The impact of demographic change on U.S. labor markets.; US percentage breakdown of 25-to-64-year-old resident population by level of education, correlated with person's country of birth (based on merged Current Population Survey data for 1994 to 2000)

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Body

According to ***U.S.*** Census Bureau projections, the ***United States*** will face dramatic demographic changes over the next one hundred years. Indeed, the country will be entering largely uncharted territory. In the twenty-first century, the ***population*** is expected to grow more slowly than ever before over an extended period. The ***population*** will also age rapidly, with the share of the ***population*** over 65 climbing to a succession of new record highs. Finally, the ***United States*** will once again become a nation of immigrants. Over the past decade, the wave of new immigrants has already neared proportions last seen in the early 1900s at the end of the Great Migrations. And this inflow is projected to persist throughout the coming century, with new immigrants and the children of those immigrants contributing well over half of the ***increase*** in the ***U.S.*** ***population***. But because the source of this inflow has shifted from Europe to Latin America and Asia, this new wave will change the voice and face of America forever.

These demographic shifts are likely to trigger some major adjustments within the ***U.S.*** economy--many of which will play out in ***U.S.*** labor markets. To many observers, one particularly challenging issue is how a relatively small workforce will supply the consumption needs of a growing number of dependents without a decline in ***U.S.*** living standards. ***Increased*** productivity provides one obvious answer to this challenge. But human capital has proved key to achieving productivity gains, and, on average, recent immigrants have relatively little schooling compared with ***U.S.*** natives. Thus, while the renewed inflows of migrant workers will enlarge the supply of labor, their arrival may also reduce average levels of educational attainment and possibly slow ***U.S.*** productivity ***growth*** relative to what they otherwise might be. Further, while some analysts anticipate capital deepening, others fear that investment capital will be in short supply.

While much previous work has examined the impact of ***population*** aging and slow workforce ***growth*** or ***increased immigration*** on ***U.S.*** labor markets (see Gruber and Wise 2001, Borjas 2000, or Smith and Edmonston 1997, for instance), this paper explores the implications of all three projected demographic developments for ***U.S.*** labor markets. In so doing, it puts particular emphasis on the outlook for aggregate ***U.S.*** welfare, labor quality, and productivity ***growth***. The next section describes the three major demographic trends in more detail, while the second section discusses the rise in the ratio of the non-working-age ***population*** to the working-age ***population*** that is likely to result from these interwoven developments. The third section examines the economic adjustments that might be triggered by these demographic trends, while the final section explores some policy implications.

I. The Major Demographic Trends

As outlined in the introduction, demographic projections reveal three major trends affecting ***U.S.*** labor markets in coming decades: the slowdown in ***U.S.*** ***population growth***, ***population*** aging, and the ***increased*** importance of

immigrants and their descendants within the ***population*** and labor force. This section also discusses likely changes in the educational attainment of the labor force.

Slow ***Population Growth***

According to the Census Bureau'***s*** most recent middle series projection, (1) the annual rate of ***U.S.*** ***population growth*** will decline fairly steadily from an average of about 1 percent in the 1990s to 0.7 percent in 2050. That rate would be lower than any experienced in the twentieth century except during major wars, when a significant share of the ***U.S.*** resident ***population*** served on foreign battlefields, and during the 1930s when ***population growth*** rates ranged between 0.6 and 0.8 percent (Figure 1). This projected decline reflects an assumed rise in crude death rates as the ***population*** ages and a fall in crude birth rates as the share of the ***population*** of childbearing age declines. (2) Since the working-age ***population*** is expected to grow even more slowly than the entire ***population*** (0.6 percent per year), its share in the total falls from 52 percent currently to 45 percent in 2100.

It is worth noting as a caveat, however, that early results from Census 2000 indicate that the ***U.S.*** ***population*** actually grew faster than the Census Bureau had expected between 1990 and 2000--with the total ***population*** reaching 281 million, or 2 percent more than projected in January 2000. The 13.2 percent gain between 1990 and 2000 was the biggest since the 1960s, when the ***population*** rose 13.4 percent, and the 1950s, when it soared by 1.8 percent. Accounting for almost half of the unexpected gain was a surge in the Hispanic ***population***, which grew by almost 3 million more than projected. (3) Since a growing share of ***U.S.*** immigrants come from Mexico and the Caribbean, an unexpectedly high rate of ***immigration*** may explain a significant part of the surprising outcome.

Population Aging

The second major demographic trend--the rapid aging of the ***U.S.*** ***population***--reflects the decline and stabilization in ***U.S.*** fertility rates since the birth of the baby boom generation, (4) and, more important, a secular ***increase*** in life expectancy and the entry of the large baby boom cohort into normal retirement age between 2011 and 2030. As a consequence of these trends, the Census Bureau expects the share of the ***population*** over 65 to rise, after this decade'***s*** short pause, from 13 percent now to 20 percent in 2050 and 23 percent by 2100. The proportion over age 85 will triple, from less than 2 percent to 6.5 percent at the end of the century.

The ***Increased*** Importance of ***Immigration***

The third major development is the ***increased*** ***role*** of ***immigration*** in ***U.S.*** ***population growth***. As Figure 2 shows, the share of ***U.S.*** ***population growth*** explained by the arrival of permanent legal immigrants has grown from very low levels in the 1930s and 1940s to its highest level in decades in the 1990s. Estimates based on ***Immigration*** and Naturalization Service (INS) data suggest that over the past ten years immigrants may have supplied roughly 35 percent of the ***growth*** in the ***U.S.*** ***population***, a level of contribution not seen since the early 1900s. (5) Similarly, legal immigrants of working age (and with a listed occupation) may have supplied about 40 percent of the ***growth*** in the ***U.S.*** labor force in the mid 1990s. (6) Alternatively, Census data suggest that, on a net basis (net of emigration and deaths) the foreign born provided about 30 percent of total ***U.S.*** ***population growth*** in the second half of the 1990s. (7) As a consequence, the foreign born comprised almost 10 percent of the ***U.S.*** ***population*** in the late 199 0s, its highest share in 60 years. (8)

The steady ***increase*** in ***immigration*** to the ***United States*** over the past half century reflects a series of legal changes in this country along with shifting economic and social conditions here and abroad. From the mid 1920s to 1965, ***immigration*** to the ***United States*** was sharply curtailed by the combination of the ***Immigration*** Act of 1924, the Great Depression, and World War II. The ***Immigration*** Act of 1924 (9) imposed the country'***s*** first permanent limit on ***immigration*** and established the national-origins quota system that governed ***U.S.*** ***immigration*** policy for decades. This act set a (small) annual quota for each nationality on the basis of the stock of immigrants already living in the ***United States*** in 1920. It thus favored migrants from Northern and Western Europe while sharply reducing the size of the total inflow. (10) By exception, to facilitate farm production during World War II, 1943 ***immigration*** legislation allowed farm workers from North, South, and Central America to work on ***U.S.*** farms on a temporary basis d uring the war years. This program became the basis for the Mexican "Bracero Program," which

lasted through 1964 and expanded the community of Mexican workers with ties to the ***United States***. In 1965, in the midst of the Vietnam War and another period of relatively low unemployment, the ***United States*** revised its approach to ***immigration***. It abolished the national-origins quotas from 1924, established an expanded worldwide quota system that included Asia, and gave preference to family unification and the admission of people with skills or training needed in the ***United States***. This legislation opened the way to a notable shift in the origin of ***U.S.*** immigrants from Europe to the developing world.

For example, in the 1980s, Latin America'***s*** Lost Decade, a series of financial crises caused per capita income to stagnate or fall in much of the region." During this period, the flow of undocumented workers to the ***United States*** gathered strength. As a consequence, and of some significance for recent demographic developments, the ***Immigration*** Reform and Control Act (IRCA) of 1986 provided for the legalization of millions of undocumented aliens who had lived in the ***United States*** since 1982. As these individuals became ***U.S.*** citizens in the 1990s, they were in turn able to sponsor the legal ***immigration*** of immediate relatives without numerical limits. Reflecting ***U.S.*** ambivalence to these developments, other recent legislation has both limited legal immigrants' eligibility for government benefits and expanded the numbers of temporary work visas available each year. In late 2000, for example, the ***U.S.*** Congress ***increased*** the number of H-1B non-immigrant visas available annually to 195,000 for FY 2001-2003. In FY 2004 the number reverts to 65,000. (12)

As a result of these and other legal, economic, and political forces, by 1990 over half of the ***U.S.*** foreign born came from Latin America (with 35 percent from Mexico and Central America and 10 percent from the Caribbean), as Figure 3 shows. Another 26 percent were born in Asia, and only 15 percent came from Europe. In 1900, by contrast, 85 percent of the foreign born came from Europe, with Asia and Latin America contributing 1 percent each. Even in 1960, 75 percent of the foreign born were European.

