



# THE SECOND GREAT MIGRATION: ECONOMIC AND POLICY IMPLICATIONS

**I**N RECENT DECADES, immigration to the United States has reached historic proportions. Many observers liken this large and sustained wave of immigration to the Great Migration at the beginning of the 20th century.<sup>1</sup> Certainly the promise of America is the same—a land of opportunity and freedom. The number of immigrants today is also similar to that at the turn of the century. Natives' concerns regarding the skill composition and ethnic makeup of the immigrant flow are likewise a familiar tune.

Many things are also different, however. Immigration policy today is restrictive and complex. Illegal immigration is commonplace. The types of jobs immigrants fill have also changed, with service sector jobs largely replacing jobs in manufacturing. The fiscal impact of immigration is far more significant today than a hundred years ago.

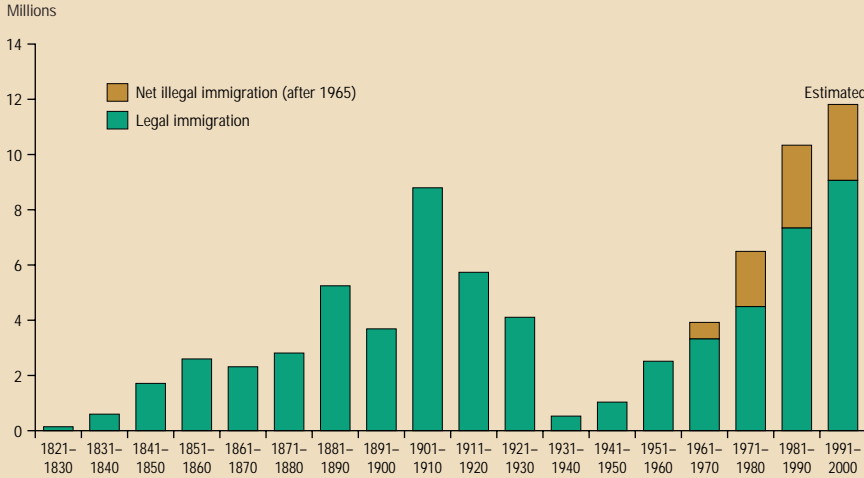
The economic and policy implications of this Second Great Migration are far-reaching. In this article, we touch on the most important components of the immigration debate. We first discuss the number and composition of immigrants and the forces attracting them to the United States. Next, we analyze the economic performance of immi-



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*The 1990s Inflation Puzzle*

**Chart 1**  
Immigration Rises to Historic High



SOURCES: Immigration and Naturalization Service; authors' calculations.

grants and the economic and fiscal impact of immigration on natives. Finally, we describe current policy and discuss some options for policy reform.

## Number and Composition of Immigrants: Who's Coming and Why?

The current immigration wave is the largest in U.S. history. The number of legal immigrants admitted in the decade 1991–2000 is estimated at more than 9 million, exceeding the previous record of 8.8 million set nine decades earlier during the First Great Migration (*Chart 1*). In addition, net illegal immigration is estimated to be 2.8 million during this decade. The nation's number of foreign-born residents is also at an all-time high, over 25 million. As a share of the population, however, foreign-born residents are only about 10 percent. This is up from 5 percent in 1970 but below the 15 percent peak reached during the First Great Migration.

Immigrants increase both the population and the labor force. During the last two decades, immigration has supplied at least one quarter of the nation's labor force growth. For fast-growing states such as Texas, the impact has been much larger. International immigration to Texas in the 1990s surpassed domestic in-migration as a contributor

to population growth in six of nine years (*Chart 2*).

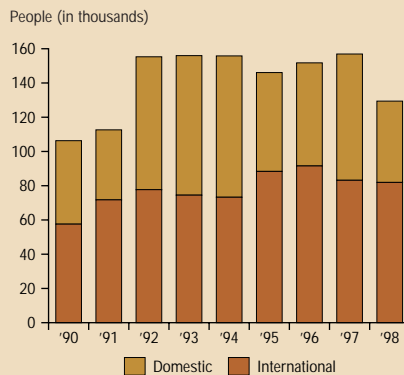
Dramatic shifts have occurred in both the national origins and the skill levels of recent immigrants. Latin America and Asia have replaced Europe and Canada as primary sending areas (*Chart 3*), much as Southern and Central Europe replaced Western and Northern Europe during the First Great Migration. The skill levels of immigrants have also changed. Since the late 1960s, immigrants have been much more likely to be at the low end of the native education distribution compared with immigrants in the early post-World War II

period. For example, a disproportionate number of recent immigrants lack high school diplomas. While the number of natives without a diploma has dropped sharply during the last few decades, the decline among immigrants has been much less rapid (*Chart 4*).

Although much attention has been devoted to this rise in low-skilled immigration, it is important to note that the United States continues to attract high-skilled immigrants as well. In fact, the United States attracts labor disproportionately from both extremes of the skill spectrum. Immigrants are more likely to be high school dropouts, but they are also disproportionately likely to have at least master's degrees—12.5 percent compared with 10 percent for natives.

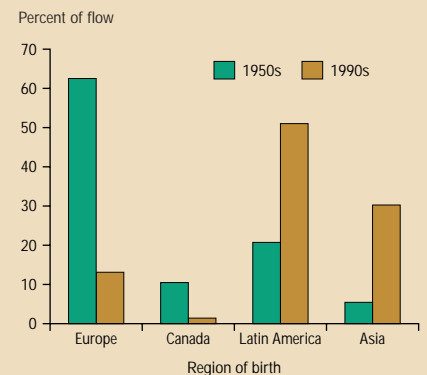
Market forces draw both low-skilled and high-skilled labor to the United States. Low-skilled workers come because such labor is relatively scarce here. This scarcity implies that low-skilled workers' wages are relatively high compared with those in developing countries where such labor is plentiful and cheap. The attraction of high-skilled workers to the United States arises from demand as well as supply factors. Demand for these workers is strong because many of the industries that require high-skilled workers are located in the United States. The higher wages, combined with a favorable tax climate (relative to Europe and Canada), have resulted in substantial immigration of high-skilled workers.

**Chart 2**  
International Labor Flows Are as Important as Domestic  
(Net migration to Texas)



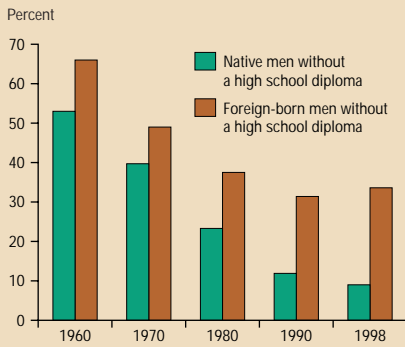
SOURCE: Bureau of the Census.

**Chart 3**  
Immigrant Origins Have Shifted to Latin America and Asia



SOURCE: Immigration and Naturalization Service.

**Chart 4**  
Immigrants Are More Likely to Be High School Dropouts



NOTE: Calculations using 1960–90 Public Use Microdata Samples (PUMS) of U.S. census and pooled 1996–98 Current Population Survey (annual demographic files).

SOURCE: George J. Borjas, *Heaven's Door: Immigration Policy and the American Economy* (Princeton University Press, 1999), p. 21.

Of course, immigrant composition depends not only on which foreigners want to enter the United States but also on which are legally allowed to do so, a subject considered later in this article.

## Economic Performance and Contribution of Immigrants

Two distinct issues arise in economic analysis of immigration policy. The first is the immigrants' economic performance, which looks at their well-being in the U.S. economy. The second is immigrants' impact on the well-being of natives. As discussed below, these two issues turn on somewhat different considerations.

**How Do Immigrants Fare in the U.S. Economy?** The shift in immigrant origins to Latin America and Asia and the higher proportion of immigrants with low education levels have been accompanied by a decline in immigrants' earnings levels relative to natives'. Earnings capacity is correlated with country of origin (*Chart 5*). While European immigrants earn higher average wages than natives, Mexican immigrants have average wages 40 percent below those of natives.

