilton & Whalley 1984; Moses & Letnes 2004, 2005), differentiated into skilled and unskilled (Iregui 2005; Klein & Ventura 2007, 2009; Kennan 2013, 2016), or even differentiated along a continuum according to skill level (Iranzo & Peri 2009). The supply of those types of labor can be fixed or can be elastically supplied so that changes in wages induce changes in the global supply. The skills of workers can be internationally transferable or can be, to varying degrees, specific to the location of origin (Klein & Ventura 2007, 2009; di Giovanni et al. 2015; Aubry et al. 2016). Likewise, capital can be fixed (Hamilton & Whalley 1984; Moses & Letnes 2004, 2005) or mobile between locations (Iregui 2005; Klein & Ventura 2007, 2009; Kennan 2013, 2016), and there may be other immobile factors such as land (Klein & Ventura 2007, 2009). Technology could be the same everywhere but is typically assumed to differ across locations (Hamilton & Whalley 1984; Moses & Letnes 2004, 2005). If technology differs, it can be through differences in total factor productivity (TFP) (Klein & Ventura 2007, 2009), specifically in labor productivity (Kennan 2013, 2016), or both. Labor income can be consumed locally by migrants or can be remitted in part to the location of origin and spent there (Walmsley & Winters 2005, di Giovanni et al. 2015). Factor incomes can be taxed or not and the revenue used to fund public spending (Iregui 2005; Aubry et al. 2016). Labor movement can be costless or there can be psychological or legal costs to migration, which can be similar in form for similar individuals (Iregui 2005, Iranzo & Peri 2009) or show more complex heterogeneity (Kennan 2013, 2016; Docquier et al. 2015).

Besides questions about the way in which to model the economic effects, there are also questions about how those effects should be evaluated. They can be simply measured in terms of global GDP or can account for distributional sensitivities, which may lead to very different conclusions, as we point out above and discuss further below. Going beyond consideration of the straightforwardly economic impact, we can recognize that migration has social and cultural consequences that may well be of more importance for understanding public attitudes and the resistance to liberalizing international labor movement than economic effects (see Dustmann & Preston 2007, Card et al. 2012), as discussed in Section 7.

3. SOURCES OF INTERNATIONAL PRODUCTIVITY DIFFERENCES

3.1. Differences in Factor Endowments

Given the importance that differences in marginal products (and therefore wages) at different locations have for the economic gains from free movement, it is worth asking what possible reasons there might be for the existence of such differences. Why would marginal products differ between locations in the absence of migration? The most obvious reasons concern differences

in factor endowments. The two locations may have identical production functions but differ in endowments of labor. The labor-rich location will then have a lower marginal product of labor, and free movement will be economically advantageous by virtue of spreading the labor force more evenly across locations.

Typically, however, there are also differences in other factors of production, and international differences in the supply of labor relative to other factors are critical. Suppose again that technology at the two locations is the same and that output is produced using labor L_i and some other factor that we will call capital K_i ; wages are denoted w_i and the price of capital is r_i , $i = A, B$. Suppose that production shows constant returns to scale in labor and capital, so that we can write a common unit cost function $c(w, r)$, increasing and linearly homogeneous, giving the cheapest cost of producing one unit of output. Profit maximization in competitive factor markets will lead to the equating of marginal products to factor prices for both factors and of unit cost to output price. Equivalently, we have

$$c(w_i, r_i) = 1, \quad i = A, B, \quad 1.$$

and

$$g(w_i/r_i) = \frac{K_i}{L_i}, \quad i = A, B, \quad 2.$$

where $g(w_i/r_i) \equiv c_r(w_i, r_i)/c_w(w_i, r_i)$.

Differences in the marginal product of labor between locations can be a consequence of either differences in labor employed or differences in capital. In particular, if labor is evenly divided between the two locations but A has a greater immobile capital stock, then labor will be attracted toward A to enjoy the higher productivity associated with its higher capital/labor ratio. If capital and labor are themselves heterogeneous, then the greater complementarity between certain types of labor and certain types of capital may lead to migration so as to sort labor efficiently according to the location of particular sorts of capital.

Just as labor can be mobile so can be other factors. The analysis of **Figure 1** and **2** is based on labor demand curves taking the location of other factors as fixed. However, differences in factor endowments that cause differences in returns to labor will also cause differences in returns to capital, and if there is free movement of capital then capital also will tend to move to where it is best rewarded. Indeed, cultural barriers are less likely to inhibit capital mobility (though, to the extent that capital may be physically fixed, other considerations may do).

If capital is perfectly mobile, the price of capital will be equated between locations: $r_A = r_B = r$. If this is the case, it follows from Equation 1 that $c(w_A, r) = c(w_B, r)$ and that wages must also therefore be equalized: $w_A = w_B = w$. From Equation 2 it is then clear that capital/labor ratios will be equated across locations by virtue of capital movements whether labor is free to move or not: $K_A/L_A = K_B/L_B = g(w/r)$. In this case, capital moves between locations to spread itself proportionally to labor so that factor prices for both capital and labor are equalized, removing any economic incentive for labor to move. Free movement of labor is then unnecessary to achieve spatial productive efficiency. Constant returns to scale mean that the location of production is immaterial, provided that the capital/labor ratio is equal at different locations. Wherever labor is located, capital will join it in such a way to ensure productive efficiency and a marginal product of labor that is the same everywhere. It follows therefore that—in this simple world described by a model in which capital and labor are used to produce one output good according to technology that is the same everywhere—free movement of labor is required to achieve productive efficiency only to the extent that free movement of capital is somehow restricted.

3.2. Technological Differences

The discussion above has concentrated on differences in the marginal product of labor between locations as both a source of incentives to migrate and the reason that migration is economically beneficial. However, as shown above, different endowments of labor or capital as sole causes of such differences would be nullified by capital mobility alone, without the need for labor to move across places. Furthermore, exercises in development accounting (McGrattan & Schmitz 1999, Caselli 2005) conclusively reject differences in factor endowments as sufficient explanations of international productivity differences under a common technology.