Looking ahead, the Census Bureau'***s*** middle series projection shows that new (post-2000) immigrants and their offspring will account for almost two-thirds of the ***growth*** in the ***U.S.*** ***population*** between 1998 and 2100. In addition to the projected impact of ***increased*** ***immigration*** on ***U.S.*** fertility rates, this projection assumes that net ***immigration*** flows will decline from over 900,000 a year in the late 1990s to 750,000 in 2010 and then rise again to over 1 million a year in 2030. The near-term decline reflects the diminishing impact of the amnesty program under the IRCA of 1986, while the resurgence anticipates an ***increase*** in the demand for immigrant labor as the large baby boom cohort leaves the workforce. (13) Although the projected 30 percent ***increase*** in the inflow of migrants may seem large, the Census considers it to be a fairly conservative estimate, given the response of previous migration flows to demographic changes as large as the projected rise in the ***U.S.*** dependency ratio. However, as the surprise outc ome of the Census 2000 suggests, these projections may well be too low.

Under Census middle series projections, the foreign-born share of the ***population*** is projected to peak at 13.3 percent of the ***population*** between 2045 and 2055. (14) Largely as a result of this ***increased*** ***immigration***, which Census expects to be dominated by flows from Mexico and other countries in Central and Latin America, the Hispanic ***population*** is projected to rise from 12 percent of the ***population*** currently to 33 percent (and rising) in 2100. (See Figure 4.)

II. The Rising Dependency Ratio

As suggested above, the Census Bureau'***s*** middle projection results in a total dependency ratio (the ratio of those under 15 or over 65 to the working-age ***population***) that exceeds its previous peak in the 1960s, largely because of a rise in the elderly dependency ratio (the ratio of those over 65 to the ***population*** aged 15 to 65). According to this projection, the elderly dependency ratio is likely to double from its current level of 0.2 dependent for every person of working age to just under 0.4 by the end of this century, as shown in Figure 5. Of more relevance, however, is the total dependency ratio, which adds the number of children under age 15 to the number of the elderly. Currently, with the leading edge of the baby boom cohort just approaching retirement, the total dependency ratio remains relatively low in historical terms-at just above 0.5. However, the Census Bureau'***s*** new projections suggest that the total dependency ratio is likely to rise to 0.67 in the early 2030s and to reach 0.72 in 2100. For mo st of the century, thus, it will hover near or above the previous high of 0.69 that it touched just briefly in 1961. Moreover, if one assumes

with Cutler et al. (1990) that, with education and medical expenses, children have just 0.72 the consumption needs of working-age adults while the elderly have 1.27 times a prime-age adult's needs, the gap between the future and previous peaks is substantially greater. By the weighted measure, the dependency ratio is likely to reach 0.73 in 2100 after remaining well above its previous high (0.58) and its current level (0.48) for many years.

As already mentioned, the Census Bureau's middle series projection assumes a substantial ***increase*** in ***immigration*** and anticipates that immigrants and their offspring will account for almost two-thirds of the total ***growth*** in the ***U.S.*** ***population*** and over three-fourths of the ***growth*** in the working-age ***population*** over this century. Because most new immigrants are young adults, their arrival tends to lower the dependency ratio almost immediately. However, these young immigrants also create an above-average number of dependents, since they tend to be of childbearing age and have a relatively high fertility rate compared with the ***U.S.*** average. Moreover, by mid century, immigrants arriving today will themselves be starting to retire. Accordingly, many analysts have concluded that ***increased*** ***immigration*** can make only a very limited contribution to easing any burdens imposed by a high dependency ratio. For example, Hoilman, Mulder, and Kallan (2000) conclude that ***immigration*** "may address a high dependency ratio decisive ly in the short term, yet is highly inefficient in reducing it over the longer term."

Using Hollman, Mulder, and Kallan's data, Figure 6 shows the dependency ratio assuming zero ***immigration*** starting in 2000 as well as the dependency ratio from the middle series projection, which assumes substantial ***immigration***. By 2100, the middle series dependency ratio reaches 0.72--compared with the 0.77 eventuating with zero migration. Moreover, if we assume once again that children have more modest consumption needs than the elderly, the dependency ratio hits 0.80 in the absence of ***immigration*** versus 0.73 for the weighted middle series. ***Immigration*** reduces the gap between the weighted dependency ratio at its previous peak (0.58) and the level projected for 2100 by over 30 percent (and the gap between the weighted dependency ratio now and the level projected for 2100 by 20 percent). By these measures, and, in contrast with Hollman, Mulder, and Kallan's conclusions, ***immigration*** appears to have a notable impact on the dependency ratio. (15)

Because the rise in the dependency ratio reflects an ***increase*** in (generally active) life expectancy, it represents an unmitigated gain in welfare. But to some economists and policymakers, a high dependency ratio raises concerns about how a small workforce will provide for a relatively large number of dependents without a decline in the ***U.S.*** standard of living. Indeed, assuming that labor force participation rates do not change, the projected ***increase*** in the dependency ratio implies the need for a 40 percent gain in labor productivity by the mid 2030s (50 percent by 2100) if we are just to maintain current living standards. Since productivity more than doubled between 1960 and 2000, such a gain should be well within reach if current trends continue. But, if productivity ***growth*** were to revert to a much slower pace, per capita income could fall.

Alternatively, most people are not physically dependent at age 65 and are capable of working well past this age. Accordingly, if, at one extreme, years of lifetime labor force participation rose one-for-one with added years of life expectancy, the problem of ***increasing*** old-age dependency would be largely resolved (although the transitional issues associated with the retirement of the baby boomers would remain). In a sense, then, the old-age dependency "problem" can be seen as a need to redesign institutions to allow older adults in good health to continue working, while providing for the consumption needs of those elderly who find continued labor force participation to be difficult.

How Did the Economy Adjust in the 1960s?

Since we now look back at the early 1960s as a golden era for the ***U.S.*** economy, the high dependency ratio of that period clearly did not trigger seriously adverse developments in ***U.S.*** economic welfare. But the postwar decades also witnessed two trends that, on balance, contributed significantly to the ***growth*** in per capita output but are not likely to be repeated. First, this period saw a surge in women's labor force participation rates, which rose--in the case of the young women ages 20 to 24 who led the way--from 45 percent in 1948 to 73 percent currently. The rise was particularly rapid in the mid 1960s to late 1970s as the baby boom generation and their immediate predecessors entered the labor force. According to Easterlin (1968), the baby boom's large size damped down its

lifetime earnings prospects, delaying household formation and childbearing and encouraging female labor force participation. But clearly, other developments, like the widespread availability of contraception and changes in social norms, also played very important ***roles*** (Goldin and Katz 2000). After growing more slowly in the 1980s, women'***s*** labor force participation stabilized in the 1990s. While prime-age women'***s*** labor force participation remains below that for men and could conceivably edge higher, a surge like the one that followed the previous peak in the dependency ratio is clearly out of the question.

As the men and women of the baby boom generation entered the workforce, their youth and inexperience reduced the effective size of the labor force. However, a second major development of the early postwar era--the ***increased*** educational attainment of the ***population***--provided an important countervailing force. Measured by the median years of schooling of the ***population*** age 25 and above, educational attainment rose particularly fast during the 1950s and 1960s. As Claudia Goldin (1998) has documented, secondary school attendance soared in the three decades before World War II, with enrollment rates rising from 18 percent in 1910 to 73 percent in 1940. Thereafter, the passage of the GI Bill of Rights in 1944 gave another important spur to ***increased*** schooling. This legislation provided federal support for veterans attending educational institutions in the postwar years. (16) When Congress enacted similar benefits after Korea and Vietnam, even higher shares of the veterans from those conflicts used their benefits t o attend college.

Naturally, a rise in the average educational attainment of the workforce ***increases*** its effective size. (17) Thus, the educational gains of the working-age ***population*** helped to offset the decline in workforce experience that accompanied the baby boom'***s*** entry into the workforce. Figure 7 provides two measures of labor force "quality"--one calculated by Ho and Jorgenson (1999) and the other by the ***U.S.*** Bureau of Labor Statistics (BLS). In both cases, the negative impact of the baby boom'***s*** entry into the workforce is apparent in the flattening of the lines. The renewed rise in these quality indexes recently reflects the maturing of the baby boom cohort along with ongoing ***increases*** in educational attainment. (18) Looking ahead, however, improvements in average educational attainment can no longer be taken for granted, for reasons to be discussed below. Thus, two major developments that supported per capita output ***growth*** in the past half century are unlikely to recur as the dependency ratio reaches new highs. On t he other hand, a sizable ***increase*** in the labor force participation of workers age 65 to 69 is certainly not out of the question, especially given the rise in the Social Security retirement age already scheduled to occur. (19) Such a rise could make a modest dent in the dependency ratio. (20)

III. Possible Adjustments to Projected Demographic Trends

Rapid Productivity ***Growth***

One possible response to projected demographic trends could be a relatively rapid ***increase*** in labor and multifactor productivity (MFP)--as occurred in the 1960s. As many have already argued, as (if) labor becomes scarce and costly relative to capital, producers will face incentives to substitute equipment for workers or to make labor-saving technical or organizational improvements. In other words, they will try to shift the labor productivity schedule outward through capital deepening or innovation. Accordingly, economists would expect to find a negative relationship between the ***growth*** of the labor force or the working-age ***population*** and the ***growth*** in labor or multifactor productivity. (21)

And indeed, such a negative relationship is now reasonably well established empirically. For example, in his "Crazy Explanations for the Productivity Slowdown," Paul Romer (1987) found that the elasticity of output with respect to changes in the labor supply was somewhere between 0.2 and 0.5--a lot less than labor'***s*** share of national income, perhaps because some forms of innovation are labor saving. (22) The key implication, Romer pointed out, is that a pickup (decline) in labor force ***growth*** will be associated with a slowdown (rise) in labor productivity ***growth***. He argued that this link likely explained the ***U.S.*** productivity experience from the late 1960s to 1990.