As less-skilled workers have become a larger portion of immigrant flows, recent immigrants (defined as arriving in the five years prior to each census sur-

vey date) have been doing progressively worse relative to natives. In 1998 a recent male immigrant could expect to earn one-third less than a male native worker (*Chart 6*). In 1960, this difference was only 12 percent. The deterioration in immigrants' earnings has placed more of them at the bottom of the native wage distribution. In 1998, 23 percent of immigrants had wages that placed them in the bottom tenth of the native wage distribution, compared with only 7 percent in 1960.<sup>2</sup> The wage differences reflect that the majority of recent immigrants are young, have lower education levels and little work experience, and speak limited English.

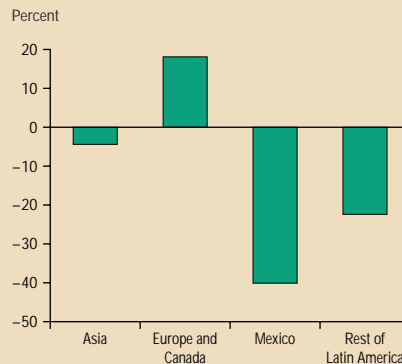
The aggregate statistics are discouraging. For an individual immigrant, however, the large initial wage disparity does not persist over time. The earnings difference between natives and immigrants falls as the immigrant remains in the United States and assimilates. Most studies find that immigrants experience faster wage growth than natives, although they do not, on average, reach wage parity with natives. When compared with *similar* natives, however—by statistically controlling for education and English fluency—immigrants reach wage parity after 16 to 20 years in the United States, according to one study.<sup>3</sup>

As mentioned above, the economic performance of immigrants does not

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**Chart 5**  
Wage Differential Is Related to an Immigrant's Country of Origin

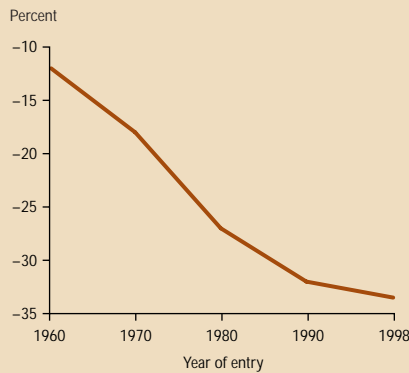
(Native-immigrant wage differential)



SOURCE: James Smith and Barry Edmonston, eds., *The New Americans: Economic, Demographic and Fiscal Effects of Immigration* (Washington, D.C.: National Academy Press, 1997), p. 191.

*The more different immigrants are, regardless of whether they have lower or higher skills than natives, the bigger the economic gains to immigration.*

**Chart 6**  
**Recent Immigrants Are Doing Worse Relative to Natives**  
(Native-immigrant wage differential)



SOURCE: George J. Borjas, *Heaven's Door: Immigration Policy and the American Economy* (Princeton University Press, 1999), p. 27.

determine their effect on the well-being of natives. The contribution of immigrants is determined by how their presence in the labor market changes wages and prices and to what extent these changes affect native workers, employers and consumers. Another way in which immigrants affect natives in the modern welfare state is through their impact on public spending and, hence, taxes.

#### **What Are Immigration's Effects on Native Workers and Consumers?**

In general, the effects of immigration on economic output and well-being are analogous to the effects of trade. With immigration, as with trade, gains accrue when resources can be more efficiently allocated. This "specialization" raises the productivity of inputs and increases output. By taking jobs for which they are better suited, immigrants free up natives, allowing them to flow into more specialized production. Gains also arise as consumption is shifted toward goods whose costs have consequently fallen. A reasonable calculation of the increase in the value of U.S. output (GDP) due to immigration puts the number at about \$14 billion per year in 1997.<sup>4</sup>

Gains from immigration arise when immigrants differ from natives, just as gains from international trade arise when countries differ from each other. The more different immigrants are, regardless of whether they have lower or higher skills than natives, the bigger the economic gains.

This reasoning also implies that the gains from immigration are not distributed evenly—there are winners and losers. The losers are the natives who are similar to immigrants and have to compete with them in the labor market. The winners are the natives who are complementary to immigrants and become more productive. In the case of low-skilled immigration, the skilled natives see their wages rise. Other winners include employers of immigrants, who pay lower wages; consumers, who pay lower prices; and suppliers of goods and services to immigrants, who have more customers.

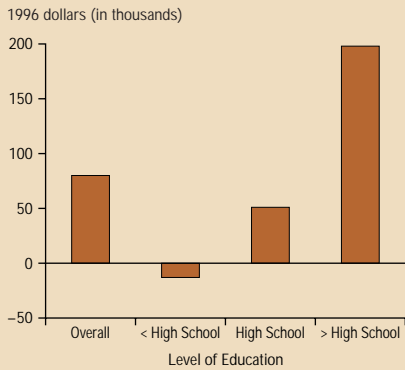
The last two effects are easily demonstrated. Consumers benefit directly from immigration if they consume goods and services produced by immigrants. For example, the large number of low-skilled immigrants in Texas has lowered prices for labor-intensive goods and services such as baby-sitting, house-keeping and gardening. These prices range from 17 percent to 24 percent below the national average.<sup>5</sup> Another effect of immigration is an increase in the demand for existing commodities such as real estate. The revival of many inner-city neighborhoods is due to the growth of immigrant enclaves, the increase in immigrant-run businesses and greater demand for housing. This has had a positive effect on property values.

### **Fiscal Impact How Does Immigration Affect Taxpayers?**

During the First Great Migration, there were few publicly provided services, so even low-skilled immigrants had little fiscal impact. Today, however, taxpayers fund an array of transfer programs as well as public education. To fully evaluate the economic effects of immigration, it is necessary to include impacts on taxpayers.

Some studies calculate the fiscal impact of immigrants on an annual basis. However, a National Research Council study adopts a more meaningful approach. The study computes the lifetime fiscal impact of immigrants and their descendants—their expected tax payments minus the expected cost of

**Chart 7**  
Most Immigrants Have Positive Fiscal Impact



SOURCE: James Smith and Barry Edmonston, eds., *The New Americans: Economic, Demographic and Fiscal Effects of Immigration* (Washington, D.C.: National Academy Press, 1997), p. 334.

the public services provided to them.<sup>6</sup> Public services include (but are not limited to) welfare, Social Security, Medicaid and Medicare, as well as public schools, police, fire protection and public health services. The study estimates that tax payments exceed the cost of services by \$80,000 for the average immigrant and his or her descendants (*Chart 7*).<sup>7</sup> The cost of services slightly exceeds taxes paid by the original immigrant, but the contributions of the immigrant's descendants more than make up the difference.

The average fiscal impact of immigrants (like that of natives) varies by education level. Immigrants with a high school degree or better and their descendants contribute more in taxes than they use in public services, which produces the overall positive impact mentioned above. The average fiscal impact of an immigrant with less than a high school education, however, is minus \$13,000. The impact of the original immigrant is minus \$89,000, largely offset by the positive \$76,000 in contributions by the immigrant's descendants.

**Are Immigrants More Likely to Use Public Assistance?** The negative fiscal impact of immigrants is felt largely at the state and local level. Taxpayers located near clusters of immigrants with limited skills and education bear additional tax burdens. The increased burden is due to immigrants' higher usage of schools and transfer programs. Al-

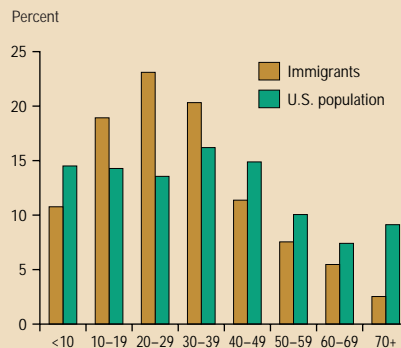
though attention has recently shifted to the burden on schools, a disproportionate amount of literature has focused on immigrants' use of welfare. It is true that immigrants are more likely to participate in public assistance programs—defined as Medicaid, Aid to Families with Dependent Children (now Temporary Assistance to Needy Families), Supplemental Security Income, food stamps, and housing and energy assistance. Specifically, 22 percent of immigrant households receive some type of assistance, compared with 15 percent of native households.<sup>8</sup>

This welfare gap arises from immigrant-native differences in family size, education, age and gender of household head, and state of residence. When these variables are taken into account, the welfare gap falls from 7 to 2 percentage points. This difference in welfare participation is not large enough to suggest that immigrants enter the United States primarily to collect welfare payments. The high labor force participation rates of the poorest immigrants also suggest that this is not the case. Working-age male Latin American immigrants participate in the labor force at a rate of 94 percent, higher than the corresponding 91 percent rate for natives.

