

## A TALE OF THREE SUPPLY SHOCKS, NATIONAL INFLATION AND THE REGION'S ECONOMY

**I**N RECENT YEARS, several supply shocks—unusual shifts in production costs—have kept U.S. inflation low by putting downward pressure on prices for certain commodities, especially computers, health care and, until 1996, energy.<sup>1</sup> Because the sectors producing these goods and services are important to the Eleventh Federal Reserve District, these shocks have had an impact on its economy. After examining these shocks' effect on U.S. inflation, this article analyzes their impact on the District and assesses the outlook for computers, energy and health care.

### Supply Shocks and U.S. Inflation

U.S. inflation has remained low through early 1997, even though, since 1995, the unemployment rate has been below 5.75 to 6 percent, a range below which inflation had previously tended to rise.

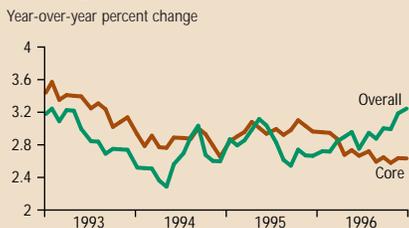
There are three plausible explanations for this change in behavior. One is that job uncertainty has held down wages.<sup>2</sup> Another is that the competitive pricing environment of the 1990s has enabled the econ-

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*Does Electronic Money  
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### Chart 1 Overall and Core Inflation Diverge in 1996 ...



### ... As Energy Price Swings Drive Overall U.S. Inflation



SOURCE: Bureau of Labor Statistics.

omy to operate at higher capacity levels without a pickup in inflation, or—put another way—has slowed the pace at which excess demand pressures induce rises in inflation, as some of my research under way suggests.<sup>3</sup> A third explanation—the focus of this article—is that inflation has been low because several supply shocks have put downward pressure on prices for three key commodities: computers, energy and health care.

Between 1993 and early 1994, inflation fell, according to both the consumer price index (CPI) and the core CPI, which excludes food and energy prices (*top panel, Chart 1*). The overall CPI has drifted upward since early 1994, picking up from mid-1994 to mid-1995, slowing in late 1995 and then picking up again in 1996. In contrast, core CPI inflation was stable over 1994–95 before slowing in 1996. A comparison of the upper and lower panels of Chart 1 suggests that most of the wiggles in the overall CPI reflect swings in consumer energy prices. On the surface, the slowing of core inflation last year seems puzzling in the face of rising energy prices, which had tended to bolster core inflation in the past.<sup>4</sup> However, innovations in both health care delivery and computers have played an important role in holding down core inflation.

As shown in the upper panel of Chart 2, medical inflation resumed falling in late 1995 after leveling off over mid-1994 to early 1995. Indeed, medical inflation has declined more than overall inflation has in the mid-1990s, reflecting the shift toward managed health care and the adoption of other cost-saving practices.

In the mid-1990s, the pace at which computer prices have fallen (deflation) has swung substantially. After slowing sharply in 1994, deflation in the “electronic computers” category of the producer price index accelerated sharply (*middle panel, Chart 2*), partly reflecting technological advances in computer chips as well as excess plant capacity and inventory buildup prompted by overly optimistic expectations. These wholesale price movements influence retail consumer prices in the CPI’s home furnishings category, which comprises furniture, computers, other electronic goods and home appliances. Comparing the middle and lower panels of Chart 2, one can see how wholesale computer price deflation has influenced consumer home furnishings’ inflation in the mid-1990s. Indeed, on a year-over-year basis, prices for home furnishings actually had dipped 0.1 percent as of December 1996, while producer prices for electronic computers had fallen 21 percent. Excluding its home furnishings component, core inflation barely decelerated in 1996.

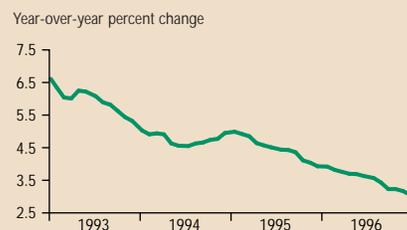
Thus, the pickup in overall inflation and the decline in core inflation during 1996 largely reflect the two extremes of an acceleration of energy price inflation (overall) and an acceleration of computer price deflation (core). This pattern suggests that isolated price developments may be distorting the inflation picture. One way to filter out the disproportionate influence of unusual price factors is to measure inflation by excluding the highest 10 percent inflation components (by expenditure weights) and the lowest 10 percent inflation components.<sup>5</sup> This “trimmed mean” CPI measure (*Chart 3*) shows an upward drift in inflation since late 1995—consistent with the view that the economy has been operating at levels of the unemployment rate previously associated with rising inflation.<sup>6</sup>

## Supply Shocks and the Region

Each of these supply shocks has affected Eleventh District employment trends. With respect to computers, advances in technology have spawned an increased demand for information equipment and, until late 1995, a concomitant rise in production and capacity. Indeed, as semiconductor orders continued to exceed shipments, reflected in a domestic book-to-bill ratio above 1,<sup>7</sup> high-tech manufacturing job growth was very strong in District states (Texas, Louisiana and New Mexico), as shown in the upper panel of Chart 4.<sup>8</sup>

However, as demand growth for computer equipment unexpectedly slowed in 1996, computer chip plant

### Chart 2 After Pausing in 1994, Health Care Disinflation Resumes ...



### Computer Price Deflation Accelerates ...



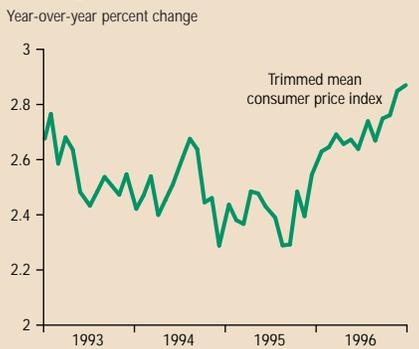
NOTE: Prices based on the producer price index for the computer electronic category.

### ... Driving Down Home Furnishings Prices



SOURCE: Bureau of Labor Statistics.

**Chart 3**  
Filtering Reveals a Modest Pickup in U.S. Inflation



SOURCES: Bureau of Labor Statistics; author's calculations.

capacity outstripped demand. The temporary imbalance between production and orders was reflected in a decline in the domestic book-to-bill ratio to levels below 1, generally indicating that domestic shipments exceeded orders.<sup>9</sup> Overproduction and overexpansion of capacity led to a buildup of inventories and an unexpected drop in memory chip prices, which in turn slowed job growth in the overall high-tech manufacturing industry in District states.