Following Paul Romer (1987), Cutler et al. (1990) also suggested that incentives to innovate are strongest when labor is scarce. Using data for 29 relatively high-income countries, they found that a 1 percentage point decrease in annual average labor force ***growth*** was associated with an ***increase*** in average labor productivity ***growth*** of 0.6

percent between 1960 and 1985. They used this evidence that labor scarcity may spur technological gains to support their optimistic general conclusion that projected demographic change will provide opportunities as well as challenges.

In a more recent paper, Bernanke and Gurkaynak (2001) construct factor shares (23) and estimate long-run total factor productivity (TFP) ***growth*** rates for 50+ and 80+ countries over a period from 1965 to 1995. Like Cutler et al., they find that TFP ***growth*** has a strong negative relationship with ***population growth***, although the link is weaker when the savings rate is included. The coefficients on labor ***growth*** generally ranged between -0.4 arid -0.7, with the larger coefficients obtained for the 1980-95 estimates.

By contrast, in his "One Big Wave" paper, Gordon (2000) relies on related arguments to reach admittedly pessimistic conclusions. After adjusting multifactor productivity ***growth*** for the changing composition of labor and capital inputs, Gordon finds that the big wave in productivity ***growth*** was flatter than previously thought, that it peaked between 1950 and 1964, and that the post-1972 slowdown in MFP ***growth*** remains evident. He attributes the great wave to the diffusion of four truly major pre-World War II innovations--electricity and electric motors, the internal combustion engine, petroleum-based products, and communication technology such as radio and television-beside which, he suggests, computers and other recent inventions pale in comparison. Also important in explaining the big wave, he argues, were the closing of the ***U.S.*** labor market to ***immigration*** in the 1920s and the goods market to trade during the Great Depression and war. These developments temporarily boosted real wages and, thus, capital-labor ***s*** ubstitution and productivity ***growth***. By contrast, the reopening of the ***U.S.*** labor and goods markets starting in the mid 1960s contributed to the post-1972 slowdown in MFP ***growth***. With the spread of the four big technologies now complete, Gordon does not expect the "new economy" and ongoing globalization to lead to a new era of rapid productivity ***growth***.

In general, then, much (but not all) of the evidence in the existing literature suggests that a slowdown in labor force ***growth*** is likely to be partially offset by a pickup in the ***growth*** of labor or multifactor productivity. (24) For illustrative purposes and to see if this historic relationship continues to hold, we present results of some simple regressions showing the relationship between the ***growth*** of the working-age ***U.S. population*** and rates of productivity ***growth*** from 1904 to 1999. The first three columns in Table 1 show the coefficients from regressions of annual labor productivity ***growth*** rates on a three-year moving average of the ***growth*** rate of the ***U.S. population*** ages 25 to 65, the change in the unemployment rate, and a dummy variable for years affected by the mobilizations and demobilizations associated with the two world wars. The relationship between the working-age ***population growth*** rate and the productivity ***growth*** rate is consistently negative, large in magnitude, and statistically significant. Adding the change in the unemployment rate to the specification, which controls for cyclical influences on productivity, adds greatly to the explanatory power of the regression but has relatively little effect on the ***population growth*** rate coefficient. The world war years indicator variable has little effect on the other coefficients. The next two columns show the effect of splitting the sample period at 1950. When this split is made, the coefficient on the working-age ***population growth*** rate ***increases*** in magnitude. (25) A similar pattern occurs in the regressions of the ***growth*** rate of multifactor productivity and the ***growth*** rate of the working-age ***population*** shown in the next three columns. The estimated effect of ***population growth*** on multifactor productivity ***growth*** is stronger when the sample is split. Overall, the regressions suggest that much of the effect of demographic trends on labor productivity ***growth*** occurs through the effect of demographics on multifactor productivity.

These regressions are, at best, a reduced-form representation of the relationship between productivity ***growth*** and demographic change that has existed in the past. Although many other factors enter into the determination of productivity ***growth***, including both physical and human capital formation, the simple regression relationship does remarkably well in tracking the broad decade-to-decade shifts in productivity ***growth*** rates. Figure 8 compares decade-long averages of actual labor productivity ***growth*** with those predicted by the labor productivity ***growth*** regression based on 1950-99 data. It also shows productivity ***growth*** rates for the twenty-first century as predicted by this regression based on the Census Bureau'***s*** middle series ***population*** projections. The transition from the fast productivity ***growth*** of the 1950s and 1960s to the relatively slow productivity ***growth*** of the 1970s and 1980s is surprisingly well "explained" by the large ***increase*** in the ***growth*** rate of the working-age ***population*** associated

with the m aturation of the baby boom generation. The simple regression also predicts the uptick in productivity ***growth*** in the 1990s.

Looking forward, the regression predicts that the projected slow ***growth*** of the working-age ***population*** in the next century will be accompanied by generally high rates of productivity ***growth***. Although there are many reasons for being very skeptical of predictions from this regression, the historical relationship does provide some grounds for optimism about productivity ***growth*** in coming decades. However, one important factor not controlled for in these regressions is the past trend of ***increasing*** educational attainment. As we discuss below, there is reason to be concerned about future trends in educational attainment.

Increased Immigration and Its Impact on Educational Attainment

Although ***increased immigration*** is one of the major demographic trends factored into the Census Bureau'***s*** projections and has, thus, already been discussed in detail above, this likely development is itself a response to labor shortages stemming from the aging of the ***U.S. population*** combined with current and expected ***U.S.*** fertility rates. While a relative rise in the ***U.S.*** demand for labor may lead to ***increases*** in the female or elderly participation rate, these ***increases*** are likely to be fairly small, as already noted. In addition, a sustained ***increase*** in the ***U.S.*** fertility rate, while possible, seems highly unlikely. Thus, immigrants may represent the most elastic available source of labor--as the recent influx of foreign workers in response to the low ***U.S.*** unemployment rates and tight labor market conditions of the 1990s seems to illustrate.

While ***immigration*** is projected to make a large contribution to the ***growth*** in the ***U.S.*** working-age ***population***, the impact of the ***increased*** size of the labor force on national output may be attenuated by the large gap between the average educational attainment of the foreign- and the native-born ***populations***. The next section explores this gap and its possible consequences in some detail.

Educational Attainment

Immigration will not only change the size of the ***U.S. population*** and labor force but also has the potential to affect the level of ***U.S.*** educational attainment. Relative to the ***U.S.***-born ***population***, a much higher percentage of immigrants have not completed high school (as shown in Table 2), although it is also true that a higher percentage of immigrants than native-born Americans have earned graduate degrees. (26) This bimodal pattern, with large shares of the immigrant ***population*** having either very high or very low levels of educational attainment at the time of the survey, mainly reflects big differences in the educational attainment of immigrants by country of origin. Nearly 68 percent of Mexican migrants ages 25 to 64 have not completed high school, compared to roughly 11 percent of ***U.S.***-born residents in the same age range. In the case of the foreign born from other Western Hemisphere countries, roughly 34 percent have less than a high school education. In contrast, the percentage of immigrants from other parts of the world who have not completed high school is close to the share for ***U.S.***-born residents.

At the high end of the spectrum of educational attainment, roughly 26 percent of native-born Americans have completed a four-year college degree, compared to less than 5 percent of Mexican immigrants and approximately 16 percent of immigrants from other Latin American countries. But immigrants from other parts of the world are more likely to have completed a four-year college degree than are native-born Americans. Similarly, immigrants from outside Latin America are substantially more likely to hold graduate degrees than are native-born Americans.

Examining the educational attainment of immigrants and native-born Americans by age cohort, shown in Table 3, indicates that the educational attainment of all groups has ***increased*** over time. (27) Within age cohorts, Mexican immigrants have by far the lowest levels of educational attainment, followed by immigrants from other Latin American countries. The tendency for immigrants from outside Latin America to be better educated than native-born Americans is more pronounced for younger than for older cohorts.

Underlying the differences in educational attainment by country of origin are several factors. Migrants from Mexico can travel to the ***United States*** at a lower cost than immigrants from most other countries, and strong family and social networks link the two countries, in part because Mexicans have worked in ***U.S.*** agriculture for decades.

