

FEDERAL RESERVE BANK OF KANSAS CITY

# Economic Review



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*Fourth Quarter 1994*

*Capacity Utilization and U.S. Inflation*

*Past and Prospective Causes of High Unemployment*

*Reducing Unemployment: Current Issues and Policy  
Options—A Summary of the Bank's 1994 Symposium*

*Bank Credit Growth in the Tenth District: Recent Developments*

*Is the Debit Card Revolution Finally Here?*



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- Capacity Utilization and U.S. Inflation* 5  
By C. Alan Garner
- Past and Prospective Causes of High Unemployment* 23  
By Paul Krugman
- Reducing Unemployment: Current Issues and Policy  
Options—A Summary of the Bank's 1994 Symposium* 45  
By Bryon Higgins
- Bank Credit Growth in the Tenth District: Recent Developments* 59  
By William R. Keeton
- Is the Debit Card Revolution Finally Here?* 79  
By John P. Caskey and Gordon H. Sellon, Jr.
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# Contents

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## *Capacity Utilization and U.S. Inflation*

5

By C. Alan Garner

Policymakers and economic analysts have recently been concerned about potential inflationary pressures in the U.S. economy. Various economic statistics show the amount of unused productive resources has been diminishing. For example, the civilian unemployment rate has decreased and the capacity utilization rate of the nation's factories has risen. If real output grows rapidly in the future, the competition for scarce productive resources could put upward pressure on wages and other production costs and ultimately could raise consumer price inflation.

Some analysts have challenged the view that productive resources are becoming so scarce that higher inflation is a danger. This challenge partly turns on whether the capacity utilization rate, which measures the percent of manufacturing capacity currently in use, is a reliable indicator of inflationary pressures.

Garner examines whether the capacity utilization rate for the manufacturing sector is still a reliable indicator of inflationary pressures. He concludes that the historical relationship between capacity utilization and inflation still holds, indicating the capacity utilization rate remains a reliable indicator of inflationary pressures.

## *Past and Prospective Causes of High Unemployment*

23

By Paul Krugman

Twenty years ago, on the eve of the first of the great post-Bretton-Woods recessions, unemployment did not appear to be a major problem for advanced economies. Today, of course, unemployment is back with a vengeance. In Europe, in particular, the seemingly inexorable rise in the unemployment rate has led to the creation of a new word: *Eurosclerosis*. While the United States has not seen a comparable upward trend, many people on both sides of the Atlantic believe the United States has achieved low unemployment by a sort of devil's bargain, whose price is soaring inequality and growing poverty.

Why has unemployment risen? Will it continue to rise? What can be done to reverse the trend? These daunting questions have been the subject of massive amounts of research. Many economists have coalesced around a common view of the nature of the unemployment problem. In his remarks before the bank's 1994 symposium, Krugman restates that conventional wisdom.

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*Reducing Unemployment: Current Issues and Policy  
Options—A Summary of the Bank's 1994 Symposium*

45

By Bryon Higgins

Reducing unemployment has become a top priority for economic policy in most industrialized nations. While unemployment will ebb somewhat as countries recover from the recent global recession, millions are likely to remain jobless for a variety of structural reasons. Moreover, there is a disturbing trend in many industrialized countries toward long-term unemployment, especially among low-skilled workers. This trend has had less effect on measured unemployment in the United States than in Europe in part because U.S. workers have greater incentives to accept low-wage jobs. Nonetheless, virtually all industrial countries face a jobs problem that impairs living standards and threatens a breakdown in social cohesion.

To enhance understanding of what has caused this problem and to analyze policies to address it, the Federal Reserve Bank of Kansas City invited central bankers, academics, and economists to a symposium entitled "Reducing Unemployment: Current Issues and Policy Options." The symposium was held August 25-27, 1994, at Jackson Hole, Wyoming. Higgins highlights the issues raised at the symposium and summarizes the papers and commentary.

*Bank Credit Growth in the Tenth District: Recent Developments*

59

By William R. Keeton

Bank credit, the sum of loans and securities at commercial banks, is widely viewed as providing information about the current and future state of the economy. Analysts have been concerned about the behavior of bank credit during the nation's recovery from the 1990-91 recession. At first, analysts worried the recovery would be hampered because banks were making too few loans and purchasing too many securities. More recently, loan growth has picked up and securities growth has slowed, a development some analysts view as a sign the economy is growing too fast to keep inflationary pressures in check.

Bank credit growth may also shed light on the current and future state of the district economy. Trends in Tenth District bank credit may vary substantially, however, from trends in the nation as a whole. For example, district banks could be in better financial condition than banks nationwide, making district banks more willing to lend. Or district businesses and households could be more optimistic about future earnings, making them more willing to borrow.

Keeton describes the growth in bank credit in district states during the recovery and compares the district experience with that of the nation. He concludes that loan growth and securities growth followed the same pattern in the district as the nation, but that loan growth in the district was much stronger.

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## *Is the Debit Card Revolution Finally Here?*

79

By John P. Caskey and Gordon H. Sellon, Jr.

For three decades, experts on payments systems have forecast the imminent arrival of a completely electronic, paperless payment system. In this vision of the future, households, businesses, and government agencies would replace paper transactions with faster, more efficient electronic payments. The centerpiece of this new payment world is the debit card, a magnetically encoded plastic card that would eliminate cash, checks, and even credit cards in most retail transactions.

While some parts of this payment revolution have arrived, in many respects the forecasts have proved to be overly optimistic. The biggest disappointment, thus far, is the debit card. Despite claims of cost savings and greater efficiency, consumers and merchants have been reluctant to switch from traditional payment methods to the debit card.

Caskey and Sellon analyze the factors that have limited the debit card's success and examine prospects for future growth. They find that debit cards are likely to experience strongest growth where consumers find them more convenient than other payment methods, where merchants find them to be cost effective, and where consumers do not have access to a full range of payment alternatives.

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# Capacity Utilization and U.S. Inflation

*By C. Alan Garner*

Policymakers and economic analysts have recently been concerned about potential inflationary pressures in the U.S. economy. Various economic statistics show the amount of unused productive resources has been diminishing. For example, the civilian unemployment rate has decreased and the capacity utilization rate of the nation's factories has risen. If real output grows rapidly in the future, the competition for scarce productive resources could put upward pressure on wages and other production costs and ultimately could raise consumer price inflation.