**How Does Immigration Affect the Social Security Trust Fund?** While the lower education levels of immigrants make their fiscal impact negative, their age distribution does the opposite. An important fiscal benefit from immigrants

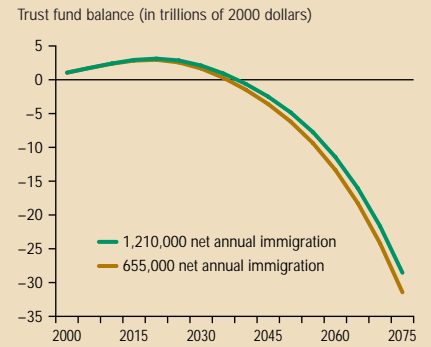
**Chart 8**  
Immigrants Are Younger than Natives

(Age distribution of immigrants and natives)



SOURCE: Immigration and Naturalization Service.

**Chart 9**  
Immigration Extends Trust Fund Solvency



SOURCE: Social Security Administration, Office of the Actuary.

arises from the fact that they are relatively young (*Chart 8*). Immigrants are overrepresented in the age range 10–34. The influx of younger people expands the labor force and slows the ongoing decline in the ratio of workers to retirees. This, in turn, helps maintain the solvency of pay-as-you-go retirement programs, such as Social Security and Medicare.

The Social Security Administration has estimated the effects of changing immigration levels on the Social Security trust fund (*Chart 9*). Under the baseline assumption that annual net migration is 900,000, the trust fund becomes insolvent in 2037, and an immediate payroll tax increase of 1.89 percent would be necessary to keep the fund solvent until 2075. However, with annual net immigration of 1,210,000, the trust fund remains solvent until 2039 and the required tax increase falls to 1.75 percent. Conversely, if annual net immigration were only 655,000, insolvency would be accelerated to 2036 and the required tax increase would rise to 2.01 percent. This calculation understates the positive effects of immigration, as it does not account for the higher fertility of immigrants and does not include Medicare.

## Current Policy

Our analysis has identified a number of benefits from immigration as well as some costs. What implications does our



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## Current Immigration Limits

Current immigration law allows permanent resident visas (green cards) for five major categories of foreigners—immediate relatives of citizens, other family members, “diversity” immigrants, refugees and asylum seekers, and employment immigrants. Immigrants from any single country (excluding immediate relatives and refugees) cannot comprise more than 7 percent of total immigration, a cap that natives of China, India, Mexico and the Philippines currently reach.

All categories of admissions except immediate relatives of citizens (defined as their parents, spouses and minor children) are subject to annual numerical limits: 226,000 for other family members, 55,000 for diversity immigrants, approximately 100,000 for refugees/asylum seekers, and 140,000 for employment immigrants. Uncapped admissions of immediate relatives averaged 283,000 per year in 1995–98.

Visas in each of the capped categories, except employment visas, are fully exhausted each year. “Other family members” experience waiting periods ranging from 18 months (for unmarried adult children of citizens) to over 11 years (for siblings of citizens). Natives of China, India, Mexico and the Philippines face longer waiting periods because they have reached the 7 percent country cap. The longest wait is 20 years 11 months, for siblings born in the Philippines.

Diversity immigrants and their families are chosen in an annual mail-in lottery (typically entered by more than 7 million people) open to foreigners who have a high school diploma or two years’ work experience. Because this program is intended to diversify the immigrant stream, most visas are reserved for natives of Europe and Africa—regions underrepresented among recent U.S. immigrants. Asylum and refugee admissions are set each year by the president and are granted to people facing persecution abroad.

analysis have for immigration policy? Before addressing this question, it is necessary to provide a brief description of current policy.

**Family Members Prioritized.** U.S. immigration policy at the time of the First Great Migration was largely an open door approach. World War I ushered in an era of restricted labor flows—a policy that has persisted to the present. Initially, under the National Origins Act of 1924, immigrants were admitted under country quotas that

heavily favored Northern Europeans. The Immigration Act of 1965, which is the framework for current policy, abolished national-origins quotas and based entry on principles of family reunification. Employment-related immigration was given a very limited role. This law was the catalyst for the Latin American and Asian immigration now observed.

Since 1965 there have been several modifications to existing policy. The Immigration Reform and Control Act of 1986 granted a one-time amnesty to over 3 million undocumented residents. The Immigration Act of 1990 increased employment visas to some extent. However, employment immigration continues to be much smaller than family immigration.

Current law limits employment-related immigration to 140,000 each year, while granting over 600,000 visas to family members and other immigrants. (See the box entitled “Current Immigration Limits.”) Moreover, about one-third of the allotted employment visas go unused each year. Average annual admissions in 1995–98 were only 93,000, consisting of about 40,000 workers (and a few hundred investors) and over 50,000 spouses and minor children.<sup>9</sup>

### **Why Do Employment-Related Permanent-Resident Visas Go Unused?**

In a growing economy experiencing record-low unemployment rates, it may seem puzzling that all available employment visas are not used. Workers admitted with employment visas represent only 6 percent of total immigration in an average year. The stringent requirements and restrictions on these visas partly explain their limited use.

The law provides for five types of visas (EB-1 through EB-5), allocated under a variety of complex criteria. Forty thousand are allotted to highly skilled “priority workers” and do not require a job offer (EB-1). Another 80,000 visas go to workers with job offers: professionals with advanced degrees (EB-2) or workers needed to fill labor shortages (EB-3). Only 10,000 of the latter may be used for unskilled workers. For visas requiring job offers, the employer must comply with a labor certification process that requires an extensive search for domestic applicants. The employer must interview all respondents and submit a report on each

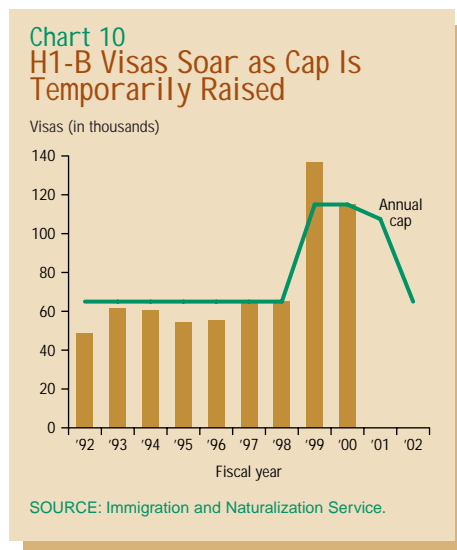
applicant to the state employment agency.<sup>10</sup> Finally, two smaller visa programs have a quota of 10,000 visas each (EB-4 and EB-5), of which about 7,000 and 1,000, respectively, are used. EB-4 visas are for religious and other special workers, while EB-5 visas are granted to investors with at least \$1 million of capital who will create at least 10 U.S. jobs.

Although the law allows 40,000 EB-1 visas, the criteria are sufficiently strict that average yearly admissions in 1995–98 were only 22,000. Similarly, due to the labor certification requirement and other factors, only 15,000 of the available 40,000 EB-2 visas per year were issued in 1995–98. However, 47,000 EB-3 visas were issued, using up all 40,000 visas allotted to that category plus 7,000 of the unused EB-1 and EB-2 visas. Demand is particularly high for the 10,000 EB-3 visas allotted for low-skilled workers, who face about a six-year waiting period for admission. Also, despite the excess supply of EB-2 and skilled EB-3 visas, Chinese and Indian workers face waiting periods because they have reached the 7 percent country limit discussed in the box.

**H1-B and Other Temporary-Worker Visas on the Rise.** The difficulties associated with permanent-resident visas have prompted employers to make greater use of temporary-worker visas. Temporary visas are issued for a limited time period and usually restrict the recipient to working exclusively for the sponsoring employer (perhaps another source of their rising popularity among employers). In contrast to permanent residents, who can be naturalized after five years in the United States, temporary-visa holders are not eligible for citizenship. They are also ineligible for most government transfer programs.