Moreover, the long border between the ***U.S.*** and Mexico makes illegal ***immigration*** from Mexico easier than from other countries. These factors would tend to facilitate ***immigration*** of relatively unskilled workers. By contrast, outside Mexico (and especially outside of Latin America), legal restrictions, high travel costs, and lack of information networks impede the ***immigration*** of those with relatively low levels of education. Highly educated workers, in contrast, tend to be more favored under ***immigration*** law, are more likely to possess the financial resources to pay travel expenses, and may have information about job opportunities through university or corporate contacts. This pat tern is somewhat similar to that for intranational migration: Highly educated workers effectively face a national labor market, less educated workers a local one.

Figure 9 shows the region of origin of foreignborn ***U.S.*** residents (as of 1994-2000) by decade of arrival. Over time, the shares of new immigrants from Mexico and Asia have ***increased***, while the share of immigrants from Europe has declined. Because immigrants from Europe and Asia tend to attain high levels of education, while Mexican migrants do not, this shift in country of origin has depressed the average educational attainment of recent immigrants.

What does this imply for the educational attainment of the future ***U.S.*** labor force? The answer largely depends on several factors, including where future immigrants originate, trends in educational attainment in countries of origin, and the speed at which the educational attainment of immigrants' descendants converges to that of the native-born ***population***. Regarding the first factor, the ***U.S.*** Census Bureau projects that ***immigration*** from Mexico and Central America will decline in importance relative to ***immigration*** from South Asia, sub-Saharan Africa, and the Middle East (Hollmann, Mulder, and Kallan 2000). The Census Bureau notes that much of the recent legal ***immigration*** from Mexico and Central America reflects the arrival of the immediate relatives of migrants who became legalized under the IRCA in the late 1980s (as discussed above), and predicts that ***immigration*** linked to this amnesty program will gradually decline to zero. Instead, the Census Bureau expects that future immigrants will increasingly come fr om areas with rapid ***population growth*** and consequent economic pressures. Because countries in South Asia, sub-Saharan Africa, and the Middle East currently have fertility rates well above those of Mexico and most other Latin American countries, the Census Bureau expects that these regions will become increasingly important sources of ***immigration*** to this country.

Because immigrants from Asia and Africa have had high average levels of educational attainment in recent decades, this shift in the mix of countries of origin might tend to boost the overall educational attainment of future immigrants. However, average levels of educational attainment may slip as the volume of ***immigration*** from these areas ***increases***. Moreover, the degree to which the source-country mix will change is quite uncertain. Europe, which is closer to the high ***population growth*** areas than is the ***United States***, may be a more likely destination for immigrants from Africa and South Asia. Europe is widely forecast to experience ***population*** declines over the next half century and will generally experience more rapid ***population*** aging than will the ***United States***; thus, that continent'***s*** sharply higher wages are expected to be a draw for immigrants.

One encouraging sign for the future ***U.S.*** workforce is a pronounced trend toward higher educational attainment among recent cohorts of Mexican immigrants. Comparing high school completion rates across age cohorts suggests that the percentage of Mexican immigrants who failed to complete high school is dropping at a rate of roughly 0.6 percentage point per year. Although these impressive gains indicate that future immigrants from Mexico will carry substantially higher levels of human capital than have previous cohorts, a large disparity between the educational attainment of Mexican immigrants and native-born Americans will likely continue well into the future.

Many immigrants arrive in the ***United States*** at an age when their ***U.S.***-born counterparts are still in school. For example, roughly one-quarter of the Mexican immigrants ages 20 to 45 (when sampled between 1994 and 2000) settled permanently in the ***United States*** when they were less than 15 years old. Immigrants arriving as children can potentially take advantage of the ***U.S.*** educational system, but their ability to do so may be impeded by lack of English language skills and gaps in their education prior to ***immigrating***. Children who come at a very young age are likely to have a relatively easy time learning English and are able to enter the ***U.S.*** school system at an early level. We would expect these children to complete higher levels of schooling on average than immigrants who arrive at an older age. The data support this expectation: Only 30 percent of the Mexican immigrants who settled

permanently in this country by age 8 failed to complete high school, compared to 60 percent who arrived at ages 8 to 14, and 70 percent who were 15 or older when they arrived. (28) A somewhat similar pattern is found for immigrants from other Latin American countries, but generally not for immigrants from Asia or Europe.

Although our focus in this section has been on immigrants, ***U.S.***-born Hispanics (that is, the second-and third-plus-generation Hispanics) and blacks also suffer from levels of educational attainment that on average are significantly lower than that of non-Hispanic whites. Table 4 shows patterns of educational attainment for ***U.S.***-born citizens by age group. As with immigrants, younger cohorts are significantly better educated than older cohorts. However, this pattern of improvement has largely stopped in recent decades. There is relatively little difference between the educational attainment of 35- to 44-year-olds compared to the 25- to 34-year-old group (although the 25-to-34-year-olds will have acquired additional schooling by the time they are 35 to 44). At all age levels, Hispanics, blacks, and American Indians have lower average levels of educational attainment than do non-Hispanic whites and those of Asian or Pacific Islander ancestry. The data shown for Hispanics and for non-Hispanic whites are split in to separate groups, for those whose parents were born in the ***United States*** and those who have at least one parent who was born outside the ***United States***. (29) Among non-Hispanic whites, having at least one parent who was an immigrant is associated with higher average levels of educational attainment for all but the oldest age group. Among Hispanics, the youngest cohorts show a similar tendency.

Although the ***U.S.***-born children of Hispanic immigrants (the second generation) attain as much education as the children of ***U.S.***-native Hispanics (the third generation), their educational attainment falls well short of the overall ***U.S.*** average for all age groups. Thus, the ***increasing*** share of Hispanics in the working-age ***population*** may exert a downward pull on average levels of educational attainment of the ***U.S.*** labor force unless substantial progress is made in addressing the educational needs of Hispanic youngsters.

Trade as an Alternative to ***Immigration***

A third possible adjustment to slow labor force ***growth*** and rising wages in this country might be ***increased*** import activity, for, as economists discussing ***immigration*** often point out, ***immigration*** and imports are alternative ways of tapping foreign labor supplies. Both are efficient in that they improve the allocation of resources and raise global productivity. And both tend to reduce the return to competing domestic resources, unskilled labor, in particular.

Analysts describing the impact of ***immigration*** on destination-country wages sometimes point out that buying imports and hiring immigrants are alternative ways of purchasing the labor of non-native workers. These discussions tend to focus on the impact of ***immigration*** on the relative supply of labor; they pay considerably less attention to the impact of ***immigration*** on the level or composition of labor demand. They usually explain that both ***immigration*** and trade effectively ***increase*** the supply of labor, particularly lowskilled labor, in this country and should thus be expected to reduce the wages of native (unskilled) workers. (30) But many of these studies ignore the likelihood that by adding to the number of consumers living in this country, ***immigration*** raises the demand for ***U.S.*** labor and, possibly, alters the composition of demand as well. Almost surely, ***immigration*** raises the demand for labor by more than would the marginal ***increase*** in ***U.S.*** exports occurring if the ***United States*** were to import from the orig in countries a quantity of goods equal to that produced by the new immigrants. Despite some similarities, accordingly, ***immigration*** and trade are not equivalent in this respect.

As a practical matter, moreover, many services--particularly personal care and household services--are not tradable. However, ***immigration*** can reduce the cost of providing non-tradable services. Non-tradable service industries that employ relatively large numbers of low-skilled, low-paid immigrants include health care, housekeeping and food services, domestic tourism, construction, landscaping, and agriculture. According to the Consumer Expenditure Survey, the over-65s and, even more, the over-75s spend disproportionately large shares of their income on many of these services. Thus, the demand for workers to staff these industries is likely to rise as the ***population*** ages.

It is unclear to what extent either ***increased*** trade or ***increased immigration*** can help provide for the consumption needs of the aging ***U.S. population***. Filling the gap between ***U.S.*** consumption and output with net imports requires

that foreigners be willing to finance the ***U.S.*** trade deficit. While the ***United States*** has often been able to run a trade deficit for extended periods, eventually those deficits must be repaid. In the meantime, the ***United States*** remains vulnerable to abrupt corrections. By contrast, ***increased immigration*** allows the ***United States*** to satisfy ***increased*** domestic consumption with domestic output, avoiding the need to repay foreign investors at a future date and the danger of disruptive reversals. But immigrant workers must also be paid, and they have their own consumption needs. ***Increased immigration*** would improve the finances of pay-as-you-go social insurance programs and would attenuate cost ***increases*** associated with domestic labor shortages, but it should certainly not be viewed as a magi cal way of meeting the consumption needs of the aged.

