IF YOU SUPPORT FREE TRADE, WHY NOT FREE IMMIGRATION?

September 5, 2016

Abstract

Immigration increases the income of native capital more than it reduces the income of native labor, although the transfer of income from labor to capital is a much bigger effect. Free trade often does this too. Even aside from possible negative externalities and public finance costs to natives, however, immigration is different because if the aggregate production function has diminishing returns to private capital and labor the conclusion of increased overall income can easily be reversed. Such a production function is plausible because public capital— government capital and social capital— is unpriced and fixed, with immigrant labor receiving a portion of its benefit. Thus, even aside from fiscal effects and social externalities, whether the total income of natives rises or falls with immigration is open to doubt.

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This paper: http://www.rasmusen.org/papers/immigration-rasmusen.pdf.

I thank the BEPP Brown Bag Lunch, Frank Buckley, Andrew Butters, Michael Carey, Patrick Grady, Herbert Grubel, Andrew Linde, Francesco Marchionne, Nathan Smith, and Alex Tabarrok for helpful comments. Note that some of these people disagree completely with my policy conclusions.

1. Introduction

How could anyone who favors free trade object to unrestricted immigration? As Benjamin Powell says,

> Conservatives who support free trade in goods and services, but oppose greater migration, and liberals who support immigration but oppose free trade, both need to understand that the economic case for free trade in both labor and in goods and services is essentially the same. Freeing markets in both areas will make the world, and the United States, wealthier.[1]

University of Chicago economist John Cochrane puts it more forcefully:

> Well, do you believe that the Federal government should mandate a large minimum wage, to raise Americans wages? Do you believe that the Federal Government should ban imports and subsidize exports, to raise Americans wages? Do you believe that the Federal Government should give more power to unions, to raise Americans wages? Do you believe that the Federal Government should pass even more stringent rules in its own contracts to pay higher wages? Do you believe that the government should pass more licensing restrictions, to lessen competition and raise American's wages? Should Illinois restrict Indianans working in Illinois, to keep up Illinoisans' wages?
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> These are all the same sorts of steps. At least people who believe all these wrong things believe them together. It makes no sense whatsoever to oppose, correctly, all of these counterproductive economic interventions, but to support exactly the same intervention aimed at immigrants.[2]

Here we will explore one answer to Powell and Cochrane: diminishing returns resulting from the fixity of public capital. Licensing, the minimum wage, and strong unions do raise wages, at least for those workers, who still have jobs after the wages rise. Their drawback is that they hurt other workers, consumers, and owners of other inputs even more than they help their beneficiaries. Banning imports and subsidizing exports can also be a way to raise wages, though they can also lower wages, depending on the particular goods imported and exported. It is quite true that we could use trade policy to raise wages by banning the import of labor-intensive goods, but that this increase in wages for some workers would reduce overall national wealth by increasing the prices of those goods. So why should we restrict immigration, if what we care about is overall national wealth rather than high wages?

There are two obvious differences between free trade and free immigration: public finances and consumption externalities. Free trade does not create new taxpayers or

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[1]Benjamin Powell, "Immigration Reform — The Time for Free Trade," *The Huffington Post* (Aug 16, 2013).

[2]John Cochrane, "Immigration and Wages," *The Grumpy Economist* blog (June 27, 2014).

new beneficiaries of government spending; immigration does. If immigrants are people who will pay less in taxes and require more spending on public services than the average American, they make native Americans worse off. If the immigrants pay more taxes and require less spending, of course, then the opposite is true, and this becomes an argument for immigration, not against it. The obvious policy response is for the government to select from the large number of people wishing to immigrate depending on whether they would drain the Treasury or help fill it.[3]

The second obvious difference between free trade and free immigration is in consumption externalities: the spillovers, beneficial or negative, that immigrants' actions have on their new country. Free trade has no externalities because the foreign producers stay in their own countries. Immigrants, however, bring their tendencies to volunteer, to help neighbors, to beautify neighborhoods, and to lead civic projects. And, on the other hand, they bring their crime, corrupt politics, littering, and bullying. Thus, externalities too can be either an argument for more immigration or for less, depending on how immigrants are selected.

Let's put aside public finance and consumption externalities, though, and assume that immigrants are identical to natives in everything, including their economic productivity, so we can focus on the less obvious, if perhaps less important, marketplace benefits and harms from immigration. Let's also ignore the procedure of immigration, whether it's better to admit three million immigrants from a list of legal applicants and three million illegally, or to switch to six million legal immigrants. Rather, let's look just at the standard economist's argument that immigration helps the employers who hire them more than it hurts the workers who compete with them.

I'm writing this in the style of a scholarly article, which means I use some few equations and focus narrowly on a particular aspect of the question, and I spew footnotes liberally. If you want to skip the equations and footnotes, go ahead. The mathematics makes my assumptions and reasoning precise, but to the extent that you trust my judgment, you can rely on words alone.

2. How Immigration Helps: It Increases the Productivity of Private Capital

[3]On the fiscal question, see Peter Nannestadaz, "Immigration and Welfare States: A Survey of 15 Years of Research," *European Journal of Political Economy* 23 (2007): 512-532; Robert Rector & Jason Richwine, "The Fiscal Cost of Unlawful Immigrants and Amnesty to the U.S. Taxpayer," (May 6, 2013); Matthew Yglesias, "No, the Gang of Eight Immigration Bill Won't Cost You $6.3 Trillion," *Slate* (May 7, 2013); Steven A. Camarota, ``Immigration's Impact on Public Coffers in the United States,'' pp. 29-40 and Jean-Paul Gourévitch, ``Immigration and Its Impacts in France,'' pp. 41-56 of *The Effects of Mass Immigration on Canadian Living Standards and Society*, edited by Herbert Grubel (Fraser Institute, 2009). Related to this is what might be categorized as a third difference: immigrants vote, but exporters do not, so immigrants can manipulate the fiscal effect to their advantage.