What, then, leads to sustained differences in labor productivity despite capital mobility and trade? A possible reason for divergence in marginal products across locations is differences in technology. Technology differences can be thought of as differences in physical specification or quality of fixed infrastructure or as differences in working or productive practices at different locations. Suppose we return to the case of one traded good with two factors of production. If location A has production function $F(L, K)$, then we could suppose that location B has production function $\alpha F(\beta L, K)$, where α and β are parameters capturing technological difference. The first (α) allows for a Hicks-neutral difference in TFP. If $\alpha < 1$, then both labor and capital are less productive in location B but the ratio of marginal products is unaltered. On the other hand, if $\beta < 1$, then labor is specifically disadvantaged.

If the unit cost function in A is $c(w, r)$, the unit cost function in B is $c(w/\beta, r)/\alpha$. Hence, under profit maximization and zero profits

$$c(w_A, r_A) = 1, \quad 3.$$

$$\frac{1}{\alpha} c\left(\frac{w_B}{\beta}, r_B\right) = 1, \quad 4.$$

$$g(w_A/r_A) = K_A/L_A, \quad 5.$$

$$\beta g(w_B/\beta r_B) = K_B/L_B. \quad 6.$$

Suppose α, β , or both are less than one, so there is some technological disadvantage at B . Then Equations 3 and 4 cannot both be true with wages and rental rates equal at the two locations. Free mobility of capital and labor will tend, if allowed, to drag both factors inexorably toward the more productive location.

If capital mobility alone is unrestricted, so that $r_A = r_B = r$, then Equations 3 and 4 imply $w_A > w_B$, so the marginal product of labor will be higher at A and workers will want to move from B to A . If capital is immobile and labor mobility is unrestricted, labor will move until allocated across locations so as to satisfy Equations 3–6 with $w_A = w_B = w$, and capital/labor ratios will generally differ across locations.

To the extent that technological differences reflect immutable conditions at the two locations, such differences may persist indefinitely. However, if differences reflect differences in knowledge or customs at the two locations, then migration itself might be a means of transfer of technology between them. If the two countries are subject to knowledge shocks, it may be the movement of people between the two countries that transfers productive knowledge or practice and ensures dissemination of productivity-improving innovations. During the large labor migrations within and to Europe after World War II, some sending countries hoped for such knowledge

transfer to help their industrializing economies with essential skills (see, e.g., Mehrlaender 1980, p. 82).⁹

3.3. Quantifying the Gains to Free Movement

The earliest significant attempt to quantify the potential economic gains from the liberalization of international labor mobility was made by Hamilton & Whalley (1984). In this model, a single traded output good is produced by homogeneous labor and immobile capital; technology has a constant imposed elasticity of substitution covering a range of plausible values; and the world is divided into seven regions with differing TFP and relative factor productivity parameters, which are calibrated to 1977 data on GNP and factor shares.

The effects of removing immigration controls worldwide are simulated by finding the hypothetical allocation of labor across regions that equalizes marginal revenue products. There are implicitly no movement costs, and equilibrium population distribution is driven by technology differences and capital location. Potential gains, though “highly speculative” (Hamilton & Whalley 1984, p. 74), are enormous. In the base case, worldwide efficiency gains vary from about three quarters of the world output to over twice the world output, depending upon whether low or high values for the elasticity of substitution between labor and capital are assumed; in the central case of unitary elasticity of substitution, the gains are about one and a half times the world output.

Distributional effects are also dramatic. In the central case (with unitary elasticity of substitution), wages in the most developed region (the United States) fall by almost half, whereas those in the least developed region increase more than tenfold (with large changes in return to capital in the other direction). A global Lorenz curve shows world inequality cut to a fraction of the existing level. “The incentive for labor unions in high wage countries to oppose liberalization of immigration restrictions” (Hamilton & Whalley 1984, p. 73) is noted.

Although these figures are striking, they rely on reforms that take the world economy to points very far from experience (as emphasized, for instance, in Borjas 2015). The precise values for gains obviously rely heavily on the extrapolability of the specification adopted, but they are so large that they are unlikely to affect the conclusion that this is a reform with very big potential worldwide efficiency gains relative to other policy reforms under discussion. Interestingly, Hamilton & Whalley (1984) note that a large fraction of the efficiency gains can be realized with only partial liberalization, because the concave technology assumed implies marginal product differences that come down rapidly in the initial phases of migration. A closing of only 10% of international wage differences, for example, generates over 40% of potential gains in one case to which they draw attention.

Moses & Letnes (2004, 2005) replicate Hamilton & Whalley (1984), update the simulations so as to use data from the late 1990s rather than the late 1970s, and consider alternative values for some parameters, including dividing the world into three rather than seven regions. The point about largest gains being realizable with only moderate liberalization is confirmed with more detail, in particular with reference to distributional effects. In their central case, a 10% closing up of international wage gaps realizes about 22% of potential gains, with wages falling by 3% in the most developed region and rising by 11% in the least (Moses & Letnes 2004). Where these data are particularly informative is in giving an indication of the size of the population flows involved (absent from Hamilton & Whalley 1984). Whereas the simulation with complete open borders involves an astonishing 3 billion people migrating (or 60% of the global workforce), the 10%

⁹Immigration may also be an important source of innovation in itself, affecting the technology of the receiving country (see, e.g., Kerr 2018).

liberalization is achieved with the smaller, though still substantial, movement of a little under half a billion people.

4. CHARACTERISTICS OF LABOR

4.1. Heterogeneity of Labor

So far, we have assumed that there is only one type of labor. If workers have different skill levels, however, the simple diagrammatic exposition above is no longer adequate and indeed obscures considerations that may be relevant to assessing the distributional consequences.

