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Immigration and Globalization: A Review Essay[†]

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This essay revisits the argument that the removal of worldwide immigration restrictions would induce a very large increase in world GDP. The recent books Exodus: How Migration is Changing Our World *by Paul Collier and* The Price of Rights: Regulating International Labor Migration *by Martin Ruhs raise a number of questions about the underlying economic model. The essay shows how these concerns can greatly attenuate the predicted gains.* (*JEL* F22, F66, J11, J18, J61)

1. *Introduction*

A simple question lies at the core of any examination of the link between immigration and globalization: what exactly would a world without national borders—a world in which people could move freely from one country to another—look like?

Economists have, in fact, devoted a lot of effort to documenting how international differences in economic conditions change as national governments lower the barriers that limit trade across countries. Much of international trade theory attempts to imagine what happens to employment, prices, and incomes when countries allow unrestricted flows of goods and capital across national boundaries. One common theme in these models, which has greatly influenced economic policy, is that the removal of restrictions on such flows increases global income and tends to equalize prices and wages across countries.

Decades of experience with various trade liberalization policies, however, do not seem to have had as much of an impact on global income or on international wage inequality as the proponents of free trade would have expected. This fact has motivated some economists to consider yet another scenario: the removal of immigration restrictions that prevent the movement of people across countries.

The modeling of economic adjustments resulting from unrestricted international migration adds greatly to the complexity of describing what would happen in such a world: How many persons would move? What would economic conditions in the new borderless world look like? What would happen to the institutions and social norms that govern economic exchanges in specific countries after the entry/exit of perhaps hundreds of millions of people? Would the institutions that presumably led to efficient exchanges in the richer countries remain dominant and

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spread throughout the globe, or would these institutions be replaced by the political and cultural inefficiencies that may have hampered growth in the poorer countries? These additional complexities arise from a simple fact embodied in Max Frisch's profound quip about the German guest worker program of the 1960s: "We wanted workers, but we got people instead."

Although much of the economic literature on immigration has typically focused on estimating employment and fiscal impacts in specific receiving or sending countries, there has been a parallel tradition that attempts to examine the impact of international migration flows from a global perspective. Beginning with the seminal work of Hamilton and Whalley (1984), a number of studies propose a variety of models that are then calibrated to describe what the economy would look like if sovereign countries surrendered their ability to restrict in- or out-migration flows.[1] One common implication from these simulations is that the global gains from the removal of immigration restrictions would be huge, amounting to trillions of dollars annually. This finding has led to a popular metaphor that there are "trillion-dollar bills" lying on the sidewalk, ready for the taking, if only the receiving countries would remove the self-imposed migration barriers.

The two books that form the basis for this review essay address some of these global issues from very different perspectives. Paul Collier's *Exodus: How Migration is Changing Our World* examines whether the available evidence suggests that the unrestricted flows of labor will, in fact, generate the sizable gains that are promised by the generic study in the literature, while Martin Ruhs's *The Price of Rights: Regulating International Labor Migration* shows that practically all receiving countries walk by the trillion-dollar bills promised by the economic models, and instead set up a variety of strict and sometimes draconian immigration restrictions. Put together, the two books suggest (at least to me) that perhaps it is time for a reappraisal of the economic argument that unrestricted migration would generate huge global gains.

[1] Representative studies include Benhabib and Jovanovic (2012), Clemens (2011), di Giovanni, Levchenko, and Ortega (2015), Docquier, Machado, and Sekkat (2012), Kennan (2013), Klein and Ventura (2007), Lundborg and Segerstrom (2002), Moses and Letnes (2004), Pritchett (2010), and Walmsley and Winters (2005).

2. *Basic Model*

To get a better grasp of the issues at hand, it is best to begin with a description of the basic model. The key question is straightforward: what types of gains or losses would accrue to the world's population if countries decided to remove all legal restraints to international migration and workers moved to those countries that offered them the highest wages? To illustrate the source of the gains, consider the impact of migration flows in a two-region setting, the North (N) and the South (S). The North is an industrialized region with relatively few workers, while the South is a developing region with a large population. Initially, the wage in the North, w_N, exceeds the wage in the South, w_S.