If the wage falls, employers will hire more workers. Conversely, if more workers enter the marketplace, employers will not be willing to hire all of them unless the wage declines. The demand curve for labor in Figure 1 (which, by the way, is drawn out of scale to show the areas more clearly) shows how much labor would be employed at each possible wage. If the wage is lower, employers are willing to hire more workers. We will set the initial amount of labor to 100 at a wage of 1 so as to make it easy to see percentage changes after immigration. If immigration adds 20% more workers, the wage must decline to .56 for them all to be employed in this particular example. The 100 in native labor has lost area A as a result of the lower wage. Employers, however, benefit from the lower wage by amount A+B. The rectangle A is a wash; labor's loss is employers' gain. Employers also have gained area B, however, which represents the excess of what employers would have paid (if they'd had to) over the actual wage of .56 for those workers. At that level of employment, employers are making less profit per worker than when L = 100, but each worker still is worth more than what they have to pay.[4]

Let's call the area B, the "Borjas triangle" after Harvard professor George Borjas, who has emphasized its importance and its intimate connection with the size of the income transfer from workers to employers.[5] The size of the Borjas triangle depends on the elasticity of demand for labor, which is the sensitivity of the number of jobs to the wage. In Figure 1, demand is fairly insensitive, so for the extra 20 in labor to be absorbed into the economy, the wage must drop 44%, from 1 to .56. The size area A, the transfer from workers to employers, is 44 (from .44*100). The size of area B, the Borjas triangle is 4.4 (from .5*.44*20). Thus, to obtain the relatively small increase in total native income of 4.4, we must go through the upheaval of a transfer of 44 from workers to employers.

Suppose employer demand for labor is more sensitive to the wage, so the wage only had to drop to .9 to absorb the immigrant labor. In that case, the size of area A would only be 10 (10%*100), so the redistribution of income would be much less. Area B, however, would now equal only 1.0 (.5*10%*20). Borjas's insight is that the size of the triangle is big only if the rectangle is big too. If immigration is to raise national income, it must also redistribute. We cannot have one without the other.

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[4]Note that this is not because the immigrants have lower ability than the natives, since we have assumed identical abilities. Rather, it is that employers fill the most profitable and productive job slots first, and only if the wage falls do they hire more workers for the less important jobs. Immigrants are not as different from native Americans as one might think. In 2014, 30 percent of the 37 million immigrants over age 25 lacked a high school degree or GED compared to 10 percent of natives, but 29 percent had college degrees, compared to 30 percent of natives. The average age for all immigrants was 43.5, compared to 35.9 years for natives; 14% were 65 or older compared to 15%. Jie Zong & Jeanne Batalova, "Frequently Requested Statistics on Immigrants and Immigration in the United States," Migration Policy Institute (April 14, 2016).

[5]Relevant work of George Borjas includes: "The Labor Demand Curve Is Downward Sloping: Reexamining the Impact of Immigration on the Labor Market," *Quarterly Journal of Economics* 118 (2003): 1335-1374; "Immigration and the American Worker: A Review of the Academic Literature," *Center for Immigration Studies* (April 2013); *Immigration Economics*, (Harvard University Press, 2014); "Immigration and Globalization: A Review Essay," *Journal of Economic Literature* 53 (2015): 96-174.

For immigration to increase America's national income, it must drive down wages. No redistribution means no income gain.