This deceleration in high-tech job growth helps explain why nonfarm job growth in Texas slowed toward the U.S. average in 1996, after several years in which it substantially exceeded the national average. As demonstrated by two Dallas Fed researchers, the high-tech sector—which includes high-tech manufacturing along with communications and computer-related services—was a major contributor to Texas job growth over 1988–94.<sup>10</sup> Roughly half of the broadly defined high-tech jobs in Texas are in the Dallas–Fort Worth metroplex, where there is a high concentration of telecommunications firms, while roughly one-fifth are in Austin, where computer chip production expanded rapidly in the first half of the 1990s.

Within Texas, the weakening of the computer chip market was most apparent in Austin, where overall job growth decelerated from a rapid to a moderate pace. By contrast, job growth maintained a strong pace in the Dallas–Fort Worth metroplex, whose economy, relative to that of Austin, is less dependent on the high-tech sector

and, within this sector, is less focused on computer chip production.

In contrast to computer prices, energy prices rose in 1996, reflecting a sudden weather-related rise in demand coupled with low inventories. This price rise spurred the oil industry to expand exploration and hiring.<sup>11</sup> In addition, new exploration technology made it more profitable to search for oil under waters where an ocean-bottom salt layer had previously obscured reserves—especially true of the Gulf of Mexico. Both high energy prices and a technological innovation favoring oil exploration in local waters have boosted drilling in the gulf and energy employment in the Eleventh District's states (*middle panel, Chart 4*). Increased worldwide demand for drilling equipment has also bolstered manufacturing employment in areas such as Houston.

Finally, the restructuring of health care has slowed job growth in that sector, despite the continued increasing demand for health care associated with a general aging of the population. Health care restructuring likely contributed to a recent slowing of the pace at which the share of private health care employees in the District's three states has risen (*lower panel, Chart 4*).<sup>12</sup>

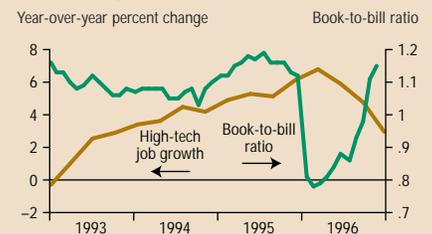
## The Outlook for Computers, Energy and Health Care

**Computers.** Some analysts attribute last year's speedup in computer price deflation to two factors that reduced prices for semiconductors (memory and microprocessor chips), which are important computer components. First, prices for memory chips (such as DRAMs) plummeted in early 1996, largely reflecting the overexpansion of capacity as growth in the demand for high-tech equipment unexpectedly moderated. Recently, memory chip prices appear to have nearly stabilized and may have bottomed out (*upper panel, Chart 5*). Second, computer prices fell in 1996, partly because cost-saving innovations to microprocessors, such as the Pentium chip, were more widely adopted. This second factor may

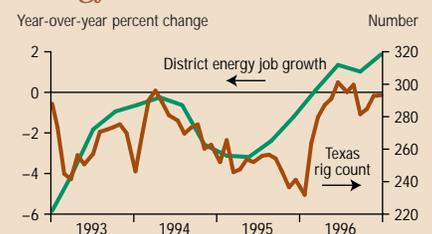
wane over 1997–98 if some analysts are correct in predicting that microprocessors are nearing the end of the *current* wave of innovation, as suggested by the slower pace of microprocessor price deflation since early 1996. Perhaps for similar reasons, prices for integrated circuits—another key computer component—have declined at a slower pace since spring 1996.

Nevertheless, computer price deflation actually picked up to more typical levels last year, as reflected in the GDP chain-weight price index for computers and peripheral equipment investment (*lower panel, Chart 5*). This index excludes typewriters and noncomputer equipment, whose share of GDP's broader "information-processing and related equipment" component of busi-

**Chart 4**  
District High-Tech Manufacturing Jobs Reflect Semiconductor Industry's Fortunes

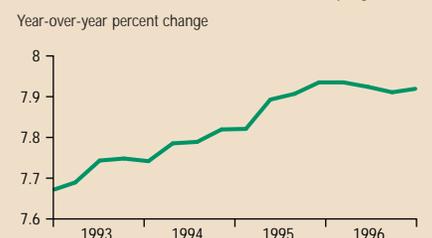


**Oil Drilling and District Energy Jobs Recover**



**Restructuring Slows Growth Of District Health Care Jobs**

(Health Care Share of Total District Employment)



SOURCES: Bureau of Labor Statistics; Semiconductor Industry Association; Baker Hughes.

ness investment has fallen over time. Nevertheless, even though computer price deflation was near its long-run average last year, the pace of deflation has been very volatile.<sup>13</sup> The unpredictability of past technological breakthroughs makes it difficult to anticipate future computer prices.

Within the District, several factors suggest renewed but moderate output growth in this industry. On the plus side, more realistic expectations and the return of balance between chip orders and shipments may be setting the stage for a modest near-term expansion. In addition, retail demand for computers may be bolstered in coming quarters by the introduction of new microprocessors, such as the MMX chip, which enhances the audiovisual and multimedia capabilities of new PCs. Furthermore, export demand could pick up if the economies of Western Europe and Japan begin to experience a strong recovery from their recent slowdowns. On the downside, unless product improvements such as the MMX boost the demand to replace old PCs, some analysts are concerned that growth in the domestic PC market will slow as the share of households with personal computers rises at a slower pace than in the early 1990s.

**Energy.** Based on energy futures markets (markets in which people buy energy today for delivery at a future date), oil prices are expected to be near \$20 a barrel in mid-1997, down from \$25 a barrel at year-end 1996. Factors behind this expected fallback include an end to the severe winter weather in Europe that had helped drive up prices, some rebuilding of inventories and an increased supply of oil. If these expectations prove correct, energy prices will fall and help push down CPI inflation from the 3.3 percent pace posted between December 1995 and December 1996.

In addition, if futures markets prove correct, energy-related job growth will slow. However, producers have viewed energy prices as being temporarily high and have cautiously expanded production and hiring. This prudence will likely temper any price-driven slowing of energy job growth in 1997. In addition, because of the decline in ex-

ploration costs, oil production and production of oil equipment may not slip as much if a modest price decline materializes.