Suppose L_A and L_B are vectors of labor in a variety of different types, distinguished by skills. In this case, movement of a worker of any type from one location to the other motivated by wage differences for that skill type between the two places will still raise global output, but a full consideration of the distributional impact in both source and destination locations will require an evaluation of the impact on labor of all types. As an example, assume that the migrant is of a particular skill type. As in the analysis above, wages of similarly skilled types will be depressed at the receiving location and rise in the sending location. However, the wages of other types of worker in the two locations will also be affected, in ways that will depend on the complementarity or substitutability between labor of the different skill types. In particular, those supplying labor that is closely substitutable will suffer at the receiving location, whereas labor that is complementary will gain. Suppose for example that highly skilled and less skilled labor are complements. Emigration of highly skilled labor will benefit unskilled workers in the receiving location but harm unskilled workers in the sending location. This sort of phenomenon is part of the source of concern about the so-called brain drain effect on poorer countries.¹⁰

Welfare analysis has to take account of the heterogeneity of labor income recipients. For instance, migration from country B to country A of a labor type that is not the worst off in B may not be beneficial to the least advantaged in the world income distribution and therefore not be evidently beneficial for global social welfare. Consider the case of just two types of labor, unskilled and skilled, in B and A , where initial wages have an ordering such that $w_B^U < w_A^S$ and both w_A^U and w_B^S lie somewhere in between them. Here, w_i^U and w_i^S stand for the wages of unskilled and skilled workers in the i th location, respectively. Now allow for migration of skilled workers from B to A . This will depress wages of the topmost and bottommost groups, assuming complementarity between labor of different skill types, and raise wages in the middle two groups.¹¹ We illustrate the distributional effects among workers in **Figure 3**, using a generalized Lorenz curve (assuming $w_B^S > w_A^U$). It is obvious from the figure that in this case, although world labor income rises, the generalized Lorenz curves cross because of the losses to the worst-off world citizens. If the poorest are made worse off, then a sufficiently inequality-averse global social welfare function will judge that global worker social welfare decreases even if world income rises.

The extensive literature on brain drain effects is focused on this problem and identifies several mitigating and complicating considerations (Bhagwati & Rodriguez 1975, Docquier & Rapoport 2012). Remittances from migrants to unskilled nonmigrants in sending countries can more than

¹⁰Different types of labor may also have different abilities to bear the costs of migration. If, for instance, there are fixed migration costs concerned with travel, paperwork, and so on, or if cultural adaptation in the receiving society is easier for those with higher skills (and therefore higher incomes), then migration may be concentrated among highly skilled labor.

¹¹Ruffin (1984) considers possible effects of factor flows on factor returns in models with more factors than goods and different patterns of complementarity and substitution. Davies & Wooton (1992) draw Lorenz curves for different countries under a variety of assumptions about which factors are complements and substitutes.

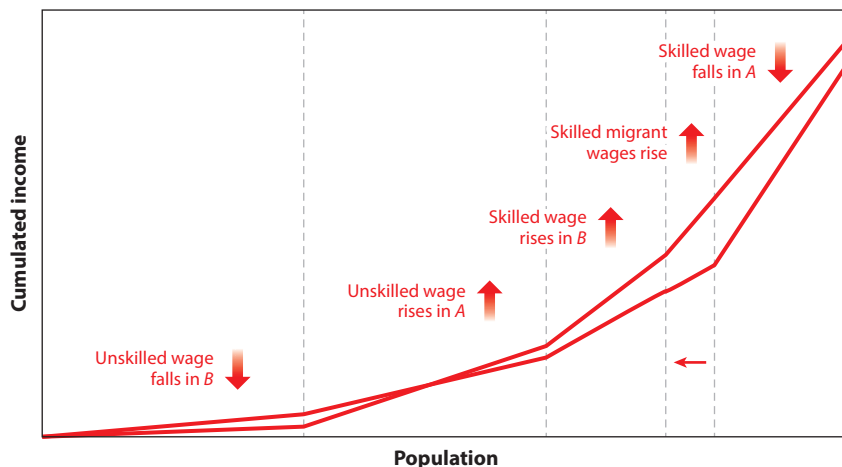


Figure 3

Distributional effects with heterogeneous labor.

compensate for losses (Bollard et al. 2011). Furthermore, if the supply of skills is responsive to economic incentives, the higher wages available to the initially unskilled in poorer countries could incentivize development of human capital in a way that also counteracts the brain drain's deleterious effects (Mountford 1997, Beine et al. 2008, Mountford & Rapoport 2011). Furthermore, returning migrants can bring back skills, technological knowledge, and trading links that ultimately help the source country.

4.2. Transferability of Skills

The discussion of technological differences above raised the possibility that labor might be less efficiently used at one location than another. It is possible, however, that the lower productivity of apparently similar labor at the two locations may be tied, at least temporarily, to the person's upbringing and education rather than to the location where the labor is employed. The assumption that labor productivity can be enhanced by moving between locations is then questionable. If skills are not transferable, or not so immediately, then movement of labor cannot be obviously analyzed in the framework we have set up above. For instance, if the skills immigrants bring with them are not productive at the receiving location (e.g., because lack of language competence makes those skills not transferable to the receiving labor market), then migrations may still take place (for example, because technological differences lead workers' marginal products in unskilled jobs in the receiving location to be higher than in skilled jobs back home), but the gain to global worker social welfare is smaller, and there are different distributional consequences.