There are a variety of temporary-worker visas.<sup>11</sup> Most are occupation- and skill-based, such as H1-B visas for high-skilled workers in “specialty occupations,” H2-A visas for seasonal farmworkers and H2-B visas for other low-skilled workers. Some of these, such as the H2-A visas, require labor certification by the employer as well as employer-provided housing and transportation.

The H1-B visa program is the largest and most prominent of the temporary-



visa programs. To qualify for an H1-B visa, the worker generally must have at least a bachelor's degree. The visa allows employment for three years and can be renewed once. The visa does not require labor certification; instead, the employer simply files a labor-condition application certifying that the foreign worker will be paid the prevailing market wage.

H1-B visa use has increased sharply (*Chart 10*). An annual cap limiting H1-B visas to 65,000 took effect in fiscal 1992. Nonetheless, in 1998 the cap was reached four months before the end of the fiscal year. This prompted an October 1998 law raising the H1-B cap for three years: to 115,000 for 1999 and 2000 and to 107,500 for 2001. In 2002, the cap reverts to 65,000. Interestingly, the higher cap has been insufficient to meet the demand by high-tech firms and other employers such as universities and research institutions. In fiscal 1999, the cap was reached three months before the end of the year, and, as shown in the chart, the Immigration and Naturalization Service mistakenly issued almost 22,000 excess visas. The cap for this year was reached in March, six months before the end of the fiscal year.

The TN visa program for Mexican and Canadian professionals is also growing. Visas are issued to college-educated applicants with job offers in specified professions. Visas are issued for one year at a time but can be renewed an unlimited number of times. Although Canadian visas are unlimited,

Mexican visas are capped at 5,500 per year through 2003. The application process is simple, particularly for Canadians, who can often obtain visas at the border in a matter of minutes. The TN program has become one of the most common methods for Canadian workers to enter the United States.

## Future Policy Options: Where Will the Workers Come From?

As described above, current policy gives little weight to employment-based immigration. Yet the need for foreign workers is higher than at any other time in the post–World War II period. Federal Reserve Chairman Alan Greenspan recently cited the nation's labor shortage as “the greatest threat” to the record-long economic expansion.<sup>12</sup> Immigrant labor has been an integral part of the economic boom. Should the United States continue to turn to immigrants to satisfy labor demand?

On balance, the benefits of immigration still outweigh the costs. Improvement in policy can further these benefits. For example, more employment-based immigration would alleviate labor market tightness and mitigate increases in immigrant use of public services. Simpler visa rules would increase the use and effectiveness of job-based visas.

**Short-Run Policy Options.** Steps toward more employment-based immigration can be taken within the existing policy framework. Possible steps include raising the number of employment-based visas and simplifying the rules for obtaining and keeping those visas. Several proposals to achieve the first objective are already being considered in Congress. These include temporarily increasing the number of H1-B visas, expanding the H2-A and H2-B program, and instituting a guest-worker program. Federal Reserve Bank of Dallas President Robert McTeer and Fed Chairman Greenspan have endorsed expansion of H1-B visas.<sup>13</sup> Other possible changes include abolishing the 10,000 limit on EB-3 visas for unskilled workers and eliminating the country cap that forces natives of India and China to wait for EB-2 and skilled EB-3 visas.

McTeer has also proposed abolishing the labor certification process for EB-2 and EB-3 visas. Similar changes could be made in the temporary-visa programs. Government-defined specialty worker requirements exclude a majority of professions. Under the current H1-B provisions that require a college degree, the equivalent of Microsoft founder Bill Gates could not receive a visa. In the New Economy, some skilled high-tech workers leave school to pursue lucrative entrepreneurial activities. U.S. firms have experienced difficulty recruiting these individuals under H1-B rules. The H2-A visa program requires employers to provide housing and transportation for their seasonal workers, which deters use of the program. Both temporary-visa programs restrict the worker to one employer, a practice that has been criticized as a form of indentured labor. A better approach might be to let the market determine which workers come here and let foreign-born workers switch employers to ensure competitive wages.

### What Are Some Long-Run Options?

Moving beyond the existing policy framework, a more dramatic potential reform would be to work toward a common North American labor market. Viable long-run policy should satisfy labor demand at both the low and high ends of the skill distribution. Although greater political emphasis has been placed on shortages in the high-tech sector, three-fourths of all new jobs in the coming decade will be in the services and retail trade industries, continuing the pattern of the past decade.

Currently, illegal immigration meets the needs of employers where policy falls short. Our NAFTA partners rank high as source countries for illegal immigration—Mexico first and Canada fourth. Skilled labor is plentiful in Canada and unskilled labor is plentiful in Mexico. Both types are coming to the United States, legally and otherwise.

One possible response to this economic reality is to integrate the three labor pools into one common North American labor market, as European countries have done in the European Union. Canadian and Mexican workers with job offers could be admitted on temporary, renewable visas. Like other temporary workers, they would not be

eligible for citizenship or most government transfer payments. Extending TN visas to lower skilled workers and removing (or greatly increasing) the cap for Mexican workers would be one way to meet the U.S. economy's labor needs at all skill levels.

## Summary

The United States is experiencing a Second Great Migration, similar to the first a century ago. Immigrant origins have shifted as Latin America and Asia have become primary sending areas. This shift in origins has been accompanied by an increase in the number of low-skilled immigrants. Although upon arrival these immigrants earn much less than natives, their wages rise over time. Interestingly, the United States continues to attract a disproportionate number of skilled immigrants as well. The influx of both types of workers has contributed more than 25 percent of the increase in the U.S. labor force over the past two decades.

As new and different workers join the labor force, economic gains arise from the more efficient allocation of resources. Immigration allows native workers to specialize in the goods they can produce at lower cost, and consumers receive their preferred goods more cheaply. Native taxpayers also gain from immigration, but only once the contributions of the immigrants' descendants are included in the calculation. Moreover, the positive fiscal impact of immigrants depends crucially on the immigrant's education level. Taxpayers located near low-skilled immigrant clusters will bear additional tax burdens as a result. One important benefit at the federal level, however, is the significant positive effect immigrants have had on the Social Security system.

Current immigration policy has many shortcomings. Employment-based immigration is very limited. Despite small quotas, job-based visas are going unused, largely because of cumbersome rules and other obstacles that prevent their distribution. Although temporary-worker visas, such as H1-B visas, have eased the worker shortage somewhat during the recent economic boom, there

is much room for reform in the policy arena.

Consideration should be given to re-shaping immigration policy to increase job-based immigration. This would ensure that the economic expansion is not curtailed by labor market shortages. Short-run options include increasing and simplifying the existing permanent and temporary visa programs. A possible long-run option is to allow the free exchange of workers with our NAFTA partners, Canada and Mexico.

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## Notes

- <sup>1</sup> "The huge flow that has come to be known as the Great Migration began around 1880 and continued until 1924, bringing with it about 26 million immigrants." George J. Borjas, *Heaven's Door: Immigration Policy and the American Economy* (Princeton University Press, 1999), p. 7.
- <sup>2</sup> *Heaven's Door*, p. 23.
- <sup>3</sup> Heather Antecol, Deborah Cobb-Clarke and Stephen Trejo, "Immigration Policy and the Skills of Immigrants to Australia, Canada, and the United States," unpublished manuscript, Illinois State University, Normal, Ill., November 1999.
- <sup>4</sup> James Smith and Barry Edmonston, eds., *The New Americans: Economic, Demographic and Fiscal Effects of Immigration* (Washington, D.C.: National Academy Press, 1997), p. 152.
- <sup>5</sup> Runzheimer International, U.S. press release, December 8, 1999.
- <sup>6</sup> *The New Americans*, pp. 297–362.
- <sup>7</sup> The August 1996 welfare reform law, which disqualified many non-citizen permanent residents from receiving food stamps and cash welfare, is not included in this analysis. Including it improves the average fiscal impact by \$8,000, according to *New Americans*, pp. 338–39.
- <sup>8</sup> *Heaven's Door*, p. 111.
- <sup>9</sup> Employment-related permanent visas are discussed in more detail in Demetrios Papademetriou and Stephen Yale-Loehr (1996), *Balancing Interests: Rethinking U.S. Selection of Skilled Immigrants* (Washington, D.C.: The Carnegie Endowment for International Peace), pp. 37–48, and David Weissbrodt (1998), *Immigration Law and Procedure in a Nutshell* (St. Paul, Minn.: West Publishing Co.), pp. 119–21.
- <sup>10</sup> For a detailed description of the labor certification process and its difficulties, see *Balancing Interests: Rethinking U.S. Selection of Skilled Immigrants*, pp. 48–70, 102–13.
- <sup>11</sup> Temporary-worker visas are discussed in more detail in *Balancing Interests*, pp. 70–99, and *Immigration Law and Procedure*, pp. 143–47.
- <sup>12</sup> Alan Greenspan, testimony before Senate Banking Committee, February 23, 2000.
- <sup>13</sup> Robert McTeer, "How to Keep the Economy Growing," *Wall Street Journal*, May 20, 1999; Alan Greenspan, testimony before Senate Banking Committee, February 23, 2000.