**Health Care.** There is some concern that much of the recent health care disinflation largely reflects the transition from traditional insurance to managed care plans. Indeed, some studies maintain that employer costs for health care coverage typically fall sharply within the first or second year following a switch to a health maintenance organization (HMO) but thereafter increase at the general pace of medical inflation.<sup>14</sup> Put another way, health care disinflation accelerates when the pace at which people shift into managed care picks up. But when the transition is largely completed, the trend of falling medical inflation could slow or even end.

Some analysts believe that, in addition to completing the transition to managed care, HMOs and insurers will need to step up the pace of price increases in coming years to rebuild profit margins. Some of these analysts argue that HMO and insurance price hikes have not kept pace with health care

costs, and as a result, profit margins have been squeezed either too thin or to a minimum sustainable level. If either possibility proves correct and if cost inflation for providers does not decelerate enough, the pace of HMO and insurance premium inflation could very well pick up.<sup>15</sup> Whether health care inflation will rise or stabilize is uncertain because further innovations in health care delivery may enhance the ability of managed care to reduce costs, and future technological gains could accelerate cost savings.

With respect to the Eleventh District economy, it is unclear whether the pace at which people with medical coverage shift into managed care will slow. On the one hand, because Texas has lagged other states in moving to HMOs (HMO penetration in Texas was well below the U.S. average as of 1994), the shift may continue after the transition in the rest of the country is over. Thus, the shift toward managed care could arguably continue to slow health care employment growth in the region. On the other hand, because many Mexicans come to Texas for health care, the recovery of the Mexican economy could bolster health care employment in 1997-98. How these forces will balance out is unclear.

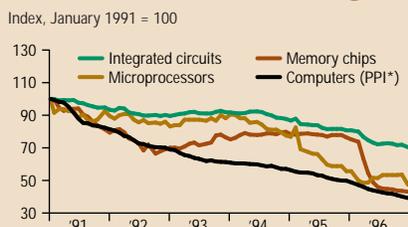
## Conclusion

Changes in the supply conditions for computers, energy and health care have substantially affected inflation in the United States and the composition of job growth within the Eleventh District. Because these industries have changed markedly in recent years and may continue to do so in unpredictable ways, supply conditions in these sectors can be viewed as a major wild card for future U.S. inflation and District employment patterns. However uncertain the outlook for computer, energy and health care prices, the way they actually evolve will almost certainly affect the direction of U.S. inflation and the regional economy.

— John Duca

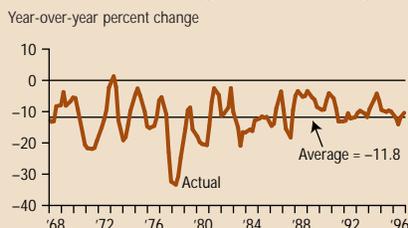
(See "Notes" on page 8)

**Chart 5**  
**Computer Component Prices Stabilize After Plummeting**



\* Producer price index.  
SOURCE: Bureau of Labor Statistics.

**Computer Deflation Moves Toward Its Long-Run Average**



NOTE: Prices based on the GDP chain-weight price index for computers and peripheral equipment investment.  
SOURCE: Bureau of Economic Analysis.

# DOES ELECTRONIC MONEY MEAN THE DEATH OF CASH?

*Cash is dirty. Cash is heavy. Cash is quaint. Cash is expensive. Cash is dying.*

—New York Times Magazine

*We've heard the techno-babble for years about a cashless society. But only now is the propeller-head contingent putting its digits where its mouth is.*

—Newsweek

ELECTRONIC MONEY HAS received much media attention recently, with journalists and economists alike predicting the impending “death of cash.” Some analysts forecast that within a few years the new electronic means of making payments will have permanently altered the payments system as we know it, with E-money completely replacing currency in the U.S. economy.

This article attempts to put the development of electronic money into a more realistic perspective. Rather than being a revolution unto itself, electronic money is really just another financial innovation within a payments system that is constantly evolving. During the early part of this century, most transactions were conducted with either cash or checks. In the 1960s, charge cards and credit cards provided the first alternative means of making payment. Deregulation of the financial institutions in the 1970s and 1980s brought about another round of financial innovation in the form of NOW (Negotiable Order of Withdrawal) accounts and money market funds, as well as the increased usage, acceptance and liquidity of bond and equity funds.

Considering the rapid pace of technological advancement over the past decade and consumers' growing desire for convenience, the development of electronic money is no surprise. Indeed, the widespread use of electronic money

is certain to have an impact on the way we do business in our economy, but it may be a bit premature to pronounce currency dead just yet.

## What Is E-Money?

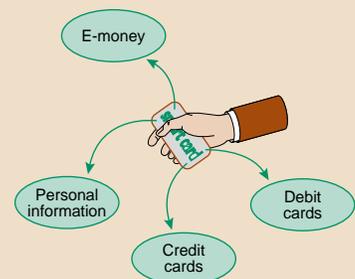
Despite the recent hype, many people are not sure precisely what is meant by the term *E-money* and the lingo that has developed around it. In a nutshell, electronic money refers to balances stored on a computer chip embedded in a *smart card* that can be used for transaction purposes. Because they are usually equipped with a central processing unit and have both long- and short-term memory, smart cards are capable of serving a variety of purposes at once. Chart 1 illustrates the possibilities of smart cards. It is technologically feasible for a single smart card to serve simultaneously as an electronic money card, several credit cards and a debit card, as well as contain personal information and identification such as a driver's license and emergency medical information. The smart cards in use today hold only electronic money, making them simply stored-value cards.

Although E-money is often touted as being equivalent to cash, there are both similarities and differences between the two instruments. Like cash, E-money (as well as checks, credit cards and debit cards) serves as a means of making payment in so much as

merchants are willing to accept it in exchange for goods and services. In addition, E-money has several “cash-like” qualities, such as anonymity and the ability to transfer value at the point of sale without engaging a third party (as with credit cards and debit cards). A key distinction, however, between E-money and cash is the issue of final settlement. With currency and coin, final settlement takes place the moment a transaction occurs. With E-money, final settlement must still be made with cash or bank reserves. In other words, electronic money is just another instrument for transferring ownership of cash or bank reserves from one party to another.