As illustrated in figure 1, the two regions have competitive labor markets with downward-sloping labor demand curves that are assumed to have the same slope. The two demand curves, however, may have different intercepts. The intercept differential measures the economic value of the different "infrastructures," with the North's infrastructure allowing a specific worker to have a higher value of marginal product in the North than in the South. It is useful to think of the infrastructure not only in terms of physical capital, but also as including the value of the political, social, and cultural institutions and organizations that regulate social and economic interactions in the two

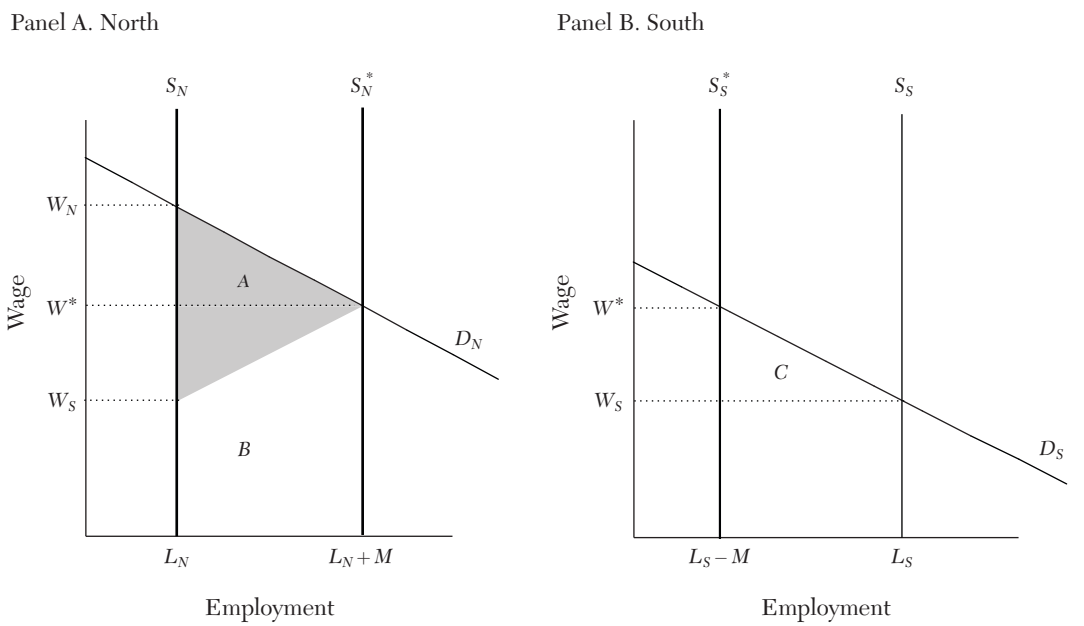

Figure 1. The Global Gains from Open Borders

regions. As is common in the literature, I initially consider a short-run situation where the infrastructure is fixed in each region, so that the height of each labor demand curve is fixed. Finally, assume that all labor is homogeneous and supplied inelastically in each of the regions, with supply curves S_N and S_S, respectively.[2]

The figure illustrates the initial labor market equilibrium: the wage in the North is substantially higher than the wage in the South. Income-maximizing workers in the South wish to move to the North to take advantage of the higher wage. Immigration restrictions, however, prevent this flow. Suppose, however, that all migration restrictions are suddenly lifted *and* that migration from the South to the North is costless. Workers will flow from the low-wage to the high-wage region as long as any wage difference exists, and the flow will stop only when the wage in the two regions is equalized at w^*. This new equilibrium is reached when a total of M workers have left the South and entered the North's labor market.

The out-migration reduces the South's GDP by an amount equal to the area of the trapezoid C, while the entry of M workers increases the North's GDP by the area $A + B$. The area of the trapezoid giving the North's gain exceeds the area of the trapezoid giving the South's loss. In particular, note that the South's loss in GDP is also given by the (mirror-image) trapezoid B in the graph illustrating conditions in the North's labor market. The global immigration surplus, therefore, is given by the triangle A. This

[2] Under some conditions, the homogenous labor assumption may be far less restrictive than it appears. It is trivial to reformulate the model by interpreting employment level L in figure 1 as the number of efficiency units supplied in a given market, and the efficiency units are defined by an Armington (CES) aggregation of the number of workers belonging to particular skill groups. Borjas (2014, chapter 3) presents a technical discussion of the implications of this approach to allowing for a heterogeneous workforce.

surplus arises for two distinct reasons: The first is the relative imbalance of supply, with "too many" workers initially in the South. The second, and more important one, is the fact that the Northern infrastructure increases the marginal product of any worker.

In Borjas (2014), I proposed a parameterization of this model that leads to transparent and straightforward calculations and gives some sense of the magnitude of the key underlying effects. The transparency is particularly useful because it exposes the robustness of the predictions to changes in the underlying assumptions. Specifically, suppose that the inverse labor demand functions in the two regions are given by:

$$\log w_N = \log \alpha_N + \eta \log L_N, \tag{1a}$$

$$\log w_S = \log \alpha_S + \eta \log L_S. \tag{1b}$$

These demand curves implicitly assume that the aggregate technology in each of the two regions can be represented by a Cobb–Douglas production function. Further, the demand curves incorporate the assumption that the factor price elasticity η is the same in both regions (with $\eta < 0$). In a linear homogeneous Cobb–Douglas world, the factor price elasticity would equal (the negative of) capital's share of income, so that the parameter η will be set to -0.3 in the simulation that follows.