There are many reasons for which skills may not be perfectly transferable. For instance, skills may be specific to institutional settings at the place of origin; migrants may lack skills that allow them to make the knowledge they have more productive, such as language proficiency or cultural knowledge; or there may be informational deficiencies that create frictions. There is ample evidence that downgrading takes place, whereby workers find employment in the receiving country in jobs that are below their level of observed skills. For instance, Dustmann et al. (2013) show that migrant workers are placed in the UK labor market at very different positions in the wage distribution than would be comparable natives, based on their observed skills. Dustmann et al. (2016) illustrate similar patterns for Germany and the United States. Also, earnings equations estimated

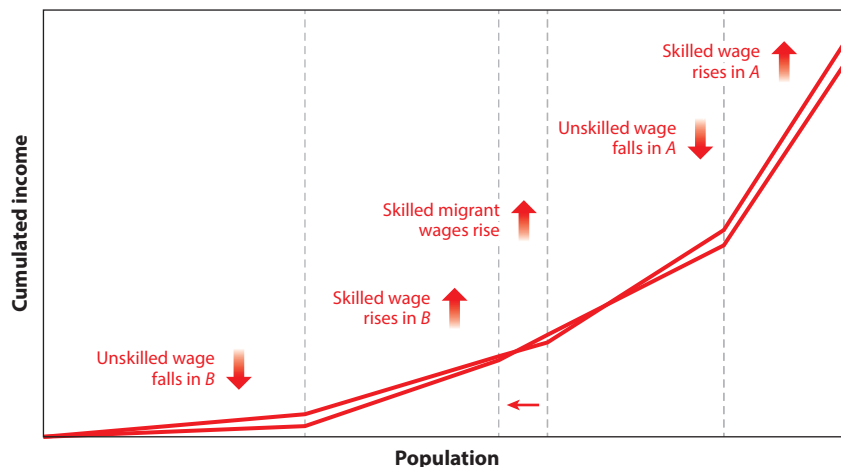


Figure 4

Distributional effects with nontransferable skills.

for immigrants usually show that education and experience gained in the home country have far lower returns than they have when obtained in the host country [see, e.g., early papers by Chiswick (1978) and Dustmann (1993)].

Suppose labor is heterogeneous. High-skilled immigrants migrate in the expectation of eventually competing for high-skilled jobs in the recipient country, but they initially seek employment in low-skilled jobs while acquiring necessary skills or finding their way into job acquisition networks that will give them access to better jobs. In this case, even high-skilled immigration could depress the wages of low-skilled workers in the receiving country (see Dustmann et al. 2016 for further discussion).

Quite a complex pattern is then possible. Consider, for example, that there is unskilled and skilled labor in B and A and the initial wage ordering is $w_B^U < w_B^S < w_A^U < w_A^S$. Assume there is migration of skilled workers from B to A , where they work as if unskilled. This depresses wages of the worst-off group in each country and improves the wages of the better off in each country. The unskilled in B lose out because they are working with fewer skilled workers, assuming complementarity, and the unskilled in A lose out because they are competing with an influx of skilled workers from B . On the other hand, skilled workers in B gain because they have fewer competing workers locally, and those in A gain because they are working with migrants in unskilled jobs. Generalized Lorenz curves can cross multiple times. This case is illustrated in **Figure 4**.

Borjas (2015) goes further in suggesting not only that the skills of migrants from poorer countries may fail to transfer productively, but also that the migrants may bring with them poor working practices that could spill over to receiving countries. He argues that the existence of large global gains presupposes implausibly “that billions of immigrants can move to the industrialized economies without importing the ‘bad’ organizations, social models, and culture that led to poor economic conditions in the source countries in the first place” (Borjas 2015, p. 968) and that the lack of evidence on such effects renders claims of large gains tenuous.

4.3. Quantifying the Gains with Skill Differences and Imperfect Transferability

The simulations provided by Hamilton & Whalley (1984) and Moses & Letnes (2004, 2005) include some that allow that labor in less developed countries might transfer to developed regions

with lower productivity. This reduces the estimated gains considerably, even though gains remain large.

Iregui (2005) adds heterogeneity in labor by allowing for skilled and unskilled labor and a two-stage nested constant elasticity of substitution (CES) production specification. In Iregui's model each country has a single output, but different goods are produced in different countries and consumers in each country have preferences between goods produced at home and abroad. Taxation is incorporated. Gains from eliminating migration restrictions are between 15% and 67% of world GDP, and most of the gain is associated with movement of unskilled labor (if only because this is the larger part of the workforce). Extensions to the standard model allow for capital mobility and for costs of migration.¹²

Walmsley & Winters (2005) develop a computable general equilibrium model in which temporary and permanent migrants have different productivities, there are multiple production sectors, and remittances are modeled. Liberalization of temporary migration is beneficial to both developing and developed economies, and, as in Iregui (2005), relaxation of unskilled migration is most important.

Klein & Ventura (2007) also differentiate between skilled and unskilled labor, concentrating on the role of TFP differences in driving migration, adding land as a factor, and allowing capital to be fully mobile. Their model is intertemporal, individuals have finite lives and migration is permanent (which is to say that no return is allowed), and there are costs to migration (both psychic costs and loss of productivity through imperfect transferability). Combining cross-country data from the Penn World Tables with parametrizations from a variety of sources, these authors assess the potential impact of liberalizing reforms. Large population movements are needed to allocate population fully efficiently, but there are substantial output gains as a consequence; nonetheless, even "(suboptimal) small labor movements" can generate "fairly large changes in output" (Klein & Ventura 2007, p. 24). Movement of capital is found to be an important part of the story and dampens down the resulting wage losses in countries receiving large labor inflows. As with other studies, the authors conclude that "hardly any policy reform at a global scale ... would deliver output gains of similar magnitude" (Klein & Ventura 2007, p. 26) and that it is barriers to mobility of unskilled labor that cause the worse distortion. Specific simulations in Klein & Ventura (2009) suggest large gains to free mobility of labor within both the European Union and (hypothetically) the NAFTA bloc.

