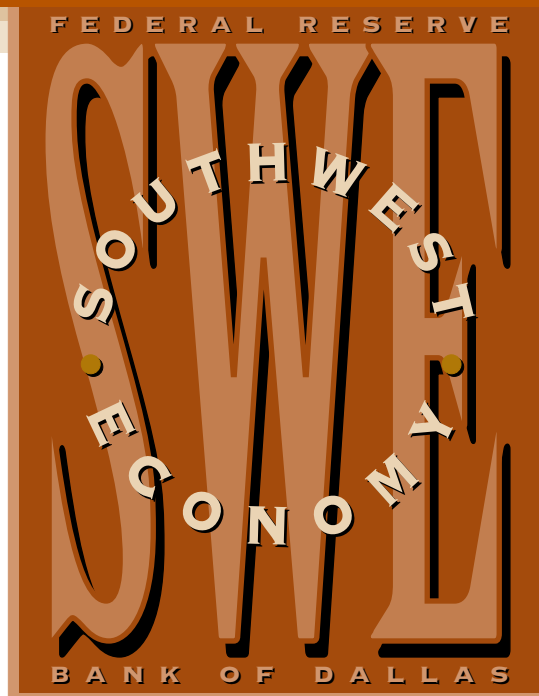


ISSUE 4



JULY/AUGUST 1998

IMMIGRATION AND THE ECONOMY—PART I

FOR GENERATIONS BOTH past and present, the story of America is one of immigration. There is no better reminder of this than the Statue of Liberty, which extends the invitation, “Give me your tired, your poor, your huddled masses yearning to breathe free...,” to immigrants from around the world. Yet the role of immigration in the U.S. economy is not easy to decipher. Among the many questions immigration researchers grapple with are (1) what motivates immigrants to come to the United States, (2) how do immigrants from different countries fare once they arrive and (3) what are the costs and benefits of immigration.

To foster understanding on these issues, the El Paso Branch of the Federal Reserve Bank of Dallas hosted the conference, “Immigration and the Economy.”¹ This article is the first in a two-part series addressing the complex issue of immigration that draws upon the ideas discussed at the conference. Part I introduces the framework under which immigration discussions often fall; Part II will focus on the costs and benefits of immigration—at both the national and regional levels.



INSIDE

*What's New About the
New Economy?*

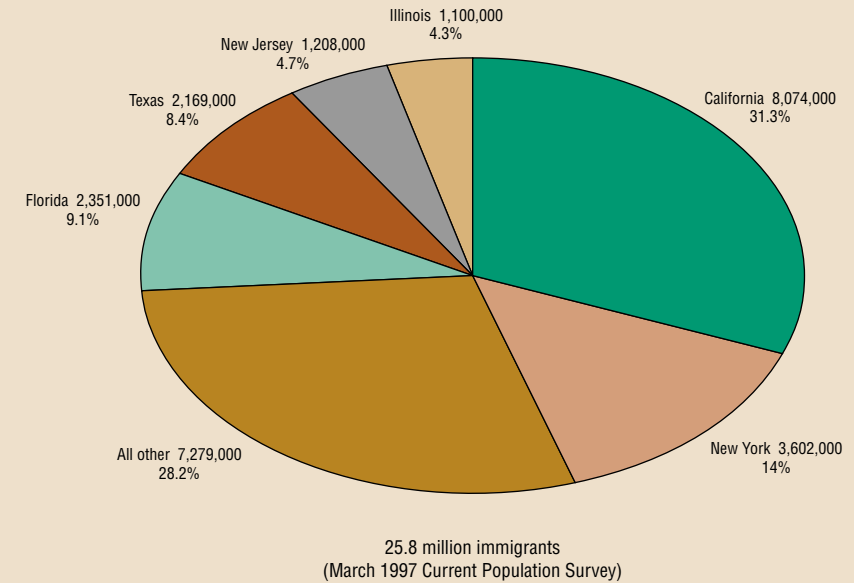
*Latin American Central Banking:
Does Independence
Make a Difference?*

Immigration: The Numbers

More than a million people a year immigrate to the United States. About 850,000 of these are immigrants who have been admitted for

Immigrants provide labor services to businesses in destination countries and often return a portion of what they earn to their home countries in the form of remittances.

CHART 1
STATES WHERE IMMIGRANTS ARE CONCENTRATED



SOURCE: The Urban Institute.

permanent residence. Another 250,000 are undocumented immigrants who make their way into the population numbers.² About 40 percent of such immigrants first entered the country legally—as students, tourists, short-term employees—but have since overstayed their allotted time.³ In all, about 25 million immigrants are living in the United States—an all-time high; however, as a percentage of the population, the share of immigrants is well below its historical high. From 1870 through 1920, 13 percent to 15 percent of the U.S. population consisted of immigrants. Today, that proportion is only 9.3 percent.⁴

Immigrants are highly concentrated in certain areas of the United States; almost a third live in California. Texas ranks fourth, with 8.4 percent of the immigrant population (*Chart 1*).⁵ Because immigrants are concentrated within so few states, assessing both the national and regional impact of immigration is crucial.

Immigration as Trade

Immigration can be seen as a form of international trade. Immigrants provide labor services to businesses in destina-

tion countries and often return a portion of what they earn to their home countries in the form of remittances. Similar to the benefits of free trade in goods, both the immigrant-receiving countries and the immigrant-sending countries can benefit from this trade in human capital.⁶ For example, one of the main benefits of free trade in goods is that the increased competition leads to lower consumer prices. Likewise, the increased competition for jobs brought about by immigration—or free trade in labor—can decrease the cost of goods imported laborers are relatively better able or more willing to produce than are native workers. It also allows the native population to shift to activities for which they have a comparative advantage.

Many countries, such as Mexico, Portugal, Turkey and Egypt, reap the benefits of having exported migrants. In 1996, for example, families and businesses in Mexico received about \$4.2 billion in remittances from Mexican nationals living and working in other countries. Countries such as Saudi Arabia and the United States, which receive a large fraction of the world's immigrants, benefit from the labor services provided by immigrants. Immigrants in

these countries pay a large fraction of the world's remittances (*Chart 2*).⁷

Why Do People Migrate?

The most obvious reason people migrate is that they expect to be better off—either socially or economically—if they move to another country. About 100,000 immigrants a year are admitted to the United States for humanitarian reasons. Their motivation for leaving their home country is clear: they are refugees and asylum seekers fleeing persecution, discrimination or oppression.⁸

For the remainder of immigrants, the traditional view is that migration decisions are motivated by income differences across borders. This incentive is probably stronger than in the past, as the income gap between the richest and poorest countries has risen substantially, from a ratio of 38-to-1 in 1960 to 52-to-1 in 1985.⁹ Thus, higher incomes in immigrant-receiving countries could be a factor that increases migration.

Similarly, changes in real wages between two countries can affect the incentive to migrate. Recent research using data on apprehensions of illegal (or undocumented) immigrants attempting to cross the U.S.–Mexican border concludes that the number of apprehensions corresponds to changes in Mexican and U.S. wages. Increases in Mexican real wages result in a decline in apprehensions at the border, while increases

in U.S. real wages result in an increase in apprehensions. Interestingly, it is the purchasing power of the U.S. dollar in Mexico, more than its purchasing power in the United States, that results in a change in border apprehensions. The fact that migrants to the U.S. care about the purchasing power of the dollar in Mexico suggests that prospective migrants expect to remit a portion of their earnings to Mexico.¹⁰ Economic crises that affect wages—such as the severe devaluations that have plagued Latin American countries and, more recently, countries in Asia—can become factors that significantly influence migration decisions.