To bring this difference between cash and E-money into sharp relief, Chart 2 illustrates the clearing and settlement of a transaction conducted with currency and a transaction using electronic money. When consumers use cash to purchase goods and services, the transaction is settled on the spot. A transaction conducted with E-money must go through a more complicated clearing and settlement process, similar to that of a check. Depending on the arrangement between the consumer and the institution that issues the E-money, an individual downloads electronic money from his or her account onto a stored-value card by telephone, an ATM machine or perhaps a personal computer. The issuing institution then transfers balances from the

Chart 1  
Smart Card Potential



individual's account into its own general account. The individual may then spend that E-money with a merchant equipped and willing to accept the institution's electronic money, or may transfer balances to another individual who holds a smart card. The merchant then collects all its E-money balances at the end of the day and deposits them into its own bank, which settles directly with the institution that originally issued the E-money or indirectly through some type of clearinghouse.

The clearing and settlement of transactions made with E-money and transactions made with a check are quite similar, except with regard to *float*. The float associated with a check is the interval of time that begins when a merchant receives a check in payment for a purchase and ends when that check clears the bank upon which it was written. Clearly, the benefit from the float on checks goes to the consumer, especially in the case of interest-bearing checking accounts. The float with E-money, on the other hand, benefits the issuing institution since funds are transferred to the institution's account from the consumer's account the moment E-money is downloaded

and remain there until the merchant's bank redeems them. Unless unspent E-money balances earn interest, the issuers of E-money will reap the benefits from the lag between the time E-money is downloaded onto the card and the time the transaction clears the issuing institution.

### Just Another Financial Innovation

Electronic money has been hyped as a revolutionary development in the payments system, the likes of which have never been seen. Considering that a smart card with an embedded computer chip is like having a computer in your wallet, the technology surrounding E-money is indeed amazing. Nevertheless, the notion that a new means of payment, such as E-money, might displace an old means of payment, such as cash, is not new.

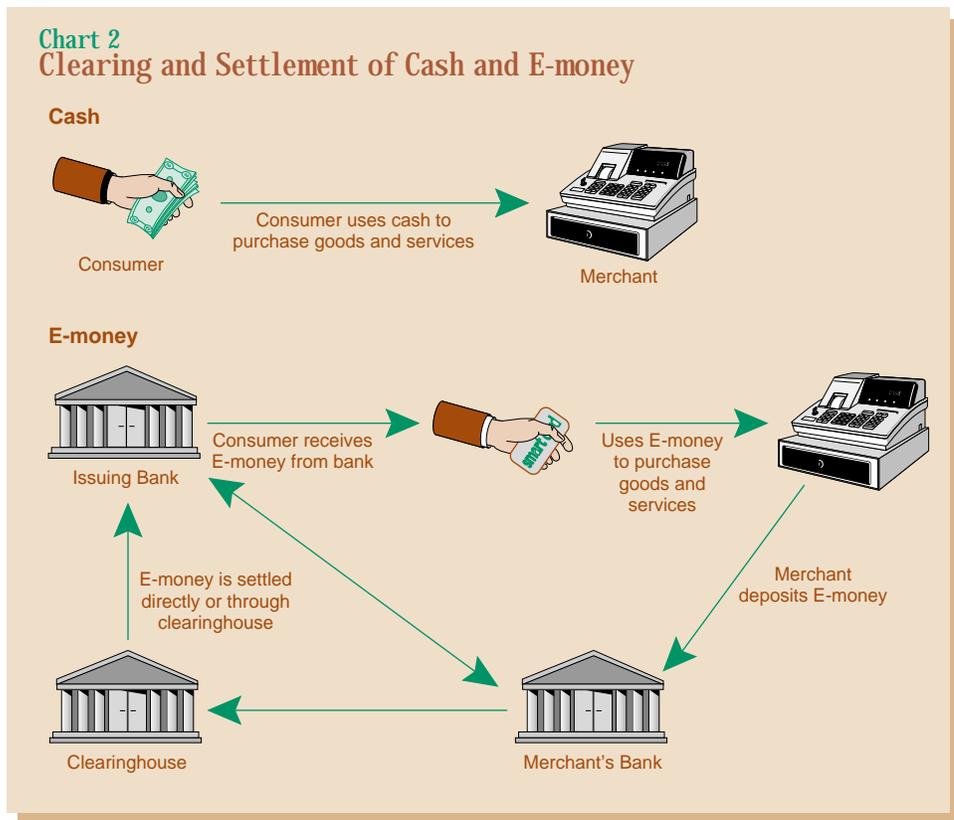
Chart 3 illustrates how the financial system and the notion of money have evolved over the past 25 years. Before 1970, money as a means of payment and a store of value was limited to three instruments: cash, demand deposits and interest-bearing savings accounts.

As the shaded areas of Chart 3 indicate, the value of currency and demand deposits in the economy has grown since the early 1970s. At the same time, however, there has been explosive growth in other payment instruments and means of holding wealth. In addition to traditional savings accounts—which held the lion's share of deposits until the late 1960s—there are small time deposits (CDs) and Other Checkable Deposits (OCDs), which both pay interest. These two innovations evolved to compete with traditional savings and checking accounts by offering higher rates of return in exchange for somewhat more limited access to funds. Innovation has taken place outside the traditional banking sector as well, with money market funds and bond and equity funds growing in value over the past 15 years to the point that they are now roughly as large in value as traditional savings accounts.

Why the explosion in alternatives to cash and demand deposits? Deregulation of the financial industry and a dramatic decline in transaction costs have made it possible for average citizens to hold their wealth in a way similar to what large firms and wealthy individuals have done all along—that is, hold financial assets that earn a relatively high rate of return, then rapidly liquidate those assets to meet expected expenditures. In other words, it is now easy and cheap to charge everything from groceries to gasoline on a credit card (which often offers incentives for use, such as free airline miles), then write one big check on a money market fund to cover the bill at the end of the month, bypassing currency and demand deposits completely. Most people continue to hold some cash and maintain a traditional checking account, but the decline of cash relative to other types of financial instruments has been going on for quite some time.