Figure 1
The Borjas Triangle

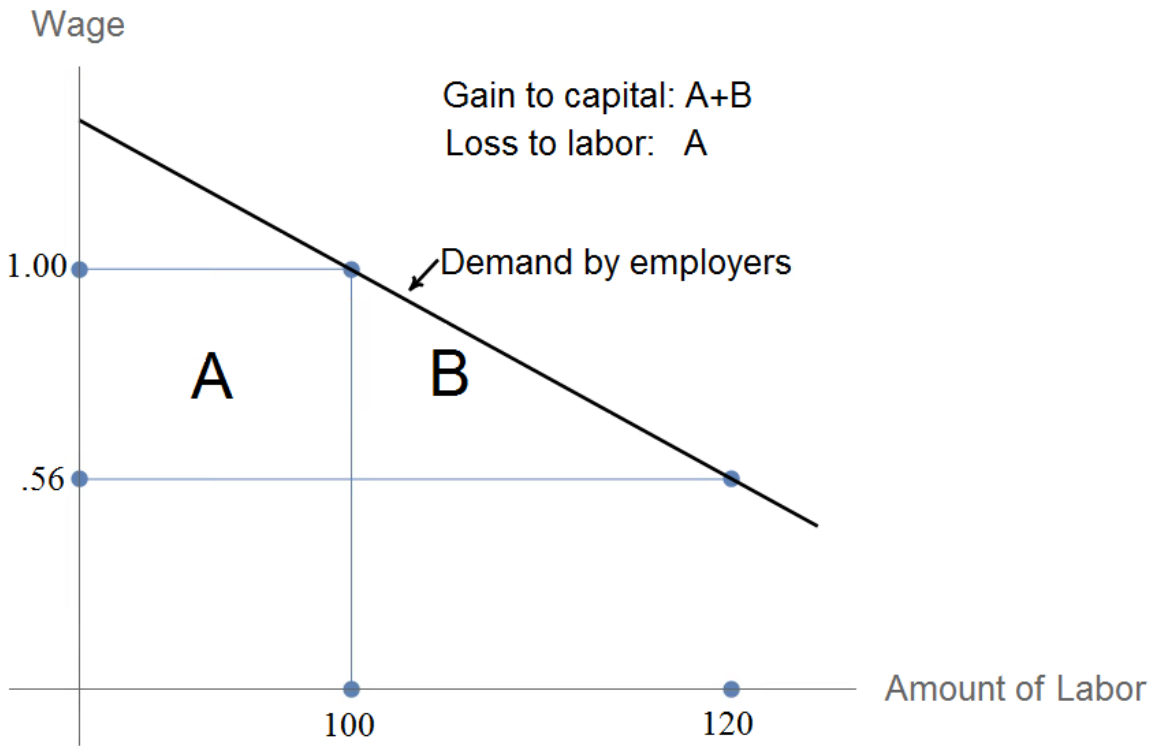

Figure 1 is helpful in understanding what is happening, but it is only partial equilibrium, looking at the labor market in isolation, whereas we are really talking about general equilibrium— the change in the returns to both capital and labor. To rigorously include both inputs, let's use a model of an economy that produces one good using a Cobb-Douglas production function. Let the economy be composed of *n* firms, each with the production function

$$Q_i = L_i^{.6} K_i^{.4} X, \tag{1}$$

where I will explain later why I chose the numbers .6 and .4, and where X is a variable that we will take to equal 1 for now. The Cobb-Douglas function has diminishing returns to each input separately: since the coefficient on labor is less than 1, if just L is doubled, the marginal product of labor will decline. It also has constant returns to scale: since .6 + .4 = 1, doubling both capital and labor will double output. As a result, firms can differ in size and still compete with each other on equal terms, but

they will all need to use the same capital-labor ratio to survive.[6] Adding up across the n firms[7], national output is $Q = L^{.6}K^{.4}X$. Labor's share of national income turns out to be 60%, a property of the Cobb-Douglas function.[8]

I can now explain where the numbers .6 and .4 come from. It's difficult to estimate the production function, especially at the level of an entire country, but it is much easier to measure labor's share of national income, which has been estimated to equal 58%. Rounding for simplicity gives 60%.[9] The remaining 40% is not all capital income— it also includes income from land and natural resources— but for our purposes we can lump those in with capital.

Let's define the initial amounts of labor and capital as $L = 100$ and $K = 100$ so that a change of 1 is a change of 1%. Taking those values, output will be $Q = 100$, labor income will be 60, capital income will be40, and the total income of Americans is 100, the sum of those two. This is our baseline.

The foreign-born, legal and illegal, were 16.7% of the workforce in 2015.[10] Let's look at the case of an increase in labor by 20%, to $L = 120$. This is a relatively small increase, something like what we might expect given the current levels of immigration. The result would be an increase in output from 100 to 111.6. The wage would fall by 44.2% and the return to capital would rise by 11.5%, leaving native labor with an income of 55.8 instead of 100, and native capital with an income of 44.6 instead of 40. American workers are hurt and American investors are helped, but overall American income rises to 100.4, an increase of 0.4%. Immigrant workers receive the rest of national product, an amount equal to 11.2.

Naturally, having more labor in America would increase output, but the new competitors in the labor market drive down wages. On the other hand, with more workers per unit of capital, the value of capital rises. In the end, capital wins more

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6 If the wage is w and the cost of capital is r, firm i's cost function is $wL_i + rK_i$. Minimizing cost subject to producing Q_i yields $\frac{dQ_i}{dL_i}/\frac{dQ_i}{dK_i} = w/r$, $.6\frac{K_i^{.4}X}{L_i^{.4}}/.4\frac{L_i^{.6}X}{K_i^{.6}} = w/r$, so $K_i = \frac{1.5w}{r}L_i$. Thus, for any value of Q_i (any size of firm), costs are minimized— and the firm is able to survive— only if K_i is chosen to equal that unique multiple of L_i.

7 $Q = \sum_{i=1}^{n} Q_i = \sum_{i=1}^{n} L_i^{.6}K_i^{.4}X = \sum_{i=1}^{n} L_i^{.6}(\frac{1.5w}{r}L_i)^{.4}X = (\frac{1.5w}{r})^{.4}\sum_{i=1}^{n} L_iX = (\frac{K}{L})^{.4}LX = L^{.6}K^{.4}X.$

8 The marginal product of labor equals the wage in equilibrium, so $\frac{dQ_i}{dL_i} = .6\frac{K_i^{.4}X}{L_i^{.4}} = w$. Then $wL = .6\frac{K_i^{.4}X}{L_i^{.4}}L = .6L^{.6}K^{.4}X = .6Q$.

[9]For the years 2010-2013. See Michael W. L. Elsby, Bart Hobihn & Aysegul Sahin, "The Decline of the U.S. Labor Share," *Brookings Papers on Economic Activity* (2013): 1-52.

[10]http://www.bls.gov/news.release/pdf/forbrn.pdf.

than labor loses, an effect which doesn't depend on the particular numbers in this simple model. The increase in Americans' total income is very small though, and most Americans lose, even though those that win--- the people who own capital assets as well as earning labor income--- do win more. To get an idea of the winners, note that the 24% of American households whose head is white or Asian, middle-aged, and went to college owned 67% of the nation's private wealth in 2013. The median net wealth of white families was $134,000, of Asian families $91,000, of Hispanic families $13,900, and of black families $11,000.[11]

Many intellectuals says that restricting immigration is morally wrong, and we should open the borders completely. In that case, the increase in the labor force would be more than 20%, of course, and even 100% over the next twenty years would be a conservative estimate. Americans tend to think of Mexico as being the main potential source of new immigration, but Mexico is a high- income country by world standards and would not necessarily dominate future immigration. Although America's per capita income is $55,837 and Mexico's is $9,009, Mexico income is above China's $7,925, Indonesia's $3,347, and India's $1,582.[12] Even Mexico might well find native Mexicans a minority if allowed unrestricted immigration from, say, India.[13] Villagers in India might not know of the opportunity to go to a country 6 times or 35 times as wealthy per capita (Mexico or the U.S.), but manufacturers in the United States or in Mexico would find it profitable to tell them, just as American manufacturers sent recruiters to Europe in the early 1900's.[14] When able, large fractions of populations have migrated. The

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[11]William R. Emmons & Bryan J. Noeth, "Race, Ethnicity and Wealth," in "The Demographics of Wealth," Federal Reserve Bank of St. Louis, February 2015.