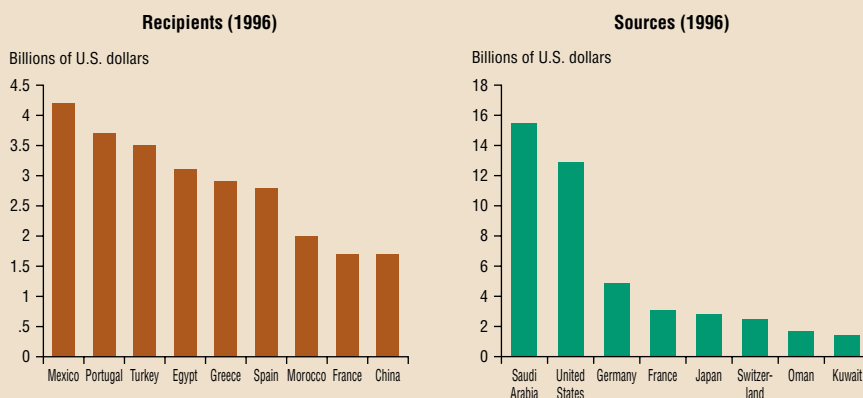
Migrant Networks Are Important

The argument that migration decisions are based primarily on wage and income differentials is compelling. However, research suggests that while these differentials may provide the initial impetus for immigration, the creation of family and social networks in immigrant-receiving countries has become more significant as a factor influencing further immigration. Once the process of immigration has begun, there seems to be a strong tendency for it to become self-perpetuating.¹¹

Networks have become more sophisticated as more immigrants have established themselves in the United States. According to a binational study on mi-

The most obvious reason people migrate is that they expect to be better off—either socially or economically—if they move to another country.

CHART 2
RECIPIENTS AND SOURCES OF THE WORLD'S REMITTANCES



SOURCE: International Monetary Fund, Balance of Payments Statistics Yearbook, 1997.

Networks have become more sophisticated as more immigrants have established themselves in the United States.

Immigration from Mexico

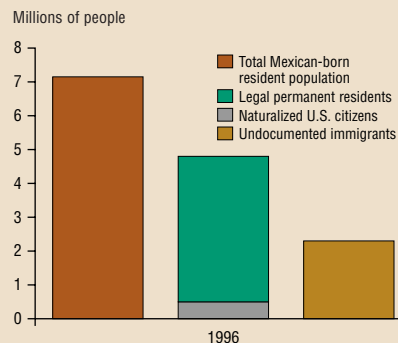
Mexico is the No. 1 source of immigrants to the United States. This is not surprising given geography and economics. The two countries contrast dramatically in earnings and income levels. With a joint border of 2,000 miles and significant income disparity, international migration would seem inevitable. Just as Mexican migrants are drawn to the United States in search of economic improvement, the U.S. labor market draws on these migrants as a source of readily available and inexpensive labor.

Mexico-to-U.S. migration is closely linked to periods of economic necessity in each country. For example, the United States recruited Mexican workers when it suffered labor shortages during World Wars I and II. In fact, the *Bracero* program, a binational initiative launched in 1942, was so successful in filling the U.S. need for seasonal agricultural workers that it lasted more than 20 years. Correspondingly, periods in Mexico of high inflation and economic recession have prompted the movement north of some of the country's labor force. Recent trends in migration, though still largely motivated by economic factors, are sustained and facilitated through a growing family and social network in the United States. In addition, as enforcement efforts at the border have grown, migrant-smuggling operations have become more established and sophisticated, perpetuating a steady flow of undocumented immigrants to the United States. For example, a recent study estimated that approximately 70 percent of successful crossings by such immigrants from Tijuana to San Diego in 1996 took place through smugglers.*

In the past, dialogue on migration between the United States and Mexico was not easy, as the United States usually opted for unilateral decisions on the matter, while Mexico traditionally adopted a stance of nonintervention. However, the 1990s brought a change in this regard as bilateral dialogue on migration has increased, largely fueled by the institutional framework of cooperation embedded in NAFTA. In fact, in 1994, the two governments decided for the first time to sponsor a binational study on migration, which was published last year. This type of thorough, cooperative analysis of migration could lead to a better understanding of the subject and to mutually beneficial policies that address the issue.

* B. Lindsay Lowell, Director of Policy Research, U.S. Commission on Immigration Reform; presentation on the Mexico-U.S. Binational Study on Migration at the Third Annual International Economic Forum of the El Paso Branch, Federal Reserve Bank of Dallas, "Immigration and the Economy," November 14, 1997.

MEXICAN-BORN RESIDENT POPULATION IN THE UNITED STATES, 1996



SOURCE: Mexico-U.S. Binational Study on Migration.

gration between the United States and Mexico, "new employers and labor brokers, along with cross-border social networks of relatives and friends, link an expanding list of U.S. industries, occupations and areas to a lengthening list of Mexican communities that send migrants to the U.S."¹² (See the box titled "Immigration from Mexico.") Having a social tie to a migrant family member in the United States has also been found to increase the wages, hours of work and total monthly incomes of new immigrants, regardless of their country of origin: having kin contacts in the workplace aids immigrants in finding job

connections, communicating with potential employers and establishing references.¹³

Once immigrants reach the United States, family and social networks are the primary determinants of where they will settle. Economic conditions, such as the unemployment rate in a particular region, play a smaller role in immigrants' locational decisions, while public policies, such as welfare benefits and average tax payments, have little or no impact on these decisions.¹⁴

Family and social networks are more powerful draws for immigration in part because of U.S. immigration legislation.

The Immigration and Nationality Act Amendments of 1965 replaced the national origin quota system, which favored European immigrants, with a preference system that made family reunification the first priority; skill-based applicants and refugees were placed lower on the priority list. This act also opened the door to immigration from Asia and Latin America. As a result, having a family member already in the United States has become the chief criterion upon which an immigrant's ability to enter this country rests.

The Changing Composition of Immigrants

A major result of the preference system created by the Immigration and Nationality Act Amendments of 1965 has been a change in the composition of immigrants to the United States. Between 1951 and 1960, 66 percent of legal immigrants to the United States were from Europe or Canada, while 32 percent came from Asia, Latin America and Mexico. Between 1981 and 1990, the share of immigrants from Europe and Canada dropped to 15 percent, while the share from Asia, Latin America and Mexico jumped to 83 percent (*Chart 3*).¹⁵

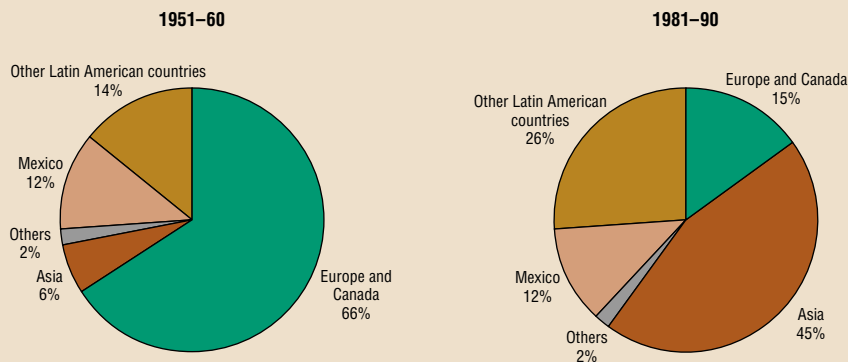
Concurrent with the changing composition of the immigrant population has been a change in the economic performance of immigrants relative to

natives. U.S. immigrants on average earn less than native workers, and the deficit has been growing mainly because the gap in education and skills has been widening. According to the National Research Council, "This relative decline in immigrant skills and wages can be attributed essentially to a single factor—the fact that those who have come most recently have come from poorer countries, where the average education and wage and skill levels are far below those in the United States."¹⁶ Indeed, when broken down by country of origin, immigrants from Europe and Canada generally earn significantly higher wages than U.S. natives, while immigrants from Latin America and Asia earn significantly lower wages.

