

## RETHINKING THE EFFECTS OF IMMIGRATION ON WAGES: New Data and Analysis from 1990-2004

by Giovanni Peri, Ph.D.\*

### EXECUTIVE SUMMARY

A crucial question in the current debate over immigration is what impact immigrants have on the wages of native-born workers. At first glance, it might seem that the simple economics of supply and demand provides the answer: immigrants increase the supply of labor; hence, they should decrease the wages of native workers. However, the issue is more complicated than this for two reasons that have been largely overlooked. First, immigrants and natives tend to differ in their educational attainment, skill sets, and occupations, and they perform jobs that often are interdependent. As a result, immigrants do not compete with the majority of natives for the same jobs. Rather, they “complement” the native-born workforce—which increases the productivity, and therefore the wages, of natives. Second, the addition of new workers to the labor force stimulates investment as entrepreneurs seize the opportunity to organize these new workers in productive ways that generate profits. When these two factors are included in the analysis of immigration and wages, it becomes clear that immigration has a positive effect on the wages of most native-born workers.

Among the findings of this report:

- Immigrants are increasingly concentrated among workers with the lowest and highest levels of education, but comprise a relatively small share of workers in intermediate groups.
- During the 1990-2004 period, immigration accounted for 20 percent of employment growth among workers without a high-school diploma and 14.1 percent among workers with

at least a college degree. In contrast, immigration accounted for 9.9 percent of employment growth among workers with only a high-school diploma and 6.5 percent among those with some college.

- The share of foreign-born workers within each educational group varies according to years of experience, sometimes by wide margins. In 2004, for instance, 34.1 percent of workers without a high-school diploma were foreign-born, but the foreign-born share ranged from 11.6 percent to 49.3 percent depending on years of experience.
- Since workers with different levels of experience tend to fill different types of jobs, even if they have comparable levels of education, this pattern suggests that natives are in direct competition only with a subset of immigrants within a given educational group, while benefiting from complementarities with workers in other experience groups.
- Immigrants tend to choose different occupations than natives. Since the services provided by different occupations are not perfectly substitutable for each other, this implies that natives and immigrants are not perfect substitutes for each other even if they have similar levels of education and experience.
- During the 1990-2004 period, the 90 percent of native-born workers with at least a high-school diploma experienced wage gains from immigration that ranged from 0.7 percent to 3.4 percent depending on education. Native-born workers without a high-school diploma lost only 1.1 percent of their real yearly wages due to immigration.

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## INTRODUCTION

A crucial question in the current debate over immigration is what impact immigrants have on the wages of native-born workers. At first glance, it might seem that the simple economics of supply and demand provide the answer: immigrants increase the supply of labor; hence, they should decrease the wages of native workers. However, a March 2006 IPC report, *Immigrants, Skills, and Wages: Reassessing the Economic Gains from Immigration*, described how the issue is more complicated than this for two reasons that have been largely overlooked. First, immigrants and natives tend to differ in their educational attainment, skill sets, and occupations, and they perform jobs that often are interdependent. As a result, immigrants do not compete with the majority of natives for the same jobs. Rather, they “complement” the native-born workforce—which increases the productivity, and therefore the wages, of natives. Second, the addition of new workers to the labor force stimulates investment as entrepreneurs seize the opportunity to organize these new workers in productive ways that generate profits. When these two factors are included in the analysis of immigration and wages, it becomes clear that immigration has a positive effect on the wages of most native-born workers. In a previous study we illustrated the wage gains from immigration during the 1990s.<sup>1</sup> These findings are reinforced by new data from 1990-2004.<sup>2</sup>

## A KEY QUESTION IN THE IMMIGRATION DEBATE

During the last three-and-a-half decades, the United States has experienced a remarkable surge in immigration. The share of foreign-born workers in the labor force has grown steadily from 5.3 percent in 1970 to 14.7 percent in 2005.<sup>3</sup> Between 1990 and 2005, almost one million immigrants (legal and undocumented) entered the country every year. As the foreign-born population has increased, the

debate about the economic impact that immigration—particularly undocumented immigration—has on U.S. natives has intensified among policymakers, academics, and the press. This debate lately has become particularly intense in Congress, where the House of Representatives and the Senate have passed conflicting immigration-reform bills. The Border Protection, Anti-Terrorism, and Illegal Immigration Control Act (H.R. 4437), passed by the House on December 16, 2005, would—among other provisions—treat undocumented immigrants as felons. In contrast, the Comprehensive Immigration Reform Act (S. 2611), passed by the Senate on May 25, 2006, would create a pathway to legal status for the undocumented. Underlying these bills are different perspectives on immigration, including conflicting views of the impact that foreign-born workers have on employment opportunities and wages for native-born workers.