Some analysts have challenged the view that productive resources are becoming so scarce that higher inflation is a danger. This challenge partly turns on whether the capacity utilization rate, which measures the percent of manufacturing capacity currently in use, is a reliable indicator of inflationary pressures. Most economic forecasters believe inflationary pressures build after capacity utilization rises above a certain level. Some analysts have claimed, however, this historical relationship is no longer valid because the economy has become more open, allowing imported goods to relieve any shortage of domestic capacity. Some analysts also have argued that manufacturing capacity shortages will not be a problem in the foreseeable future

because of rapid technological progress and strong business investment.

This article examines whether the capacity utilization rate for the manufacturing sector is still a reliable indicator of inflationary pressures. The first section describes the capacity utilization rate and summarizes recent arguments about whether the relationship between capacity utilization and inflation has changed. The second section presents empirical evidence testing whether the economy can now operate at a higher utilization rate than in the past without the inflation rate rising. The article concludes that the historical relationship between capacity utilization and inflation still holds, indicating the capacity utilization rate remains a reliable indicator of inflationary pressures.

## *BACKGROUND ARGUMENTS*

Inflationary pressures typically emerge when the overall demand for goods and services grows faster than the supply, causing a decrease in the amount of unused productive resources, or economic slack. Economists measure economic slack in various ways. Perhaps the most common measure is the unemployment rate, which measures unused resources in the labor market. Another measure of slack is the real output gap, the estimated difference between actual real output and the economy's potential output. This section examines a third major measure of economic slack, the capacity utilization rate.

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*C. Alan Garner is a senior economist at the Federal Reserve Bank of Kansas City. David Hensley, a research associate at the bank, and James O'Toole, a research assistant, helped prepare the article.*

### *Stable-inflation capacity utilization*

The capacity utilization rate measures the operating rate of the nation's industrial capacity. This article focuses on capacity utilization in the manufacturing sector and thus excludes mining and utility output. The capacity utilization rate equals the Federal Reserve's index of manufacturing output divided by the index of manufacturing capacity. Capacity is defined as the highest sustainable level of output by the manufacturing sector.<sup>1</sup> Because estimates of capacity evolve slowly over time, short-term movements in the capacity utilization rate primarily reflect changes in manufacturing output. But over longer periods, the growth rate of manufacturing capacity varies in response to technological progress and changing levels of business investment.

Most economic forecasters believe the capacity utilization rate is a useful indicator of inflationary pressures. Historically, capacity utilization in the manufacturing sector has tightened before the rate of consumer price inflation has increased (Chart 1). As the slack in the economy diminishes, firms typically face higher production costs in order to raise their output further. Firms may have to hire inexperienced workers or put older, less efficient plant and equipment back into service. The higher production costs would usually be passed through to the ultimate purchaser as higher prices of finished goods.

Inflationary pressures can be judged by comparing the current capacity utilization rate with an estimated stable-inflation capacity utilization rate. When capacity utilization is at the stable-inflation rate, inflation tends neither to increase nor decrease. The concept is similar to the natural rate of unemployment, the unemployment rate for which inflation neither increases nor decreases, but uses capacity utilization rather than unemployment as the measure of economic slack.<sup>2</sup> In this view, inflation will rise as long as capacity utilization is above the stable-inflation rate. Conversely, inflation will fall whenever capacity utilization is below the stable-inflation rate.

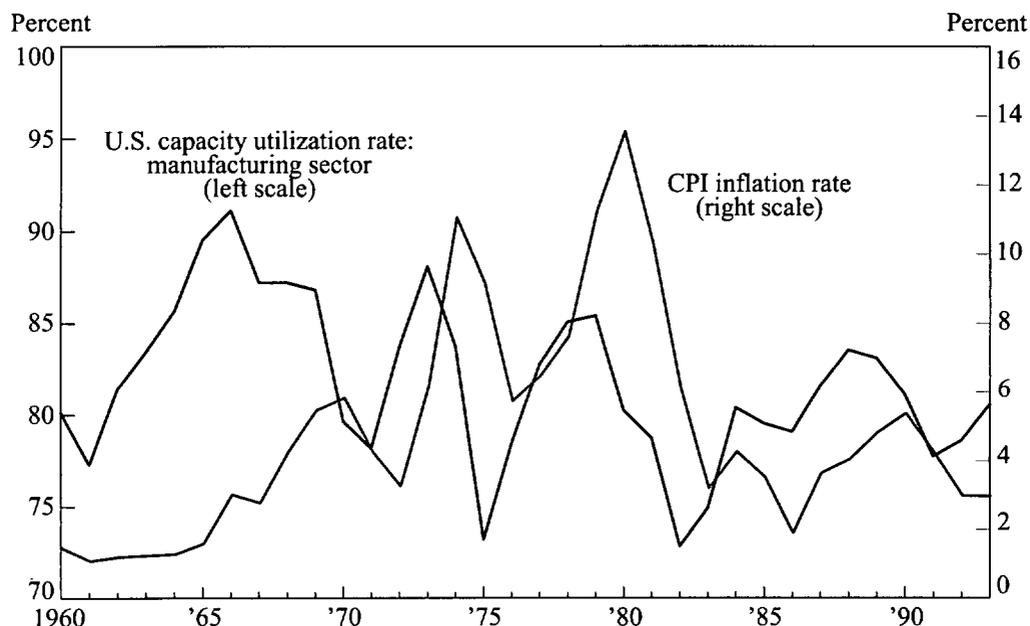
Past economic research found that the stable-inflation capacity utilization rate in the manufacturing sector was about 82 percent. For example, McElhattan (1985) estimated a stable-inflation capacity utilization rate of 81.7 percent for 1959-83. More recent work by Franz and Gordon produced an identical estimate for 1973-90 even though they used a different estimating equation and a different inflation measure.<sup>3</sup> Moreover, these studies found the stable-inflation capacity utilization rate was relatively steady over time. But despite this evidence, some analysts believe the capacity utilization rate has become a less reliable indicator of inflationary pressures.

### *Effects of greater openness*

Some analysts contend the capacity utilization rate has become a less dependable indicator of inflationary pressures because the greater openness of the U.S. economy to foreign-produced goods has shifted the stable-inflation capacity utilization rate (Harris). International trade in goods and services has clearly become more important as a share of economic activity. Chart 2 shows that nonoil merchandise imports have risen steadily as a share of gross domestic output, or GDP, over the last three decades. When domestic demand is strong and U.S. factories are operating at a high utilization rate, goods can be purchased from foreign producers with excess capacity. The extra supply of imported goods will, it is argued, moderate inflationary pressures and so weaken the link between domestic capacity utilization and the inflation rate.