The gap between the educational attainment of immigrants versus that of U.S. natives has widened substantially since 1970, as the average education level of U.S. natives has increased faster than that of immigrants. However, much of this gap can be explained by the influx of undocumented immigrants, who are generally more poorly educated. Indeed, while only 4 percent of total Mexican immigrants possess college degrees, 15 percent of legal Mexican immigrants are college graduates. Recent immigrants from Mexico, Guatemala and El Salvador—which supply more than 60 percent of undocumented immigrants to the United States—have a 71 percent high school dropout rate.¹⁷ However, legal immigrants to the United States from the rest

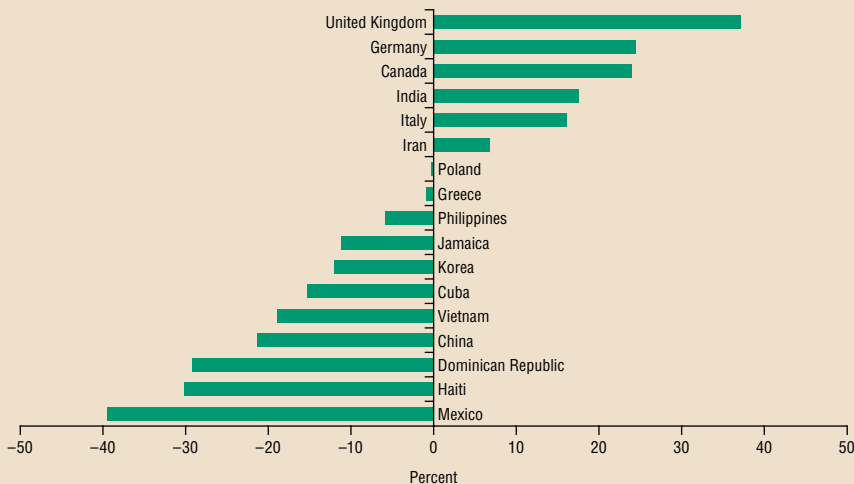
Having a family member already in the United States has become the chief criterion upon which an immigrant's ability to enter this country rests.

CHART 3
CHANGING COMPOSITION OF LEGAL IMMIGRANTS TO THE UNITED STATES



SOURCE: The Urban Institute.

CHART 4
WAGE DIFFERENTIAL BETWEEN IMMIGRANT MEN AND NATIVE MEN, 1990



NOTE: The statistics are calculated in the subsample of men aged 25–64 years who work in the civilian sector, are not self-employed and do not reside in group quarters. The educational attainment of native men in 1990 is 13.2 years.

SOURCE: 1990 Public Use Sample of the U.S. Census of Population.

of the world have only a 28 percent dropout rate—more in line with the 16 percent rate for U.S. natives. At the other end of the education spectrum, legal immigrants come out ahead: 36 percent of recent legal immigrants to the United States have college degrees versus only 24 percent of U.S. natives.

Ignoring the legal status of immigrants may also confound discussions of relative wage differentials. Chart 4 illustrates the wage differentials of immigrants, relative to U.S. natives, by country of origin. Because the data make no distinction as to the legal status of these immigrants, much of the emphasis on the bottom end of the chart may be due to the presence of undocumented and humanitarian admissions to the United States—groups that have different socioeconomic characteristics, are governed by different laws and regulations, and are eligible for different benefits and programs than are legal admissions.¹⁸

and Latin America than from Europe and Canada, the perceptions and the realities of immigration's impacts will continue to change.

Much of the immigration debate in the United States has been fueled by the changing composition of immigrants and the increasing numbers of undocumented immigrants. In the end, however, the debate will hinge on the costs and benefits of international migration. While most studies of the costs and benefits of immigration to the United States conclude that immigration provides a net benefit, Part II of this article will show that the situation is much more complicated. Even when the economy as a whole gains from immigration, there may be losers as well as winners among different groups of U.S. natives and within different regions of the country.

—Beverly Fox Kellam
 Lucinda Vargas

Conclusion

The U.S. immigration landscape continues to evolve, the result of both modifications in U.S. immigration policy and changing economies around the world. As more migrants arrive from Mexico

Notes

- ¹ "Immigration and the Economy," the Third Annual International Economic Forum sponsored by the Federal Reserve Bank of Dallas, El Paso Branch, was held November 14, 1997.
- ² Jeffrey S. Passel, The Urban Institute, Washington, D.C.; outline of remarks presented at the economic forum, "Immigration and the Economy."

³ James P. Smith and Barry Edmonston, eds., *The New Americans: Economic, Demographic and Fiscal Effects of Immigration* (Washington, D.C.: National Academy Press, 1997), p. S-2.

⁴ Passel, economic forum.

⁵ Passel, economic forum.

⁶ Finis R. Welch, Texas A&M University, College Station; remarks presented at the economic forum, "Immigration and the Economy."

⁷ J. Edward Taylor, University of California at Davis; outline of remarks presented at the economic forum, "Immigration and the Economy."

⁸ Passel, economic forum.

⁹ Taylor, economic forum.

¹⁰ Gordon H. Hanson and Antonio Spilimbergo, "Illegal Immigration, Border Enforcement and Relative Wages: Evidence from Apprehensions at the U.S.–Mexico Border," paper presented at the economic forum, "Immigration and the Economy."

¹¹ Douglas S. Massey, Joaquin Arango, Graeme Hugo, Ali Kouaouci, Adela Pellegrino and J. Edward Taylor, "An Evaluation of International Migration Theory: The North American Case," *Population and Development Review*, December 1994, p. 729.

¹² B. Lindsay Lowell, U.S. Commission on Immigration Reform; presentation on the Mexico–U.S. Binational Study on Migration at the economic forum, "Immigration and the Economy."

¹³ Massey, et al., p. 731.

¹⁴ Madeline Zavodny, "Determinants of New Immigrants' Locational Choices," paper presented at the economic forum, "Immigration and the Economy."

¹⁵ Passel, economic forum.

¹⁶ Smith and Edmonston, p. S-6.

¹⁷ Data exclude legal refugees.

¹⁸ Passel, economic forum. Immigrants in this study are grouped into three categories based on their legal status in the United States: legal immigrants, humanitarian admissions and undocumented immigrants. While humanitarian admissions are legal, they are placed in a separate category for purposes of demographic research.

WHAT'S NEW ABOUT THE NEW ECONOMY?

Some Lessons from the Current Expansion

THERE IS A hot, ongoing debate over whether the behavior of the economy has fundamentally changed. This debate has been brought on by the economy's extraordinary performance over the past seven years. Since 1991 output has grown faster than most people had thought possible—without an acceleration of inflation. The stock and residential real estate markets are booming, the federal budget is in surplus and consumer confidence is near an all-time high. Sustained good news has led increasingly to talk of a “new paradigm.” It's argued that global competition has made it difficult for firms to raise prices. Tight labor markets may cause wage increases, but these cost pressures are offset by productivity growth. If anything, it is *deflation*, not *inflation*, that is a threat. Further, some argue that output growth at recent rates can continue indefinitely, provided that monetary policy is sufficiently accommodative. They also argue that changes in the composition of economic activity and new, more flexible ways of organizing production and distribution mean that the business cycle is dead. At the very least, traditional business-cycle indicators have lost much of their usefulness.

This article sheds some light on factors that have contributed to the economy's recent extraordinary macroeconomic performance. It argues that the combination of strong output growth and low inflation we have experienced cannot be attributed to unusually strong productivity growth. Some of the other elements of the new-paradigm story, however, receive considerable empirical support. For example, there are indications of a notable shift in firms' pricing power that may be linked to increasing global competition. Also, the idea that new pro-

duction and distribution technologies have helped smooth the business cycle appears to be correct.

Rapid Output Growth: Can It Be Sustained?

Can the economy keep on growing like this forever? Only if trend productivity growth accelerates. Since 1991 business-sector productivity has increased at a 1.3 percent annual rate, while the adult population has increased at a 1 percent annual rate. Meantime, business output has risen 3.3 percent per year. The 1-percentage-point gap between output growth and productivity-adjusted population growth has been filled by increases in the labor-force participation rate and hours worked per employee, and decreases in the unemployment rate. Physical limits on the participation rate, hours worked and unemployment rate mean that output growth derived from changes in

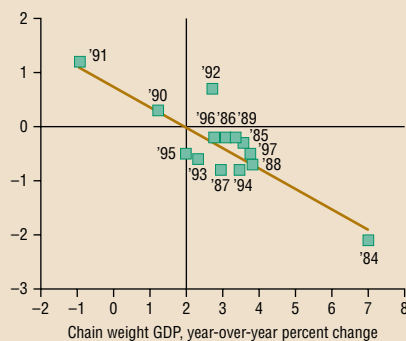
these variables cannot continue forever. As a practical matter, with the participation rate and factory hours near their post-World War II highs and the unemployment rate at its lowest level in almost 30 years, it's likely that only a pickup in trend productivity growth can keep output growing at recent rates for any significant period of time.¹

To illustrate the difficulty in continuing on our current path, Chart 1 plots changes in the unemployment rate against changes in real GDP.² With a single exception (1992), GDP growth rates in excess of 2 percent have been achieved only as a result of declines in unemployment. Conversely, GDP growth rates below 2 percent have been accompanied by increases in unemployment. Since the unemployment rate cannot fall indefinitely, GDP growth cannot continue indefinitely at rates much above 2 percent without faster productivity growth.