## REASSESSING THE EFFECT OF IMMIGRATION ON WAGES

Over the past decade, the view that immigrants have a negative impact on the wages of native-born workers, particularly those in less-skilled occupations, has gained prominence. This perspective has been shaped mostly by the recent work of Harvard economist George Borjas. In particular, in an influential article published in 2003, Borjas concluded that the real wages of native-born workers fell by about 3 percent due to immigration over the 1980-2000 period, and that this loss approached 9 percent, at least in the short run, for native workers without a high-school diploma.<sup>4</sup> However, these estimates are based on two assumptions which our analysis calls into question: (1) that foreign-born and native-born workers with the same level of education and labor-market experience are interchangeable with each other; and (2) that immigration represents an increase in the labor supply for a given amount of physical capital (machinery, buildings, etc.) that does not change over time.

<sup>1</sup> Gianmarco I.P. Ottaviano & Giovanni Peri, *Rethinking the Gains from Immigration: Theory and Evidence from the U.S.* (Working Paper No. 11672). Cambridge, MA: National Bureau of Economic Research, October 2005.

<sup>2</sup> Gianmarco I.P. Ottaviano & Giovanni Peri, *Rethinking the Effects of Immigration on Wages* (Working Paper No. 12497). Cambridge, MA: National Bureau of Economic Research, August 2006.

<sup>3</sup> Our calculations based on IPUMS data from Steven Ruggles, *et al.*, Integrated Public Use Microdata Series: Version 3.0 [Machine-readable database]. Minneapolis, MN: Minnesota Population Center, 2006.

<sup>4</sup> George J. Borjas, “The Labor Demand Curve is Downward Sloping: Reexamining the Impact of Immigration on the Labor Market,” *Quarterly Journal of Economics* 118(4), November 2003, Table IX, p. 1369.

Neither of these assumptions permits a realistic assessment of how immigration impacts the wages of native-born workers. To begin with, foreign-born workers are likely to have some culture-specific skills and to differ from natives in their language abilities and other characteristics that affect their choice of occupations and their performance in the labor force. Therefore, it is reasonable to view them as imperfect substitutes even for those natives who have similar levels of formal education and work experience. Since we have data that permit us to estimate the degree to which native-born and foreign-born workers complement each other, this ultimately is an empirical question that our analysis seeks to answer. Moreover, the stock of physical capital does not remain fixed while immigration is taking place, even in the short run. Rather, investors continually respond to the opportunities presented by the expansion of the workforce.

Any study of the effects that immigration has on the wages of workers who differ by education, experience, and nativity should describe how these different types of workers interact with each other and with physical capital to produce output. Then, one can derive the demand for each type of labor, which depends on the productivity and employment of the other types of labor, as well as on the changing stock of physical capital. These estimates can in turn be used to assess the effect of immigration (a change in the supply of different types of workers) on wages (the marginal productivity of different types of workers).

Our analysis accomplishes this through a “general equilibrium” model that builds upon the methodology used by Borjas. As with his analysis, we distinguish between workers in different “education-experience” groups on the basis of four levels of educational attainment (no high-school diploma, high-school diploma only, some college, and at least a college degree) and, within each of these educational groups, eight levels of labor-market experience (1-5 years, 6-10 years, 11-15 years, etc).<sup>5</sup> **But we adopt a fresh approach to two**

**critical issues by: (1) estimating the complementarities of native and foreign-born workers even within the same education-experience group (which stem from differences in occupations, skills, or jobs) and (2) allowing capital investments to respond in a realistic fashion to new flows of immigrant workers (as the presence of more workers stimulates the creation of new businesses).**<sup>6</sup>