The gap between immigrants' earnings in the ***United States*** and in their native country suggests that it may sometimes be more efficient for the ***United States*** to tap foreign labor supplies via ***immigration*** than by trade. This differential reflects the gap between their productivity in the ***United States*** and abroad, which, in turn, reflects ***U.S.***-foreign differences m capital-labor ratios, accumulated human capital, institutional arrangements, and so forth. (31) As Lucas (1990) and Bernanke and Gurkaynak (2001) have pointed out, investments in physical and human capital appear to create important externalities. For example, physical investment allows private knowledge to become publicly available. Similarly, investment in schooling provides externalities because highly educated individuals tend to be more productive working with other well-educated people than alone. (32) By reducing the return to investment in the capital-poor countries and raising it in the capital-rich ones, these externalities may help to expla in why people and capital often both flow to the industrialized countries. (33)

All in all, then, despite their similarities, trade and ***immigration*** are likely to have considerably different impacts on ***U.S.*** labor markets, the ***U.S.*** trade balance, and global productivity. They are not equivalent.

Wage Structure and Inequality

Demographic shifts will likely also affect labor markets in additional, somewhat subtle, ways. For example, changes in the relative supplies of different types of labor are likely to affect the structure of wages. As the supply of young workers shrinks relative to that of older workers, the wage premium attached to labor market experience is likely to decrease--a phenomenon that may have started to take place in the late 1990s.

In contrast, demographic trends may exert upward pressure on the educational wage premium. A commonly advanced explanation for the ***increase*** in the economic return to higher education in the late twentieth century, at the same time that the relative supply of college graduates was growing, is as follows: Skill-biased technical change ***increased*** demand for highly educated workers to such a degree that their relative earnings rose even in the face of ***increased*** supply. Given that future gains in average levels of educational attainment are quite uncertain, continued skill-biased technical change could exert a powerful upward push on the economic return to education.

In a recent paper, Card and Lemieux (2000) examine the interaction of age and education effects in the determinants of the wage structure. They note that the ***increase*** in the college wage premium has occurred for younger, but not older, men, and they advance the hypothesis that this is due to a slowdown in the ***growth*** of educational attainment. Because of imperfect substitutability between older and younger workers, the ***increase*** in the education premium has been concentrated in the younger cohorts, who have experienced the slowdown in the ***growth*** of educational attainment. Over time, as older cohorts are replaced by younger ones, the ***increase*** in the education wage premium will extend over more workers. Intriguingly, Card and Lemieux note that the slowdown in educational attainment seemed to coincide with the baby boom generation reaching college age. This fact, which is presumably due to a crowding effect, suggests that future ***growth*** in educational attainment may vary with the size of the college-age cohort.

Overall, demographic trends seem to be working toward further ***increases*** in earnings inequality. The ***increase*** in the percentage of workers who are immigrants, who tend to be more concentrated in the tails of the distribution of educational attainment than native-born Americans, will likely lead toward ***increased*** inequality. The ***increase*** in the percentage of future school-age youths who are Hispanic will also tend to exacerbate inequality unless the educational attainment of Hispanic youths rises to the national average. Possible further ***increases*** in the economic

return to education would also contribute to ***increased*** inequality (while ***increasing*** the incentive to invest in educational attainment). The possible decrease in the return to labor market experience, in contrast, would tend to reduce inequality. However, this decrease in inequality would result in a larger share of the remaining inequality stemming from differences in lifetime earnings rather than from differences in earnings over the stages of the lif e cycle.

Unemployment and the NAIRU

Younger workers tend to have more volatile labor market experiences than do older workers. The young tend to move in and out of the labor force at higher rates, often because they are moving in or out of school. They also tend to switch jobs more frequently as they search for opportunities that match their evolving skills. And when employed, they are at higher risk of being laid off because of their low levels of seniority. As a result of these factors, younger workers tend to have significantly higher unemployment rates than older workers.

This suggests that unemployment rates (and the NAIRU) likely ***increased*** with the entry of the baby boomers into the labor force, and then decreased as they matured. Bleakley and Fuhrer (1997) estimate that the aging of the baby boom generation resulted in a decrease in unemployment rates of 0.75 percentage points between 1979 and 1995. Similarly, Katz and Krueger (1999) estimate that age-structure effects ***increased*** unemployment rates by 0.71 percentage points between 1960 and 1979, and then decreased unemployment rates by 0.73 percentage points in subsequent years.

As the labor force ages further in the years ahead, this trend can be expected to result in additional downward pressure on unemployment rates and the NAIRU. However, Katz and Krueger suggest that future demographically driven reductions will be modest, with a further decline of just 0.05 percentage point in unemployment rates by 2006.

Summary

This section has reviewed ways in which the ***U.S.*** economy may adjust to the demographic changes that produce a rising dependency ratio. Labor or multifactor productivity may ***increase***, and ***U.S.*** employers may tap foreign labor supplies in two different ways--by hiring more immigrants and by importing more goods and services. Theory and empirical evidence suggest that periods of slow labor force ***growth*** should be (and historically have been) associated with capital deepening and ***increased*** labor and multifactor productivity. However, in recent years, tight ***U.S.*** labor markets have also triggered sizable flows of foreign workers with relatively low levels of educational attainment, flows that the Census Bureau projects will continue well into the future. These large inflows of foreign workers will ease ***U.S.*** labor shortages but may curb future aggregate productivity gains in this country by slowing improvements in the average educational attainment of the ***U.S.*** workforce. Projections of future levels of educational at tainment in major source countries like Mexico, where recent improvements have been substantial, suggest that closing the gap with the ***United States*** will nevertheless take a long time. In this country, moreover, data on the educational attainment of second- and third-generation Hispanic children provide cause for concern. Finally, while trade provides another channel for employing foreign workers, trade and ***immigration*** are likely to have somewhat different effects on the wages of similar ***U.S.*** workers. Moreover, earnings differentials reflecting effects of accumulated investments in human and physical capital in the ***United States*** suggest that ***immigration*** may at times be more effective than trade in raising global productivity.

IV. Summary and Discussion

This paper has suggested that projected demographic changes are likely to ***increase*** the ***U.S.*** dependency ratio--on a long-term basis--to a level well above the previous peak touched briefly in 1961. The ***increase*** occurs despite the substantial ***immigration*** and a consequent ***increase*** in fertility that keep the dependency ratio from rising even higher than in the Census Bureau's middle series projection. Because the ***increase*** in the dependency ratio primarily reflects longer (and generally healthier) life expectancies, it is much to be welcomed. However, it also raises questions in some observers' minds about the ease with which a relatively small workforce will supply the consumption needs of a relatively large number of dependents.

This paper also suggests, however, that we can be reasonably confident that the ***U.S.*** economy will accommodate the real demands posed by these demographic changes without serious strain--although certain groups may bear a disproportionate share of the adjustment costs. (34) Judging from history, the wage pressures resulting from the relatively slow ***growth*** of the labor force are likely to encourage additional capital deepening and an acceleration in labor and multifactor productivity ***growth***. ***Increased*** productivity will, in turn, help the relatively small labor supply to support a larger number of dependents--if historic relationships continue.

But a second part of the adjustment--already factored into the Census Bureau'***s*** projections--entails a growing ***role*** for immigrants and their descendants. While this projected ***increase*** lowers the dependency ratio to a noticeable degree (compared with the alternative of no ***immigration***), some observers are concerned that an ***increased*** reliance on ***immigration*** could slow this country'***s*** productivity gains--largely because many of these new Americans arrive with very little schooling. While immigrants from countries outside Latin America are on average slightly better educated than ***U.S.*** citizens, and while the average educational attainment of immigrants has risen over time, the ***increased*** importance of unskilled migrants from Mexico and the Caribbean is creating a growing gap between ***U.S.***- and foreign-born average educational attainment. This gap is likely to persist well into the future despite expected gains in schooling in the source countries. Moreover, and well within the reach of ***U.S.*** domestic responsibilities, the second- and third-plus generations of native-born Hispanics continue to exhibit educational attainment well below the ***U.S.*** average.

The relative ***increase*** in the supply of unskilled workers is likely to exacerbate ***U.S.*** income inequality by reducing the life chances of native-born workers with little schooling. In contrast to the past century, which brought big gains in ***U.S.*** schooling that were important in boosting ***U.S.*** productivity ***growth***, the current century could see average ***U.S.*** educational attainment stagnate or even decline. Given the importance of productivity gains to maintaining or ***increasing*** our standard of living as the ***population*** ages and the relative size of our workforce shrinks, raising ***U.S.*** educational attainment heads the set of policy implications listed below.

U.S. Educational Attainment

The data collected for this paper suggest that finding ways to address the educational needs of our Hispanic youth should be a high priority. The fact that young Hispanic adults exhibit lower educational attainment than their black and white non-Hispanic counterparts suggests that a lack of English language skills may be an important deterrent to educational and occupational success, as corroborated in a recent paper by Bleakley and Chin (2001). Because Bleakley and Chin'***s*** results show that better English language skills induce greater educational attainment, the authors suggest that early intervention is likely to be most beneficial. Other new research by Reynolds et al. (2001) followed children who had participated in the Chicago Child-Parent Centers, a highly structured preschool program, for 15 years. They found that by age 20 the program participants had considerably higher rates of high school completion than the control group. (35) Again, the results suggest that early childhood education can be a goo d investment.