Although the solid output gains we've observed over the past seven years cannot be attributed to rapid productivity growth, an acceleration in measured productivity growth may now be underway. A series of methodological improvements to the Consumer Price Index that will continue into 1999 is expected to add about half a percentage point to productivity growth, raising the economy's sustainable rate of GDP growth from between 2 percent and 2.25 percent to between 2.5 percent and 2.75 percent.³ Output growth of 2.5 percent to 2.75 percent is substantially below the 4.1 percent growth rate we've enjoyed over the past six quarters, but fairly close to the 2.8 percent average growth rate we've seen during this expansion as a whole. Of course, to avoid higher inflation, it may not be enough for output growth to stabilize at 2.5 percent to 2.75 percent if the level of output is above potential.

CHART 1
RAPID OUTPUT GROWTH IS NOT SUSTAINABLE

Year-over-year change in unemployment rate, percentage points



SOURCES: U.S. Department of Labor; U.S. Department of Commerce; author's calculations.

Low Inflation: Is the Phillips Curve Dead?

There is pretty solid evidence that the economy really has been more stable over the past decade and a half than it was in the 1970s or even the 1960s.

A striking feature of the economy's performance over the past four years is how well behaved inflation has been, despite tight labor markets. Inflation usually rises as the unemployment rate falls—a negative relationship called the Phillips curve, after New-Zealand-born economist A. W. Phillips. As shown in Chart 2, the inflation–unemployment experience during the late 1980s and early 1990s followed the historical pattern. In the years since 1993, however, the unemployment rate has fallen by 2 percentage points without any increase in output-price inflation. Indeed, inflation has declined! This experience has led some analysts to declare the Phillips curve dead.

One response is to argue that the Phillips curve is not dead, merely shifting. Shifts in the Phillips curve are nothing new—the Phillips curve over the 10-year period from 1985 to 1994 is very different from that observed from 1974 to 1983, for example, or from that observed during the 1960s. (Again, see Chart 2.) Large, sustained shifts in the Phillips curve can generally be attributed to changes in long-run inflation expectations, which are, in turn, often an outgrowth of changes in the conduct

of monetary policy. For example, the upward shift that occurred in the early 1970s followed several years in which policymakers allowed money growth to accelerate in an (ultimately vain) attempt to keep the unemployment rate low. The downward shift in the mid-1980s occurred only after policymakers demonstrated that they were willing to tolerate high unemployment, if necessary, to move the inflation rate lower. In empirical work, expected inflation is usually assumed to be a weighted average of lagged actual inflation. Although this treatment of inflation expectations is simplistic, it has generally performed well.

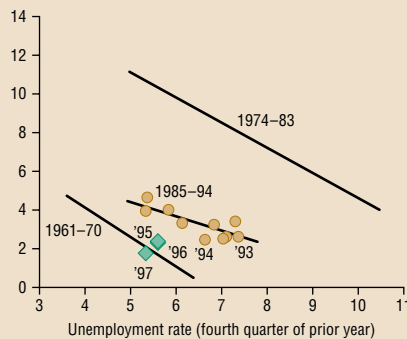
Besides shifting in response to changes in expected inflation, the Phillips curve is buffeted about by “supply-side shocks” such as changes in the relative prices of food, energy and imports. A problematic feature of supply-side shocks is that they are typically difficult to predict very far in advance. This characteristic potentially limits the usefulness of the Phillips curve to policymakers: a wide range of unemployment rates may be consistent with stable aggregate inflation, depending on the vagaries of food, energy and import prices.

Are favorable supply-side shocks and shifting inflation expectations sufficient to explain the low and falling inflation rates we have seen over the past three years? To see, I fitted a conventional Phillips curve equation to annual data through 1994, then used this equation to predict inflation over the period from 1995 to 1997.⁴ A total of three different predictions were prepared for each year. Each set of predictions is conditioned on the actual path of the unemployment rate. The predictions differ in their treatment of inflation expectations and supply-side shocks.

The first set of predictions is based on the static Phillips curve of Chart 2: inflation expectations are held fixed and supply-side shocks are ignored. The second set of predictions models expected inflation as an average of past inflation rates and is conditioned on realized changes in food and energy prices. The third set of predictions allows inflation expectations to vary and is conditioned on realized values of food, energy and import prices. Predic-

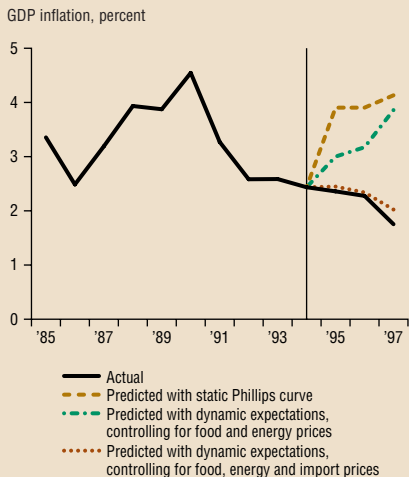
CHART 2
RECENT PRICE BEHAVIOR
SUGGESTS A SHIFT IN
UNEMPLOYMENT–INFLATION
TRADE-OFF

Fourth-quarter-over-fourth-quarter
GDP price index growth, percent



SOURCES: U.S. Department of Labor; U.S. Department of Commerce; author's calculations.

CHART 3
GLOBAL COMPETITION KEY TO
KEEPING INFLATION LOW



SOURCES: U.S. Department of Commerce; author's calculations.

tions are compared with actual inflation in Chart 3.

As we knew already from Chart 2, the static Phillips curve model performs abysmally during the past three years, overpredicting inflation by an average of 1.9 percentage points from 1995 to 1997. Controlling for changes in food and energy prices and allowing inflation expectations to reflect past declines in actual inflation improve the performance of the Phillips curve model, but it still overpredicts inflation substantially over the three-year out-of-sample period. It is only when one controls for the pressure on U.S. prices coming from overseas competition that the predictions of the Phillips curve model match up well with actual inflation.

The findings summarized in Chart 3 are broadly consistent with the new-paradigm view of the economy. One lesson is that inflation predictions based solely on the unemployment rate and past inflation aren't worth much in an economy subject to large supply-side shocks. A second lesson is that overseas competition has played a major role in restraining U.S. inflation in recent years. A corollary lesson is that how sanguine one feels about current U.S. inflation prospects ought to depend very much on one's view of the outlook for foreign inflation and the strength of the dollar.

There is much less empirical support

for another inflation story that sometimes carries the new-paradigm label—the story that accelerating wage increases have failed to translate into higher output-price inflation because of a surge in productivity growth. The problem is that business-sector labor productivity growth averaged only 1.1 percent per year from 1994 through 1997 (the period over which the inflation–unemployment relationship appears to have broken down)—a rate of productivity increase identical to that recorded from 1985 through 1994. Of course, our productivity measures may be faulty—they may have failed to capture a surge of productivity growth in the service sector, for example. But an unmeasured acceleration in productivity growth will show up only in an increase in unmeasured real wage growth. (Price gains will be overstated, leading to an understatement of real wage growth.) Unmeasured productivity growth cannot explain recent increases in measured real wage growth.