# THE 1990s INFLATION PUZZLE

*A Commentary by Harvey Rosenblum*

**T**HE CURRENT ECONOMIC expansion differs from its post-World War II predecessors. First, it has lasted longer, 110 months and still counting (as of May 2000). Second, inflation has drifted downward throughout the expansion, contrary to the usual pattern of inflation rising as an expansion ages. Moreover, even though unemployment fell to around 4 percent in 1999 and early 2000, inflation—at least as measured by the core inflation rate, which excludes food and energy—has basically maintained its downward trajectory (*Chart 1*).

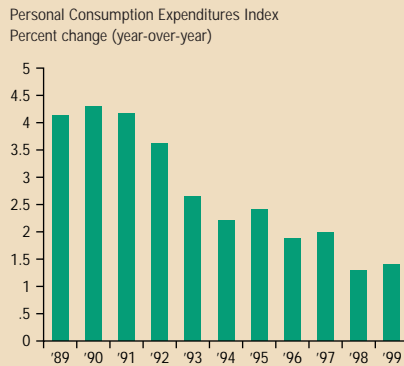
In earlier decades, low unemployment was associated with rising wage growth and rising inflation. During the 1990s, however, that connection seems to have been broken. This article explores a variety of factors that may help explain why the processes that generate inflation have undergone a fundamental shift during the 1990s.

I conclude that neither the unemployment rate nor the monetary growth rate can explain the declining inflation rate during the 1990s. Rather, the missing pieces to the inflation puzzle are to be found in the synergies among (1) immigration, (2) expanded trade and globalization, (3) the explosion of private-sector applications of new technologies, (4) the beginning of a reduced scope for government and (5) a quantum leap in the availability of capital to businesses of all sizes.

## The Phillips Curve

For over 35 years, economics textbooks have addressed the Phillips curve. Back in the 1960s, the Phillips curve depicted an inverse relationship between inflation (actually wage growth) and

**Chart 1**  
1990s Core Inflation Drifts Downward



SOURCE: Bureau of Economic Analysis.

unemployment. The concept was fairly simple: at low levels of unemployment, workers would demand higher wages; employers would capitulate but would increase product prices to maintain profit margins. In this world, lower unem-

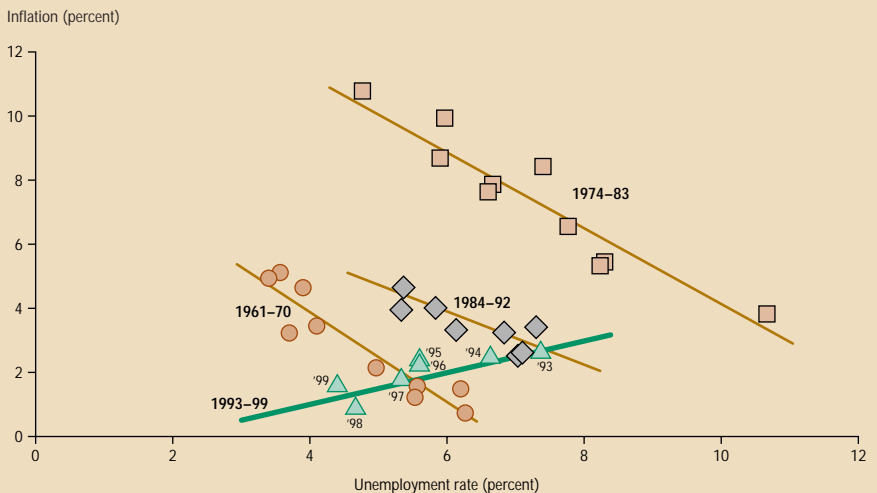
ployment tended to be followed by, but not necessarily cause, higher inflation.

This simplistic version of the Phillips curve framework has been discredited for a couple of decades, but belief in this relationship persists. A best-selling economics principles textbook deals with the matter this way:

“In what sense, then, do policymakers face a *trade-off* between inflation and unemployment? The answer is that: The cost of *reducing unemployment* more rapidly by expansionary fiscal and monetary policies is a permanently *higher inflation rate*.”<sup>1</sup>

Before the mid-1990s a casual glance at the Phillips curve would have verified the previous quotation. The changing nature of the Phillips curve during the 1990s was not apparent until 1996 or 1997 (*Chart 2*). Even with additional data through the end of 1998, the author of a leading intermediate macroeconomics text suggests that the improved in-

**Chart 2**  
The Phillips Curve Slopes Up in the '90s



SOURCE: Bureau of Economic Analysis, NIPA tables; Bureau of Labor Statistics.

flation performance of the 1990s was due to temporary factors:

“Low unemployment still leads to pressure on wages. The good inflation performance of the 1990s appears to be due more to an unusually slow increase in nonwage costs and import prices rather than to fundamental changes in the labor market. It is therefore reasonable to forecast that the natural rate [of unemployment] will not remain as low as it appears to be in the late 1990s.”<sup>2</sup>

More recently, Professor Brad DeLong challenged the mind-set of those who continue to believe in the Phillips curve:

“Thus perhaps the surprising thing is not that the Phillips Curve-based forecasts of inflation have gone awry in the past half decade. Perhaps the surprising thing is that the complicated economic processes determining changes in inflation could be summarized for so long by such a simple relationship as the Phillips Curve. In any event one thing is very clear: the simple theory of the relation between inflation and unemployment that economists have peddled for a quarter century no longer works.”<sup>3</sup>

Given the economics profession’s belief in the Phillips curve, at least in the short run, it is worth examining the forces that changed the inflation–unemployment relationship during the 1990s. What are these economic forces, and, equally important, are they likely to remain in place in the coming decade? The answers are critical in the Fed’s conduct of monetary policy. I now turn to another single-factor view of inflation that prevailed for many years.

### **Money as the Source of Inflation**

Economists as far back as the 18th century observed a correlation between growth in the money supply—discoveries of gold and silver in those days—and subsequent outbreaks of inflation. Ultimately, this observation developed into the Quantity Theory of Money, which attempted to explain the relationship between money, prices and national income. Milton Friedman, winner

of the 1976 Nobel Prize for economics, expressed the relationship succinctly: “Inflation is always and everywhere a monetary phenomenon.”

It was adherence to this belief that induced then Federal Reserve Chairman Paul A. Volcker and the Federal Open Market Committee (FOMC) on October 6, 1979, to abandon conducting monetary policy by setting the federal funds rate and to instead focus more directly on controlling the growth rate of money. In part because extreme volatility of interest rates accompanied monetary targeting and in part because inflation had become more muted, the FOMC’s experiment with rigid monetary control ended three years after it began.

Although the inflation rate dropped from double-digit levels in the late 1970s and early 1980s, it rarely fell below the 3 percent to 4 percent range. The Fed finally abandoned monetary targeting altogether in mid-1993, following several consecutive years of exceptionally weak monetary growth. The FOMC announced its downgrading of M2 and M1 as intermediate targets because it recognized, in the words of Fed Chairman Alan Greenspan, “that the relationship between spending and money holdings was departing markedly from historical norms....The FOMC will continue to monitor the behavior of money-supply measures for evidence about underlying economic and financial developments more generally, but it will still have to base its assessments regarding appropriate policy actions on a wide variety of economic indicators.”<sup>4</sup>

In other words, in the Fed’s pursuit of price stability, money growth matters, but it matters a lot less than previously.