## FOREIGN-BORN WORKERS COMPLEMENT NATIVE-BORN WORKERS

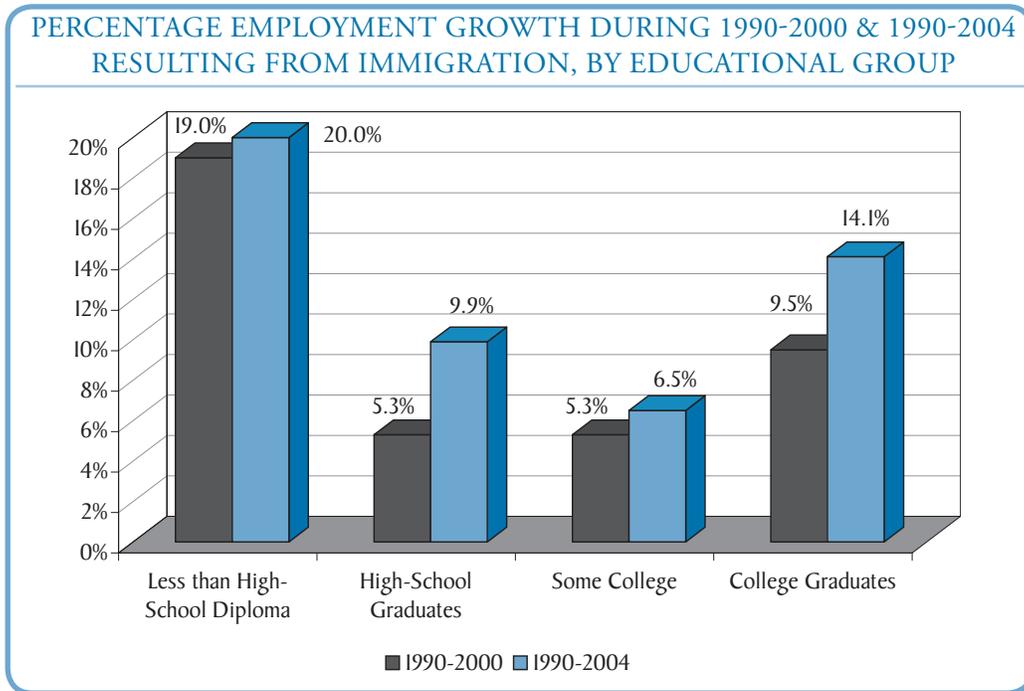
**A**t the broadest level, the complementarities of foreign-born and native-born workers are apparent in the fact that immigrants are increasingly concentrated among workers with the lowest and highest levels of education (those without a high-school diploma or with at least a college degree), but comprise a relatively small share of workers in the two intermediate groups (those with only a high-school diploma or some college short of a four-year degree). For instance, during the 1990-2004 period, immigration accounted for 20 percent of employment growth among workers without a high-school diploma and 14.1 percent among workers with at least a college degree. In contrast, immigration accounted for 9.9 percent of employment growth among workers with only a high-school diploma and 6.5 percent among those with some college {Figure 1}.

Moreover, the share of foreign-born workers within each educational group varies according to years of experience, sometimes by wide margins. For some experience groups within an educational category, the immigrant share of the workforce is much higher or lower than for the educational category as a whole. In 2004, for instance, 34.1 percent of workers without a high-school diploma were foreign-born, but the foreign-born share ranged from 11.6 percent to 49.3 percent depending on years of experience {Figure 2}. Among workers with at least a college degree, 14.6 percent were foreign-born, with the foreign-born share ranging from

<sup>5</sup> See George J. Borjas, “The Labor Demand Curve is Downward Sloping,” November 2003, section VII, p. 1359-1369. A similar methodology is used in George J. Borjas & Lawrence F. Katz, *The Evolution of the Mexican-Born Workforce in the United States* (Working Paper No. 11281). Cambridge, MA: National Bureau of Economic Research, April 2005; and George J. Borjas, “Native Internal Migration and the Labor Market Impact of Immigration,” *Journal of Human Resources* 41(2), Spring 2006, p. 221-258.