Several counterarguments suggest that domestic capacity utilization may remain a reliable indicator of inflationary pressures despite the greater openness of the U.S. economy (Tatom; Krugman). Most domestic output is not traded internationally, including most consumer services and government output. As Krugman noted, large parts of the economy are "effectively insulated" from foreign markets and therefore can experience inflation even

Chart 1

**Capacity Utilization and the CPI Inflation Rate**

Sources: Board of Governors of the Federal Reserve System and U.S. Department of Labor.

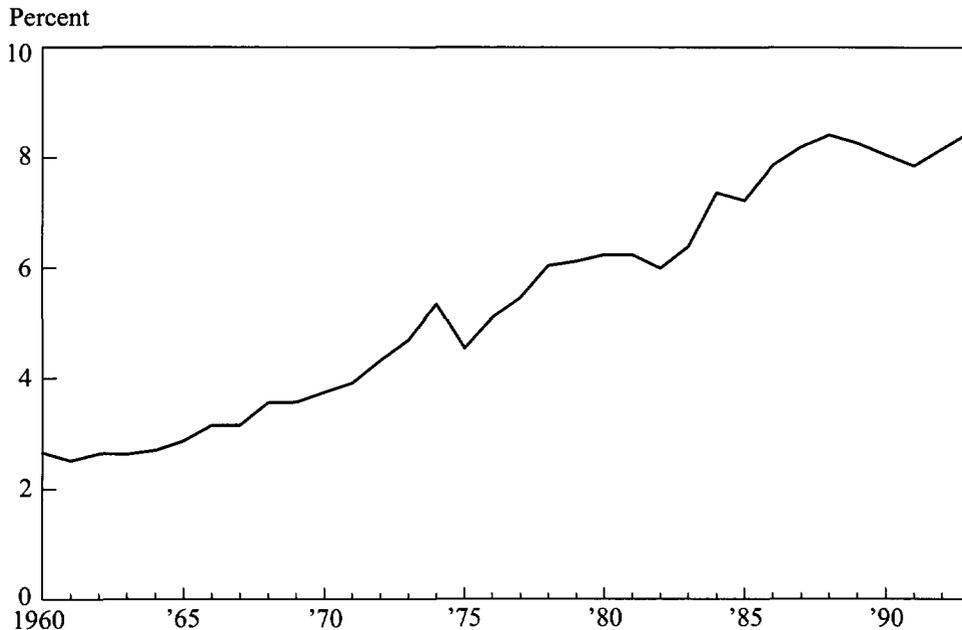
when substantial economic slack exists abroad. And for internationally traded goods, U.S. and foreign products are often not perfect substitutes, implying domestic producers may have some ability to raise their prices relative to foreign producers when aggregate spending is strong.

A sharp increase in U.S. spending on imported goods also might have inflationary exchange rate effects. Tatom noted that an increased demand for foreign goods as domestic inflationary pressures rise would likely increase the demand for foreign currencies. The resulting decrease in the foreign exchange value of the dollar would tend to raise import prices and so worsen the U.S. inflation rate. A booming U.S. economy therefore may raise the

inflation rate even if domestic demand can, to some extent, spill over into foreign markets with excess capacity.<sup>4</sup>

Recent history provides clear examples of open economies that developed inflationary problems when growth was too fast. For example, Krugman pointed to the British experience in the late 1980s. A boom in the British economy produced a sharp increase in inflation even though the United Kingdom has a much more open economy than the United States. Similarly, Tatom noted that strong monetary growth associated with German reunification in 1991 caused inflation to rise even though Germany has a more open economy than the United States, and substantial excess capacity existed at the

Chart 2

*Nonoil Merchandise Imports as a Share of GDP*

Source: U.S. Department of Commerce.

time in the United States, Canada, and the United Kingdom.

*Effects of productivity growth*

Some analysts believe the capacity utilization rate is not a reliable indicator of inflationary pressures because the U.S. economy is currently experiencing rapid productivity gains (Farrell). In this view, the economy is undergoing major structural changes such as corporate reengineering, adoption of new computer and telecommunications technologies, and high levels of business equipment investment. The extreme version of this argument

is that capacity is unlikely to be a constraint on economic growth in the near future because of these improvements in industrial productivity. In this extreme case, there is virtually no limit to how fast the economy can grow with stable inflation.

Policymakers and forecasters should be skeptical of any claim that the economy is departing dramatically from the historical relationship between capacity utilization and inflation. At this point in the recovery, the evidence does not support the extreme view that business productivity has improved radically. Business spending on plant and equipment has been strong recently, and labor productivity has grown faster in the current expansion. But these variables typically grow faster

in an economic recovery. Moreover, the growth of business fixed investment and labor productivity in the current recovery is not dramatically different than in other postwar recoveries of the same duration (Chart 3). For example, productivity rose 6.6 percent—not annualized—over the first 13 quarters of the current expansion, but productivity also rose 7.9 percent over the first 13 quarters of expansion in 1975-78 and 6.6 percent over the similar period in 1982-86. Thus, the recent strength in business investment and productivity growth appear to primarily reflect cyclical fluctuations rather than a break with longer term economic trends.

A less extreme view is that current statistics may overstate the capacity utilization rate somewhat because of problems in measuring manufacturing capacity (Epstein). In particular, official capacity estimates are based partly on a biennial survey by the U.S. Department of Commerce. The most recent data from this survey are for the end of 1992, and the next survey will provide end-of-year capacity use data for 1993 and 1994. If the official statistics have not fully captured recent capacity gains resulting from technological progress and strong business investment, the figures on manufacturing capacity might be revised upward, and the corresponding capacity utilization rates might be revised downward.

But revisions to the capacity utilization statistics might not change the conclusion that the manufacturing sector is operating at or somewhat above its stable-inflation capacity utilization rate. Because capacity utilization is currently well above McElhattan's estimated stable-inflation rate, the capacity utilization rate could be revised downward without changing the conclusion that the economy is operating at or above the stable-inflation rate. Revisions to past capacity utilization rates also might have a small effect on the estimated stable-inflation capacity utilization rate. Large changes in the estimated stable-inflation rate are unlikely, however, because the capacity utilization statistics will be revised for only a small part of the sample period.

## EMPIRICAL EVIDENCE

The arguments against using capacity utilization as an indicator of inflationary pressures are not particularly compelling in light of the previous discussion. Moreover, the open economy arguments could have been made over much of the last 30 years, yet empirical evidence shows the stable-inflation capacity utilization rate has been surprisingly steady. This section presents additional estimates confirming the steadiness of the stable-inflation capacity utilization rate.