Residential Isolation

If the need to encourage the educational attainment of second- and third-generation Hispanic children and other ethnic/racial groups who tend to leave school early is obvious, the solutions are clearly not easy. Remedies remain difficult, in part because immigrants from Central America and native Hispanics tend to cluster in a few impoverished inner-city neighborhoods. (36) Indeed, according to the Census 2000 data, over half of all Hispanics live in two states, California and Texas, while over 20 percent live in four urban counties--Los Angeles, CA; Miami-Dade, FL; Harris County, TX (Houston); and Cook County, IL (Chicago). Indeed, Logan et al. (2001) conclude that Hispanics live more isolated lives now than they did in 1990. (37) This residential segregation undoubtedly deters the attainment of English language skills and helps to maintain expectations that discourage advanced schooling, especially for women. (38) Although ethnic communities clearly provide important support networks, it seems worth consid ering whether experiments like the ***U.S.*** Department of Housing and Urban Development'***s*** Moving to Opportunity program, which combines subsidies for private housing with significant counseling, could be beneficial. (See Katz, King, and Liebman 2001 and Ludwig, Duncan, and Hirschfield 2001 on the MTO experiment.)

Federal Funding for Communities Affected by ***Immigration***

While the forces propelling ***immigration*** are national and international, education is largely a local responsibility. Because the Hispanic ***population*** is highly concentrated, the cost of educating the second and third generations falls largely to a relatively few cities where resources for coping may be scarce. For example, Hispanics accounted for 46 percent of the ***population*** of Los Angeles, CA, 59 percent of the ***population*** in San Antonio, TX, and over 90 percent of the ***population*** in Laredo, TX, Brownsville, TX, and Hialeah, FL. This concentration suggests the need for federal support for educating these children. Since the costs of ***immigration*** are likely to fall heavily on ***U.S.*** youth with little schooling while its benefits will largely accrue to highly skilled and older ***U.S.*** natives, (39) federal funds to encourage ***increased*** schooling more generally in low-income areas (where students tend to drop out early) may also be worth considering.

Social Insurance Policy

The aging of the ***U.S.*** ***population*** implies that an ***increasing*** share of future federal government spending will be devoted to the major social insurance programs serving the older ***population***: Social Security, Medicare, and Medicaid. In order to free up resources for the interventions discussed above, and more generally to reduce the magnitude of old age dependency, social insurance reforms that encourage ***increased*** self-reliance on the part of the "young" elderly seem worth exploring.

One possible reform would be to raise the age at which workers become eligible for full Social Security pensions to 70 and, perhaps, to index the normal retirement age to future ***increases*** in life expectancy. However, it is essential to recognize that the elderly are a very heterogeneous group. First, the health status of the elderly varies widely, with those with low lifetime earnings generally at higher risk for disability at relatively young ages. And then, as Smith (1997) points out, the ***U.S.*** elderly also exhibit great disparities in income and wealth. Policy reforms will need to protect those who find continued work difficult and those who are in financial need. Protecting the disability insurance component of Social Security and, perhaps, making the Primary Insurance Amount formula more progressive as the normal retirement age ***increases***, are two ways of achieving this outcome.

Social Security has been very successful in reducing poverty among older Americans: The poverty rate for the ***U.S.*** elderly has now fallen to less than 10 percent. However, the poverty rate for children under 18 has risen to 22 percent from 14 percent in 1969. Focusing social insurance more directly on the goal of preventing poverty among the elderly, while using the resources freed up to address the needs of younger residents, warrants consideration.

Immigration Policy

As discussed in the body of the paper, relatively unfettered movements of goods, services, people, and the ideas they carry with them are likely to promote an efficient allocation of resources and productivity gains. But while trade and investment both allow ***U.S.*** residents to buy labor services from non-native workers, they may have different effects on ***U.S.*** wages, trade balances, and productivity developments. In particular, the gap between real earnings in the ***United States*** and in migrants' home countries and the lack of generalized cross-country convergence in productivity levels suggest that ***immigration*** is likely to be both inevitable and, often, relatively efficient as a means of raising global productivity and ***U.S.*** standards of living. (40) Redesigning our ***immigration*** policies to limit entry to the most highly skilled, as is widely under discussion (Wasserman 2001), is not likely to be either effective (since it will not deter immigrants who can walk across the border) or in our economic best interests . Surely, however, given ***U.S.*** traditions and ethical concerns, ***immigration*** policy must be determined by considerations beyond the purely economic.

Outside California, Texas, and Florida, much of the ***U.S.*** public appears unaware of, or surprised by, the fact that the ***United States*** is once again a nation of recent immigrants. But this outcome should not have taken us by surprise, since shifts in labor market conditions and trends in fertility and ***immigration*** are all closely intertwined. After all, with hindsight, we see that the ***U.S.*** policy decision to close the door to immigrants in the 1920s helped to trigger the baby boom- baby bust phenomenon. The recent and projected pickup in the flow of immigrants is a natural response to the entry of the baby bust generation into the labor force and to the retirement of the baby boom

cohort that lies ahead. If the low average educational attainment of a fraction of these migrants and their offspring is a cause for concern, the responsibility for choosing policy actions that will help turn a potential problem into a major asset lies with us.

[FIGURE 1 OMITTED]

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[FIGURE 8 OMITTED]

[FIGURE 9 OMITTED]

(1.) Released in January 2000 (1990-based projections). The Census Bureau designates its middle series projection as the most likely outcome. The high and low series are included to illustrate the great degree of uncertainty surrounding the central projection (***U.S.*** Census Bureau, 2000). The projected ***U.S. population*** in 2100 ranges from 283 million in the low series to 1,182 million in the high series compared with 571 million in the middle series.

(2.) The birth rate is expected to fall despite the fact that these projections assume a slight ***increase*** in total fertility rates because of the ***increased*** importance of racial/ethnic groups with relatively high fertility rates within the ***population***. However, in a break with past practice, the most recently issued projections do assume convergence in fertility rates across racial/ethnic groups. Immigrant women'***s*** fertility is expected to converge to native rates within the same racial/ethnic group, and fertility rates for all racial groups are assumed to converge very gradually to the replacement level of just over 2 percent. Fertility rates for non-Hispanic white women have been at this level since the late 1980s. (See Hollman, Mulder, and Kallan 2000, p. 3.)

(3.) According to the ***U.S.*** Census definition, Hispanics may be of any race.

(4.) Born between 1946 and 1964.

(5.) This surge partly reflects an amnesty program legalizing the status of undocumented workers already living in this country, as will be discussed further below.

(6.) Tracking the flow of immigrants and their impact on the labor force is not straightforward. Beyond the legal immigrants, other foreign-born residents, including those who entered without documents, people with temporary work visas, and students, many of whom are entitled to work for limited periods as part of their practical training, may also contribute to the ***U.S.*** labor supply. For example, in 1998, the ***United States*** admitted 660,000 permanent immigrants, just over half of whom were new arrivals; the rest were simply adjusting their status. In addition, the INS estimates that 275,000 illegal immigrants entered the country each year in the mid 1990s. Further, individuals with temporary work visas granted under several relatively new or expanded programs numbered over 372,000 in 1998, about 145,000 more than in 1996. (See Wasserman 2001 for a discussion of these programs.) Foreign students admitted in 1998 equaled 565,000, an ***increase*** of 138,000 since 1996. To make keeping track even harder, while the INS counts "arrivals," students and people making intra-company transfers may enter more than once a year. Altogether, the figure gives only a hazy picture of the impact of the foreign-born on the ***U.S.*** workforce in the late 1990s.

(7.) The Census Bureau'***s*** middle series projection assumes foreign-born emigration rates of 12 percent. Under alternative assumptions, these rates rise as high as 30 percent.

(8.) That share peaked at nearly 15 percent in 1910.

(9.) This act followed a series of restrictive laws, including, in particular, the ***Immigration*** Act of 1917 that codified previous exclusion provisions, barred illiterate aliens, and declared natives of the "Asia-Pacific triangle" to be "inadmissible."

(10.) "Easterlin (1968 and 1980) credits the ***Immigration*** Act of 1924 with helping to set the conditions that led to the baby boom. The act largely cut off ***immigration***, with the result that the very small cohort coming of age in the mid 1940s thrived. As a result, they married early and had unusually large numbers of children.

(11.) In Mexico, to take one important example, the poverty rate rose by almost 14 percent between 1984 and 1989 as real income per capita fell. While total poverty declined over the next five years, poverty rates continued worsening in the agricultural areas in part because coffee prices plunged with the end of the International Coffee Agreement. Then, following the peso crisis of 1994-95, total real wages fell sharply again. In manufacturing, real wages declined 30 percent between early 1995 and mid 1997. Throughout this period, unskilled workers fared especially poorly. In the decade to 1995, real wages for skilled workers rose 8 percent while real wages for unskilled workers fell 22 percent. Since analysts had expected ***increased*** openness to trade to benefit Mexico'***s*** relatively abundant pool of unskilled workers, this outcome came as a surprise. The most likely explanation appears to be that NAFTA speeded the introduction of skill-biased technical change. (See Lachler 1998, LopezAcevedo 2000, and Lustig 200 1.)