[12]2015 numbers. "GDP per capita (current US$)," The World Bank, .http://data.worldbank.org/indicator/NY.GDP.PCAP.D

[13]Mexico has quite restrictive immigration rules. In 2014, the U.S. deported 414 thousand illegal immigrants, while in 2015 Mexico deported (*devuelto*, meaning "returned" or "vomited up") 181 thousand, 177 thousand of them Central Americans. "Cuadro 3.2.1 Eventos de extranjeros devueltos por la autoridad migratoria mexicana, segn continente y pas de nacionalidad, 2015," Secretaria de Gobernacion, http://www.politicamigratoria.gob.mx/esmx/SEGOB/ Extranjeros alojados y devueltos 2015; 2014 U.S. deportations were 414,481 (p. 103) of 2014 *Yearbook of Immigration Statistics*, Dept. of Homeland Security, p. 103. On Mexican immigration law, see Allan Wall, "Is Illegal Immigration into Mexico Really a Felony? Does It Matter?" *Vdare* blog, January 3, 2011 (on the law as of 2011--- it changed in 2012) and "LEY Federal de Derechos", http://www.aduanas-mexico.com.mx/ claa/ctar/leyes/lfd.html (December 23, 2015).

[14]On recruiting, see Merle Curti & Kendall Birr, "The Immigrant and the American Image in Europe, 1860-1914," *The Mississippi Valley Historical Review* 37 (1950): 203-30. The previous high in the percentage of Americans who were foreign born was 14.8 percent, in 1890 (Jie Zong and Jeanne Batalova, "Frequently Requested Statistics on Immigrants and Immigration in the United States," Migration Policy Institute (2016)).

number of people of Puerto Rican descent in the United States is 5.1 million, compared to 3.5 million remaining on the island, and about 1 in 5 Salvadorans now lives here.[15]

If immigration doubles the American work force in our model, output rises from 100 to 151.6. The wage falls 54.5% and the return to capital rises by 51.5%. The labor income of natives is 45.5, capital income is 60.6, and total native income is 106.1, a 6.1% increase. Immigration generate a much bigger increase in national income than 0.4%, but requires an even bigger redistribution from poor to rich.

Have wages fallen as a result of previous immigration? We certainly have not seen a drop in wages of 45% in any one year, but it is unclear what the effect of immigration spread over a fifty-year period has been on wages. This is especially difficult to see because we would have to adjust for general economic growth and for other changes in the labor market such as increased education and changes in the participation of women and teenagers. There is much controversy over what we should say about wage growth, especially wage growth for the unskilled, over this time period.[16]

This is all premised on the Cobb-Douglas production function, of course. That is the place to start, because it is simplest, but one might redo the analysis with a more general constant-elasticity-of-substitution (CES) production function (Cobb-Douglas is CES with the elasticity equal to one) or some other functional form. It is unclear which function one ought to use, but it is up to anyone who objects to Cobb-Douglas to propose a specific alternative, to explain why it is more realistic, and, most importantly, to show that it generates meaningfully different results. Whichever specification is chosen, we cannot escape the logic of the Borjas Triangle: the bigger the national income gain, the bigger must be the gain to investors and the loss to workers.

This result of small income gains as a result of large income transfers is similar to what happens with free trade. It can even be true that labor wins and capital loses, though the most immediate effects are that one industry wins and another loses. One difference is that international trade is a relatively small part of the American economy, and its increase has had a much smaller effect than an increase of 20% in our labor force, much less 100%. In 2015 imports were 15.5% of GDP and exports were 12.6%

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[15]Jens Krogstad, "Puerto Ricans Leave in Record Numbers for Mainland U.S.," Pew Research Center (October 14, 2015). Aaron Terrazas, "Salvadoran Immigrants in the United States," Migration Policy Institute (January 5, 2010).

[16]For surveys of the empirical literature on the effect of immigration on wages, see George Borjas's 2014 book or David Roodman, "The Domestic Economic Impacts of Immigration," *David Roodman* blog (September 3, 2014). An important article written after Roodman's survey that illustrates the difficulties in the empirical literature is George Borjas, "The Wage Impact of the Marielitos: A Reappraisal," Harvard working paper (October 2015). Empirical estimates find small effects of the quantity of labor on wages. If they are correct, the Borjas Triangle and hence the total income gain to Americans is tiny, even without adjusting for public capital. I am skeptical of the empirical studies, however, since not being able to find an effect can simply be due to data limitations and confounding effects. For a humorous take on empirical studies which fail to match basic economic theory, see Donald Boudreaux, "Science: A Short Story,'' *Café Hayek* blog (August 28, 2016).

(*Economic Report of the President, 2016*, Table B-1). Another difference is that although free trade often has both winners and losers, it is also possible to have all winners. Economists use two basic models for international trade: the Heckscher-Ohlin and the Ricardian.[17] In the Heckscher-Ohlin model, trade occurs because countries have the same production function for two goods, but they have different amounts of capital and labor. If free trade is permitted, countries with lots of capital will specialize in one good and countries with lots of labor will specialize in the other. By the Stolper-Samuelson Theorem, this will raise national income overall but will help capital and hurt labor in the high-capital countries, and the reverse in high-labor countries. That is like what we have just seen for immigration. In the Ricardian model, trade occurs because countries have different production functions for two goods. Countries specialize in producing the product in which they have a comparative advantage. This benefits everyone in every country. The reason is that in combination each country can focus on doing what it does best.