Nevertheless, the view that recent wage increases will not soon place upward pressure on output prices may be correct. Supporting evidence is presented in Chart 4, which displays a plot of the ratio of output prices to unit labor costs. (Unit labor costs measure productivity-adjusted wages.) Chart 4 shows that pricing power has been on the decline since 1994. However, the

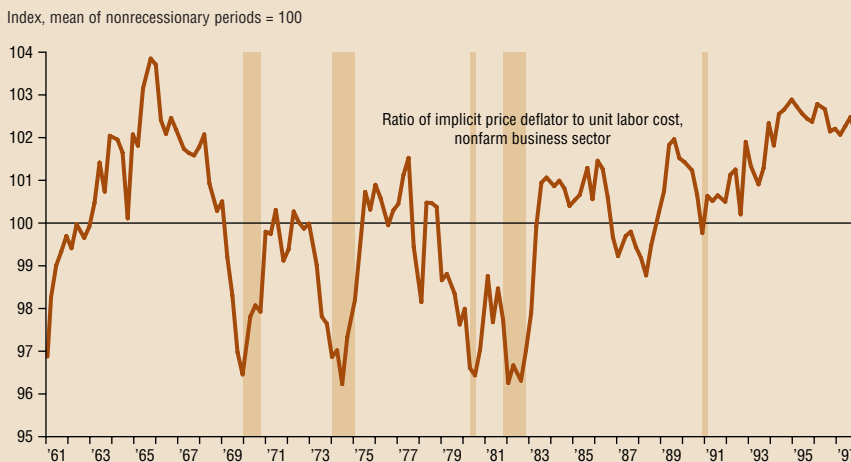
really striking feature of Chart 4 is how high the price/labor-cost ratio had previously risen—one has to go all the way back to 1965 to find comparable figures. There is considerable room for further acceleration of wage growth, relative to price growth, before mark-ups return to historically normal levels.

A Clear Change for the Better: The Business Cycle Has Lost Some of Its Sting⁵

As shown in Chart 5, the current expansion is the third-longest on record and comes on the heels of the second-longest expansion on record. (Arguably, there would have been no interruption to growth in 1990–91 had Iraq not invaded Kuwait.) Do changes in the structure of the economy and new ways of organizing the production and distribution of goods mean that we have less to fear from the business cycle?

There is pretty solid evidence that the economy really has been more stable over the past decade and a half than it was in the 1970s or even the 1960s. The increased stability is evident in Chart 6, which plots annualized quarterly real GDP growth from 1959 through 1997. Vertical lines divide the plot into three subperiods of equal

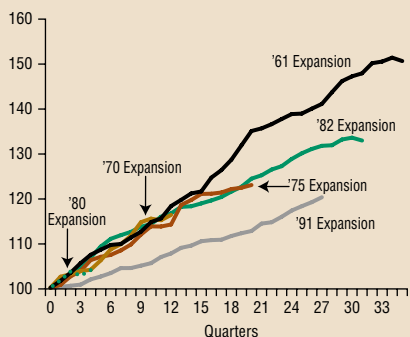
CHART 4
LABOR COSTS RISING FASTER THAN PRICES



NOTE: Shaded bands indicate recessions.
 SOURCE: U.S. Department of Commerce.

CHART 5
STILL GOING...

Real chain-weighted GDP index,
start of expansion = 100



SOURCE: U.S. Department of Commerce.

length. Column 2 of Table 1 reports the standard deviation of quarterly real GDP growth over each of these subperiods. The numbers confirm what Chart 6 suggests—that growth volatility from 1985 through the present has been roughly half that experienced in either of the earlier subperiods.

What has happened in the economy to make output growth so much less variable? Several stories have been offered. One popular explanation is that we are moving away from a goods economy and toward a service economy. Growth is steadier because the service-producing sector is less volatile than the goods-producing sector. It's a nice story, but the premise is false. Although employment has been shifting toward the production of services, the share of real GDP accounted for by goods has been rising slowly—not falling (Chart 7). Durable goods are increasing in importance relative to nondurable goods.

There is no question that international trade is playing a larger and larger role in the U.S. economy. As a percentage of GDP, real imports rose more than threefold between 1959 and 1997, from 4.8 percent to 15.4 percent. Exports rose more than fourfold, from 3.3 percent of GDP to 13.4 percent over the same period. Exports and imports might be expected to serve as buffers between domestic demand fluctuations and domestic production. It's plausible, therefore, that the globalization of the economy accounts for the reduced

volatility of U.S. output growth. Plausible, but incorrect. The trade sector does play a stabilizing role in the economy, but this stabilizing role has not been increasing in importance. It contributes almost nothing to the reduced output-growth volatility we have seen since the mid-1980s.

We can gauge the impact of international trade on the stability of U.S. output growth by comparing the volatility of gross domestic product growth with the volatility of growth in gross domestic purchases. U.S. gross domestic purchases are the total quantity of goods and services purchased in the United States, including our imports and excluding our exports. As such, gross domestic purchases approximate what gross domestic product would have been in the absence of international trade. Table 1 reports the standard deviations of purchases and product in columns 3 and 2, respectively. Note that the entries in column 3 are consistently larger than those in column 2. The implication is that net exports acted to stabilize output growth in every subperiod of our sample. However, the ratio of standard deviations (column 4) exhibits no clear trend. It follows that the amount of stabilization provided by international trade has not increased over time, despite the rapid increases in the volume of trade we have witnessed.

The lion's share of the reduction in

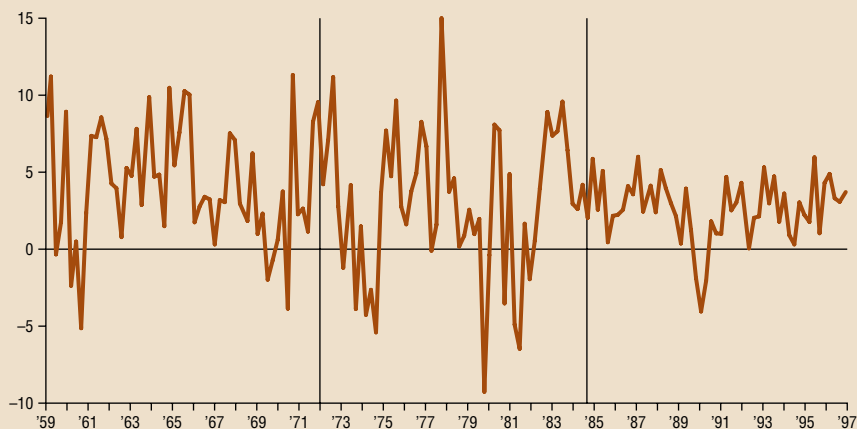
the volatility of output growth appears to have been a result of better inventory management. To see this, we can strip inventory investment from real GDP and look at the growth contribution from final sales of domestic product. The standard deviation of this growth contribution is displayed in column 6 of Table 1. The fact that this standard deviation declines very little as we move from the early to the late subperiod indicates that were it not for inventories, output growth would have been nearly as volatile from 1985 to 1997 as it was from 1959 to 1971. Hence, improved inventory management techniques have paid off in increased macroeconomic stability.⁶

Summary and Implications for Monetary Policy

The U.S. economy has performed extraordinarily well over the past seven years, generating solid, uninterrupted output gains and falling inflation. This strong performance has led many people to wonder whether “the rules have changed”—whether the economy's behavior is now fundamentally different. Certainly we are seeing rapid technological advance, a freer flow of goods and services between countries and the adoption of new methods for organiz-

CHART 6
REAL GDP GROWTH HAS BECOME MORE STABLE

Percent, annual rate



SOURCE: U.S. Department of Commerce.

TABLE 1

WHY HAS OUTPUT GROWTH BECOME LESS VOLATILE?