Docquier et al. (2015) use a general equilibrium model with two worker types and nested CES production, but they are distinctive mainly for using Gallup World Poll data on migration intentions to estimate costs of migration within a random utility model of migration decisions. The high migration costs found suggest that potential flows are much smaller than in other studies and that gains to liberalization are correspondingly reduced. Delogu et al. (2018) incorporate effects on education and the fertility decisions of migrants and find that this magnifies the long-run gains as population growth diminishes and education improves in migrant populations.

5. TRADE

5.1. Trade with Multiple Goods

So far, we have assumed that there is only one (traded) output good. If we allow for multiple output goods (all traded), then it is unnecessary even for capital to move to achieve equalization of factor

¹²Cortes & Tessada (2011) make the point that low-skilled immigrants may perform household tasks that are otherwise carried out by skilled native women, and by allowing those women to participate in the labor market, they help increase overall productivity of the native workforce.

prices across locations. Mundell (1957) recognized that movements of goods and of factors could be regarded as substitutes. Free movement of goods across locations (and free movement of factors between production of different goods at the same location) may be enough alone to equate wages across countries (Samuelson 1948, Lerner 1952).

To see this better, suppose there are two goods Q^0 and Q^1 produced using common production functions with the usual properties. Suppose both goods are traded, and let their prices be p^0 and p^1 . Unit cost functions, labor, capital, and so on in the two sectors are distinguished by superscripts in the obvious way. Then, so long as both goods continue to be produced at both locations,

$$c^I(w_i, r_i) = p^I, \quad i = A, B, \quad I = 0, 1, \quad 7.$$

$$g^I(w_i/r_i) = K_i^I/L_i^I, \quad i = A, B, \quad I = 0, 1, \quad 8.$$

$$L_i^0 + L_i^1 = L_i, \quad K_i^0 + K_i^1 = K_i, \quad i = A, B. \quad 9.$$

This is basically the Heckscher-Ohlin model of international trade. It is well known that, even without mobility of factors, factor prices are equalized across locations in this model. From Equation 7, we obtain $c^0(w_A, r_A) = c^0(w_B, r_B)$ and $c^1(w_A, r_A) = c^1(w_B, r_B)$, which, given appropriate regularity conditions, particularly the absence of factor intensity reversals, together require $w_A = w_B = w$ and $r_A = r_B = r$. Movement of factors between industries producing the two goods at each location ensures that capital/labor ratios within each sector are equated across locations, and this brings marginal products into line everywhere. There is no need for movement of capital or labor to make this happen, and therefore no economic incentive for workers to move between locations.

The result, however, holds only if both goods are actually produced in both countries. If capital/labor ratios are sufficiently different in the two countries, then it is possible that one or the other might specialize completely in production of one of the goods. If that happens, the reasoning above breaks down.

Technology differences will also destroy factor price equalization. Suppose that, in line with Section 3.2 above, location B has production functions $\alpha F^i(\beta L^i, K^i)$, so that the parameters determining both TFP differences α and labor-augmenting differences β are common to the two sectors. Then

$$\alpha c^I(w_A, r_A) = c^I(\alpha w_A, \alpha r_A) = c^I(w_B/\beta, r_B) = \alpha p^I, \quad I = 0, 1, \quad 10.$$

$$g^I(w_A/r_A) = K_A^I/L_A^I, \quad I = 0, 1, \quad 11.$$

$$\beta g^I(w_B/\beta r_B) = K_B^I/L_B^I, \quad I = 0, 1. \quad 12.$$

From Equation 10, we obtain $\alpha\beta w_A = w_B$ and $\alpha r_A = r_B$, so a Heckscher-Ohlin-like factor price equalization result holds but for technology-adjusted labor and capital; moreover, from Equations 11 and 12, we find that $K_A^I/L_A^I = K_B^I/\beta L_B^I$, so the capital/labor ratio will be lower in B in both sectors. If technology difference is solely labor augmenting ($\alpha = 1$), then we find $\beta w_A = w_B$, so the price of labor is equated in efficiency units. However, that still leaves an incentive to migrate.

As labor moves from B to A , global production of the more labor-intensive good will increase relative to the other good, because global labor will now be located where it is more productive. Price effects can be involved. The relative price of that good will tend to fall, to the benefit of

those at whichever location imports that good, and wages will tend to fall, to the detriment of labor (Kenen 1971, Rivera-Batiz 1983).

Kennan (2013, 2016) considers such a model in which productivity differences drive migration, but these are specifically labor-augmenting differences rather than differences in TFP. There is a distribution of psychological costs to migration within the population of potential migrants that prevents the entire population from migrating to locations with the better technology. As labor moves, the global supply of efficiency units increases because labor is located where it is more technically efficient, and wages consequently fall everywhere for nonmigrants. Nonetheless, global income increases.

Kennan (2013) uses information on international wage differences from Clemens et al. (2008) and on labor shares from Gollin (2002) and Bernanke & Gurkaynak (2002) to assess gains from global open borders. A more recent paper extends the analysis to EU free movement (Kennan 2016). Global open borders yield gains that are “enormous” (Kennan 2013, p. L11), comparable to doubling the income of an average person in a less developed country. Gains from EU free movement are less dramatic because productivity differentials are less marked, though still substantial. Depressing effects on real wages in receiving countries are surprisingly small, especially in the long run if higher returns to capital are allowed to induce higher investment.

5.2. Nontraded Goods and Market Size

Our discussion so far has been premised on the assumption that all forms of output are traded costlessly on world markets. There is therefore no possibility that movement of labor can have any effects through changing the size of goods markets at sending and receiving locations. Migration changes the location of production, but the goods produced can be consumed anywhere. If we allow instead that some or all goods might either be traded with costs or not traded at all, this is no longer the case. Immigration adds to local demand for less than fully traded goods, and this can be a source of local benefits (and emigration can be correspondingly harmful).