I have put this in terms of capital and labor, but the first step in extra realism would not be to change the production function, but to separate labor into different types of labor. We have been assuming that immigrant labor is identical to native labor. If immigrants are less skilled, they don't compete with all native labor. If immigrants only have high school degrees and not college degrees, for example, it is likely that firms will substitute immigrant unskilled labor for native unskilled labor, but the effect will be to increase the value not just of capital but of skilled labor. The impact of the competition will be on a smaller group of natives and so the wage drop will be greater. If the 100 native labor is composed of 50 skilled and 50 unskilled, then 20 immigrant labor will be a 40% increase in the amount of unskilled labor, not 20%. If the size of immigration is 100, that is a 200% increase in the amount of unskilled labor. We should expect not just capital, but also skilled labor, to support the immigration of unskilled labor. Of course, we should expect native skilled labor to be hostile to a change in immigration laws that favored immigration of skilled labor instead of our present system which gives priority to relations of Americans and turns a blind eye to illegal immigration.

2. How Immigration Hurts National Income: Pressure on Public Capital

Our conclusion thus far would be that immigration hurts labor significantly, helps capital, and overall has a small but positive effect on American's incomes. Economists generally recommend policies that increase income overall, because if you are concerned about income inequality, that can be addressed via the tax system. We could open up immigration, but then increase taxes on capital and reduce taxes on labor, or even give labor refundable tax credits. Next, however, let's consider whether

[17]A good set of slides on basic international trade theory is at: Ralph Ossa, "33501: International Commercial Policy," University of Chicago, http://faculty.chicagobooth.edu/ralph.ossa/coursematerials/.

immigration really would help capital more than it hurts labor. So far we've assumed that labor and capital are the inputs, the economy has constant returns to scale, and each input is paid its marginal product. But it's not true that a firm needs to pay for all the capital it uses. It must pay for private capital, but public capital--- government capital and social capital--- are available for free. If labor doubles, and private capital doubles but public capital does not, output will not double.

Government capital is just as tangible as private capital. President Obama's Council of Economic Advisors devoted an entire chapter of the 2016 *Economic Report of the President* to it:

> Public investment in infrastructure propels future productivity growth through several channels: enabling firms to take advantage of economies of scale and increase production through reduced input costs; lowering transport, storage and vehicle maintenance costs for households and firms by easing congestion and improving the quality of roads and highways; increasing the productivity of private capital through improved resource utilization; and increasing workers access to labor market opportunities, thus facilitating more efficient hiring matches. These effects are especially relevant today as the United States continues to experience lagging productivity growth...
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> Increasing public infrastructure investment supports growth in labor productivity by augmenting growth in total factor productivity and by increasing the capital intensity of production throughout the economy. Boosting the capital intensity of production occurs both directly, by increasing the accumulated stock of public capital, and indirectly because a larger stock of public infrastructure fosters increased private capital investment. By increasing private-sector output and improving the productivity of private capital, infrastructure spending can induce greater private spending by increasing the returns to investment on private capital. Larger stocks of public capital, and the flow of services they generate, raise the marginal productivity of other inputs to production, including private capital and labor.[18]

Boston University Professor Lawrence Kotlikoff, the nation's leading expert on social security, notes that if we have a problem with insufficient infrastructure for our population, one solution is to stop increasing our population:

> Legal immigration is also fueling a veritable population explosion. Unless we reduce legal immigration, our population will rise by one-third--- over 100 million people--- in just 45 years. That's the current population of the Philippines. Most of these additional people will locate in the nation's major cities. Driving in our major cities at peak hours is already a major challenge. With one-third more people, driving in our major cities may be like driving in Manila--- an experience I don't recommend.[19]

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[18]Council of Economic Advisers, "The Economic Benefits of Investing in U.S. Infrastructure," *The Economic Report of the President 2016,* pp. 251-290.

[19]Lawrence Kotlikoff, "The Truth about Our Economy" https://kotlikoff2016.com/economy .

The other part of public capital is social capital. Chicago sociologist James Coleman said in 1988 that social capital, in analogy to physical and human capital, consists of "obligations and expectations, which depend on trustworthiness of the social environment, information-flow capability of the social structure, and norms accompanied by sanctions. A property shared by most forms of social capital that differentiates it other forms of capital is its public good aspect: the actor or actors who generate social capital ordinarily capture only a small part of its benefits, a fact that leads to underinvestment in social capital."[20] The concept took off in the 1990's with the work of Harvard political scientist Robert Putnam, who said that social capital is "connections among individuals --- social networks and the norms of reciprocity and trustworthiness that arise from them."[21] He noted that changes such as women's entry into the workforce (which reduced the time spent on such things as parent-teacher associations) and television (which substituted couch time at home for movies' time downtown), and, most famously, the substitution of bowling by oneself for bowling in leagues, reduced the amount of social capital in America.[22] The concept is hard to define and even harder to measure in dollars, but it is widely recognized that investment in social relationships is important to the economy, that this investment depreciates over time if not replenished, and that it benefits more than just its creators.