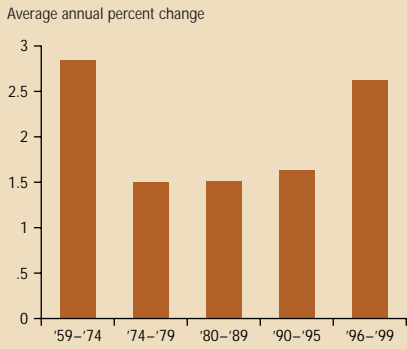
### **Other Influences on Inflation**

If both the unemployment rate and the money growth rate have lost their systematic linkage with inflation, what other factors influenced the disinflationary outcome of the 1990s? Several circumstances stand out from prior decades: (1) the surge in immigration; (2) the acceleration of world trade, especially the impact of NAFTA; (3) the spread of technology to the consumer

***The simple relation between inflation and unemployment that economists have peddled for a quarter century no longer works.***

***In the Fed’s pursuit of price stability, money growth matters, but it matters a lot less than previously.***

**Chart 3**  
**Productivity:**  
**Back to the Good Old Days**



SOURCE: Bureau of Labor Statistics.

and business sectors, as military and other government programs subsided; and (4) the increased availability of financial capital throughout the U.S. economy. A more forward-looking monetary policy that dealt quickly and preemptively with inflation shocks may have also contributed to these more favorable inflation results.

**Immigration.** The accompanying article by Pia Orrenius and Alan Viard details the demographic and labor force impacts of the 1990s surge in immigration. By some estimates, at least one-fourth and perhaps as much as one-third of the labor force growth over the past two decades was supplied by immigrants. Casual observation suggests these proportions have risen in recent years and might be even higher if undocumented workers were accurately counted.<sup>5</sup> This extra—seemingly endless—supply of labor has likely reduced worker demands for wage increases for any given level of unemployment, thereby muting the impact of the Phillips curve relationship.

As long as U.S. wages are several-fold greater than wages in countries whose workers can cross into the United States, legally or illegally, these higher U.S. wages will attract such workers like a magnet. In congressional testimony earlier this year, Greenspan cited the nation's labor shortage as "the greatest threat" to the economic expansion. Clearly, immigration has mitigated this threat and will continue to do so as long as the U.S. immigration door remains open. An economic expansion

without accelerating inflation requires, among other things, an abundant labor force.

In this context, consider an alternative to the traditional Phillips curve relationship. During the 1990s (and especially after 1993), low rates of unemployment were accompanied by "Help Wanted" banners on restaurants, hotels, retail establishments and other businesses. Immigrants filled many of these jobs. Immigrants add to the labor supply and also increase aggregate demand for goods and services in the overall economy. This further stimulates the demand for labor (native and immigrant) to produce the needed goods and services. As immigrant workers repatriate some of their earnings to their families in their country of origin, word spreads about the availability of "good jobs" in the United States. More immigrants follow, creating a different mix of jobs, particularly a higher proportion of low-skill, low-paying service-sector jobs that would not even have existed if the immigration door had been locked. Native workers gravitate toward the medium and higher skilled jobs.

In this dynamic setting, demographics is *not* destiny. Low unemployment does not drive up wages in excess of productivity, nor does it produce inflation that undermines an economic expansion. Rather, low unemployment induces an inflow of workers from abroad, changes the skill mix of the working-age population and feeds further economic expansion. This hypothesis is consistent with the evidence of the 1990s and is advanced to stimulate discussion and debate.

**Technology, Trade and Globalization.** Two of the most common economic anecdotes heard in Federal Reserve surveys of businesses in recent years are (1) labor markets are tight and (2) pricing power is virtually nonexistent (that is, price increases are undercut by competitors). Thus, businesses are searching the world for workers and investing more in training the workers they find. Freer trade, and the added competitive pressures that accompany it, spurred businesses to improve productivity, thereby helping to keep inflationary forces down (*Chart 3*).

When businesses have been unable to bring workers to the job location, they have sometimes managed to take the job to the workers. Such "virtual immigration" is made possible by the Internet and other low-cost communications technologies that have allowed information-processing jobs—such as writing software or processing credit card and hospital bills—to be shipped to other countries, including Ireland, India and Mexico. This has increased the pool of available labor beyond the conventional measures of the domestic labor force.

Companies are taking advantage of lower trade barriers to outsource production to places throughout the world where goods can be produced most cheaply. As a result of NAFTA's passage in 1993, Mexico has become a source of increased manufacturing capacity for the United States. Trade (exports plus imports) as a percentage of GDP has increased fairly steadily since the late 1940s. This trend has accelerated somewhat during the 1990s as trade with Canada and Mexico has become a

**Table 1**  
**Locus of Manufacturing Shifts to the Southwest**  
*(State Rankings by Manufacturing Employment)*

| 1985      |                     | 1999     |                     |
|-----------|---------------------|----------|---------------------|
| Rank      | State               | Rank     | State               |
| 1         | California          | 1        | California          |
| 2         | New York            | <b>2</b> | <b>Maquiladoras</b> |
| 3         | Ohio                | 3        | Texas               |
| 4         | Pennsylvania        | 4        | Ohio                |
| 5         | Texas               | 5        | Illinois            |
| <b>10</b> | <b>Maquiladoras</b> |          |                     |

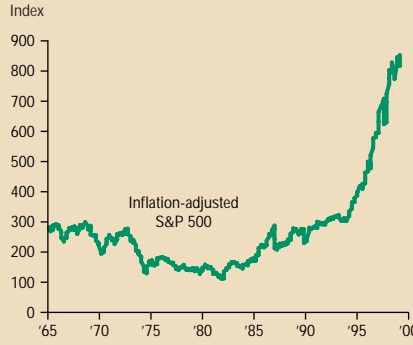
NOTE: Maquila employment grew from 212,000 in 1985 to 1.1 million in 1999.

SOURCE: Bureau of Labor Statistics; Instituto Nacional de Estadística, Geografía e Informática.

*Clearly, immigration has mitigated the inflation threat and will continue to do so as long as the U.S. immigration door remains open.*

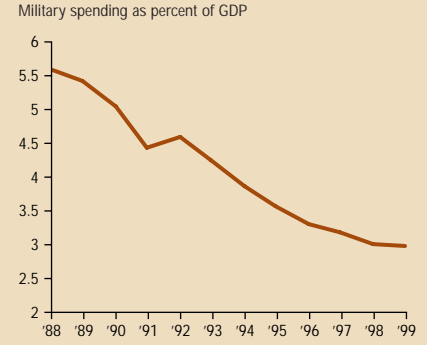
*'Virtual immigration' is made possible by the Internet and other low-cost communications technologies.*

**Chart 4**  
Stock Market Takes Off



SOURCE: Federal Reserve Board of Governors; Bureau of Labor Statistics; author's calculations.

**Chart 5**  
Cold War Ends



SOURCE: 1999 Economic Report of the President, Table B-80.

growing percentage of overall U.S. trade following NAFTA's passage.

One of the best-kept secrets in Washington, D.C., is that NAFTA is a success. Mexico has become our second-largest trading partner, with exports to Mexico currently exceeding \$100 billion annually. Because U.S. companies are sharing production among their U.S., Canadian and Mexican plants, the epicenter of U.S. manufacturing has shifted from the Northeast and Midwestern states to the Southwest. If maquiladora manufacturing is thought of as a physical extension of Texas and California production, the locus of manufacturing employment has clearly shifted during the past 15 years (Table 1). Moving production to its lowest cost location allows U.S. firms to compete more effectively with foreign companies. This has permitted output to grow while both unemployment and inflation fall.

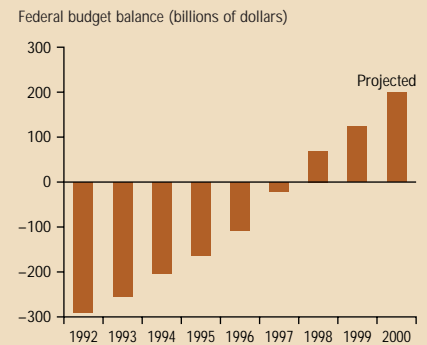
**Access to Capital.** The 1990s began with a credit crunch in many parts of the country. In the late 1980s, bank failures increased to post-Depression highs, and many banks, as well as non-bank lenders, had financial difficulties that induced them to deny credit to businesses. The situation began to improve by 1993 as banks rebuilt their liquidity and capital positions. By the late 1990s, it was a rarity to find businesses citing lack of access to credit. Labor shortages, not capital shortages, had become the issue of the day.