A great deal of evidence suggests that the ratio α_N/α_S is greater than one. In fact, the productivity of a specific worker could easily triple or quadruple by moving him or her from the South to the North. Clemens, Montenegro, and Pritchett (2008) report that the adjusted wage ratio for a low-skill worker between the United States and a large number of low-income countries is around 4.1.

The functional form assumptions in equation (1) provide all the information that is needed to get a back-of-the-envelope estimate of the ratio α_N/α_S. In particular, note that:

$$R = \frac{w_N}{w_S} = \left(\frac{\alpha_N}{\alpha_S}\right)\left(\frac{L_N}{L_S}\right)^{\eta}. \tag{2}$$

Equation (2) shows that it is trivial to calculate the ratio α_N/α_S once we know the geographic distribution of the workforce, the value of the wage ratio R, and the value of the elasticity η.

World GDP prior to the relaxation of immigration restrictions is given by the sum of the relevant areas under the value of marginal product curves:

$$\begin{aligned} Y_0 &= \int_0^{L_N} \alpha_N L^{\eta}\, dL + \int_0^{L_S} \alpha_S L^{\eta}\, dL \\ &= \frac{\alpha_S}{1+\eta}\left[\frac{\alpha_N}{\alpha_S} L_N^{1+\eta} + L_S^{1+\eta}\right], \end{aligned} \tag{3}$$

where Y_0 gives the (known) value of world GDP in the initial equilibrium. Note that the simultaneous solution of equations (2) and (3) uniquely solves for the values of the intercepts α_N and α_S.

If there were no legal restrictions on international migration and if migration were costless, the opening up of the borders equates wages between the two regions. This equilibrium condition implies that the number of movers is implicitly defined by:

$$\frac{\alpha_N (L_N + M)^{\eta}}{\alpha_S (L_S - M)^{\eta}} = 1. \tag{4}$$

Finally, the gains to world GDP ($\Delta Y = Y_1 - Y_0$) are given by the difference between the gains accruing to the North after the entry of M workers and the losses suffered by the South after the exit of M workers, or:

$$\begin{aligned} \Delta Y = &\int_{L_N}^{L_N+M} \alpha_N L^{\eta}\, dL \\ &- \int_{L_S-M}^{L_S} \alpha_S L^{\eta}\, dL. \end{aligned} \tag{5}$$

TABLE 1
THE SIMULATED GLOBAL GAINS FROM UNRESTRICTED AND COSTLESS MIGRATION

	Value of R (w_N/w_S)		
	2	4	6
1. Net gain in world GDP (in trillions of dollars)	9.4	40.1	62.4
2. Number of migrant workers (in billions)	1.7	2.6	2.7
3. Number of migrants as percent of South's workforce	62.3	94.8	98.6
4. Number of movers (in billions)	3.7	5.6	5.8
5. Percent wage change in the North	−33.0	−39.3	−39.8
6. Percent wage change in the South	34.0	143.0	261.1
7. Change in income of capitalists (in trillions of dollars)	2.8	12.0	18.7
8. Percent change in income of capitalists	13.4	57.2	89.1

Notes: The simulations assume that world GDP is $70 trillion in the premigration regime; 600 million persons work in the North; 2.7 billion persons work in the South; and the factor price elasticity is −0.3. The number of movers equals the emigration rate of workers times the South's population (assumed to be 5.9 billion).

It is straightforward to simulate the model in equations (1)–(5). Table 1 reports the results of the numerical exercise.[3] The various columns of the table use alternative values of the wage ratio R, although I limit the discussion to the case where $R = 4$. The simulation uses the 2011 World Bank estimate that 600 million persons worked in the high-income countries (a region with a population of 1.1 billion), and 2.7 billion persons worked in the developing countries (where the population was 5.9 billion). Finally, the value of world GDP prior to the relaxation of immigration restrictions is $70 trillion.

As in the generic study in the literature, the removal of immigration restrictions (combined with the assumption of costless mobility) would lead to a huge increase in world GDP. Specifically, row 1 of the table predicts that world GDP would increase by $40 trillion, almost a 60 percent increase. Moreover, these gains would accrue each year after the migration occurs, so that the present value of the gains nears one quadrillion dollars! Not surprisingly, some economists have latched onto variants of this model to engage in social engineering by proposing that world poverty could be eliminated in one fell swoop—if only countries would stop being countries.