Rivera-Batiz (1982) considers a model with two locations, two factors, and one traded and one nontraded good. Without full factor mobility the price of the nontraded good can differ between locations, and migration can have effects through changing its price. If the nontraded good is labor intensive, for example, it gets more expensive in the location that migrants leave and cheaper where they arrive. Emigration harms the source country by tending to reduce “any internal exchange of traded for nontraded goods existing between migrants and nonmigrants” (Rivera-Batiz 1982, p. 86).

Recent work analyzing market size effects typically makes use of the sort of monopolistically competitive model with differentiated goods and love of variety developed by Dixit & Stiglitz (1977) and notably applied to trade in papers such as those by Krugman (1980) or Melitz (2003). Suppose, to take a simplified example, that we supplement the traded goods sector assumed above with another sector producing a differentiated good that is either untraded or subject to significant trading costs. This good is supplied in many varieties, each version produced by no more than a single firm paying a fixed entry cost and earning zero profit. At every location, immigrants and natives spend on both types of goods, with the consequence that an inflow of workers expands the size of the local market for the less traded differentiated good, therefore allowing more varieties to be produced and local consumer welfare to gain.

Absent from models of the sort simulated by Hamilton & Whalley (1984), effects of this type introduced in papers by Iranzo & Peri (2009), di Giovanni et al. (2015), and other authors have been shown to be potentially of considerable importance. Whereas simple models suggest that immigration, even though globally beneficial, must harm at least some sorts of labor at receiving

locations, models with market size effects show that there are countervailing benefits to receiving countries that may mean that labor mobility is not necessarily harmful even there.

The introduction of market size effects into studies of free movement goes back at least to Iranzo & Peri (2009). In their model, each country produces two goods, one undifferentiated and the second differentiated. Labor is the sole input, and there is extensive worker heterogeneity in the form of a continuum of skills with TFP differences between countries. Migration has psychological costs, skill loss due to imperfect transferability, and legal costs. Market size effects in the differentiated sector are central, as expansion leads to greater variety in production and higher consumer welfare.¹³ In the absence of trade, countries receiving inflows of labor through migration specialize more in the differentiated good, and they have lower prices and higher average real wages despite some workers' losing through labor market competition. With trade (though assuming trade costs in the differentiated sector), market size effects spread to other countries through price falls everywhere. Simulations in the paper apply this to the extension of free labor movement associated with EU expansion: Migrants gain, prices fall everywhere, and the less educated gain in all countries. The only possible losers are highly educated workers in Western Europe.

In a similar spirit, Di Giovanni et al. (2015) incorporate market size effects with differentiated tradable and nontradable sectors. They draw a distinction between short and long runs according to whether the set of varieties produced adjusts or not. There is skilled and unskilled labor, and they consider scenarios with cross-country productivity differences as well as imperfect transferability and imperfect native-migrant substitutability. Remittances play an important role in the distribution of effects. Rather than evaluating the counterfactual of ending restrictions on migration, the paper considers the possibility of ending migration and repatriating migrants (which is obviously in some sense a mirror exercise avoiding the need to model migration costs so carefully). Migration is found to be beneficial on the whole to both OECD and non-OECD countries, benefiting all labor types in the long run but particularly favoring the unskilled in the short run. High-immigration countries gain from market size effects, whereas high-emigration countries gain from remittances.

Aubry et al. (2016) likewise consider the counterfactual of ending migration rather than liberalizing it, though with a concentration on the effects on OECD countries. The model incorporates labor market and market size effects but also fiscal effects, the last of these achieved through the introduction of retirees and of a fiscal sector with consumption and income taxes funding age-specific transfers. Market size effects are more important than either labor market or fiscal effects. Most countries gain, and some gain greatly, from labor mobility. Inflows from outside the OECD are the largest source of gains, flows within the OECD being more ambiguous because of market size losses to emigration countries (though remittances are not modeled).

Desmet et al. (2018) develop a spatial growth model with trade costs, heterogeneous local amenities, and agglomeration and innovation effects. Dynamic effects magnify the very substantial future global gains from free mobility they find, as liberalization means that high-productivity and high-amenity regions coincide in the long term.

6. PUBLIC SECTOR

The beneficial effects of freedom of movement arise principally because migration allows labor to move from less to more productive locations. If there are other incentives to move that work counter to that, the case could be weakened or even reversed. One important such incentive could

¹³Mazzolari & Neumark (2012) show that immigration is associated with an increased ethnic diversity of restaurants.

be interactions with the public sector. For instance, more generous social insurance or transfer schemes in the receiving country may have the potential to undermine the benefits of free movement by creating motivations to move that are not aligned with economic gains.

There is a large literature on fiscal federalism that deals with the allocation of public functions to different tiers of government and points to labor mobility between locations at lower levels as an important issue. To be more concrete, we focus on a simplified public sector providing two sorts of functions: provision of public goods and income redistribution.

Consider first the provision of public goods. The arguments for collective provision of public goods are well established and hardly need rehearsing. However, whereas market-based provision of private goods allows consumers with different tastes to consume at different levels, homogeneous public provision of public services has the disadvantage of not catering to similar diversity in tastes for public goods. Where local public goods are provided at intermediate levels of government, there is a possibility of spatial heterogeneity in levels of provision and mobility between localities that can allow people to sort themselves according to tastes, allowing for a matching of tastes to levels of provision that can mimic the market-based sorting that works with the private provision of private goods (Tiebout 1956, Rubinfeld 1987, Oates 1999). The possibility of offering differing levels of provision of public goods in different localities can therefore create another case for free movement of individuals. This is an argument typically associated with provision at the municipal level, but one that also has application internationally with regard to goods provided at higher governmental tiers.

When national public sectors are providing congested public goods, movements of population affect the cost of provision. Hammond & Sempere (2006, 2009) consider how this affects arguments for gains from migration, showing that gains remain possible, at least holding fixed public good provision and congestion levels.