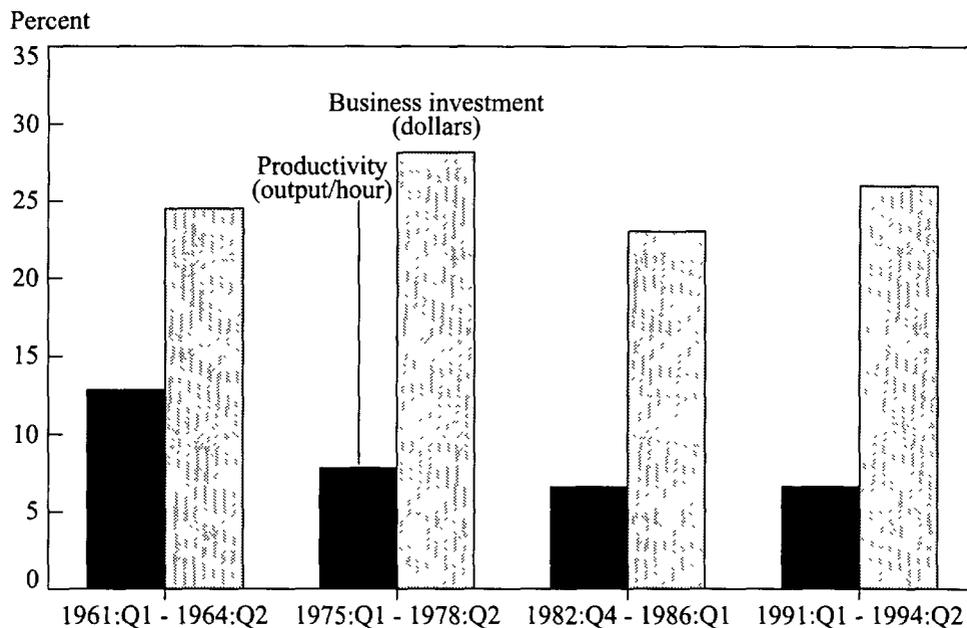
### *The estimating equation*

An estimate of the stable-inflation capacity utilization rate can be obtained from a short-run Phillips curve, a statistical equation describing the short-run tradeoff between inflation and a measure of economic slack. Slack is measured by the capacity utilization rate for the manufacturing sector. Other determinants of inflation also are included to ensure the equation adequately describes the inflationary process. After setting the effects of these other determinants to zero, the short-run Phillips curve can be solved for the capacity utilization rate that keeps the overall inflation rate stable.

The other determinants of inflation are aggregate supply variables, which affect the price level by changing the cost of producing goods and services. Perhaps the best example of such a variable is the price of crude petroleum products. Because petroleum is used to produce and transport a wide range of goods and services, large increases in crude oil prices have had a major impact on inflation during the last 30 years. Other supply-side variables included in the short-run Phillips curve represent the Nixon administration's wage-price controls and changes in the foreign exchange value of the dollar.

This section focuses on a short-run Phillips curve explaining changes in the consumer price index, or CPI, in terms of capacity utilization and the supply-side variables. The CPI is an important

Chart 3

**Changes in Productivity and Business Investment**

Note: The changes in productivity and business investment are 13-month nonannualized percentage changes calculated from the beginning of an expansionary period.

Sources: U.S. Department of Labor and U.S. Department of Commerce.

price index for policymakers and economic analysts because it measures changes in the cost of living. Other inflation measures are considered briefly at the end of this section. The equations were estimated with annual data for 1964-93 or selected subperiods. The appendix provides a further description of the short-run Phillips curve and more detailed empirical results.

**Results with the CPI**

Estimates of the stable-inflation capacity utilization rate change little when the short-run Phillips curve is estimated over different time periods. Table

1 contains estimates of the stable-inflation rate for five different periods. As the end of the period gradually moves from 1983 to 1993 in the first four columns, the estimated stable-inflation rate is surprisingly steady at slightly below 82 percent. In the fifth column, the first ten years of the sample are dropped while keeping the 1993 endpoint. This change actually reduces the estimated stable-inflation rate slightly to 80.8 percent, exactly the opposite from what one would expect based on the openness and productivity arguments. But given the uncertainty about such statistical estimates and the problems in measuring capacity utilization, this evidence of a downward shift in the stable-inflation rate is not convincing. The major conclusion from

Table 1

**Estimates of the Stable-Inflation Rate**

(in percent)

	Sample period				
	1964-83	1964-86	1964-89	1964-93	1974-93
Stable-inflation rate of capacity utilization	81.9	81.6	81.8	81.8	80.8

Note: These estimates are based on regressions with the CPI as the dependent variable.

Table 1 is simply that the estimates do not support the claimed upward shift in the stable-inflation capacity utilization rate.<sup>5</sup>

To test further for shifts in the stable-inflation capacity utilization rate, equations were estimated including an interaction variable equal to the capacity utilization rate multiplied by another variable representing the presumed openness or productivity effects. For example, a time trend was included because the openness and productivity arguments imply the relationship between capacity utilization and inflation has changed with the passage of time. But empirical estimates over 1964-93 found the interaction term involving capacity utilization and time was not statistically significant. A variable allowing a one-time shift in the stable-inflation capacity utilization rate also was not statistically significant when included in an interaction term.

Interaction variables related more directly to the growing openness of the economy also did not reveal a shift in the stable-inflation capacity utilization rate. Nonoil merchandise imports as a share of GDP (Chart 2) were not statistically significant when included in an interaction term. Traded goods as a share of GDP, which equals exports plus imports divided by GDP, were statistically significant in an

interaction term, but the coefficient of this term implied that the stable-inflation capacity utilization rate has decreased as the economy has become more open, exactly the opposite of what has been claimed.

Another test of the openness argument is to include foreign capacity utilization in the interaction term. If this argument is true, the relationship between inflation and domestic capacity utilization should vary depending on whether excess productive capacity exists abroad. A world capacity utilization rate would be preferable for this test, but capacity utilization rates are not available for many countries over the 1964-93 period. Instead, the test used the capacity utilization rate for Canada, the largest trading partner of the United States. The Canadian capacity utilization rate was not statistically significant when included in an interaction term.<sup>6</sup> Therefore, the empirical results do not support the view that the stable-inflation capacity utilization rate has risen as a result of growing openness or rapid productivity change.