A second important implication of the model is that there are going to be a lot of migrants. The simulation implies that 2.6 billion workers, or 95 percent of the workforce in the South, will move. If these workers bring along their families, the 95 percent mobility rate implies that nearly 5.6 billion persons would move from the South to the North.

It is fair to say that this particular implication of the model has not received nearly the same emphasis or attention as the fact that world GDP would increase by tens of

[3]The simulation assumes that all migration occurs instantaneously. This assumption obviously simplifies the mechanics of the exercise, but the costs and benefits will most likely be staggered over time. It is unclear how the results from a dynamic model (which would require additional assumptions about the evolution of the migration flow) would differ from the calculations reported in table 1.

trillions of dollars. For example, the original Hamilton and Whalley (1984) article spends a great deal of time poring over detailed estimates of the dollar gains, but curiously neglects to report the number of movers required to achieve those gains at *any* point in the study.

The glossing-over of this particular implication may be the politically sensible thing to do if one wishes to advocate these types of models in policy circles.[4] However, it is conceptually impossible to buy into the argument that unrestricted immigration will increase world GDP by $40 trillion without simultaneously buying into the prediction that this will entail the movement of *billions* of people from the South to the North.

These huge flows will necessarily imply a substantial redistribution of wealth, and these distributional consequences also tend to be overlooked. Specifically, the L_N native workers in the North will be at the losing end of the deal. After all, "factor price equalization" means precisely that: factor prices are equalized, with initially high-wage workers eventually earning less and initially low-wage workers eventually earning more. As figure 1 shows, the influx of M workers reduces the North's wage from w_N to w^*, and raises the wage of all Southern workers (whether they migrated or not) from w_S to w^*. The implied percent wage changes are given by:

$$(6) \qquad \frac{w^* - w_N}{w_N} = \left(\frac{L_N + M}{L_N}\right)^{\eta} - 1.$$

$$(7) \qquad \frac{w^* - w_S}{w_S} = \left(\frac{L_S - M}{L_S}\right)^{\eta} - 1.$$

Rows 5 and 6 of table 1 report these predicted wage effects. The earnings of the North's native workforce fall by almost 40 percent, and the earnings of Southern workers increase by 143 percent.

There is one final redistributive impact that is worth documenting. Specifically, the income accruing to capitalists will also change. Define the gains to "global capitalists" as the excess income produced that is not paid directly to workers. The increased returns to capital are given by:

$$(8) \quad \Delta \text{Income of Capitalists} = \left[Y_1 - w^*(L_N + L_S)\right] - \left[Y_0 - w_N L_N - w_S L_S\right].$$

As row 7 of table 1 shows, there will be a substantial increase in the wealth of global capitalists, amounting to about $12 trillion, or a 57 percent increase over their initial income. In short, a world integrated by unrestricted migration flows creates large gains for some groups, but also creates large losses for a group of workers who will vociferously fight the policy shift.

It is the existence of this losing group of workers that often leads to a degeneration of the immigration debate into a collection of slurs and facile accusations of racism. Collier's narrative, unfortunately, is not immune: "A rabid collection of xenophobes and racists who are hostile to immigrants lose no opportunity to argue that migration is bad for indigenous populations" (p. 25). The problem with such name-calling is that it downplays the fact that regardless of how the Northern workers actually feel about immigrants, their economic grievance is real and will not go away.

3. *Productivity Spillovers*

As noted above, the huge global gains typically found in these types of numerical simulations have led a number of economists to

[4] Benhabib and Jovanovic (2012) and Kennan (2013) do report the estimated number of movers in these types of simulations.

emphasize that the "gains from globalization" resulting from the decades-long effort to ease trade restrictions pale in comparison to the gains that are there for the taking if countries simply removed all existing restrictions on international migration. Clemens (2011), for example, employs the metaphor that there are trillion-dollar bills lying on the sidewalk, ready to be easily picked up, if only policymakers in the industrialized world would wisen up and remove all immigration restrictions.

Things that sound too good to be true, however, usually are. It is not surprising then that the analysis of both Collier and Ruhs can be interpreted as raising central questions about the model that predicts the presence of these trillion-dollar bills on the sidewalk, as well as providing insights for understanding why nobody ever bothers to pick them up. The problem is easy to summarize: those bills are probably fake.