(12.) Other developments pushing immigrants towards the ***United States*** have undoubtedly included spillovers from the Mexican peso crisis of 1994-95, a series of armed conflicts (in Vietnam, El Salvador, Guatemala, Haiti, Nicaragua, and recently, Colombia), and environmental problems like the dwindling availability of clean water in Mexico. Very important among the pull factors have been the relatively buoyant economic conditions in the ***United States***, particularly in the second half of the 1990s, when real average hourly earnings reversed almost half their long-term decline of 14 percent from their highs in the 1970s. In addition, trade arrangements like Mexico'***s*** maquiladora program and the Caribbean Basin Initiative, which were intended to spur development overseas, may also have ***increased*** foreign workers' familiarity with ***U.S.*** firms and encouraged the rapid expansion of Hispanic communities in all of the states facing Mexico and the Caribbean. The formation of growing networks of friends and relatives here in this country and the ***increased*** ease of communication and transportation allowing people to keep in touch with relatives left behind have also facilitated ***immigration*** to this country.

(13.) After 2030, the Census projects that ***immigration*** will proceed at a steady 1.45 million per year through 2100.

(14.) Similarly, the foreign born'***s*** share of the working-age ***population*** will rise from 12 percent now to 15.3 percent in the mid 2030s. It is projected to fall to today'***s*** level by the end of the century.

(15.) Lee and Edwards (2002) also conclude that additional ***immigration*** would have a relatively modest budget impact but would help ease the long-run fiscal situation.

(16.) Out of 15 million World War II veterans, over half used these educational benefits, and in 1947 veterans accounted for 49 percent of college enrollment.

(17.) Ho and Jorgenson (1999) conclude that ***increased*** educational attainment accounted for most of the improvement in labor quality between 1948 and 1995. Improvements in labor quality, in turn, accounted for a quarter of the ***growth*** in labor volume and almost 10 percent of the ***growth*** in ***U.S.*** output in the past half century.

(18.) Examining the reasons for the decline in the unemployment rate and the fall in the NAIRU since the mid 1680s, Katz and Krueger (1999) find the maturing of the baby boom cohort to be the primary explanation.

(19.) In 2003 the full retirement age for Social Security starts to rise gradually until it reaches 67 in 2027.

(20.) The labor force participation rates of individuals age 55 to 64 and over 65 have been rising since 1985 but remain below their previous highs. If one assumes that the Social Security retirement age rises to 70 and that 25

percent of people age 65 to 69 work (up from 12 percent now, but below this group's 27 percent participation rate in the late 1940s and below the 58 percent participation rate for people age 55 to 64 currently), the dependency ratio at the end of the century would be 0.70. That ratio would not be much above its previous peak of the early 1960s.

(21.) A slowing of the ***growth*** rate of the labor force will generally also result in an aging of the labor force. This effect will also tend to ***increase*** labor productivity due to an ***increase*** in the average level of labor force experience.

(22.) These findings were consistent across several different samples including a lengthy ***U.S.*** time series, a handful of industrial countries over an extended time frame, and, finally, 115 low- to high-income countries from 1960 to 1981.

(23.) The authors adjust the available data on corporate labor income for the downward bias that results from the importance of the informal sector in many developing countries.

(24.) Other analysts would argue that this offset should not be taken for granted. For instance, Kotlikoff, Smetters, and Walliser (2001) develop a dynamic, general equilibrium, life-cycle simulation model and find that a dramatic run-up in the payroll tax "dissipates what would otherwise be a natural process of capital deepening." This capital "shallowing" occurs in part because the ***increase*** in the payroll taxes required by Social Security and Medicare programs reduces workers' savings. In addition, KSW model faster technical progress as equivalent to an ***increase*** in the effective size of the labor force (but not in the effective stock of capital); thus, other things equal, faster technical progress leads to a fall in the capital-labor ratio. Moreover, because KSW are working with a closed-economy model, the large ***increase*** in the real return on capital that results from this exercise does not attract capital from abroad.

(25.) When the working-age ***population*** is defined as that aged 16 to 65 rather than 25 to 65, the coefficient on the working-age ***population growth*** rate is positive and statistically insignificant in the post-1950 period.

(26.) The data for this section are from merged samples of the March Current ***Population*** Survey (CPS) from 1994 through 2000. Only households in their first four months of inclusion in the survey were included in the merged sample. The data relate to all foreign-born ***U.S.*** residents, whether or not they are permanent legal immigrants. By contrast, Jasso, Rosenzweig, and Smith (1998) use INS data to examine the skills of new legal immigrants and find that since the mid 1980s the gap between the educational attainment of these legal immigrants and the ***U.S. population*** has been narrowing.

(27.) One should take account of the degree-completion effect in interpreting this figure. As individuals age, they are able to complete higher levels of education. The trend of younger cohorts to have higher levels of eventually completed educational attainment will tend to be masked by this effect, especially for completion of advanced degrees by relatively young cohorts.

(28.) These estimates are based on the authors' calculations from the March CPS pooled from 1994 through 2000.

(29.) Other groups were not similarly split because of concerns about relatively low sample sizes.

(30.) This assumption is common whether the study uses factor proportions analysis (as in Borjas, Freeman, and Katz 1996) or cross-area analysis (as in Card and DiNardo 2000). Indeed, after Card and DiNardo conclude that flight by natives from areas attracting large immigrant communities does not explain why ***immigration*** seems to have very small effects on the local labor market outcomes of the native born, they suggest that endogenous shifts in industrial structure may be responsible.

(31.) Differences in capital-labor ratios are probably most relevant for unskilled workers, while interacting with peers is probably most relevant for the highly skilled. Indeed, the spur to creativity from interactions between domestic and foreign-trained professionals may be among the primary benefits of migration.

(32.) Purchases of telecommunications equipment exhibit comparable network or agglomeration spillovers.

(33.) From the source countries' perspective, immigrants' remittances from their host-country earnings are making significant contributions to the source country'**s** resources. According to a study by the Inter-American Development Bank'**s** Multilateral Investment Fund, remittances to Latin America and the Caribbean exceeded aid flows and equaled almost one-third of foreign direct investment flows to that region in 2000. In Mexico, remittances were equivalent to tourism earnings and two-thirds of the country'**s** oil revenues. In Haiti remittances amounted to 17 percent of GDP. (See Fidler 2001.)

(34.) The difficulties in financing the needs of an increasingly elderly ***population*** were the focus of another session at the conference.

(35.) The French may also provide useful models, for in France, all children start preschool at age 3, and the government pours extra resources into schools in poor (immigrant) neighborhoods (Stanley 2001).

(36.) In 2000,24 percent of the foreign born from Central America and 21 percent from the Caribbean were impoverished versus 11 percent for ***U.S.*** natives and 17 percent for all foreign born. Poverty rates for immigrants from other areas ranged from below to just slightly above the level for ***U.S.*** natives.

(37.) For example, the average Hispanic now lives in a neighborhood that is 46 percent Hispanic, compared with 43 percent in 1990. By comparison, the average white lives in a neighborhood that is 80 percent white, down from 85 percent in 1990.

(38.) In related research, Gaviria and Raphael (2001) find that school-based peer effects are important in explaining the likelihood of dropping out.

(39.) Who will be able to purchase personal and other services supplied by these low-skilled workers at lower cost. Such services will also allow the high-skilled to spend more time in more productive activities. In addition, of course, the migrants are themselves major beneficiaries of ***immigration***.

(40.) In an era when many industrial and some developing countries are likely to have a rising dependency ratio and a domestic labor force that is nearly stagnant or shrinking, prospects for global productivity may become a matter of domestic policy concern in many countries.

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Jane Sneddon Little and Robert K. Triest, Vice President and Economist and Assistant Vice President and Economist, respectively, Federal Reserve Bank of Boston. This paper was prepared for "Seismic Shifts: The Economic Impact of Demographic Change," a conference sponsored by the Federal Reserve Bank of Boston, June

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jane.little@bos.frb.org

robert.triest@bos.frb.org

Figure 3

Percent Foreign Born by Region of Birth

	1900	1960	2000
Asia	1	5	26
Other	13	11	8
Latin America	1	9	28
Europe	85	75	7
South America	--	--	7
Central America (a)	--	--	7
Caribbean	--	--	10

(a)Excluding Mexico.
Source: ***U.S.*** Census Bureau.
Note: Table made from pie chart

Figure 4

Projections of ***U.S.*** Resident ***Population*** by Race and Hispanic Origin

	2000	2050	2100
American Indian	1	1	1
Asian/Pacific Island	4	9	13
Black non-Hispanic	12	13	13
Black Hispanic	1	1	2
White Hispanic	11	22	30
White non-Hispanic	71	53	40

Source: ***U.S.*** Census Bureau.
Note: Table made from pie chart

Table 1

Productivity ***Growth*** Rate Regression Results

The impact of demographic change on U.S. labor markets.; US percentage breakdown of 25-to-64-year-old resident population by level of education, correlated with....