*Results with other inflation measures*

Policymakers and forecasters would probably

*Table 2*  
***Estimates with Various Inflation Measures***  
*(in percent)*

	Dependent variable			
	<u>CPI</u>	<u>PPI</u>	<u>Core CPI</u>	<u>Core PPI</u>
Stable-inflation rate of capacity utilization	81.8	81.8	82.1	81.6

Note: The sample period for the CPI, PPI, and core CPI estimates is 1964-93. The sample period for the core PPI estimate is 1976-93.

feel more confident about using capacity utilization as an indicator of inflationary pressures if the estimated stable-inflation rate is not sensitive to the choice of an inflation measure. Three alternatives to the CPI are considered here. The first is the producer price index for finished goods, or PPI. The PPI is an interesting alternative because prices at the producer level might be more closely related to manufacturing capacity utilization than the CPI, which has a large services component. The second alternative is core consumer price inflation, measured by the CPI excluding food and energy prices. The core CPI is an interesting alternative because food and energy prices are subject to unpredictable supply shocks that are not easily controlled by monetary or fiscal policy. The core CPI, therefore, may be a better measure of the underlying inflationary pressures that should be the focus of policymakers. The third alternative is core producer price inflation, measured by the PPI excluding food and energy prices.

Similar estimates of the stable-inflation capacity utilization rate are obtained with these alternative measures of inflation (Table 2). The estimated stable-inflation rate using the PPI is 81.8 percent, exactly the same as was obtained with the CPI. The

estimated stable-inflation rate using the core CPI is slightly higher at 82.1 percent. But given the uncertainties surrounding such statistical estimates, this higher number is probably not meaningfully different from the 81.8 percent estimate obtained with the CPI or PPI. Finally, the estimated stable-inflation rate using the core PPI is 81.6 percent.

Using alternative inflation measures does not change the results of any of the tests reported previously for the CPI.<sup>7</sup> When the short-run Phillips curves were estimated over the same periods as in Table 1, the stable-inflation rate was again relatively steady. Tests using interaction terms also provided no evidence the stable-inflation rate has shifted because of increasing openness or faster productivity growth.

## CONCLUSION

The preceding sections imply the capacity utilization rate in the manufacturing sector remains a reliable indicator of inflationary pressures. The stable-inflation capacity utilization rate has apparently been steady at about 82 percent. The increasing openness of the U.S. economy has not produced an

upward shift in the stable-inflation capacity utilization rate that would allow the economy to operate at higher utilization rates than in the past without worsening inflation. Also, there is no evidence the relationship between capacity utilization and inflation has weakened because of rapid technological change or strong business investment.

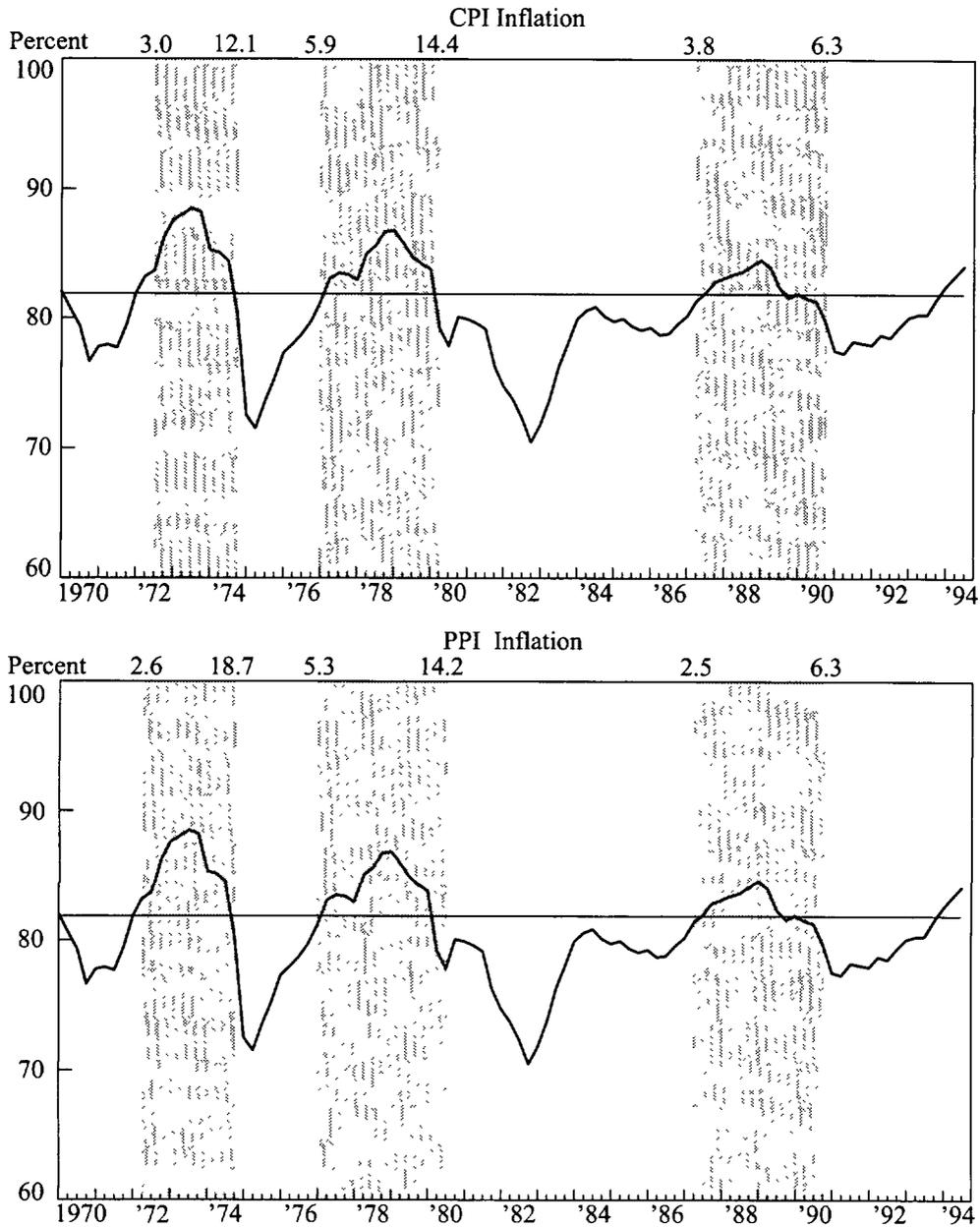
Currently, capacity utilization in the U.S. manufacturing sector is somewhat above the level that has historically been associated with stable inflation. Chart 4 shows capacity utilization with shaded areas representing periods of rising CPI inflation (top panel) or rising PPI inflation (bottom panel). In the late 1970s and the late 1980s, inflation rose at about the same time that capacity utilization crossed the stable-inflation rate of 81.8 percent estimated for the 1964-93 period. But inflation rose with a short lag after capacity utilization reached the stable-inflation

rate in the early 1970s. Capacity utilization in manufacturing averaged 84.1 percent in the third quarter of 1994, 2.3 percentage points above the estimated stable-inflation rate.