In particular, the simulation reported in table 1 is a short-run, partial-equilibrium exercise, and its implications may have little in common with what would happen in a general equilibrium setting. Collier's *Exodus*, in an important sense, marks a pivoting point in the literature by taking the long-run consequences of migration flows much more seriously than one sees in the stereotypical study. Throughout the book, Collier emphasizes how the short-run impacts of immigration can differ from what would be observed if the migration flow were to continue indefinitely: "Contrary to the prejudices of xenophobes, the evidence does not suggest that migration to date has had significantly adverse effects. . . . Contrary to self-perceived 'progressives,' the evidence does suggest that without effective controls migration would rapidly accelerate to the point at which additional migration would have adverse effects" (p. 245).

Unfortunately, we know little (read: *nothing*) about how host societies would adapt to the entry of perhaps billions of new persons, so that there is much hand-wringing in Collier's discussion of social costs, and the narrative depends far too much on references to "mutual regard," "trust," "moral outrage," and other equally hard-to-measure concepts. I personally find it difficult to place much faith on the robustness of Collier's reported evidence when the heading of a key empirical section in the chapter on social consequences is titled "Some Illustrative Anecdotes" (p. 78), and focuses mainly on the experiences of the Afro-Caribbean community in London. I have heard that the plural of anecdote is data, but Collier's specific anecdotes do not a data set make. As interesting as the experiences of this particular immigrant community may be, I doubt they provide much information about what would happen if immigration restrictions were removed and billions of persons moved to the industrialized countries.

There is also much to quibble about in terms of the specific lessons that Collier draws from existing research studies. One telling example is Collier's discussion of the wage effect of immigration on a receiving country, a key parameter in any cost–benefit exercise. *Exodus* is totally oblivious to the fact that hundreds of thousands of words have been written on this topic in the American context. The entire section discussing these wage effects takes all of two pages (pp. 112–13). Remarkably, not a single study from the American literature is cited and the fact that there has been a lively debate over how to estimate these wage impacts and that there is still an ongoing debate about the value of the factor price elasticity is ignored.

Similarly, Collier makes a crucial observation that is left dangling and unexplored: "desperate not to give succor to these groups [i.e., the "xenophobes"], social scientists have strained every muscle to show that migration is good for everyone" (p. 26). This is, in fact, quite a damning denunciation of both social

scientists and the social science literature on immigration, and is a clarion call for some publication bias studies. It is certainly the first time I have seen in print my long-held suspicion that many social scientists have indeed engaged in vigorous and strenuous workouts to ensure that they tipped the scale so that the published answer was "right." As a result, the safest way to digest academic papers on immigration may be to follow some Cold War advice from Ronald Reagan: "Trust, but verify."

Regardless of these quibbles, *Exodus* makes an important conceptual contribution by suggesting that because of the misguided emphasis on showing that immigration "is good for everyone," the literature has too often disregarded inconvenient facts, overlooked the potentially paradigm-changing general equilibrium effects, and proposed the types of political upheavals that many observers would consider to be radical rearrangements of the social order.

Because there is no precise modeling and measurement of the various costs and benefits, Collier does not provide a numerical estimate of how much accounting for the general equilibrium concerns would reduce the presumed global gains. In terms of the model presented earlier, it is evident that the problem with doing such a calculation is that we simply do not know what would happen to the shape of the North's aggregate production function after the influx of billions of persons.

As Acemoglu and Robinson (2012) note, "nations fail" mainly because of differences in political and economic institutions. Analogously, Collier argues: "one reason poor countries are poor is that they are short of effective organization" and "migrants are essentially escaping from countries with dysfunctional social models" (pp. 33–34). For immigration to generate substantial global gains, it must be the case 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. It seems inconceivable, however, that the North's production function remains unchanged after the admission of billions of new workers. Echoing Max Frisch's observation, Collier bluntly states: "Uncomfortable as it may be . . . migrants bring their culture with them" (p. 68).

A preliminary approach to understanding how the "merging" of countries can affect the calculated gains is to do so explicitly within the context of the parameterized model presented earlier. As a first step, it seems sensible to presume that the postmigration intercept of the North's inverse labor demand curve, α_N^*, will lie somewhere between the original intercept and the South's intercept. Specifically:

$$\alpha_N^* = (1 - \lambda)\alpha_N + \lambda\alpha_S, \tag{9}$$

where $0 \leq \lambda \leq 1$. If λ were equal to 0, the intercept in the North is unaffected by the migration flow; the Northern infrastructure remains intact and the resulting estimates of the global gains are those summarized in table 1. If λ were equal to 1, the immigrants "import" the entire set of institutions and norms that led to the South's poor economic performance, totally overwhelming the North's infrastructure.[5]

Using this approach, it is straightforward to conduct an alternative simulation of the model. Suppose again that migration is

[5] I ignore the possibility that the intercept in the South's labor demand curve might also shift. Because there are no labor flows from the North to the South, there is little reason to expect an improvement in Southern productivity due to the importation of the efficient Northern institutions. It may be, however, that the self-selection of the Southern out-migrants affects the stability and type of institutional arrangements preferred by the Southerners left behind.