Dependent Variable	Labor Productivity ***Growth*** Rate		
		1904-1999	
Growth Rate of ***Population*** Age	-1.308	-1.177	-1.220
25-65, 3-year Moving Avg.	(.3350)	(.3044)	(.3372)
Change in the		-.005	-.005
Unemployment Rate		(.0018)	(.0019)
World War Years			-.009
			(.0064)
Constant	.042	.040	.042
	(.0046)	(.0041)	(.0047)
Adjusted R-squared	.06	.20	.20
Dependent Variable	Labor Productivity		Multifactor
	Growth Rate		Productivity
			Growth Rate
	1904-1949	1950-1999	1904-1999
Growth Rate of ***Population*** Age	-1.473	-1.520	-1.071
25-65, 3-year Moving Avg.	(.5672)	(.3446)	(.386)
Change in the	-.005	-.003	-.007
Unemployment Rate	(.0023)	(.0016)	(.0018)
World War Years	-.014		-.011
	(.0079)		(.0068)
Constant	.050	.044	.032
	(.0105)	(.0040)	(.0057)
Adjusted R-squared	.19	.18	.30
Dependent Variable	Multifactor Productivity		
		Growth Rate	
	1904-1949	1950-1999	
Growth Rate of ***Population*** Age	-1.785	-1.330	
25-65, 3-year Moving Avg.	(.5415)	(.3722)	
Change in the	-.007	-.009	
Unemployment Rate	(.0021)	(.0016)	
World War Years	-.021		
	(.0074)		

Constant	.052	.031
	(.0096)	(.0047)
Adjusted R-squared	.32	.34

Note: ***Growth*** rates are approximated by differences in natural logarithms. The moving average is taken over the three years ending in the observation year; a five-year moving average yields weaker results, while using just the contemporaneous value yields results similar to the three-year moving average. The "world war years" indicator variable is equal to 1 for 1916 to 1918 and 1941 to 1947, and is zero in other years.

Table 2

Educational Attainment, by Country of Origin

Percent

Level of Education	United States	Mexico	Other Central and South America	Asia and Middle East
Less than High School	11.1	67.7	34.4	13.3
High School Graduate	35.4	18.3	29.3	22.0
Some College	27.5	9.4	20.2	18.5
Bachelor's Degree	17.6	3.5	11.0	29.7
Graduate School	8.4	1.1	5.2	16.6

Level of Education	Europe, Australia, Canada, and New Zealand	Africa	Not Specified
Less than High School	12.4	6.2	15.7
High School Graduate	29.1	19.8	27.6
Some College	23.4	19.7	21.6
Bachelor's Degree	21.1		32.6
Graduate School	14.1	21.6	13.3

Source: ***U.S.*** residents aged 25-64 as computed by the authors from merged March Current ***Population*** Survey files, 1994-2000.

Table 3

Educational Attainment, by Origin and Age Group

Percent

Age	Level of Education	***U.S.***-Born	Foreign-Born: Mexico	Foreign-Born: Other Central and South America
20-24	Less than High School	11	62	31
	High School	33	23	32
	Some College	44	14	32
	Bachelor's Degree		11	1
	Graduate School	1	0	0
25-29	Less than High School	9	61	32
	High School	33	24	31
	Some College	31	11	24
	Bachelor's Degree		22	3
	Graduate School	5	0	3
30-34	Less than High School	9	64	30
	High School	35	21	31
	Some College	29	10	23
	Bachelor's Degree		20	4
	Graduate School	7	1	4

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35-44	Less than High School	9	68	31
	High School	36	17	28
	Some College	29	9	22
	Bachelor's Degree		18	4
	Graduate School	8	1	6
45-54	Less than High School	11	74	36
	High School	34	13	29
	Some College	27	8	18
	Bachelor's Degree		17	3
	Graduate School	11	2	6
55-64	Less than High School	19	80	47
	High School	39	10	28
	Some College	21	6	12
	Bachelor's Degree		12	2
	Graduate School	9	1	6
65 or older	Less than High School	33	85	56
	High School	36	8	25
	Some College	17	4	9
	Bachelor's Degree		9	2
	Graduate School	5	1	5

Age	Level of Education	Asia and Middle East	Foreign-Born Europe, Australia, Canada, and New Zealand	Africa
20-24	Less than High School	10	9	7
	High School	19	31	17
	Some College	52	45	59
	Bachelor's Degree		17	13
	Graduate School	3		2
25-29	Less than High School	9	8	0
	High School	19	25	31
	Some College	26	27	32
	Bachelor's Degree		33	27
	Graduate School	14	13	11
30-34	Less than High School	9	7	10
	High School	22	26	18
	Some College	20	24	19
	Bachelor's Degree		29	27
	Graduate School	20	15	25
35-44	Less than High School	12	9	6
	High School	22	29	15
	Some College	19	24	21
	Bachelor's Degree		29	23

	Graduate School	18	16	19
45-54	Less than High School	15	13	4
	High School	23	30	24
	Some College	15	24	10
	Bachelor's Degree		31	19
	Graduate School	16	15	31
55-64	Less than High School	23	23	13
	High School	26	33	16
	Some College	13	19	22
	Bachelor's Degree		25	15
	Graduate School	14	11	18
65 or older	Less than High School	44	36	17
	High School	23	32	29
	Some College	12	15	28
	Bachelor's Degree		13	10
	Graduate School	8		6

Source: Author's computations from March Current ***Population*** files, 1994-2000.

Table 4

Educational Attainment, by Ethnicity and Age Group

Percent

			Hispanic	Non-Hispanic White
		U.S.-Born	Foreign-	***U.S.***-Born
Age	Level of Education	Parents	Born Parent	Parents
20-24	Less than High School	21	22	9
	High School	40	32	32
	Some College	36	42	46
	Bachelor's Degree		4	4
	Graduate School	0	0	1
25-34	Less than High School	20	19	8
	High School	38	31	34
	Some College	30	34	29
	Bachelor's Degree		10	12
	Graduate School	2	4	6
35-44	Less than High School	19	22	7
	High School	39	34	36
	Some College	29	30	29
	Bachelor's Degree		9	10
	Graduate School	4	4	9
45-54	Less than High School	28	27	9
	High School	33	31	34
	Some College	26	28	27
	Bachelor's Degree		8	9

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	Graduate School	5	5	12
55-64	Less than High School	45	47	17
	High School	30	28	40
	Some College	15	17	22
	Bachelor's Degree		6	6
	Graduate School	4	2	9
65 or	Less than High Schoo	66	68	30
older	High School	21	20	37
	Some College	10	9	19
	Bachelor's Degree		3	2
	Graduate School	1	2	5
		Non-Hispanic White		
		Foreign-		American
Age	Level of Education	Born Parent	Black	Indian
20-24	Less than High School	6	18	22
	High School	26	38	4l
	Some College	50	39	34
	Bachelor's Degree		17	5
	Graduate School	1	0	0
25-34	Less than High School	5	14	20
	High School	25	4l	37
	Some College	32	31	36
	Bachelor's Degree		28	11
	Graduate School	11	2	1
35-44	Less than High School	5	15	18
	High School	27	40	37
	Some College	30	30	32
	Bachelor's Degree		24	12
	Graduate School	15	4	3
45-54	Less than High School	5	22	21
	High School	30	38	36
	Some College	27	24	29
	Bachelor's Degree		21	11
	Graduate School	16	6	5
55-64	Less than High School	11	38	37
	High School	38	33	31
	Some College	23	18	21
	Bachelor's Degree		16	7
	Graduate School	13	5	4
65 or	Less than High Schoo	30	59	51
older	High School	39	24	26
	Some College	17	10	14
	Bachelor's Degree		9	4
	Graduate School	6	3	4

The impact of demographic change on U.S. labor markets.; US percentage breakdown of 25-to-64-year-old resident population by level of education, correlated with....

Age	Level of Education	Asian
20-24	Less than High School	7
	High School	26
	Some College	46
	Bachelor's Degree	20
	Graduate School	1
25-34	Less than High School	6
	High School	25
	Some College	30
	Bachelor's Degree	31
	Graduate School	8
35-44	Less than High School	3
	High School	24
	Some College	30
	Bachelor's Degree	28
	Graduate School	15
45-54	Less than High School	3
	High School	20
	Some College	34
	Bachelor's Degree	31
	Graduate School	13
55-64	Less than High School	11
	High School	33
	Some College	31
	Bachelor's Degree	17
	Graduate School	8
65 or older	Less than High Schoo	22
	High School	47
	Some College	21
	Bachelor's Degree	6
	Graduate School	3

Note: White, black, American Indian, and Asian ethnicity groups exclude those who identify themselves as Hispanic.
Source: Author's computations from merged March Current ***Population*** Survey files, 1994-2000.

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