The case with the redistributive functions of government is different. Well-known arguments establish that differences in the extent of lower-tier redistribution sit badly with mobility between districts (Musgrave 1971, Oates 1972). Poorer individuals will have reason to migrate toward more redistributive regions and richer individuals to move away from them in a way that can only compromise the intention of the policy. In the words of Stiglitz (1983, p. 46), "It is clear that the power to redistribute income locally with free migration is severely limited."

To illustrate, suppose that the two locations A and B produce a single traded good with the same constant returns to scale production technology and the same endowments of the two factors. The allocation of labor between locations is therefore productively efficient, and no worker will *want* to move. Suppose now that location B introduces a redistributive tax scheme. All income from labor or capital is taxed at the source at a rate t and the proceeds used to fund a lump sum grant to labor $G = tF^B/L_B$. The income of a worker in B is raised to $(1 - t)F_L^B + tF^B/L_B$, which exceeds F_L^A , and tax-induced migration from A to B will occur, reducing world output. Likewise, the reduction in payments to capital in B will encourage a flow of capital in the reverse direction. This movement itself undermines the purpose of the redistributive scheme introduced in B by reducing the proceeds of the tax on capital funding the grant.

This happens because of a lack of coordination of tax policies. If both locations were constrained to pursue similar schemes of redistributive taxation, or redistribution were to be assigned to a tier of government above them, then no migration would be induced (Wildasin 1991). However, such harmonization may require a similarity of political culture or a sense of social solidarity that may be lacking in the sort of international context where free movement is being considered. Therefore, the possibility that redistributive taxation or redistributive public goods provision undermines the beneficial aspects of migration is reduced in a setting where countries attempt to harmonize tax rules and redistributive legislation, such as the European Union. This

is one important factor that distinguishes free movement within well-defined groups of countries like the European Union from a general open border policy.

The extensive but inconclusive literature on fiscally induced migration is reviewed, for example, by Nannestad (2007), Giuletti & Wahba (2013), and Preston (2014). Evidence from migration both across states in the United States and between countries in the European Union suggests that migration flows may be associated in some contexts with welfare generosity, but it fails to establish this as a serious problem. Preston (2014) also surveys attempts to quantify the net fiscal impact of immigration including static analyses such as those by Dustmann & Frattini (2014) for the United Kingdom or, more recently, by the National Academies of Sciences, Engineering, and Medicine (Natl. Acad. Sci. Eng. Med. 2017) for the United States and long-term assessments such as those by Chojnicki (2013) or Storesletten (2000, 2003).

7. CULTURE AND POLITICS

Migration not only is economically significant (in the sense of immediately affecting the generation and consumption of material wealth), but it also has broader social and cultural aspects that are of critical importance for the politics of migration. Countries do not differ only in economics, and economics may be a relatively minor part of what determines the well-being of individuals who live in different countries.

Suppose countries differ in political institutions in such a way that in some countries the freedoms of some citizens are diminished at the expense of others, or politically privileged individuals are more able to benefit from corruption. If migration between those countries is possible, then political differences may create incentives for population mobility just as economic differences do. Oppressed groups in one country will have reason to migrate away, and individuals exploited by the corrupt will have reason to leave to gain from better standards of governance elsewhere. Extreme cases of the reasons that induce such movements are addressed in the 1951 Convention Relating to the Status of Refugees and its various amendments.¹⁴ If the threat that migration of this sort will diminish the economic base of the country of origin curtails the extent of corruption or persecution, then we can see this as an important advantage of population mobility. Just as economic migration promotes efficient production, the capability of individuals to move toward countries with better political arrangements may, besides enhancing the welfare of those who move, also be an encouragement to improved governance.¹⁵ On the other hand, if departure of the politically active diminishes the scope for defense of the political liberties of those who remain, then it has a cost similar to that posed by the economics of the brain drain.

The politics of receiving countries will also be affected. Arrival of individuals from societies with different social and cultural norms can be disturbing for some. Social, cultural, religious, and linguistic homogeneity can all be diminished. Although some natives of the receiving country may regard enhanced diversity as culturally enriching, and the new ideas or cultural amenities brought in by immigrants as socially (and indeed economically) enlivening, the more socially conservative may put a positive value on homogeneity and dislike the perceived cultural change that is

¹⁴Grounded in Article 14 of the 1948 Universal Declaration of Human Rights, which recognizes the right of persons to seek asylum from persecution in other countries, the United Nations Refugee Convention was adopted in 1951. Originally limited to persons fleeing events that occurred within Europe before January 1, 1951, the 1967 Protocol removed these limitations and endowed the Convention with universal coverage. As of April 2015, 145 states had signed the 1951 Convention and 142 had signed both the Convention and the 1967 Protocol (see Dustmann et al. 2017 for more detail).

¹⁵Efficiency of public services, quality of governance, and security are important factors that determine the intent of individuals to outmigrate (see Dustmann & Okatenko 2014).

associated with immigration. Research by Card et al. (2012) shows that considerations about cultural and social homogeneity and coherence are much more closely associated with individuals' beliefs about whether migration should be restricted than are concerns about economic advantage or disadvantage. Moreover, the better educated are supportive of liberal migration policies mostly because they are less concerned about homogeneity and not so much because they are less exposed to immigrant competition, as some models of the type reviewed above suggest given that migrants predominantly allocate themselves to unskilled jobs.¹⁶ Similarly, Dustmann & Preston (2007) find evidence that racial or cultural prejudice is an important component of attitudes toward immigration, and more so the more ethnically different immigrant populations are from natives. In line with these findings, Hainmueller & Hopkins (2014), in an extensive review of the literature, conclude that there is little accumulated evidence that citizens primarily form attitudes about immigration based on its effects on their personal economic situation, and they suggest that immigration attitudes are rather shaped by sociotropic concerns about its cultural impacts.