Let's combine government and social capital under the heading of public capital and denote its value by *P*. Our Cobb-Douglas production function for a firm now becomes

$$Q_i = L_i^a K_i^b P^c,$$

where $a+b+c = 1$ so we still have constant returns to scale. Since our earlier production function was $Q_i = L_i^{.6} K_i^{.4} X$, we now can identify *X,* which equals

$$X = \frac{P^c}{L^a K^b} = \frac{P^c}{\Sigma_{i=1}^n L_i^a K_i^b}$$

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[20]James S. Coleman, "Social Capital in the Creation of Human Capital," *American Journal of Sociology* 94 (1988): S95-S120.

[21]Robert D. Putnam, *Bowling Alone: The Collapse and Revival of American Community (*Simon and Schuster, 2001, p. 19).

[22]Robert D. Putnam, "Bowling Alone: America's Declining Social Capital," *Journal of Democracy* 6 (1995): 65-78.

As before, a firm with K_i in capital will hire labor up to where its marginal product of labor equals the market wage, and all firms will use the same capital-labor ratio in equilibrium, but we will continue to assume that firms ignore their effect on X.

What is the value of the public capital production parameter, c? That is, how important is government and social capital relative to private capital? The Federal Reserve estimates US net wealth to be $80.1 trillion, of which the federal governments owns $3.3 trillion and state governments own $10.0 trillion (https://www.federalreserve.gov/releases/z1/current/, Table B.1). If we take private capital income and the public capital flow of services as proportional to capital value, a few calculations give us the following production function:[23]

$$Q = L^{.56}K^{.37}P^{.07}. \qquad (4)$$

Now, after immigration raises labor by 20%, output rises from 100 to 110.7, not to the 111.6 calculated earlier under the assumption that public capital had no value, that $c = 0$. The wage falls by 44.6% instead of 44.2%. The bottom line is that total native income falls to 99.6, instead of rising to 100.4, so immigration is harmful overall rather than helpful.

That conclusion assumes that $c = .07$, however, which only accounts for government physical capital. What about social capital? If social capital is completely unimportant to the economy, then equation (4)'s value of $c = .07$ is correct. If social capital and government capital matter equally, then $c = .14$. In that case, post-immigration output is 109.9 and the wage falls 45.1%, with income falling a bit further, to 98.9. Or, if you think social capital is more important than government capital, you may prefer $c = .21$, in which case post-immigration output is 109.0, the wage falls 45.5%, and native income falls to 98.1. The exact value doesn't matter much. The wage falls about 45% and national income changes very little, at best increasing by 0.4% (when public capital has zero effect), at worst falling by 1.8%. The upshot is that the effect of immigration on national income via changes in output might well be negative but is in any case small. To decide whether immigration is desirable or not, one should really look to fiscal effects, social externalities, and non-economic considerations.

You may be curious as to how adding public capital to the model relates to the Borjas Triangle. Figure 2 shows how. The difference from Figure 1 is that now the demand curve shifts when immigration occurs. If $L = 100$, the demand curve is the same as in Figure 1. If $L = 120$, however, the strain on public capital means the demand curve

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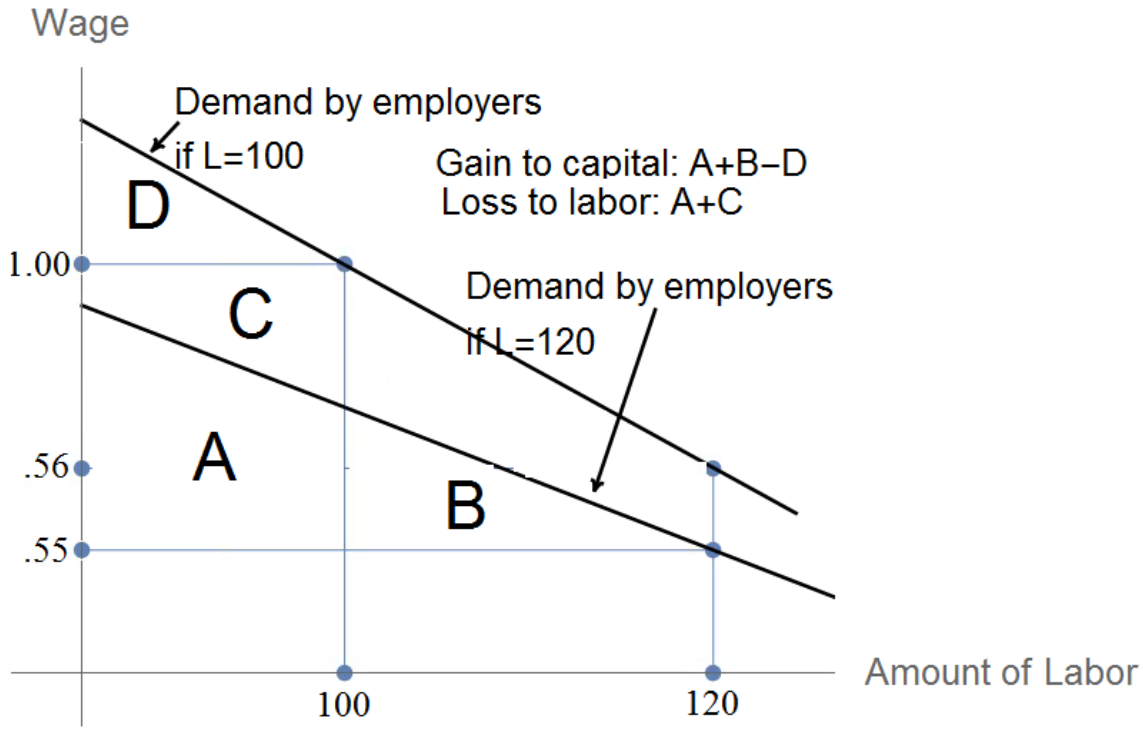
The Federal Reserve data tells us that $\frac{c}{b+c} = \frac{13.3}{80.1}$. The ratio of labor's share of income to private capital's is $\frac{a}{b} = \frac{.6}{.4}$. If L, K, and P are the only three inputs then there is constant returns to scale and $a + b + c = 1$. Solving these three equations together yields $c = .07$.

shifts down because productivity falls. The gain to employers from immigration is areas A plus B minus area D. The loss to workers is areas A plus C. Native income rises by B - C - D, which might be either positive or negative. Using the Cobb-Douglas production function and the values of *c* that I use above, native income falls. Using a different production function and different amounts of immigration, it might rise. We cannot conclude that the existence of public capital means that immigration hurts the economy, but in this first pass estimate, that is the conclusion.