Equity capital availability has also improved, especially for high-tech firms. As the second stage of the bull market

took off in 1995 (Chart 4), so too did the number of initial public stock offerings by companies with short track records and no experience of profitability. Such easy access to low-cost capital has spurred the growth of entirely new industries or forms of delivering existing goods and services that would not have been possible without such democratization of the capital markets. This new capacity has added to competitive pressures and reduced the pricing power of incumbent firms. This has forced business to increase productivity, not prices.

**Smaller Government.** Two cross-currents of fiscal policy trends have also helped. In the aftermath of the Cold War, military spending as a percent of the nation's GDP has been reduced considerably, from over 5 percent down

**Chart 6**  
Federal Budgets Shift from Deficit to Surplus



SOURCE: Office of Management and Budget; Congressional Budget Office.



to about 3 percent (*Chart 5*). This has freed up a sizable group of engineers, scientists and production workers to focus on the business and consumer market instead of the military.

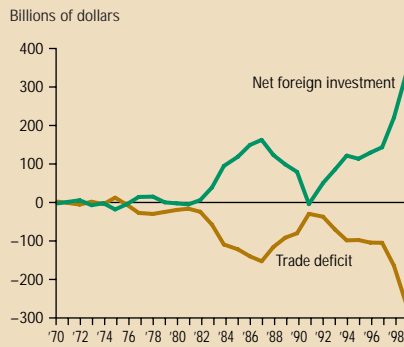
Second, government is playing a smaller role in the economy. In addition to increased deregulation and privatization of some government services, the federal government has been in budget surplus since 1998 and the budget balance has been improving for eight consecutive years (*Chart 6*). The previous government surplus was in 1969, and the last back-to-back surpluses occurred in 1956–57, when Elvis became king! With less need to finance government debt, the U.S. economy has found it easier and cheaper to finance the capital needs of U.S. businesses.<sup>6</sup> The ensuing investment boom, especially in information technology and telecommunications equipment, has deepened the stock of capital relative to labor.

Throughout the 1990s the U.S. economy has also benefited from increasing flows of net foreign investment, the mirror image of our trade deficit (*Chart 7*). Without the foreign investment that augmented our immigration-bolstered labor force growth, it is doubtful the U.S. economy would have been able to boost its capital-to-labor ratio sufficiently to sustain the higher labor productivity enjoyed in recent years. Foreign capital and foreign labor are drawn to the United States because their anticipated returns exceed those in other countries. This combination of forces—along with the increased ability to develop technology that substitutes capital for low-skilled labor—has supported productivity growth, thereby keeping inflationary forces in check. The 1990s expansion is unusual in that productivity accelerated after several years of economic expansion, the opposite of what typically occurs as a business expansion ages beyond five years (*Chart 8*).

## Sustainability

I have argued that the 1990s differed from the '70s and '80s in that a confluence of factors—immigration, technology, trade and globalization, smaller government and capital market democ-

**Chart 7**  
Capital Flows and Trade Deficits Mirror Each Other



SOURCE: Bureau of Economic Analysis.

ratization—suppressed the forces of inflation. An important issue for monetary policy is to what extent these factors will prevail in the coming decade. The answer depends in part on a few critical public policy choices to be made in the near future, particularly regarding trade and immigration.

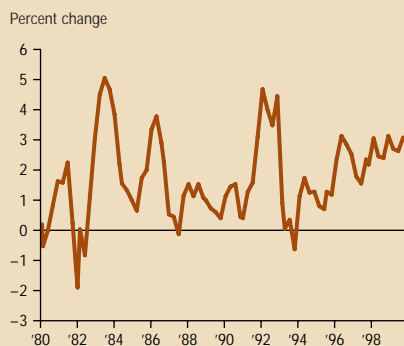
Over the past year we have seen increasing talk and modest action to open the U.S. immigration door wider than it has been over the past couple of decades and to more finely focus our immigration policy on the need for workers. Concerted action on this front would help keep inflation at bay and provide other benefits enumerated in the accompanying article by Orrenius and Viard.

Freer trade with a wider range of countries would increase market size and strengthen competitive pressures to enhance productivity. Businesses could

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**Chart 8**  
Productivity Growth Increases as Expansion Ages



SOURCE: Bureau of Labor Statistics.



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then take greater advantage of the economies of scale that are so prevalent in networked products and industries or in products with high fixed costs of development, such as pharmaceuticals.<sup>7</sup> U.S. trade policy tends to be characterized by two steps forward, one step back. We are now in the one-step-back phase, with no fast track authority for negotiating additional free trade agreements. Perhaps the provision of permanent normal trade relations with China will shift the trade gears from reverse to forward. Although we will reap the benefits of NAFTA for many years to come, we would enjoy greater growth and lower inflation if NAFTA were supplemented by freer trade across the globe.

As shown in the Dallas Fed's 1996 annual report essay, "The Economy at Light Speed," there is no shortage of new technologies waiting to be adapted to the needs of business and consumers. If anything, the inventory of innovative technologies available for commercial exploitation has grown since 1996.

The United States begins the 21st century with a healthy banking and financial system. In addition, the Gramm-Leach-Bliley Act of 1999 will give the financial services industry the necessary leeway to adapt the appropriate corporate structures to respond to changing market and competitive forces. This more flexible financial structure should assure that improvements in business access to financial capital will continue. If government surpluses remain in place "as far as the eye can see," government's reduced financing needs will continue to free up capital resources for the private sector.

This combination of forces has the potential to sustain the favorable low-inflation environment that characterizes the U.S. economy at the dawn of the new century. Even in this favorable environment, monetary policy still matters. These forces have reduced but not eliminated inflation. The laws of supply and demand have not been repealed. These forces have augmented aggregate supply and enabled it to keep pace with growing aggregate demand. The Fed must remain vigilant in maintaining this balance. Given the long and variable lags with which changes in monetary policy impact the economy, and the reduced sensitivity of some economic sectors to

higher interest rates, the Fed has been on heightened alert for any reversal of these positive supply-side forces that have restrained inflation in the 1990s. Factors such as immigration, technology, globalization through freer trade, and more democratic capital markets are not easily included in standard macroeconomic models; nonetheless, Fed policymakers are striving to better understand how these pieces fit into the inflation puzzle.

## Conclusion

To quote again from Brad DeLong: "If economists are to be of any use, they need to come up with a better—and in all likelihood more sophisticated—approach to understanding why inflation rises." This article has reviewed several difficult-to-quantify variables that contributed to, and are expected to continue to support, lower inflation than would be suggested by relationships such as the Phillips curve or the growth of traditional money supply measures. With concerted effort to extend free trade beyond NAFTA, to expand immigration based on the need to alleviate worker and skills shortages, and to continue to curtail the scope of government's role in the economy, there is good reason to believe that strong economic growth with low inflation can continue in the years to come.

*Rosenblum is senior vice president and director of research at the Federal Reserve Bank of Dallas.*

## Notes

- <sup>1</sup> William J. Baumol and Alan S. Blinder, *Macroeconomics: Principles and Policy*, 6th ed., 1994, Dryden Press, p. 395. Emphasis added.
- <sup>2</sup> Olivier Blanchard, *Macroeconomics*, 2nd ed., Prentice Hall, 1999, p. 161.
- <sup>3</sup> J. Bradford DeLong, "What Happened to the Phillips Curve?" *New York Times*, March 9, 2000, p. C2.
- <sup>4</sup> Board of Governors of the Federal Reserve System, *1994 Monetary Policy Objectives*, Washington, D.C., February 22, 1994, p. 18.
- <sup>5</sup> In the presence of widespread illegal immigration, the term "immigration statistics," by its very nature, borders on being an oxymoron.
- <sup>6</sup> There are exceptions to the smaller government story. For example, federal tax revenues reached a 54-year high of 20.1 percent of GDP in 1999. On the other hand, federal spending was 18.7 percent of GDP, the lowest since 1974.
- <sup>7</sup> See W. Michael Cox and Richard Alm, "The New Paradigm," 1999 *Annual Report*, Federal Reserve Bank of Dallas, 2000, pp. 3–25.