Capacity utilization and the unemployment rate are presently giving consistent signals about U.S. inflationary pressures. Most estimates of the natural rate of unemployment are in the range from 5.5 percent to 6.5 percent. If we take the 6.0 percent midpoint of that range as a rough estimate of the natural rate, the economy currently is operating slightly below the natural rate of unemployment. And recent credible estimates by Weiner and Phelps put the natural rate of unemployment somewhat above 6.0 percent. Thus, both measures of economic slack are currently giving similar signals about potential inflationary pressures.

Chart 4

**Capacity Utilization and Inflation**



Notes: Shaded areas represent periods of rising inflation as measured by the CPI or PPI; beginning and ending inflation rates are noted along the top edge. Inflation is measured by the percentage change from four quarters earlier.

Source: Board of Governors of the Federal Reserve System and the U.S. Department of Labor.

## APPENDIX

This appendix provides a more detailed description of the basic estimating equation and reports the empirical results in greater detail.

*The basic equation*

McElhattan (1985) showed that the stable-inflation capacity utilization rate can be estimated from a short-run Phillips equation of the form

$$IR_t = a_0 + a_1 IR_t^* + a_2 CU_t,$$

where  $IR$  is the inflation rate,  $IR^*$  is the expected inflation rate, and  $CU$  is capacity utilization in manufacturing. McElhattan found that  $a_1 = 1$  and  $IR_t^*$  could be replaced by last year's inflation rate,  $IR_{t-1}$ . Adding a supply shock variable,  $Z$ , McElhattan estimated the regression equation

$$DIR_t = b_0 + b_1 CU_t + b_2 Z_t + e_t,$$

where  $DIR_t = IR_t - IR_{t-1}$  and  $e_t$  is a random disturbance. Setting the supply shock term and the random disturbance to zero, the equation can be solved for the stable-inflation capacity utilization rate by setting  $DIR_t = 0$ , or

$$0 = b_0 + b_1 CU_t,$$

implying that the stable-inflation capacity utilization rate is  $CU^* = -b_0/b_1$ .

Adding the supply variables described in the text, the basic estimating equation for this article was specified as follows:

$$\begin{aligned} DIR_t = & c_0 + c_1 CU_t + c_2 WPON_t + \\ & c_3 WPOFF_t + c_4 DDIPE_t + \\ & c_5 DDIPE_{t-1} + c_6 DDREX_t + \\ & c_7 DDREX_{t-1} + e_t, \end{aligned}$$

where  $WPON_t$  = a dummy variable that represents the start of the Nixon wage-price controls and equals one in 1972 and zero otherwise;

$WPOFF_t$  = a dummy variable that represents the removal of the wage-price controls and equals one in 1974-75 and zero otherwise;

$DDIPE_t$  = the acceleration in the relative price of crude petroleum, which equals  $DIPE_t - DIPE_{t-1}$ , where  $DIPE$  is the annual percentage change in the relative price of crude petroleum;

$DDREX_t$  = the acceleration in the real exchange rate, which equals  $DREX_t - DREX_{t-1}$ , where  $DREX$  is the annual percentage change in the real trade-weighted value of the dollar.

*Empirical results*

The statistical results in Table A1 were used to calculate the stable-inflation capacity utilization rates in Table 1 of the text. In most cases, the Durbin-Watson test does not indicate first-order serial correlation of the regression residuals.

But in cases where this statistic fell in the indeterminate region of the Durbin-Watson test, Q-statistics for serial correlation were inspected and did not suggest a serial correlation problem. The Cochrane-Orcutt iterative method was also used to estimate a first-order serial correlation coefficient, and these coefficients were always statistically insignificant.

Table A2 reports the tests for a shift in the coefficient of the capacity utilization variable. In particular, let  $X$  be the variable reflecting growing openness or faster productivity growth. The interaction term is  $CU_t * X_t$ , where the  $*$  represents multiplication. The estimated regressions take the form

$$DIR_t = d_0 + d_1 CU_t + d_2 (CU_t * X_t) + \dots$$

Alternatively, this equation could be written as

$$DIR_t = d_0 + (d_1 + d_2 X_t) CU_t + \dots$$

If  $d_2$  were statistically significant and negative, and if  $X_t$  were increasing over time, the effect of capacity utilization on inflation would be decreasing over time. A decreasing coefficient on capacity utilization would suggest an increasing stable-inflation capacity utilization rate, consistent with the arguments that the

economy can today operate at a higher utilization rate than in the past without serious inflationary pressures.

In Table A2,  $CU*TREND$  is the capacity utilization rate multiplied by a linear time trend.  $CU*DUMMY$  is capacity utilization multiplied by a dummy variable equal to zero for 1964-78 and one for 1979-93.  $CU*IMP$  is capacity utilization multiplied by nonoil merchandise imports.  $CU*TRADED$  is capacity utilization multiplied by the share of traded goods in GDP, which equals the sum of nominal exports and imports divided by nominal GDP.  $CU*CAN$  is the U.S. capacity utilization rate multiplied by the Canadian capacity utilization rate.

Table A3 presents estimates of the short-run Phillips curve with the alternative inflation measures. The PPI and core CPI equations were estimated for 1964-93. These equations explain slightly less of the variation in the inflation rate than does the comparable CPI equation in Table A1, but the capacity utilization measure is statistically significant in each case. The core PPI equation was estimated for 1974-93 because of limited data availability. As a result, this equation also excludes the dummy variables representing the Nixon administration's wage-price controls. The equations in Table A3 were used to calculate the stable-inflation capacity utilization rates in Table 2 of the text.