FIGURE 2



LABOR DEMAND WITH FIXED GOVERNMENT AND SOCIAL CAPITAL

4. What About Capital Flows?

John Cochrane says,

> "The most common objection is the claim that letting immigrants in will hurt American wages. Before, I've addressed this on its merits: If labor doesn't move, capital will."[24]

It is correct that if labor cannot immigrate from country X to the United States, then the amount of labor in country X will be higher, wages there will be lower, and investment there will be more attractive to American owners of capital. As a result, some capital will move from the United States to country X, and with the reduction

[24]John Cochrane, "Immigration and Wages," *The Grumpy Economist* blog (June 27, 2014).

of capital in America, wages will fall. If our goal is the maximization of the income of American natives, however, that is a good thing, not a bad thing. It says that American capital owners can increase their income even if we limit immigration. Thus, the conclusion we reach is that immigration, with its resulting burden on public capital, is unnecessary even for the welfare of American capital.

It is nonetheless important to think about how the amount of capital in the U.S. reacts to immigration. We have seen that immigration increases the return to capital at the same time as it reduces the return to labor. But what happens if the increase in the return to capital leads to an increase in the amount of capital, either because Americans invest more or because foreigners invest in America? In the model without public capital (that is, with $c = 0$), the result would be no effect all on American total income in the long run. In the long run, capital would increase until the capital/labor ratio reached its pre-immigration level. The increase in capital would cause wages to rise back to their original level and the return on capital to fall back to its original level, so total American income would return to its original level too. Immigration would have no effect, except via social externalities and fiscal effects.

If public capital matters, however, an increase in capital back to the original capital/labor ratio would end with a reduction in total American income. Without an increase in public capital, a 20% increase in labor and a 20% increase in capital would end with less than a 20% increase in income, yet part of income would now be going to the immigrants instead of to natives. Thus, the long-run effect of immigration would be negative once we consider the adjustment in the amount of capital, and not just U.S. labor, but also U.S. capital would lose in the long run.

Mention of capital flows raises another question. If immigration of labor puts too much pressure on public capital, what about immigration of capital? The United States does restrict immigration of labor, but inflow of capital is completely open. Wouldn't it have the same bad effects? It could. Suppose that capital in the U.S. increases from $K = 100$ to $K = 120$ in the model used above with diminishing returns because of public capital. That could lead to a reduction in native income, because the return to capital would fall, and it might fall more than the return to labor would rise. Wages would rise, since labor would have this extra capital to work with, but the return to capital would fall.

Capital is not the same as labor, though. If you are an investor in Germany who wants to invest in the United States, you do not have to buy machines, send them to Indiana, and start manufacturing things. An easier alternative is to buy stock in an American corporation. If you do that, the quantity of capital in America does not increase, at least as far as the production function is concerned. The number of machines is unchanged— it is just that the extra demand by German investors increases the value of American machines. If one measures capital by physical quantity, there is no change; if one measures capital by dollar value, it has increased. Such a change does not increase wages, or output. It does, however, help native owners of capital, who can sell their machines at higher prices to the German investors. Thus, immigration of foreign capital takes the form of purchase of shares in American companies, this is an

unambiguous good for American natives. Since much foreign investment does take this form, the case against entry of foreign capital is much weaker than the case against entry of foreign labor, even ignoring labor's consumption externalities and public finance effects.

On the other hand, a different effect may be at work that would make an increase in the physical quantity of capital highly desirable: technological external economies of scale. Starting with the work of Robert E. Lucas and Paul Romer in the 1980's, economists have suggested that much of the growth earlier attributed to technical change generally has been mediated by increases in the capital stock.[25] As the capital stock grows, unpatented but valuable ideas on how to produce better are spread through the economy. In a model of this kind, the X of our Cobb-Douglas model would be something like

$$X = \left(\sum_{i=1} K_i\right)^{1.5}$$

and a firm's production function would be

$$Q_i = L_i^{.6} K_i^{.4} \left(\sum_{i=1} K_i\right)^{1.5}$$

where the number "1.5" could be any number larger than 1 and represents the amount of increasing returns to scale in the economy. This effect was unimportant to the analysis earlier in the paper, since we kept K constant there, but its size would be crucial to any discussion of the value of capital inflow. It has been suggested that human capital might show the same external economies as physical capital, in which case the education level of immigrants would be especially important for their effect on productivity. This takes us beyond the effect of labor as labor, however, and into the separate question of whether the government should encourage such things as science and engineering graduate programs in the hope of increasing the amount of innovation in the economy.