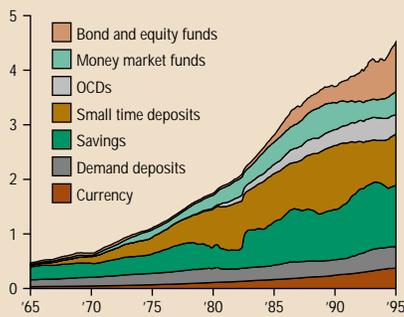
### E-Money Versus Cash

Compared with other financial innovations over the past few decades, E-money has been the most heavily hyped as a near-perfect substitute for cash. In light of such claims, what



**Chart 3**  
**Money Evolves**

Trillions of dollars



makes this high-tech means of payment better, or worse, than the good ol' greenback?

On the one hand, proponents of E-money claim it is convenient, fast and clean to use. With special equipment attached to their phones or through their PCs, E-money users can transfer balances onto their stored-value cards without ever leaving home. The point-of-sale terminals that accept E-money result in transactions that are quicker and cleaner than exchanges of cash or a check with a clerk. Perhaps E-money's most appealing feature is the elimination of the need for coins, which inevitably pile up in jars and desk drawers, only to be rolled and exchanged for bills later.

On the other hand, opponents of E-money worry about issues of anonymity, security, counterfeiting and general consumer resistance to changing payment habits. As we would expect in a market economy, institutions that issue E-money provide varying degrees of anonymity and security to appeal to the various wants and desires of their customers. Some institutions offer the ability to replace lost or stolen card balances, as with traveler's checks. Other institutions appeal to consumers more concerned with anonymity by offering electronic money that, once it has been downloaded onto the card and balances are transferred from the individual's to the institution's account, cannot be "matched" to the account from which it originated. As far as the risk of counterfeiting is concerned, the developers of E-money have invested vast resources in sophisticated encryption techniques and security systems, but the

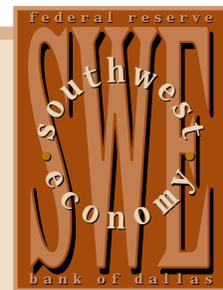
potential for fraud will remain unclear until large amounts of E-money are circulating in the economy.

The issue of whether E-money is easier to use and more convenient than other instruments for making payment will ultimately be decided by the wants and needs of the individual consumer. However, the overall convenience of E-money *vis-à-vis* other types of payment is evident in this scenario. Suppose that when shopping at your local supermarket, you have a choice of five checkout lines. The first line accepts only checks, the second credit cards, the third debit cards, the fourth cash and the fifth E-money. Which line is likely to move the most quickly? Given that checks must be written and presented with identification, that line would surely move most slowly. Credit cards are faster than checks but still require approval by the issuing institution and a signature from the consumer. Although using cash, debit cards and E-money is obviously quicker than using checks and credit cards, comparing the ease of transactions among those three alternatives is more difficult. Cash requires only that change be made if necessary. Paying with debit cards or E-money is simply a matter of swiping a card and confirming the amount. Cash, debit cards and E-money appear to be almost equivalent in terms of the time involved in making a transaction.

Regardless of the relative merits of E-money, consumer indifference—and even resistance—to adopting a new payment instrument will be a strong obstacle to overcome. The tendency of consumers to maintain payment habits is evident in the large number of checks they continue to write, despite the obvious advantage of the interest-free loan that credit cards offer when paid off in full at the end of the month. E-money will never offer sufficient advantages over currency to induce some individuals to change their habits, especially people who want absolute anonymity.

Consumer acceptance is crucial to the success of E-money, but the consumer is only part of the picture when it comes to transactions in the marketplace. Merchants play an equal, if not greater, role in the development of any means of payment. Lest we underesti-

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### Feedback

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mate the importance of merchant acceptance, recall the advent of credit cards. The BankAmericard and Master-Charge card were introduced in the United States in the mid-1960s. But according to an article that appeared in *Life* magazine in 1970, "bank cards still encounter areas of resistance. Most big department stores refuse to honor them....Restaurants in many places will have no part of them." Although credit cards were very attractive to consumers from the outset, the widespread use of credit cards was delayed by a lack of acceptance by merchants. If E-money is to succeed, it must prove its merits not only to the consumer but also to the retail community.

From a merchant point of view, the most promising aspect of E-money is the potential for substantial cost savings. It has been estimated that approximately 4 percent of the total value of a transaction made with currency is tied up in the counting, storing and protecting of that cash. Merchants are likely to be charged a fee for E-money transactions, as they are with credit cards, but electronic money may be slightly cheaper and easier for merchants to handle than cash. If so, merchants could offer in-

centives to induce consumers to use E-money rather than cash.

## Free Enterprise and E-Money

In a free enterprise system, innovations survive and flourish if the net benefit to users from a new product or service is greater than what existing substitutes offer. E-money is no exception. Should consumers and merchants fail to find the merits of electronic money sufficient to overcome any costs associated with its use, E-money could very well go the way of the Edsel.

The Federal Reserve to date has refrained from imposing regulations on electronic money (aside from the boundaries established by Regulation E) in favor of allowing the innovation to develop in a relatively unfettered market environment. The issuers of E-money do not expect individuals to hold relatively large balances on stored-value cards. So long as individual balances remain small, the potential failure of institutions that issue E-money poses no significant risk to consumers. Government intervention, therefore, appears unwarranted. In the absence of regula-

tion, the reputation of the issuing institution will be vital to the acceptance of its E-money. Should consumers and merchants doubt the safety and soundness of the institutions issuing E-money, they always have a near-perfect substitute to fall back on: currency.

—Marci Rossell

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(continued from page 4)

## Notes

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<sup>1</sup> Supply shocks are changes in technology (for example, computers), industrial structure (for example, health care) or world resource prices (for example, energy) that alter an industry's cost schedule and thereby cause substantial changes in its relative price.

<sup>2</sup> See John V. Duca, "Inflation, Unemployment, and Duration," *Economics Letters* 52 (September 1996): 293–98.

<sup>3</sup> For example, see Felix G. Rohatyn, "Recipe for Growth," *Wall Street Journal*, April 11, 1996, A21.

<sup>4</sup> For example, see Jeffrey C. Fuhrer, "The Phillips Curve Is Alive and Well," *New England Economic Review*, March/April 1995, 41–56.

<sup>5</sup> For an analysis of trimmed mean CPI measures, see Stephen G. Cecchetti, "Measuring Short-Run Inflation for Central Bankers," Federal Reserve Bank of St. Louis *Review* (forthcoming).