(Analysis of annualized quarterly changes in various aggregate measures of real economic activity)

Interval	Real GDP	Gross domestic purchases		Final sales of domestic product	
	Standard deviation	Standard deviation	Col. 2/Col. 3	Standard deviation	Col. 2/Col. 5
1959–71	.951	1.039	.915	.695	1.368
1972–84	1.226	1.394	.879	.961	1.276
1985–97	.501	.559	.896	.534	.938

NOTE: In general, $X = Y - Z$ (and, hence, $\Delta Y/Y = \Delta X/Y + \Delta Z/Y$), where Y is real GDP and X and Z are variously defined. In columns 3 and 4, X represents gross domestic purchases and Z is net exports; in columns 5 and 6, X is final sales of domestic product and Z is inventory investment. The table reports the standard deviations of $\Delta Y/Y$ and $\Delta X/Y$ and the ratios of these standard deviations.

ing the production and distribution of goods and services. These innovations have had an important impact on the types of jobs available, on income mobility and on the quality of life.⁷ But are they important for monetary policy? Have they changed the character of the business cycle? The evidence is mixed.

It is clear that a substantial portion of the output gains we've enjoyed have been achieved not through rapid productivity growth but by utilizing the labor force more intensively. Significant further increases in labor-force utilization rates are probably not sustainable. Hence, employment growth rates are likely to taper off soon. Output growth must also decelerate, unless measured productivity growth picks up. A round of technical improvements to our price indexes may give measured productivity growth the required boost. In any event, it's not the Federal Reserve's job to try to dictate if or when a slowing in real growth will occur. Rather, it's the Fed's job to try to keep measures of *nominal* demand expanding steadily, at a pace consistent with low long-run inflation (Koenig 1995).

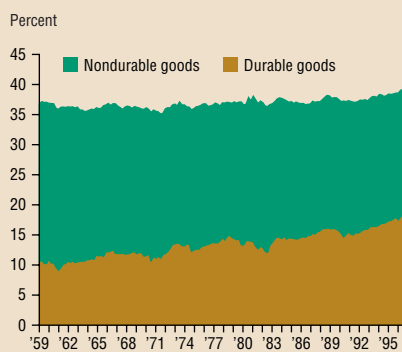
New-paradigm advocates are correct when they say that firms' pricing power has diminished recently and that this change in pricing power has been reflected in a shift in the trade-off between unemployment and output-price inflation. Here again, accelerating productivity growth is an inadequate explanation for what's gone on. However, it's clear that increasing global competition has helped hold price increases in check. The fact that the ratio of output

prices to unit labor costs remains at a high level raises hopes that low inflation can continue for a while longer, even if labor markets stay tight.

The idea that the real economy is less volatile now than in the past also seems to be correct. The explanation is neither that the economy has become less goods intensive nor that markets have become more global in scope. Most of the credit goes to more tightly controlled inventories. The undiminished importance of goods production in aggregate output suggests that traditional leading indicators—which are oriented toward the goods-producing sector—have not outlived their usefulness. This fact and the economy's increased stability mean that the monetary policymaker's job may be getting easier.

—Evan F. Koenig

CHART 7
THE SHARE OF GOODS IN REAL GDP HAS BEEN SLOWLY RISING



SOURCE: U.S. Department of Commerce.

Notes

- ¹ Greenspan (1998) makes a similar point. For a thorough, yet readable, analysis of productivity trends, see Webb (1998). For a rigorous test of the hypothesis that productivity growth has accelerated during the 1990s, see Filardo and Cooper (1997).
- ² Chart 1 is an updated version of a chart presented in Krugman (1996) and Koenig (1997).
- ³ For a description of the technical changes to the CPI, see Jacobs (1997).
- ⁴ I estimated a vector autoregression in fourth-quarter-over-fourth-quarter changes in the relative price of food and energy, fourth-quarter-over-fourth-quarter changes in the relative price of imports, the fourth-quarter unemployment rate, and fourth-quarter-over-fourth-quarter changes in the chain-weight GDP price index. Changes in the relative import price were weighted by the value of imports relative to the value of gross domestic purchases.
- ⁵ For a more detailed analysis of the issues discussed in this section, see McConnell and Quiros (1997).
- ⁶ Alternatively, there may have been a shift in the composition of output toward goods-producing industries where inventories are more easily controlled.
- ⁷ The Federal Reserve Bank of Dallas has devoted several annual reports to these issues. See Cox and Alm (1992–96).

References

Cox, W. Michael, and Richard Alm (1996), "The Economy at Light Speed: Technology and Growth in the Information Age—and Beyond," Federal Reserve Bank of Dallas *Annual Report*.

— (1995), "By Our Own Bootstraps: Economic Opportunity and the Dynamics of Income Distribution," Federal Reserve Bank of Dallas *Annual Report*.

— (1994), "The Service Sector: Give It Some Respect," Federal Reserve Bank of Dallas *Annual Report*.

— (1993), "These Are the Good Old Days: A Report on U.S. Living Standards," Federal Reserve Bank of Dallas *Annual Report*.

— (1992), "The Churn: The Paradox of Progress," Federal Reserve Bank of Dallas *Annual Report*.

Filardo, Andrew J., and Paul N. Cooper (1997), "Cyclically-Adjusted Measures of Structural Trend Breaks: An Application to Productivity Trends in the 1990s," Unpublished manuscript, Federal Reserve Bank of Kansas City, November.

Greenspan, Alan (1998), testimony before the Joint Economic Committee of the U.S. Congress, June 10.

Jacobs, Jill (1997), "Now You See It...The Pattern of CPI Inflation in 1996," Goldman Sachs *U.S. Economic Research*, April 30.

Koenig, Evan F. (1997), "Is the Fed Slave to a Defunct Economist?" Federal Reserve Bank of Dallas *Southwest Economy*, Issue 5, pp. 5–8.

— (1995), "Optimal Monetary Policy in an Economy with Sticky Nominal Wages," Federal Reserve Bank of Dallas *Economic Review*, Second Quarter, pp. 24–31.

Krugman, Paul (1996), "Stable Prices and Fast Growth: Just Say No," *Economist*, August 31, pp. 19–22.

McConnell, Margaret M., and Gabriel Perez Quiros (1997), "Output Fluctuations in the United States: What Has Changed Since the Early 1980s?" Unpublished manuscript, Federal Reserve Bank of New York, January.

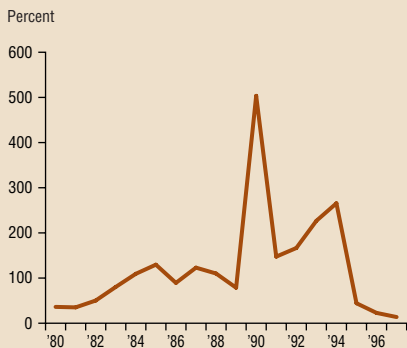
Webb, Roy H. (1998), "National Productivity Statistics," Federal Reserve Bank of Richmond *Economic Quarterly* 84, no. 1, pp. 45–64.

Latin American Central Banking: Does Independence Make a Difference?

SINCE THE 1980s, many countries in Latin America have undergone fundamental changes to their political and economic structures. Democracies are beginning to take hold where authoritarian regimes were common; large state-run enterprises are being dismantled or sold; and economic growth, which eluded the region for most of the previous decade, is slowly returning.

Accompanying these political and economic shifts have been fundamental reforms to central banking. Central banks have become more independent, and policy has grown more transparent. Countries such as Chile, Mexico and Peru have all taken steps to create more independent central banks. The aim of these changes has been to create a more credible anti-inflation program, and recent inflation rates in the region seem to indicate that the reforms are working. As Chart 1 shows, after experiencing damaging price instability over the past two decades, inflation in Latin American countries has declined from over 500 percent in 1990 to just under 14 percent last year.

CHART 1
LATIN AMERICAN INFLATION



SOURCE: International Monetary Fund, *International Financial Statistics*.

But how much of Latin America's recent success in fighting inflation is due to more independent central banks, and how much is due to other fundamental economic and political changes? Although institutional changes to central banks can make a return to high inflation more difficult and costly, the bottom line is that there is no shortcut to achieving a credible anti-inflation program through such changes. Credibility can only be achieved over time with a demonstrated broad-based commitment to keep inflation low.