TABLE 2
ACCOUNTING FOR SPILLOVERS ON NORTHERN INFRASTRUCTURE AND MIGRATION COSTS

	Intensity of externality				
	$\lambda = 0.0$	$\lambda = 0.25$	$\lambda = 0.5$	$\lambda = 0.75$	$\lambda = 1.0$
Panel A. Costless migration					
1. Number of movers (in billions)	5.6	5.4	5.0	4.1	2.3
2. Dollar gain in world GDP (in trillions)	40.1	24.2	8.8	−5.5	−17.5
3. Dollar change in Northern income (in trillions)	12.7	5.3	−2.3	−10.2	−18.4
Panel B. Accounting for migration costs					
1. Number of movers (in billions)	5.3	4.8	3.8	2.1	0.2
2. Dollar gain in world GDP net of migration costs (in trillions)	28.1	12.9	−0.9	−12.4	−20.0
3. Dollar change in Northern income (in trillions)	11.9	3.9	−4.5	−13.0	−20.0

Notes: The simulations assume that the wage ratio $R = 4$; world GDP is \$70 trillion in the premigration regime; 600 million persons work in the North; 2.7 billion persons work in the South; and the factor price elasticity is −0.3. The intercept of the inverse labor demand curve in the North in the postmigration period is a weighted average of the premigration intercepts in the Northern and Southern regions, with the parameter λ being the weight attached to the Southern intercept; see equation (9). The "dollar change in Northern income" gives the change in the income accruing to the Northern population after paying out the salaries of immigrants. The simulation in panel B assumes that migration costs for a Southern worker equal ten times his initial salary, that it is costless to move all nonworking dependents, and that the rate of discount is 5 percent.

costless so that persons can easily move back and forth between the North and the South until wages are equalized across regions. This equilibrium is characterized by the restriction that:

$$\frac{\alpha_N^*(L_N + M^*)^\eta}{\alpha_S(L_S - M^*)^\eta} = 1, \tag{10}$$

so that the equilibrium level of migration M^* takes account of the externalities that the migrants impose on the Northern infrastructure.[6] The gain in world GDP resulting from this set of assumptions is given by:

$$\Delta Y^* = \int_0^{L_N+M^*} \alpha_N^* L^\eta \, dL + \int_0^{L_S-M^*} \alpha_S L^\eta \, dL - Y_0 . \tag{11}$$

Row 2 of the top panel of table 2 shows that if λ were equal to 0.5, the net gain falls from \$40 trillion to \$8.8 trillion. In addition, if λ were equal to 0.75, the net gains become negative because now the entire world's workforce is largely operating under the inefficient organizations and institutions that were previously isolated in the South but have now spilled over to the North.

Let me stress that *this is only a simulation*—and one should put as much faith in

[6] I assume that the size of the downward shift in the North's labor demand curve (as measured by λ) is independent from the level of migration, so that it essentially occurs immediately after the relaxation of immigration restriction and a single person moves. A generalization of the model would allow for the value of λ to depend on the size of the migration flow.

these numbers as one puts on the promise that trillion-dollar bills lie strewn all over the sidewalk. The exercise, however, teaches a lesson that has far too often been ignored: the gains from unrestricted immigration depend largely on how the infrastructure in the receiving economies adjusts to the influx of perhaps billions of persons. Although we have no idea about how this adjustment will pan out, there *will* be an adjustment.

In fact, even these estimates are probably too optimistic, because I have assumed that migration is costless. Migration costs, however, are real, sizable, and will further reduce the global gains. Consider, for example, the wage differences between Puerto Rico and the United States. In 2010, the mean annual earnings of a construction worker in his thirties was $23,000 in Puerto Rico and $43,000 in the United States.[7] The annual income of a young Puerto Rican construction worker, therefore, would increase by $20,000 annually if he or she were to migrate, implying a lifetime present value of around $400,000 (if the rate of discount is 5 percent). A Puerto Rican nonmover—and two-thirds of Puerto Ricans have chosen *not* to move—is leaving almost a half-million dollar fortune unclaimed. This fact is consistent with the canonical income maximization model of migration only if the costs of migration are *at least* that high for the many people who choose not to move.