<sup>6</sup> The trimmed mean CPI can still be affected by changing supply conditions. For example, medical inflation shifted from being a high outlier excluded from the trimmed mean during much of the 1980s and early 1990s to being more in line with the pace of price rises in other items.

<sup>7</sup> For further discussion, see Sheila Dolmas and Mine Yücel, "The Texas Economy: An Overview of '96 and Outlook for '97," *Southwest Economy*, Issue 1, January/February 1997, 1–4.

<sup>8</sup> Data are based on the work of Dolmas and Yücel (1997). Note that because the book-to-bill ratio in Chart 4 is measured quarterly, whereas job growth is measured on a year-over-year basis, by construction the plotted job growth series will tend to lag the book-to-bill ratio.

<sup>9</sup> Note that the domestic book-to-bill ratio does not reflect the role of foreign demand. In addition, because the

ratio is based on nominal data, a spurt in computer price deflation will tend to lower this ratio because new orders reflect more recent and thus lower prices than shipments.

<sup>10</sup> See D'Ann M. Petersen and Michelle Thomas, "From Crude Oil to Computer Chips: How Technology Is Changing the Texas Economy," *Southwest Economy*, Issue 6, 1995, 1–5.

<sup>11</sup> For an analysis of District energy jobs and oil prices, see Stephen P. A. Brown and Mine K. Yücel, "The Energy Industry: Past, Present and Future," *Southwest Economy*, Issue 4, 1995, 1–5.

<sup>12</sup> Nevertheless, this ratio could overstate the impact of health care restructuring because it excludes health care workers in the public sector and because health care workers in the private sector likely have been more affected by cost-cutting and mergers.

<sup>13</sup> This measure is the cleanest aggregate measure of final computer goods prices that covers at least two decades. By contrast, the producer price index for the "electronic computers" category begins in 1990, and the CPI's home furnishings component blends computers with other items.

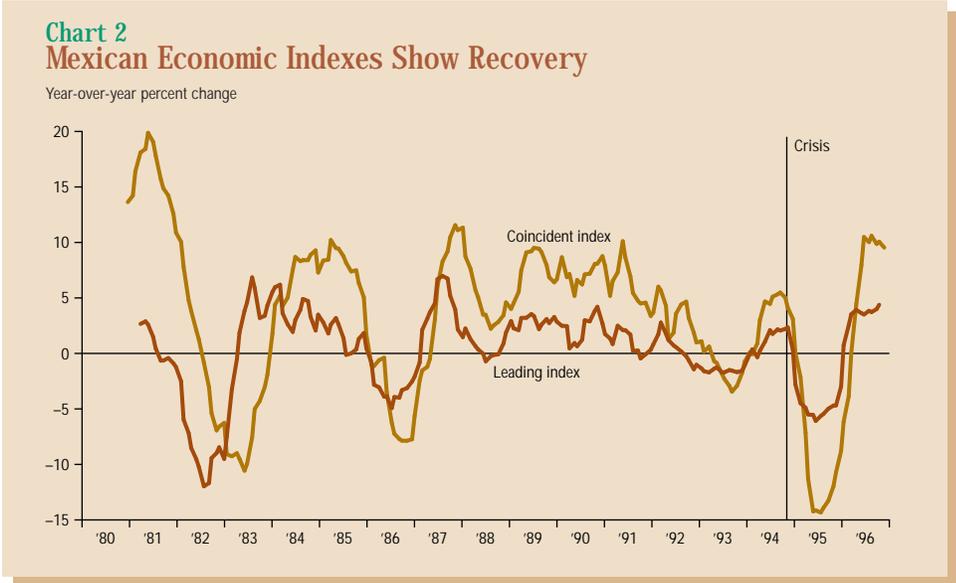
<sup>14</sup> See Elizabeth Kilbreth and Alan B. Cohen, "Strategic Choices for Cost Containment under a Reformed U.S. Health Care System," *Inquiry* 30 (Winter 1993): 372–88; J. P. Newhouse, W. B. Schwartz, A. P. Williams and C. Witsberger, "Are Fee-for-Service Costs Increasing Faster than HMO Costs?" *Medical Care* 23 (August 1985): 960–66; and Linda Radey and Richard Fullenbaum, "Are Employers' Health Benefit Costs Finally Under Control?" *Review of the U.S. Economy: Ten Year Projections* (Lexington, Mass.: DRI McGraw-Hill, 1995), 51–3.

<sup>15</sup> For details, see Millt Freudenheim, "Health Care Costs Edging Up and a Bigger Surge Is Feared," *New York Times*, January 21, 1997, national edition, A1 and C20; and Ron Winslow, "Health-Care Costs May Be Heading Up Again," *Wall Street Journal*, January 21, 1997, B1 and B6.

## The Mexican Economy Snaps Back

**M**EXICO'S 1995 ECONOMIC lunge was one of the most rapid in the nation's history, but the turnaround was also quick. Overall output is most back to the pre-crisis peak, but the particular stresses and strains of this comeback make it look different from past rebounds.

Mexico's recession and now burgeoning recovery have played out differently in the various sectors of the economy. Output in all sectors fell during the crisis, but the construction and wholesale and retail trade sectors were the hardest hit. Manufacturing also experienced a large decline; however, it benefited from a huge jump in exports. By the last half of 1995, all sectors had experienced a dramatic turnaround, with manufacturing leading the way. Even so, wage softness and a very slowly rebounding consumer sector remain problems. The availability of international financial markets to large companies, together with restricted credit for smaller and middle-sized firms as a result of troubles in Mexico's domestic banking system, has meant that the larger firms seem to be getting the lion's share of the growth.