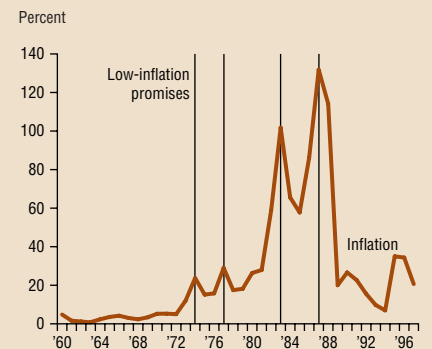
The Argument for Central Bank Independence

Why should the institutional framework of central banks make a difference in determining inflation? Presumably, if a government wants lower inflation, all it has to do is restrict fiscal spending and slow the growth of the money supply.

The problem is, however, that a government's promise to reduce inflation is often not believable. People understand that elected governments have an incentive to create higher-than-expected inflation for temporary employment gains and political support. If expectations of future inflation remain high, people will not accept wage adjustments of less than the rate of expected inflation, so any attempt to reduce inflation will be costly in terms of increased unemployment and higher interest rates.

Central bank independence may make a difference by reducing the elected government's influence on monetary policy. By handing over monetary policy decisions to an independent central bank with a clear mandate to keep inflation low, a government may create a more credible anti-inflation policy. The

CHART 2
MEXICAN INFLATION RATE



SOURCE: International Monetary Fund, *International Financial Statistics*.

idea is that an independent central bank does not have the same political incentive to inflate as do elected members of government.

Prior to the 1990s, Latin America exemplified the difficulties associated with creating a credible anti-inflation policy. Mexico, for instance, suffered increasing bursts of inflation after several failed inflation-fighting programs. As Chart 2 shows, during the 1970s and 1980s, anti-inflation programs that were implemented at inflation peaks were ultimately abandoned, and inflation subsequently accelerated to new highs. As inflation programs failed, the credibility of the government's inflation-fighting promises diminished, and, as a result, citizens raised their inflation expectations. Each subsequent anti-inflation program was less effective and more costly (in terms of reduced output) to implement. Consequently, the government accommodated higher inflation expectations with an increasing rate of money supply growth. Inflation eventually peaked in 1987 at an average annual rate of over 130 percent.

A similar scenario occurred in Argentina over roughly the same period

when the government's credibility fell after each subsequent inflation burst. Argentina's inflation eventually peaked at more than 3,000 percent in 1990.

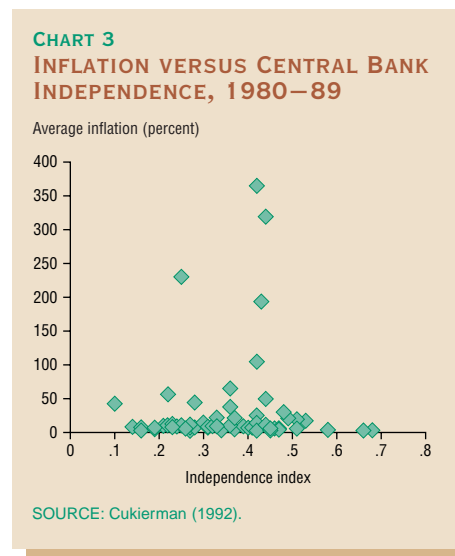
Central Bank Independence

The expected benefit of an independent central bank is that it is removed from political control, and, as a result, policy reversal is made more difficult. A government that wants to boost the money supply to increase output and employment temporarily may find it more difficult to do so because it would involve changing laws and the operational structure of the central bank.

But the factors that characterize independence are not precise, and they vary quite a bit across countries. Actual, as opposed to formal, central bank independence depends not only on the degree of independence conferred on the bank by law, but also on many other factors, such as informal arrangements between the bank and other parts of government, the quality of the bank's research department, and the personalities of key individuals in the bank and other economic policy-making departments like the treasury. Obviously, it's hard to quantify independence in a completely objective manner.

There are, however, some elements of independence that are more relevant and easier to observe than others. Alex Cukierman of the University of Tel Aviv has put together a measure of central bank independence that depends on four factors: (1) the method by which independence is achieved, (2) how the head of the central bank is appointed and the length of the appointment, (3) the central bank's policy mandate and (4) restrictions on government borrowing from the central bank.¹ Given these measures, is there evidence that central bank independence is associated with lower inflation?

Evidence on Central Bank Independence and Inflation. Although central bank independence may make



an anti-inflation program more credible, in general a relationship between legal independence and inflation does not hold. Chart 3 shows average inflation rates for 68 countries mapped against an index of central bank independence based on the four factors mentioned above. There does not appear to be even a weak relationship between measured central bank independence and inflation.

Why isn't measured independence necessarily associated with lower inflation? First, as mentioned above, a legal definition of independence does not always mean that a bank is independent in practice, nor does it mean that a bank without legal independence is run completely by the elected government. Consequently, the degree of central bank independence is sometimes difficult to measure and can be subject to varying degrees of political pressure. Moreover, fiscal spending is important. Countries with large public sectors and huge budget deficits are likely to exert tremendous pressure on the monetary authorities to print money to pay down existing debt. With enough political pressure, even constitutions can be changed. And in countries with less stable governments and shorter histories of price stability, legally declaring

a central bank independent may not mean much.

Even with the best institutions, there appears to be no quick and easy way to gain a credible anti-inflation program. Credibility can only be gained over time with a demonstrated commitment to price stability. However, in addition to other reforms, central bank independence may help. It can send a powerful signal to individuals that the elected government is serious about reducing inflation by making policy reversal more difficult. If central bank independence is pursued along with other policies such as more transparent operating policies and a reduction in general fiscal spending, a low-inflation program is that much more credible.

After years of costly high and variable inflation, polls in many Latin American countries indicate overwhelming support for fiscal and monetary restraint, despite periods of high unemployment. Recent sustained declines in inflation in the region are consistent with this support. Consequently, much of Latin America's recent central banking reform reflects a general desire to keep inflation low. Legal central bank independence is a key but not the sole determinant of low inflation.

—David M. Gould
Justin Marion

Note

¹ Alex Cukierman, *Central Bank Strategy, Credibility, and Independence* (Cambridge, Mass.: The MIT Press, 1992).

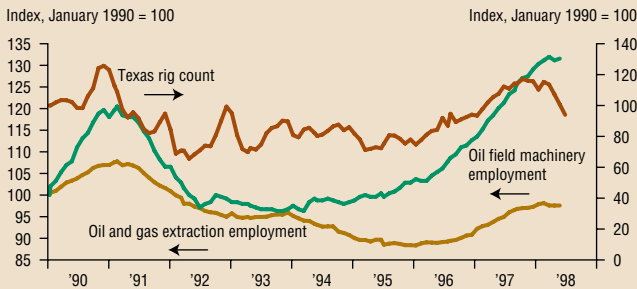
The Texas economy continued to grow at a fast clip in May, with employment increasing at a 4 percent annualized rate. The construction and service industries were the main sectors behind this growth. However, the detrimental effects of Southeast Asia's financial crisis are showing up in the energy and high-tech sectors.

Construction activity remains vigorous, and most construction industry indicators are pointing to continued

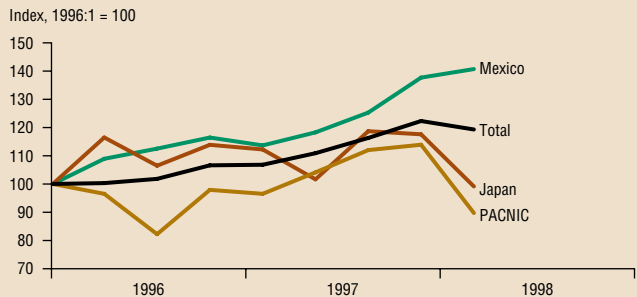
strength. Employment increased at a robust 8.8 percent annual rate in May, buoyed by the extremely strong residential sector. Both single-family and multifamily permits continued to increase in April. Residential contract values were also up 30 percent (annualized) between March and April. Brisk construction activity has fueled increased job gains in the construction-related manufacturing industries such as lumber and wood, and stone, clay and glass.