Although this calculation may seem contrived, studies that rely on structural models of labor flows often provide similarly large estimates of migration costs. Bertoli, Fernández-Huertas, and Ortega (2013, p. 89) calculate that migration costs for the average low-educated Ecuadorian immigrant in the United States are almost nine times the worker's salary. Similarly, Artuc, Chaudhuri, and McLaren (2010, p. 1021) estimate average moving costs that are around ten times the annual wage for workers who move from one sector to another in response to trade shocks in specific industries.[8]

To easily illustrate the attenuating effect of migration costs, suppose that these costs are constant in the working population and equal to π times a worker's initial salary in the South. Assume further that nonworking dependents tag along with the "householder" and migrate for free. The equilibrium condition that equates the present value of the gains from migration with the costs and that implicitly defines the number of migrants is then given by:

$$\frac{\alpha_N^*(L_N + M^*)^\eta - \alpha_S(L_S - M^*)^\eta}{r} = \pi(\alpha_S L_S^\eta), \tag{12}$$

where r is the rate of discount (assumed to be 5 percent).[9] The bottom panel of table 2 reports the results of the simulation assuming that $\pi = 10$. Although there are now obviously fewer movers, there are still a lot of them. In the case where there are no spillovers ($\lambda = 0$), the number of movers falls only from 5.6 to 5.3 billion. However, the gains from migration fall substantially because the calculation of the gains must now account for the cost of moving over 5.3 billion people. The annualized

[7] These wage differences do not adjust for price differences. The Penn World Table reports that in 2010, the PPP-adjusted per capita GDP in the United States was almost twice as large as that in Puerto Rico.

[8] Kennan and Walker's (2011) study of interstate migration for a sample of young workers distinguishes between the costs incurred by the small group of actual movers and the cost of a potential move by a randomly chosen person. While the former can be negative, the cost of "hypothetical moves to arbitrary locations" is over $300,000 (Kennan and Walker 2011, p. 232).

[9] The equilibrium condition in equation (12) assumes that potential migrants in the South internalize the externality they impose on the North's production technology so that M^* gives the optimal number of immigrants.

global gain—net of migration costs—is defined by:

$$(13)\quad \Delta Y' = \left(\int_0^{L_N+M^*} \alpha_N^* L^\eta \, dL + \int_0^{L_S-M^*} \alpha_S L^\eta \, dL - Y_0\right) - r(\pi \alpha_S L_S^\eta) M^*.$$

Table 2 shows that these net gains fall from \$40 to \$28 trillion when there are no externalities, and from a positive gain of \$9 trillion to a loss of almost a trillion dollars when $\lambda = 0.5$.

Of course, we have no idea what the costs of migration will actually be if migration restrictions were to be removed and billions of people from poor countries were on the move. The formation of social networks among migrants could substantially lower the costs of migration for the second or third billionth mover. But congestion costs in the receiving countries could also increase exponentially, making it harder to resettle that marginal migrant. Regardless, the global gains from unrestricted migration need to be contrasted with the costs of moving billions of people if the exercise is to be taken seriously. After all, it seems that migration costs do not need to be all that high to make those trillion-dollar bills disintegrate even faster.

In contrast to Collier's *Exodus*, where the focus is on the gains and losses accruing to specific groups in the population, Ruhs's *The Price of Rights* attempts to explain why receiving countries enact policies that restrict the number and types of migrants that are allowed to enter. As a result of the different focus, Ruhs's analysis raises concerns about the simulated gains from globalization that are conceptually different from those of Collier, but equally important.

Ruhs examines an exhaustive data set that summarizes various restrictions on immigration policy for forty-six countries, including such characteristics as quotas, nationality restrictions, and the rights granted to immigrant groups. Presumably, each receiving country enacts an immigration policy that maximizes the specific country's national interest (however defined). Sometimes, these decisions lead to policies that encourage the admission of skilled workers (as in the Canadian point system), or favor the entry of relatives of earlier immigrants (as in the United States), or restrict the rights granted to specific types of migrants after arrival, including the right to vote, the right to move internally within the country, or the right to become a naturalized citizen. As an example of how specific some of these restrictions can be, Ruhs (p. 119) notes Singapore's requirements that a "foreign employee shall not go through any form of marriage. . . with a Singapore Citizen or Permanent Resident," and that a "foreign employee shall not become pregnant or deliver any child in Singapore."

Ruhs calculates various cross-country correlations to determine which set of country characteristics are associated with specific types of immigration restrictions. Many of these correlations are inherently interesting—for example, high-income receiving countries are more welcoming to high-skill than to low-skill immigrants. Due to the nature of the cross-country empirical exercise, however, it is far from clear what underlying mechanism leads to the enactment of specific policies.

Despite this indeterminacy, Ruhs's detailed documentation of the existence and variation in immigration policies has a crucial implication for the models that predict huge gains from unrestricted migration. To put it bluntly, why exactly are the receiving countries being so stupid? Why do policymakers in these countries not buy into the models and enact policies that would substantially increase national income? Why do countries like Canada and Australia, which

offer both very high wages that would keep attracting immigrants and vast geographic regions waiting to be filled, keep strolling on that mythical sidewalk, keep seeing those trillion-dollar bills, and just keep walking right on by?