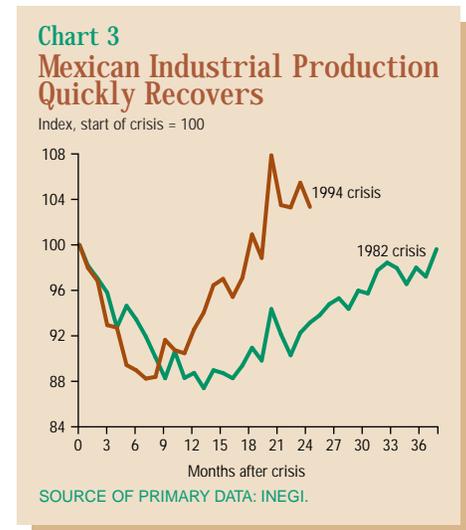
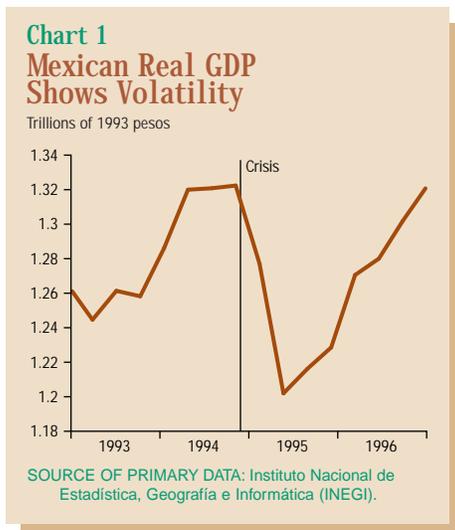
### The Nonfinancial Economy

Although real gross domestic product (GDP) fell 6.9 percent in 1995, it rose 5.1 percent in 1996 (*Chart 1*). The Federal Reserve Bank of Dallas does not forecast Mexican GDP growth for 1997 over 1996, but a consensus of private forecasters is that it will expand by about 4.5 percent. The index of leading economic indicators for Mexico, originally constructed at the Federal Reserve Bank of Dallas, shows increases throughout 1996. This pattern suggests expansion at least into the second quarter of 1997 (*Chart 2*).

Although overall output in Mexico is just now approaching its pre-crisis peak, industrial production had reached its previous peak by the middle of last year. This recovery was substantially more rapid than what occurred after Mexico's 1982 crisis, as can be seen in Chart 3. Chart 3 depicts the progress of industrial production on a month-by-month basis after the 1982 and 1994 economic crises. After the 1982 peak, industrial production took three years to reach its previous peak. This time, it took only 18 months.

Because of a dramatic increase in exports, manufacturing never suffered as much as the rest of the economy. But like most of the Mexican economy, manufacturing output dipped substantially during the first two quarters of 1995 (*Chart 4*).

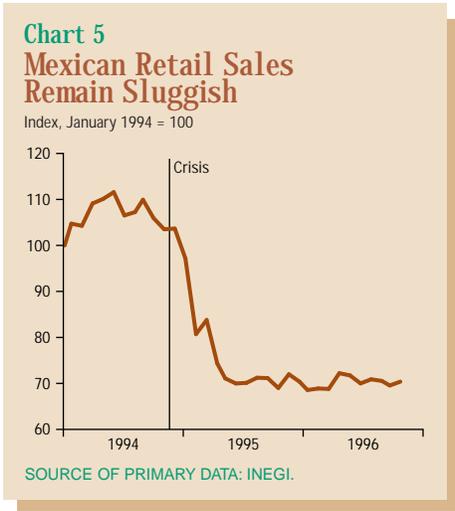
Trade liberalizations that began in the late 1980s had moved Mexican manufacturers into international competition. However, the failure of the



# Beyond the Border

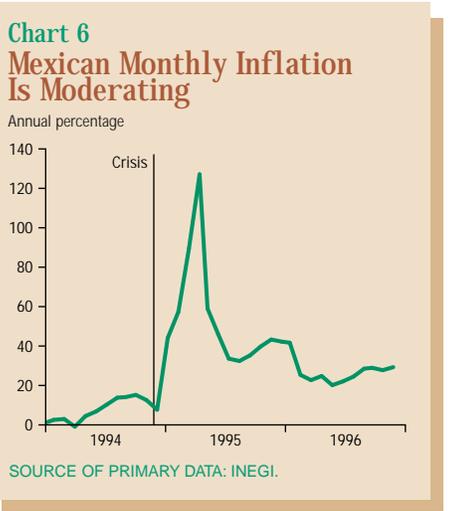
exchange rate to adjust for inflation rate differentials between Mexico and the United States made such competition increasingly difficult for Mexican manufacturers. The devaluation of December 1994 realigned prices in dollars sufficiently to trigger large increases in Mexican manufactured exports. As the manufacturing recovery ensued, investments in plant and equipment kept Mexican manufacturers competitive despite the nearly 15 percent appreciation of the real peso/dollar exchange rate in 1996.

This manufacturing rebound has now translated into similar growth throughout the economy. However, the manufacturing sector has surpassed pre-crisis levels, but the construction and wholesale and retail sectors have not. Construction, like many other sectors, did not benefit directly from the export-led boom and fell much more dramatically than manufacturing in the early months of the crisis. Now these sectors have made a dramatic turnaround but have yet to return to pre-crisis levels. Moreover, manufacturing real wages have fallen almost continuously since the economic downturn of 1995 because of the nation's soft labor market.



Because of the sectoral fragmentation of Mexico's recovery and falling real wages in manufacturing, there has been a very limited rebound in the consumer sector. Retail sales in Mexico are at a serious impasse, as Chart 5 demonstrates. Increases in wholesale and retail production apparently reflect anticipated rather than actual retail sales.

Nevertheless, the groundwork has been laid for long-run stability. The latest figure for monthly inflation, at a seasonally adjusted annual rate of 29.3



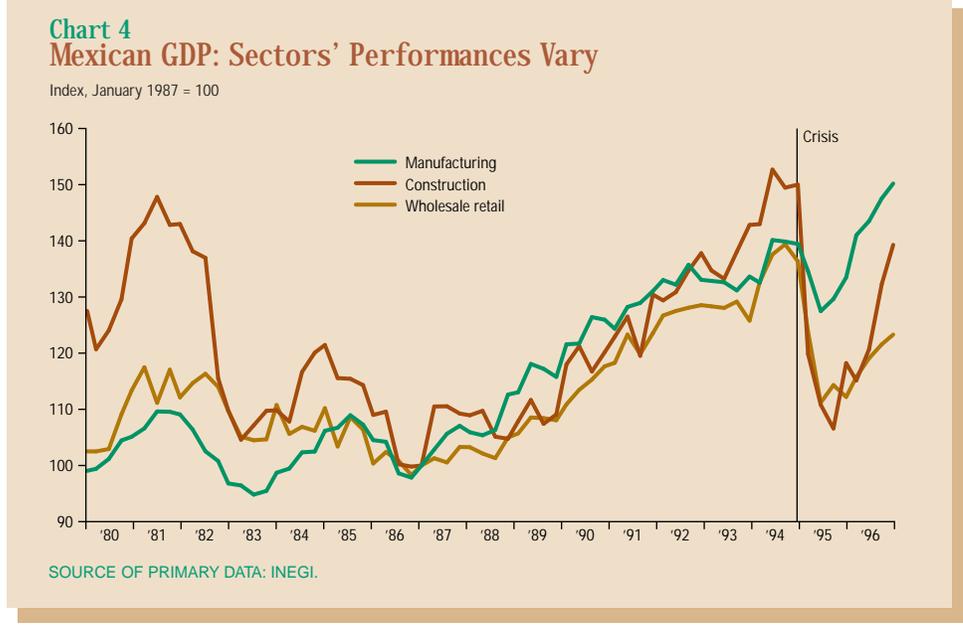
percent, is substantially below the 1995 average of 52 percent (Chart 6). Consensus expectations are that inflation will fall to 18 percent in 1997.