The service-producing sector continues to be a source of strength for the Texas economy. Private service-producing sector employment growth was a very healthy 5.5 percent (annualized) in May. A thriving national economy continues to boost the transportation and distribution sectors in Texas. Similar employment growth is seen in communications services (9.3 percent annualized) and narrowly defined services (6.9 percent annualized), which include firms in business, engineering and legal

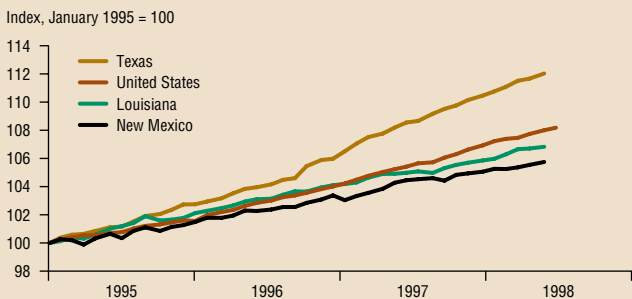
RIG COUNT AND OIL INDUSTRY EMPLOYMENT



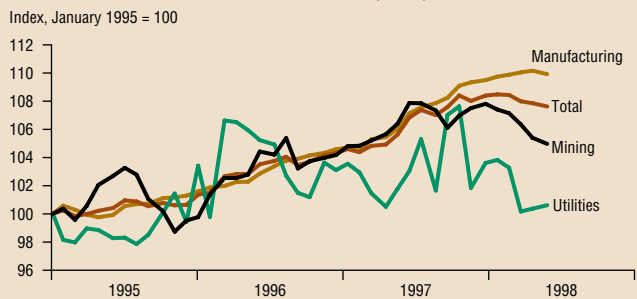
REAL TEXAS EXPORTS



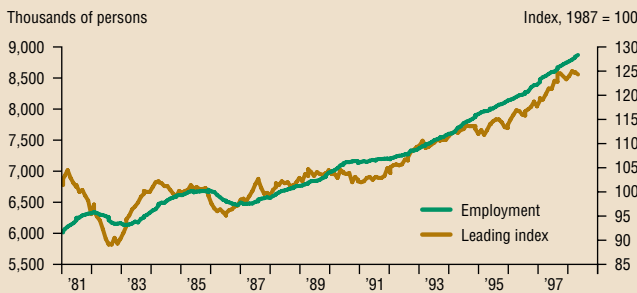
TOTAL NONFARM EMPLOYMENT



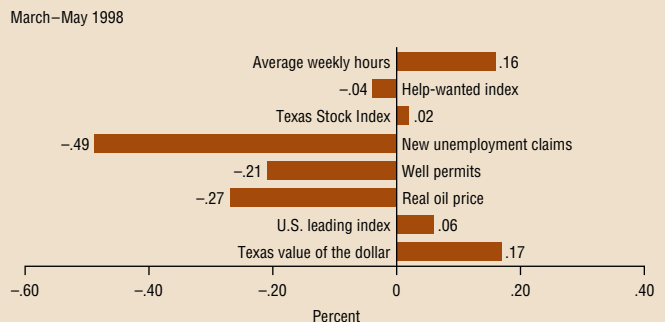
TEXAS INDUSTRIAL PRODUCTION INDEX (TIPI)



TEXAS LEADING INDEX AND NONFARM EMPLOYMENT



NET CONTRIBUTIONS OF COMPONENTS TO CHANGE IN LEADING INDEX



services. Computer services, which are included in the business services category, continue to be very healthy, augmented by demand for consulting for Y2K systems upgrades.

The problems in Southeast Asia are hurting the energy and high-tech industries. In the energy sector, low oil prices have weakened the upstream portion of the industry, and feeble product demand and low product prices have taken their toll on the downstream portion. The decline in oil prices, due to oversupply and an unusually warm winter, was exacerbated by slower demand from Southeast Asia. Low oil prices have slowed what had been a vibrant energy industry in Texas for the past couple years. Both employment and rig count, good measures for the upstream energy industry in Texas, have weakened recently. Employment growth has flattened, and the rig count has dropped considerably.

The high-tech industry is undergoing a restructuring and consolidation. Sales and profits have fallen in the high-tech industry as the result of two intermingling factors at work: lower domestic demand for high-end computers and weak demand, due to the Asian crisis,

for products using chips. Employment growth in industrial machinery (which includes computers) and electronics (which includes semiconductors) has flattened in Texas.

The Asian crisis is also affecting Texas exports. Total Texas exports fell 2.5 percent (quarter over quarter) in the first quarter of 1998. The chart titled "Real Texas Exports" shows that this decline was concentrated in exports to Japan and Pacific newly industrialized countries (PACNIC). While exports to Mexico increased 2.2 percent in the first quarter, exports to Japan, Korea and China fell 16 percent, 50 percent and 41 percent, respectively. The decreases in exports were led by declines of 2.8 percent in electronics, 6 percent in industrial machinery and 2.5 percent in chemicals.

The Texas economy is unlikely to sustain the high rate of employment gains seen in the first five months of the year. The continuing drag from Southeast Asia, along with the expected deceleration of the national economy, should slow Texas growth in the second half of the year.

—Mine K. Yücel

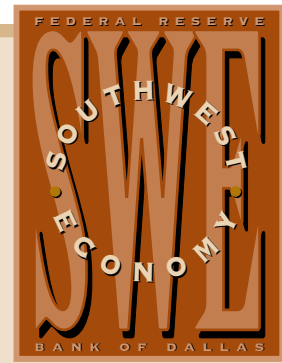
REGIONAL ECONOMIC INDICATORS

	Texas employment*							Total nonfarm employment*		
	Texas Leading Index	TIPI total	Mining	Construction	Manufacturing	Government	Private service-producing	Texas	Louisiana	New Mexico
5/98	124.3	127.9	169.9	487.7	1,099.0	1,490.8	5,623.5	8,870.9	1,871.9	717.5
4/98	124.8	128.2	170.0	484.3	1,097.4	1,490.5	5,599.8	8,842.0	1,869.8	716.1
3/98	124.6	128.3	169.9	481.7	1,097.0	1,488.4	5,592.8	8,829.8	1,868.9	714.9
2/98	125.0	128.9	170.8	479.1	1,094.2	1,481.6	5,570.6	8,796.3	1,862.6	714.1
1/98	124.0	128.9	170.4	475.7	1,091.8	1,481.3	5,551.0	8,770.2	1,857.0	714.2
12/97	123.3	128.8	169.4	470.9	1,094.0	1,480.0	5,532.0	8,746.3	1,854.9	712.8
11/97	123.9	128.4	169.0	468.1	1,091.6	1,478.2	5,514.6	8,721.5	1,852.1	712.0
10/97	124.5	128.8	168.9	464.3	1,088.3	1,475.3	5,494.4	8,691.2	1,849.4	711.3
9/97	124.6	127.9	168.6	465.6	1,087.7	1,475.0	5,474.8	8,671.7	1,845.4	708.5
8/97	122.8	127.2	168.3	465.5	1,084.4	1,480.6	5,445.5	8,644.3	1,839.4	709.7
7/97	123.0	127.6	167.3	461.4	1,079.9	1,469.8	5,425.6	8,604.0	1,841.3	709.2
6/97	121.3	127.0	165.6	457.9	1,081.5	1,472.2	5,418.1	8,595.3	1,839.6	708.7

* in thousands

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.



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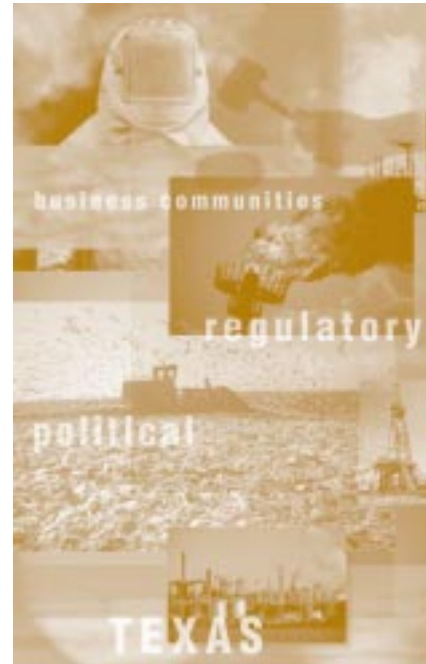
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