# Regional Update

**T**HE TEXAS ECONOMY grew at a fast pace in the first quarter, fueled by high oil prices and strong national and international economies. Employment growth in the first quarter was a brisk 3.6 percent annual rate, with March surging to a 4.9 percent annual rate.

After reaching a 10-year high of \$34 per barrel, oil prices declined in April to a more sustainable level of around \$26 per barrel. These prices are boosting drilling budgets and oil and gas activity in the region. Oil and gas extraction employment picked up, increasing at an annual rate of 6.4 percent in March. The Texas rig count climbed to over 300 in April.

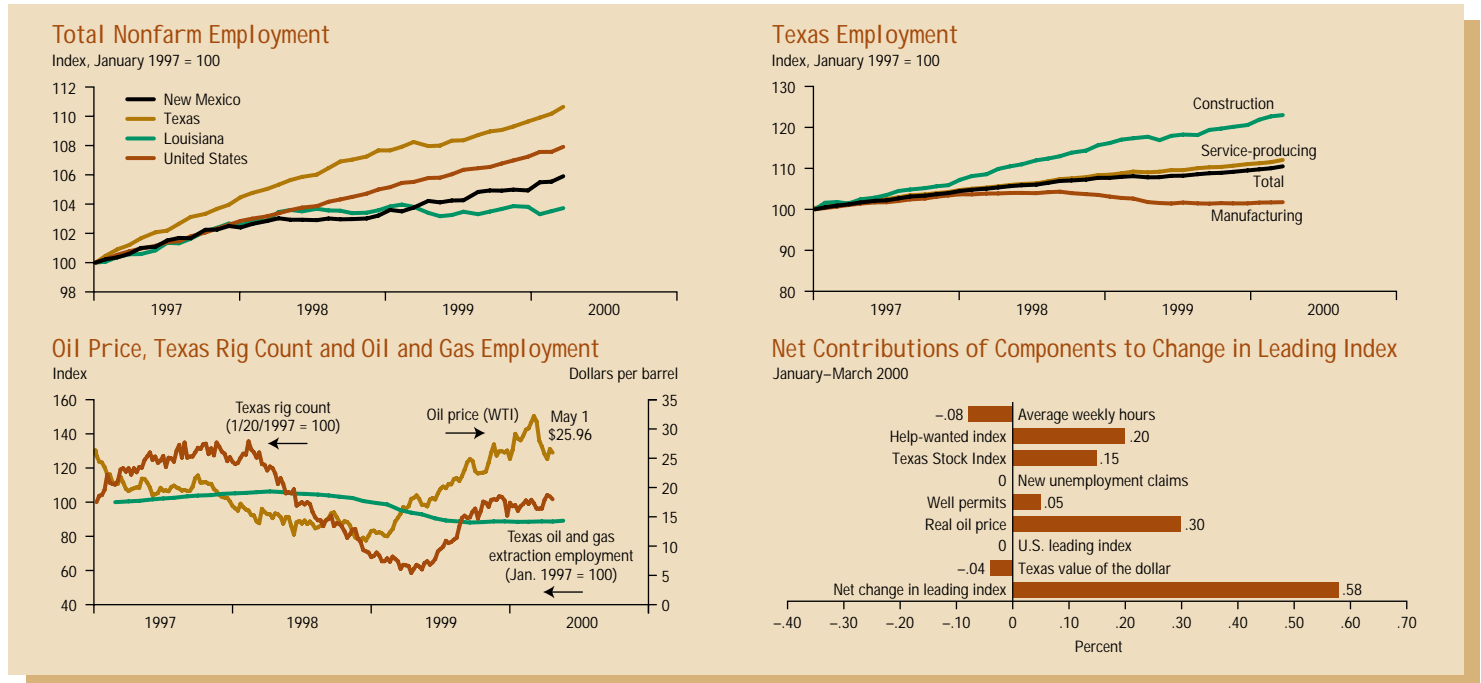
Construction employment grew 9.4 percent (annual rate) through March, aided in part by the mild weather, although growth decelerated throughout the quarter. Activity seems to be concentrated in single-family housing, however.

Manufacturing employment growth has been relatively flat. Within manufacturing, the industrial machinery sector, which includes computers, has seen very strong growth. Possibly mirroring a slower construction industry, related manufacturing sectors such as lumber, brick, furniture and fixtures have lost employment in the first quarter.

The service-producing sector has been booming in 2000. Especially strong were the distribution and business services sectors. Trucking and warehousing employment grew at an 8.9 percent annual rate and business services at a 9.4 percent rate in the first quarter.

Reflecting the strength of its trading partners, Texas exports grew 9 percent in the fourth quarter of 1999 and exports to Mexico were up 17 percent.

—Mine Yücel



## Regional Economic Indicators

|       | Texas Leading Index | TIPI† total | Texas employment* |              |               |            | Total nonfarm employment* |         |           |            |
|-------|---------------------|-------------|-------------------|--------------|---------------|------------|---------------------------|---------|-----------|------------|
|       |                     |             | Mining            | Construction | Manufacturing | Government | Private service-producing | Texas   | Louisiana | New Mexico |
| 3/00  | 127.2               | 128.2       | 144.9             | 548.2        | 1,084.3       | 1,552.3    | 5,995.9                   | 9,325.6 | 1,894.0   | 740.9      |
| 2/00  | 126.8               | 128.2       | 144.4             | 546.8        | 1,083.6       | 1,544.8    | 5,966.3                   | 9,285.9 | 1,890.2   | 738.3      |
| 1/00  | 125.7               | 128.2       | 144.4             | 543.2        | 1,083.2       | 1,543.2    | 5,949.5                   | 9,263.5 | 1,886.4   | 738.0      |
| 12/99 | 126.5               | 128.2       | 144.0             | 537.4        | 1,081.1       | 1,535.8    | 5,942.8                   | 9,241.1 | 1,895.6   | 734.1      |
| 11/99 | 124.6               | 128.2       | 143.9             | 535.4        | 1,081.1       | 1,532.3    | 5,919.5                   | 9,212.2 | 1,896.5   | 734.5      |
| 10/99 | 124.3               | 127.5       | 144.3             | 533.5        | 1,081.8       | 1,529.9    | 5,902.6                   | 9,192.1 | 1,892.9   | 734.0      |
| 9/99  | 123.4               | 126.7       | 144.4             | 532.1        | 1,080.5       | 1,535.1    | 5,891.6                   | 9,183.7 | 1,889.7   | 734.1      |
| 8/99  | 123.9               | 126.7       | 144.0             | 526.5        | 1,081.1       | 1,532.1    | 5,879.5                   | 9,163.2 | 1,886.4   | 733.4      |
| 7/99  | 124.2               | 126.3       | 143.5             | 527.0        | 1,083.3       | 1,514.7    | 5,864.2                   | 9,132.7 | 1,889.5   | 729.4      |
| 6/99  | 124.2               | 125.2       | 144.4             | 525.6        | 1,080.8       | 1,534.0    | 5,845.8                   | 9,130.6 | 1,885.4   | 729.3      |
| 5/99  | 123.3               | 125.9       | 145.3             | 520.9        | 1,082.1       | 1,533.7    | 5,820.2                   | 9,102.2 | 1,883.9   | 728.4      |
| 4/99  | 123.7               | 125.5       | 147.3             | 524.6        | 1,084.5       | 1,532.6    | 5,810.4                   | 9,099.4 | 1,888.1   | 729.1      |

\* in thousands.  
† Texas Industrial Production Index.

## Further Information on the Data

For more information on employment data, see "Reassessing Texas Employment Growth" (*Southwest Economy*, July/August 1993). For TIPI, see "The Texas Industrial Production Index" (Dallas Fed *Economic Review*, November 1989). For the Texas Leading Index and its components, see "The Texas Index of Leading Indicators: A Revision and Further Evaluation" (Dallas Fed *Economic Review*, July 1990).

Online economic data and articles are available on the Dallas Fed's Internet web site, [www.dallasfed.org](http://www.dallasfed.org).



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