Moreover, financial markets behave as if they expect continued growth and stability. Interest rates are falling. Foreign capital is flowing back into Mexico's equities market, and forecasts for Mexican output are almost unanimously positive.

## Conclusion

In sum, most of Mexico's economy is moving in a positive direction, but the consumption side is lagging. Declining real manufacturing wages in the face of increasing manufacturing productivity suggest that relative returns have shifted toward capital and away from labor. Over time, however, as Mexico fully recovers and all sectors return to pre-crisis levels, demand for labor should pick up and boost wages.

— William C. Gruben  
 David M. Gould  
 Carlos E. Zarazaga



# Regional Update

SEVERAL FACTORS TEMPERED the District's expansion in January. Bad weather disrupted construction activity. At some companies, the impact of the Mexican recession continued to curb growth, and some high-tech industries still felt the effects of weaker than expected demand in 1996. A tight labor market may also have been a restraint on the economy. The energy industry remained a strength, however, despite falling oil and natural gas prices.

District employment fell an annualized 2.1 percent in January, pulled down by a 3.2 percent drop in Texas. Louisiana employment grew 0.9 percent, while New Mexico job growth jumped 3.1 percent. Historically, the revisions of January job growth estimates have been the largest of any month, so these figures will likely be revised. (The Bureau of Labor Statistics revised the employment series for 1996. Louisiana's job growth in 1996 went up from 0.9 percent to 2.1 percent, and New Mexico's went down from 2.6 percent

to 1.7 percent. The Dallas Fed forecasts BLS revisions for Texas, so the state's 2.3 percent gain for 1996 was unchanged.)

The construction industry was an important source of economic weakness in January, when unusually severe weather stalled Texas' construction activity. Still, the industry has been cooling since activity surged in the first half of 1996.

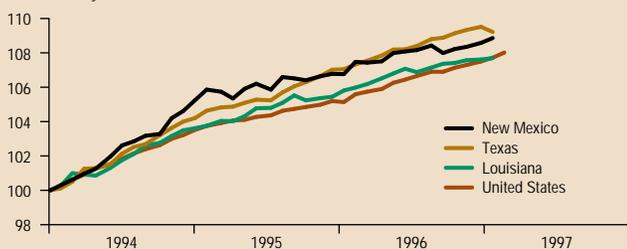
The tight labor market may be restraining expansion, particularly in Texas, where job growth has outpaced the nation's for the past decade and outpaced its long-run average for the past three years. Texas' statewide unemployment rate has been hovering around its lowest level in 15 years.

Economic indicators suggest continued moderate employment growth. After dropping in December, the Texas Leading Index increased strongly in January as seven of the eight indicators registered increases. (The retail sales category was dropped from the index because the Census Bureau discontinued the series.)

—Fiona Sigalla

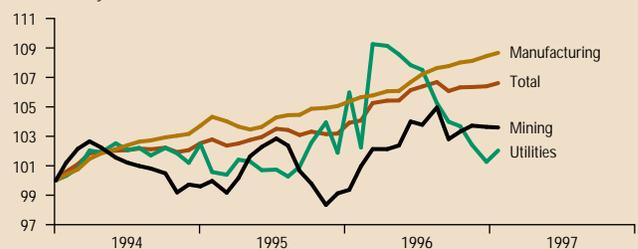
## Total Nonfarm Employment

Index, January 1991 = 100



## Texas Industrial Production Index (TIPI)

Index, January 1991 = 100



## Texas Leading Index and Nonfarm Employment

Thousands of persons

Index, 1987 = 100



## Net Contributions of Components to Change in Leading Index

November–January 1997



## Regional Economic Indicators

	Texas Leading Index	TIPI total	Texas employment				Total nonfarm employment			
			Mining	Construction	Manufacturing	Government	Private service-producing	Texas	Louisiana	New Mexico
1/97	118.8	123.6	158.7	432.1	1,057.5	1,463.2	5,190.8	8,302.3	1,820.8	700.3
12/96	117.8	123.3	157.6	441.1	1,058.9	1,461.8	5,205.7	8,325.1	1,819.4	698.5
11/96	118.7	123.3	157.3	440.2	1,058.1	1,458.1	5,197.5	8,311.2	1,818.7	697.0
10/96	117.5	123.3	156.8	440.0	1,057.5	1,454.1	5,188.1	8,296.5	1,816.0	696.2
9/96	117.0	123.0	156.7	437.4	1,057.6	1,449.2	5,176.1	8,277.0	1,815.2	694.7
8/96	116.6	123.7	156.7	437.9	1,057.0	1,453.7	5,165.2	8,270.5	1,811.5	697.5
7/96	115.9	123.3	156.6	435.8	1,054.8	1,448.3	5,145.1	8,240.6	1,807.0	695.8
6/96	116.1	123.0	156.2	436.0	1,054.6	1,447.8	5,130.9	8,225.5	1,810.3	695.3
5/96	116.6	122.2	156.0	435.1	1,053.3	1,452.5	5,127.8	8,224.7	1,805.7	694.7
4/96	116.8	122.2	155.8	431.4	1,050.6	1,450.8	5,109.6	8,198.2	1,800.9	691.6
3/96	116.1	122.0	155.9	429.3	1,049.0	1,448.6	5,092.4	8,175.2	1,795.2	691.1
2/96	115.0	120.6	155.6	430.4	1,047.4	1,447.2	5,078.2	8,158.8	1,791.8	691.4

## 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).

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