*Table A1*  
**Results Over Various Sample Periods**

<u>Independent variable</u>	<u>Sample period</u>				
	<u>1964-83</u>	<u>1964-86</u>	<u>1964-89</u>	<u>1964-93</u>	<u>1974-93</u>
Constant	-16.21 (-2.73)	-15.58 (-3.03)	-17.73 (-3.96)	-18.26 (-4.29)	-31.55 (-4.05)
CU	.20 (2.80)	.19 (3.09)	.22 (4.02)	.22 (4.32)	.39 (4.04)
WPON	-1.45 (-1.04)	-1.71 (-1.39)	-1.66 (-1.44)	-1.56 (-1.36)	—
WPOFF	1.43 (1.21)	1.41 (1.34)	1.36 (1.45)	1.67 (1.88)	2.04 (2.26)
DDIPE(t)	.09 (3.21)	.08 (3.59)	.07 (3.91)	.05 (3.65)	.03 (2.17)
DDIPE(t-1)	.04 (1.49)	.04 (1.92)	.04 (2.88)	.03 (2.58)	.02 (1.40)
DDREX(t)	-.09 (-1.64)	-.09 (-2.23)	-.08 (-2.16)	-.03 (-1.16)	-.03 (-1.03)
DDREX(t-1)	-.01 (-.22)	-.04 (-.81)	-.01 (-.39)	-.04 (-1.46)	-.02 (-.86)
R <sup>2</sup>	.81	.80	.79	.75	.84
Durbin-Watson	2.33	2.46	2.19	2.11	2.53

Note: The t-statistics are in parentheses.

Table A2  
**Results with Interaction Terms**

	Capacity utilization interacted with				
	Linear trend	Shift dummy	Nonoil import share	Traded goods share	Canadian capacity utilization
Constant	-24.58 (-4.64)	-24.54 (-4.61)	-24.06 (-4.79)	-25.95 (-5.10)	-20.39 (-2.43)
CU	.28 (4.83)	.29 (4.69)	.28 (4.94)	.29 (5.26)	.28 (1.38)
CU*TREND	.0007 (1.85)	—	—	—	—
CU*DUMMY	—	.01 (1.81)	—	—	—
CU*IMP	—	—	.003 (1.93)	—	—
CU*TRADED	—	—	—	.002 (2.33)	—
CU*CAN	—	—	—	—	-.0004 (-.30)
WPON	-1.31 (-1.20)	-1.16 (-1.05)	-1.28 (-1.17)	-1.12 (-1.05)	-1.59 (-1.36)
WPOFF	2.30 (2.52)	2.63 (2.63)	2.28 (2.54)	2.18 (2.59)	1.80 (1.78)
DDIPE(t)	.04 (3.19)	.04 (3.11)	.04 (3.04)	.04 (3.06)	.05 (3.58)
DDIPE(t-1)	.03 (2.10)	.02 (1.98)	.02 (1.98)	.02 (1.99)	.03 (2.53)
DDREX(t)	-.03 (-1.29)	-.04 (-1.41)	-.03 (-1.24)	-.04 (-1.61)	-.03 (-1.17)
DDREX(t-1)	-.03 (-1.35)	-.04 (-1.45)	-.03 (-1.25)	-.04 (-1.57)	-.04 (-1.43)
R <sup>2</sup>	.79	.79	.79	.81	.76
Durbin-Watson	2.21	2.08	2.17	2.28	2.08

Note: The sample period is 1964-93. The t-statistics are in parentheses.

Table A3

**Results with Alternative Measures of Inflation**

<u>Independent variable</u>	<u>Dependent variable</u>		
	<u>PPI</u>	<u>Core CPI</u>	<u>Core PPI</u>
Constant	-24.33 (-3.63)	-13.53 (-3.58)	-25.52 (-2.17)
CU	.30 (3.65)	.16 (3.59)	.31 (2.14)
WPON	-.50 (-.28)	-2.06 (-2.03)	—
WPOFF	1.30 (.93)	2.83 (3.57)	—
DDIPE(t)	.07 (3.74)	.03 (2.23)	.02 (.74)
DDIPE(t-1)	.03 (1.54)	.03 (2.82)	.02 (.91)
DDREX(t)	-.06 (-1.38)	-.02 (-.92)	-.04 (-1.14)
DDREX(t-1)	-.03 (-.67)	-.03 (-1.24)	-.01 (-.17)
R <sup>2</sup>	.70	.72	.54
Durbin-Watson	2.04	2.23	2.11

Note: The sample period for the core CPI and PPI estimates is 1964-93. The sample period for the core PPI estimates is 1976-93. The t-statistics are in parentheses.

## ENDNOTES

<sup>1</sup> Kenessey defined capacity more precisely as “the greatest level of output that a plant can maintain within the framework of a realistic work pattern, taking account of normal downtime and assuming the availability of inputs to operate the machinery in place.” The Federal Reserve’s concept of capacity tries to take into account both economic and engineering factors that determine capacity. An important limitation of the Federal Reserve’s capacity utilization rate is that it does not take into account the large service and government sectors of the economy. Shapiro presents a more detailed discussion of the statistical and conceptual problems in measuring industrial production and capacity utilization.

<sup>2</sup> See Weiner for an explanation of the natural unemployment rate and recent estimates for the U.S. economy. McElhattan (1978, 1985) sketches the theoretical underpinnings of the stable-inflation capacity utilization rate in a mark-up pricing model.

<sup>3</sup> McElhattan used the GNP implicit deflator to measure the aggregate price level, whereas Franz and Gordon used the fixed-weight GDP deflator. This article will focus on the consumer price index, or CPI.

<sup>4</sup> Krugman noted that the traditional view of international economists has been that an open economy with floating exchange rates faces a steeper tradeoff between unemployment and inflation than a closed economy. Thus, he concluded “it is hard to see why this view should suddenly be abandoned in favor of the idea that an open economy faces no tradeoff at all.”

Holding the exchange rate constant, however, there is a small amount of evidence that foreign capacity utilization affects U.S. import prices. Hooper and Mann included foreign capacity utilization measures in equations explaining U.S. manufactured import prices. In an equation for bilateral trade between Japan and the United States, Japanese capacity utilization had a statistically significant effect on import prices. But in an equation explaining the prices of manufactured imports from all countries, foreign capacity utilization did not affect U.S. import prices.

<sup>5</sup> Another test of the stability of the relationship between inflation and capacity utilization is to test whether the regression coefficients are equal across a split in the sample. For this purpose, the sample was split into two subperiods, 1964-78 and 1979-93. The F-statistic for testing the null hypothesis that the regression coefficients are equal in the two subperiods is 1.26. The null hypothesis of stable coefficients cannot be rejected at the 5 percent significance level because  $F_{.05}(8,22)$  equals 2.40.

<sup>6</sup> Similar results were obtained when U.S. and German capacity utilization rates were interacted in an equation covering 1965-93. The Canadian and German capacity utilization rates were also not statistically significant when added as separate regressors (that is, not interacted with capacity utilization).