<sup>6</sup> For a detailed description of this analysis, see Gianmarco I.P. Ottaviano & Giovanni Peri, *Rethinking the Effects of Immigration on Wages*, August 2006, Section 3, p. 8-16.

Figure 1:

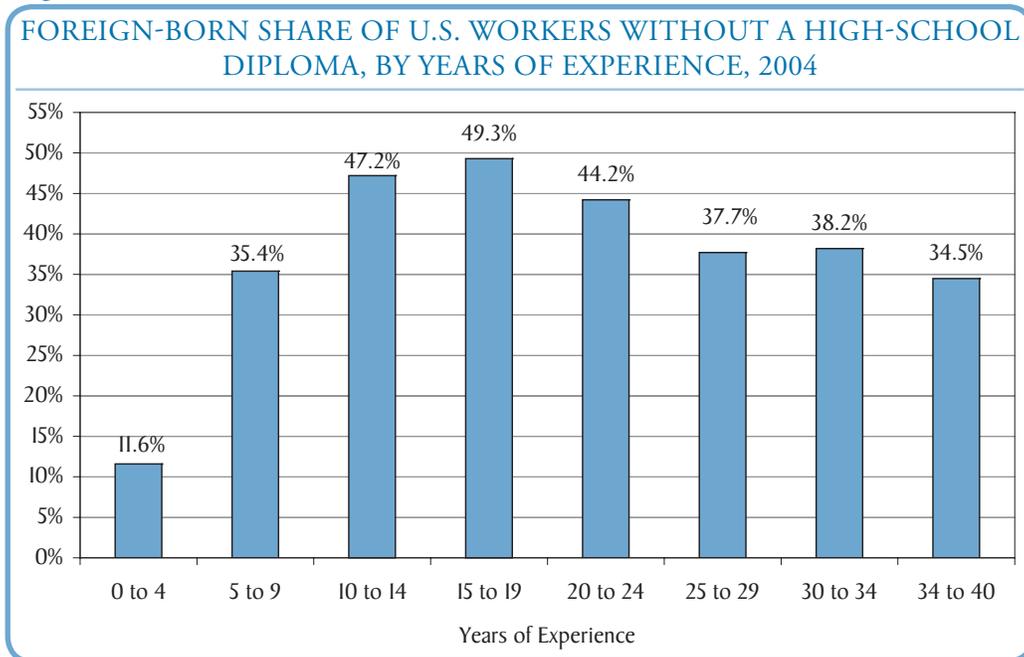


10.4 percent to 17.8 percent for different experience groups.<sup>7</sup> Since workers with different levels of experience tend to fill different types of jobs, even if they have comparable levels of education, this pattern suggests that natives are in direct competition only with a subset of immigrants within a given

educational group, while benefiting from complementarities with workers in other experience groups.

However, foreign-born workers complement native-born workers in other ways even within the same education-

Figure 2:

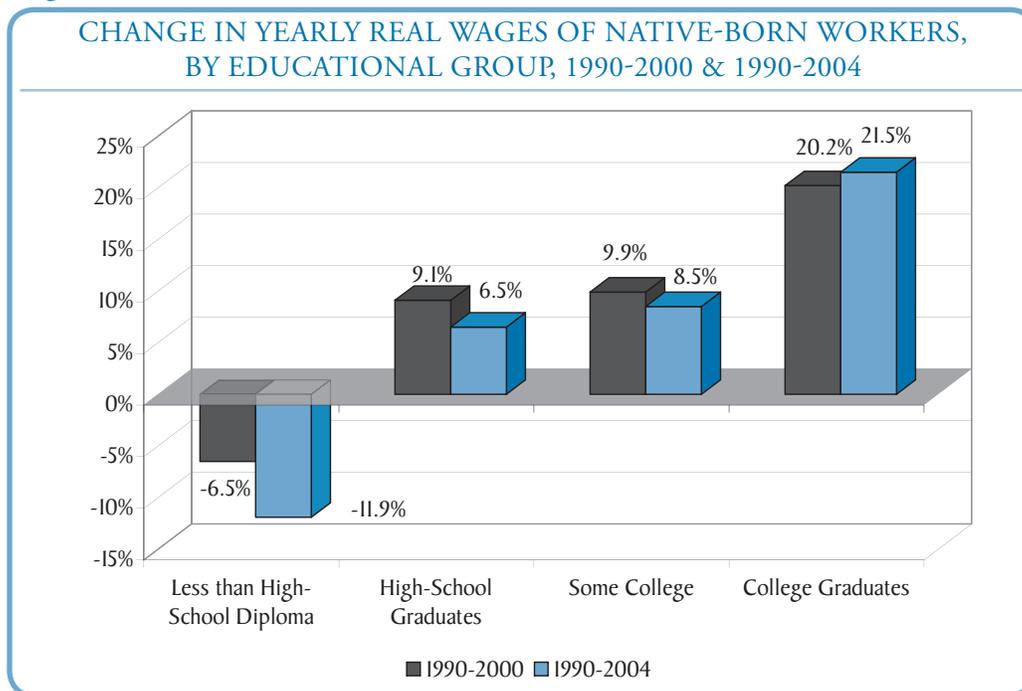


<sup>7</sup> Our calculations based on IPUMS data from Steven Ruggles, *et al.*, 2006.

experience group. First, immigrants are a select group of the populations of their home countries and therefore have skills, motivations, and tastes that may set them apart from U.S. natives. Second, in both manual and intellectual work immigrants have culture-specific skills (e.g. cooking, crafting, opera singing, soccer playing) as well as limits (knowledge of English language or American culture) that create comparative advantages in some jobs and comparative disadvantages in others. Third, and most importantly, due to the unique array of skills they bring with them and the pre-existing social networks they follow in coming to the United States, immigrants tend to choose different occupations than natives. Rather, they overwhelmingly choose those occupations in which previously arrived immigrants are already employed. Since the services provided by different occupations are not perfectly substitutable for each other, this implies that natives and immigrants are not perfect substitutes for each other, even if they have similar levels of education and experience. New immigrants compete with and substitute for immigrants already in the country much more than they compete with native workers. The impact of new immigration on wages and employment opportunities for previously arrived immigrants warrants further analysis, but is not the focus of this report.

Although most natives do not directly compete with immigrants for jobs, the fact remains that at the same time the foreign-born share of the less-educated labor force has increased, the average wages of less-educated native-born workers have fallen. During the 1990-2004 period, the real yearly wages of native-born workers without a high-school diploma fell by an average of 11.9 percent. It is tempting to attribute this decline to competition from the growing numbers of immigrant workers. Such a connection would suggest a seemingly simple solution to the problem of wage decline: stop immigration. However, it is not immediately apparent how much of the wage decline experienced by native-born workers without a high-school diploma can be attributed to the large influx of less-educated immigrants. After all, the average yearly wages of native-born workers rose by 12.5 percent in 1990-2004 even though immigration increased the size of the labor force by almost 12 percent. The wages of college-educated native-born workers rose by more than 20 percent even though immigration increased the size of the college-educated workforce by 14 percent. In general, among the 90 percent of native-born workers with at least a high-school diploma, wage increases ranged from 6.5 percent to 21.5 percent depending on education {Figure 3}<sup>8</sup>

Figure 3:



<sup>8</sup> Our calculations based on IPUMS data from Steven Ruggles, *et al.*, 2006.

## IMMIGRATION STIMULATES INVESTMENT

In addition to accounting for complementarities of foreign-born and native-born workers within education-experience groups, our analysis also adopts a more dynamic approach to the issue of capital accumulation. When evaluating the response of wages to immigration, even in the short run, it seems rather artificial to assume that the stock of physical capital does not change over time, while immigration flows occur over ten or twenty years. Immigration is an ongoing phenomenon, distributed over many years, predictable and rather slow. On average, the inflow of immigrants between 1960 and 2004 added less than 0.6 percent to the total U.S. labor force each year. As a result, investors responded continuously, although with sluggishness, to inflows of immigrant labor and to the consequent increase in the marginal productivity of capital.