5. What Are We To Make of All This?

My objective has been to highlight the fact that whether or not immigration raises the welfare of a country's natives depends crucially on the extent to which the economy has diminishing returns to scale., a neglected issue. If there are no fixed factors of production such as public capital, then the economy has constant returns and immigration has the same effect as free trade (always remembering that we are ignoring fiscal effects and social externalities for this focussed analysis). It will help capital more than it hurts labor. If fixed factors are important, then immigration is different from free trade, and it hurts labor more than it helps capital. Either way, the

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[25]The seminal papers are Robert E. Lucas, "On the Mechanics of Economic Development," *Journal of Monetary Economics* 2 (1988): 3-42, and Paul M. Romer, "Increasing Returns and Long-Run Growth," *Journal of Political Economy* 94 (1986): 1002-1037. A good and still useful survey is Paul M. Romer, "The Origins of Endogenous Growth," *The Journal of Economic Perspectives* 8 (1994): 3-22. See also George Borjas's 2014 book cited earlier.

net gain to income is small compared to the redistribution of wealth. I have presented crude estimates of the importance of fixed factors. I would not be surprised if they are wrong. Whether they are underestimates or overestimates, however, I do not know, nor do other economists.

As a final point, let me flag something far more important to my analysis than the magnitude of parameter *c* in the Cobb-Douglas production function: the assumption that our policy objective is to maximize the benefit to Americans. If your objective is to maximize the benefits to both Americans and people in the rest of the world, you need a more complicated analysis. You must then estimate the effects of immigration on the immigrants and on the people in the countries they leave behind. The distinction is crucial, because immigration might hurt Americans while helping foreigners. As John Cochrane says,

> Restricting labor benefits some American workers by hurting Mexican workers. Is it really America's place in the world to take opportunities from poor Mexicans to subsidize our workers standard of living? We are a strange country that rigorously prohibits employment discrimination "because of birthplace, ancestry, culture, linguistic characteristics common to a specific ethnic group, or accent." [EEOC] and then requires such discrimination because of, well, birthplace.[26]

Cochrane is correct that American policy favors Americans over foreigners. My analysis has taken the objective of American economic policy to be to maximize the prosperity of Americans rather than humans generally, a more complicated task and one of less practical relevance. A major split in the debate on immigration, though, is whether the happiness of Americans should be valued more highly than the happiness of foreigners. The *New York Times* says, speaking of Mr. Trump, says,

> Under his presidency, the American dream would be primarily reserved for Americans.... "The American people will come first once again," he said....Immigrant advocates, long opposed to Mr. Trump's proposals, were still taken aback by his ominous tone.[27]

Robert Putnam, of social capital fame, says

> Speaking of the recent arrival of unaccompanied immigrant kids, Jay Ash, city manager and native of the gritty, working-class Boston suburb of Chelsea, drew on a more generous, communitarian tradition: "If our kids are in trouble — my kids, our kids, anyone's kids — we all have a responsibility to look after them."

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[26]John Cochrane, "The Optimal Number of Immigrants," *The Grumpy Economist* blog (June 25, 2014).

[27]Julia Preston, "For Trump, an America That Is Not a Nation of Nations," *The New York Times* (July 22, 2016).

> In today's America, not only is Ash right, but even those among us who think like Emerson should acknowledge our responsibility to these children. For America's poor kids do belong to us and we to them. They are our kids.[28]

If American policy should worry as much about poor kids in India as poor kids in America, the implications go far beyond immigration policy. To be sure, in our immigration policy, we would need to look at how much immigrants benefit from immigration—but also at how much their homelands win or lose as a result of their departure. More radically, though, it would imply an immediate end to most our public works programs and all of our current anti-poverty programs, since the poor in America are far richer than the average person in India. We should cease work on the new I-69 interstate in Indiana and devote that money to new roads in the Punjab. We should reduce food stamp benefits by 90% so we can extend eligibility to Bengalis. We should eliminate public funding of high schools so we could make sure that everyone in both countries could be given a good grade school education. Perhaps we should indeed be doing these things--- the philosophical question is interesting--- but unless we take these implications seriously it is foolish to apply the idea just to immigration. Moreover, your answer to the question far overshadows the importance of your beliefs about the shape of the production function in determining what public policy should be.[29]

Recall, however, the preamble to the United States Constitution:

> We the people of the United States, in order to form a more perfect union, establish justice, insure domestic tranquility, provide for the common defense, promote the general welfare, and secure the blessings of liberty to ourselves and our posterity, do ordain and establish this Constitution for the United States of America.

The phrase is "to ourselves and our posterity, not "to the world." Whether right or wrong, we have taken care to try to help the moderately poor in America rather than treat them as rich on the scale of the entire world and tax them to help the poor elsewhere. Indeed, on a local level we do not even try to maximize the welfare of all Americans. Recall Professor Cochrane's question at the start of this article: "Should Illinois restrict Indianans working in Illinois, to keep up Illinoisans' wages?" Federal law does not allow Illinois to do that, but Highland Park, Illinois, to take one of many examples, does use zoning to prevent people from Indiana (or from Illinois for that matter) from immigrating. Highland Park, like many other cities, has decided that higher population density would put an undue burden on its infrastructure. It does not ban immigration per se, but zoning laws say that if someone new moves in, someone old must move out. It is not permitted to put twice as many people in the

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[28]Robert Putnam, *Our Kids: The American Dream in Crisis* (Simon and Schuster, 2015).

[29]For entry into the academic philosophy literatures, see Christopher Wellman, "Immigration and Freedom of Association," *Ethics,* 119 (2008): 109-141 (against open borders) and Joseph Carens, *The Ethics of Immigration* (Oxford University Press, 2013) (favoring open borders).

same plot of land. And this is not unreasonable. Consider the neighborhood in which you yourself live If we increased the population 20% by immigration of people who in income level and every other respect were like yourself, would that make you and the other current inhabitants better off? You could look forward to a higher price for the land you own, to be sure. But would be the extra pressure on public capital, both social capital and government capital, the new relationships of trust that would have to be built, and the congestion of the infrastructure? Many towns and cities have chosen to limit growth, and it is hard to say that they have made the wrong choice. Immigration from one country to another is much the same, and we should be wary of simple arguments that national income would increase together with an increase in the population.