This point can be quantified in the context of the simulation. Suppose that the capital stock in each region is owned by the capitalists in that region. It is then straightforward to calculate the change in the income that accrues to all Northerners *after* they pay out the immigrants' salaries. This quantity is given by:

$$(14)\quad \Delta\text{Net Income of North} = \int_0^{L_N+M^*} \alpha_N^* L^\eta \, dL - \int_0^{L_N} \alpha_N L^\eta \, dL - w_N^* M^*,$$

where w_N^* is the wage paid in the Northern labor market after the relaxation of immigration restrictions.[10] Row 3 of table 2 reports the income change accruing exclusively to Northerners. If there were no spillovers and if migration were costless, this income would increase by around $13 trillion as a result of unrestricted immigration. It would seem, therefore, that receiving countries have a huge incentive to remove immigration restrictions; the size of the national economic pie increases and the country could, in theory, redistribute some of its additional wealth so that all natives in the receiving country are better off. The simulation also shows, however, that the increase in Northern income quickly dissipates and turns negative if there are significant spillovers. If the parameter $\lambda = 0.5$, for example, the $13 trillion gain turns into a $2 trillion loss. In short, the general equilibrium effects can easily turn a receiving country's expected windfall from unrestricted migration into an economic debacle.[11]

My inference from Ruhs's *The Price of Rights* is that receiving countries endogenously choose those policies that are most beneficial for them. And those countries' revealed preference—the fact that they repeatedly keep ignoring the advice of the social engineers—contains valuable information. If the trillion-dollar benefits were really there for the taking, would not some receiving country have already chosen to go down that path? The fact that these countries instead keep enacting immigration restrictions hints at the possibility that perhaps those trillion-dollar bills are not real. I know that an easy retort to this interpretation of the evidence is that the policymakers and populations of the receiving countries form a "rabid collection of xenophobes and racists." But another interpretation, which may be just as valid, is that perhaps those policymakers and native populations know something that the social engineers ignore: there are few gains to be had after accounting for the adverse spillovers.

The striking variation in the types of restrictions that different receiving countries impose on specific types of international migrants suggests a promising avenue for research. After all, the variation may provide a great deal of information about how receiving countries perceive and quantify the potential externalities that would arise if the country were hit by very large supply shocks from specific places. These different choices may be amenable to empirical study by carefully examining how the adopted policies reflect preexisting local conditions, including the geographic,

[10] Note that the wages paid in the North and South in the postimmigration period will not be the same if migration costs are positive.

[11] In an unpublished (and prescient) working paper, Davis and Weinstein (2002) present a general equilibrium framework that implies substantial losses for receiving countries.

economic, religious, linguistic, and historical linkages among the various countries.

There is, in fact, a related and underappreciated inference that can be drawn from Ruhs's exhaustive accounting of immigration restrictions. The existing research on the economic impact of immigration typically treats the policy parameters that regulate immigration flows into a receiving country as exogenously determined, and then exploits the policy-induced variation in the size and composition of these flows to measure the various economic effects. The observed policy, however, is endogenous. This endogeneity suggests that the effects observed in a particular context may provide little insight into the economic impact that similar supply shocks would have in other places and at other times. In fact, it seems likely that a particular policy is chosen because that choice leads to the greatest benefits and/or smallest costs in that place and at that time. The application of that specific policy in any other context would likely lead to a diminution of the benefits and/or an increase in the costs. A little humility about what we actually know would seem to be a prerequisite before anyone proposes a breathtaking rearrangement of the world order.

Before concluding, let me point out that I have assiduously avoided the ethical issues surrounding the relaxation of immigration restrictions throughout the essay. I am certainly not qualified to comment on the morality of the restrictions that countries enact to restrict population flows across international borders. Although these ethical issues are often alluded to (both Collier and Ruhs offer lengthy discussions of these issues), the moral argument is often far too ideological and too steeped in an author's value system to be very convincing. Moreover, I suspect that the axioms one postulates about the foundations of a just society are very likely to influence the ending point regarding the morality of immigration restrictions—one need look no further than the different systems of distributive justice proposed by Nozick and Rawls for evidence that assumptions drive conclusions.

Abstracting from these ethical issues, there is a clear message for anyone examining the link between immigration and globalization: beware of social engineers who promise the existence of trillion-dollar bills on a mythical sidewalk at the end of the rainbow; those promises are often based on flimsy modeling and inadequate evidence.

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