Empirical evidence suggests that capital adjusts to maintain its real return in the long run. But physical capital adjustment to immigration is not immediate. Therefore, our analysis uses estimates of the speed of adjustment of capital taken from the literature on economic growth and the business cycle to calculate the “short run” impact of immigration on wages. We also estimate how long it takes for the “long

run” full adjustment to take place. Therefore, rather than reporting the effects of 14 years of immigration for either a fixed stock of capital or fully adjusted capital, we estimate the short-run effect of immigration during the 1990-2004 period as of 2004 and then we estimate the long-run effect—the greatest part of which sets in over the *subsequent* 5 years.

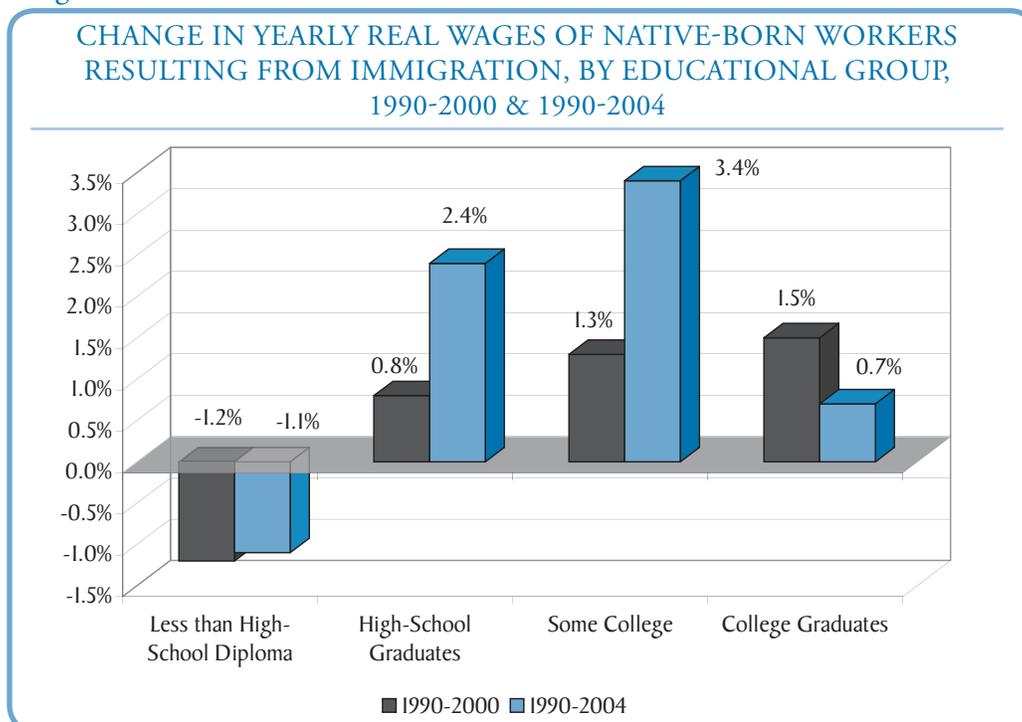
## IMMIGRATION INCREASES WAGES FOR MOST NATIVE-BORN WORKERS

New estimates using 1990-2004 data confirm our previous findings from the period 1990-2000 that immigration increases wages for most native-born workers {Figure 4}. Furthermore, these new results suggest that the wage gains experienced by the vast majority of native-born workers during the 1990s were not simply a fluke stemming from the economic boom of that decade.

During the 1990-2004 period:

- The average yearly wages of native-born workers rose by 1.8 percent as a consequence of immigration.
- Among the 9 in 10 native-born workers with at least a high-school diploma, wage gains ranged from 0.7 percent to 3.4 percent depending on education.

Figure 4:



➤ Native-born workers without a high-school diploma lost only 1.1 percent of their real yearly wages due to immigration.

## CONCLUSION

It is very hard to claim that immigration has caused a significant deterioration in the wages of native-born workers over the past 15 years. Quite the opposite, in fact.

Because immigrants stimulate investment, have skill sets that complement those of natives, and do not compete for the same jobs as most natives, immigration has increased the average wages of all native-born workers except the small share who do not have a high-school diploma. Even for this latter group, the decline in wages resulting from immigration is relatively minor.

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