This suggests that policy makers would be wrong to focus on economic considerations alone when designing and implementing policies that regulate migration, because noneconomic concerns related to homogeneity, race, and cultural prejudice may be more impactful on the way individuals form their views about migration policy. The strength of feeling that often accompanies such concerns renders migration an ideal subject for populist political movements and means that a misplaced focus on economic arguments can be particularly counterproductive.

The social integration of immigrants may be slow and generate social tensions as communities with different ways of life discover difficulties in relating to each other. Here again we see a distinction between migration within countries, which is likely to provoke less social resistance; migration between different but culturally less distant countries, where integration and assimilation of newcomers may be easier and political resistance less marked; and migration between highly culturally distinct societies, where desires to protect existing ways of life and fears of rising social tensions may be more easily excited. In the latter case, the aggravation of political tension risks fostering the growth of populist political movements that may be seen as more broadly damaging. Dustmann et al. (2018) illustrate this, using random assignment of refugees to Danish municipalities to link refugee migration to the rise of political extremism in Denmark. They find that the allocation of larger refugee shares between electoral cycles increases the vote share for parties with an anti-immigration agenda in all but the most urban municipalities, where refugee allocation has—if anything—opposite effects; this suggests that refugee immigration and vote share increases of anti-immigrant parties are not inevitably linked. They also show stark response heterogeneity according to municipal characteristics, such as pre-policy immigrant share, crime, and unemployment. Other studies that use different identification strategies come to similar conclusions (see, e.g., Otto & Steinhardt 2014, Barone et al. 2016, Halla et al. 2017, Harmon 2017).

The cultural resistance of sections of the population in receiving countries to different sorts of immigration has been particularly potent in the recent rise of populist parties, and the willingness of established parties to move to accommodating positions that favor additional restrictions carries the potential for damaging economic consequences. The strength of feeling of those inspired by the internationalist vision of open borders has not found a similarly effective political expression. Understanding and incorporating such considerations into frameworks of the sort we develop above could help produce insights that bridge the gap between predictions of the economic benefits of movement and the restrictions to it that are observed in practice.

¹⁶A common finding of attitudinal surveys is that the less educated have more hostile attitudes toward migration, often explained by more labor market competition from immigrants (see, e.g., Scheve & Slaughter 2001, Mayda 2006, and O'Rourke & Sinnott 2006).

8. DISCUSSION AND CONCLUSIONS

Economic gains from labor mobility are associated principally with differences in labor productivity in different places. These differences are large on a global scale, which hints at the existence of very big potential gains. In suggesting huge gains, early estimates such as Hamilton & Whalley (1984) also imply huge associated flows of migrants. These estimated gains are magnified by the neglect of things like the costs of migration, and they involve extrapolating a long way from actuality. Nevertheless, even if the magnitude of the potential gains can be disputed, more or less all serious studies suggest that the benefits of moving toward liberalization are large. Authors often point out that such benefits are probably an order of magnitude greater than those to be expected from alternative reforms like trade liberalization, for instance.

In the simplest models, gains from liberalization go mainly to citizens of origin countries, particularly to those who migrate. However, these are not the people whose votes decide the openness of destination countries. The same models suggest that labor market competition may lead to losers in receiving countries, and these are the people whose votes matter. Whereas empirical work on labor market effects in receiving countries suggests that, for example, the wage effects of current levels of migration are not big, their magnitude remains controversial, and the losses implied by the simplest simulations creating the largest gains from free mobility are indeed substantial. Moreover, perceived losses even from existing policies may be far larger than those that actually occur. Recent work on gains from labor mobility emphasizes things like capital flows and market size effects that tend to counteract losses and even lead to overall gains in the destination countries—but again, arguments of this sort are unlikely to be apparent to voters or to political decision makers.

Fiscal consequences may also be an important consideration, but they depend heavily on the particular migration situation that is considered and the dissimilarity of welfare institutions in sending and receiving countries. The interaction of labor mobility with fiscal considerations is less likely to compromise the case for liberalization where migration is between countries with similar welfare systems, such as within the European Union.

It is also important to note that unskilled migration is associated in many quantitative studies with large gains, even for receiving countries. The widespread supposition in much popular discourse that rich countries should open themselves only to skilled migrants finds little support in this literature. Openness to skilled migration captures part of the gains, but only part.

The principal objections to free mobility from receiving countries are probably cultural, not economic. Attitudinal evidence suggests that concerns about loss of cultural homogeneity and about the costs associated with the social tensions arising from integration of immigrant communities have more to do with concerns about open immigration policies than with worries about narrowly economic effects. A way to look at the studies we are reviewing is that they quantify the economic costs of satisfying these cultural objections.

Many of the objections to liberal migration policies, on social or fiscal grounds for example, are at their weakest where immigration is from culturally and politically similar locations. Indeed, this is why these issues are not typically treated as credible objections to free labor mobility within countries. This suggests that where such similarities make the establishment of free movement within regional blocs (such as the European Union) a feasible project, then consolidation of such projects should be economically supported. Such regional blocs generate other benefits from migration not discussed above, such as insuring workers in participating countries from adverse economic shocks by providing access to a labor market that transcends national boundaries, offering a more diverse demand for skills, and providing firms with access to a larger skill pool. The more ambitious project of global open borders seems currently unlikely to command support

from destination countries, however credible or not the magnitude of the global gains suggested by academic research. However, simulations reliably suggest that much of the large gains found in these studies could be realized by small changes, so support for gradual liberalization seems well grounded. Of course, even small steps in this direction may be politically difficult, due to the cultural resistance mentioned above and the response of populist movements that exploit fears and concerns, influence the position of mainstream parties, and may further undermine liberal democratic institutions and multilateral agreements that allow openness in the flow of capital and goods. Balancing recognition of political realities and hypothetical economic gains will remain a delicate challenge.

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