<sup>7</sup> Because core PPI data are not available before 1974, some tests of the steadiness of the stable-inflation capacity utilization rate in the previous section could not be conducted for the core PPI.

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# Past and Prospective Causes of High Unemployment

*By Paul Krugman*

Twenty years ago, on the eve of the first of the great post-Bretton-Woods recessions, unemployment did not appear to be a major problem for advanced economies. Among what would later be dubbed the G7 nations, the United States had the highest unemployment rate at 5.5 percent; but very little of this unemployment was long term, and the extent of short-term unemployment could be rationalized as the inevitable and even desirable result of a dynamic economy. Western Europe had an unemployment rate that, measured on a comparable basis, was only 3 percent. Japan's unemployment rate was a trivial 1.4 percent, a performance nearly matched by West Germany's 1.6 percent. Whatever their other economic and social problems, the world's industrial nations seemed to have left fears of mass unemployment far behind.

Today, of course, unemployment is back with a vengeance. In Europe, in particular, the seemingly inexorable rise in the unemployment rate has led to the creation of a new word: Eurosclerosis (Chart 1). The United States has not seen a comparable upward trend—indeed, the unemployment rate in 1989-90 was lower than in 1974, and the current

recovery may already have pushed the unemployment rate into the same range (changes in the survey method, introduced this year, blur the picture slightly). However, many people on both sides of the Atlantic believe that the United States has achieved low unemployment by a sort of devil's bargain, whose price is soaring inequality and growing poverty.

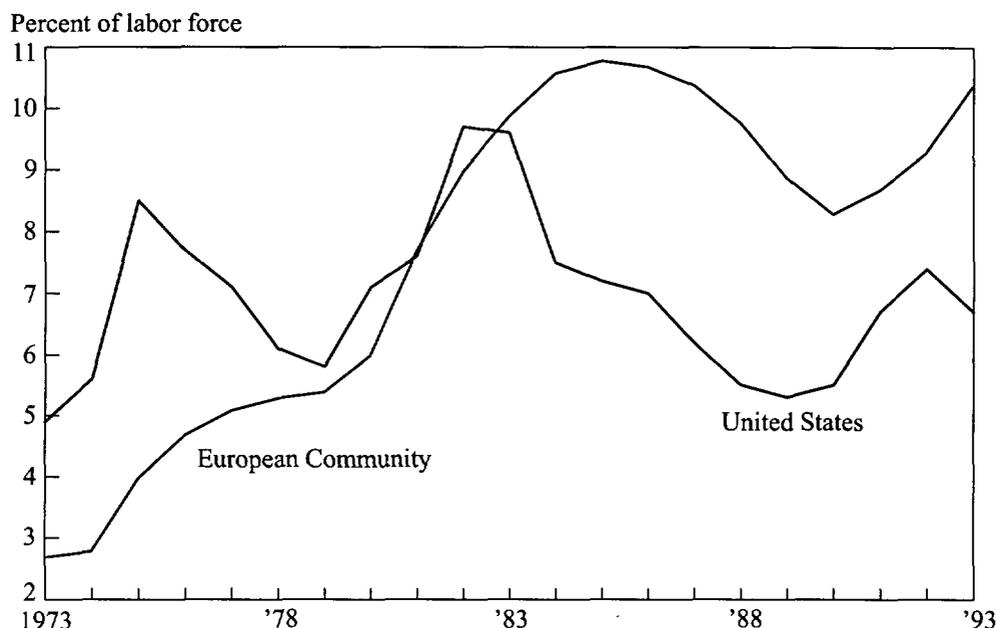
The purpose of this paper is to address the big questions about OECD unemployment: Why has it risen? Will it continue to rise? What can be done to reverse the trend? These are daunting questions. Luckily, there is no need to be original. Not only has the OECD unemployment problem been the subject of massive amounts of research, many economists have coalesced around a common view of the nature of the problem.<sup>1</sup> This common view does not exactly represent a consensus, since there are important dissenting voices, but it is the conventional wisdom. For the most part, this paper restates that conventional wisdom.

Why is such a restatement necessary? Because while economists who think about OECD unemployment may have reached a considerable degree of agreement, educated opinion more broadly defined, and the opinion of policymakers in particular, remains far more diverse. In part, this may be because the instincts of the broader public do not accord with what the economists have to say. It may also be because the standard view is far from

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*Paul Krugman delivered this paper at the Federal Reserve Bank of Kansas City's 1994 symposium on "Reducing Unemployment: Current Issues and Policy Options," Jackson Hole, Wyoming, August 1994. He is currently a professor of economics at Stanford University.*

Chart 1  
**Unemployment Rates**



comforting and seems to imply some harsh choices that the public and the policymakers would rather not face. And in part, the failure of the standard economist's view to become equally standard among noneconomists may result from a failure to explain that view clearly. This last failure, at least, may be correctable.

This paper is in five parts. The first part addresses the crucial distinction between cyclical and structural movements in unemployment, aka fluctuations around and movements in the natural rate. The second part lays out the central theme of the conventional wisdom about rising unemployment in advanced economies: that high unemployment in many industrial nations is an unintended byproduct of their redistributionist welfare states, and that the problem has worsened because the attempt to promote equality has collided with market forces that

are increasingly pushing the other way. The third part of the paper turns to the question of the sources of the apparent tendency toward greater earnings inequality, and in particular the relative roles of globalization and technological change. Finally, the last two parts of the paper are concerned respectively with possible policies and realistic prospects.

### *CYCLICAL VERSUS STRUCTURAL UNEMPLOYMENT*

The starting point for most analytical discussion of unemployment trends is the hypothesis, introduced by Friedman and Phelps a generation ago, that at any given time a national economy is characterized by a "natural rate" of unemployment. Expansion of aggregate demand may push unemployment

Table 1

**Unemployment and Inflation, 1973-93**

Change in inflation rate (fixed-weight GDP deflator)	Unemployment rate (married men)	< 4 percent	> 4 percent
		Positive	7 years
	No change	0 years	1 year
	Negative	1 year	9 years

below this rate, but only at the cost not merely of higher but of accelerating inflation. Similarly, a shortfall of aggregate demand may push unemployment above the natural rate, but this will lead to decelerating inflation. Given any policy environment that avoids explosive inflation or deflation, then, the economy cannot remain persistently either above or below the natural rate of unemployment, although it may fluctuate around that level.

It follows from this hypothesis that changes in unemployment must be separated into two components: "cyclical" fluctuations around the natural rate, which can be attributed to changes in aggregate demand, and "structural" movements in the natural rate itself, which can result from changes in labor market institutions, demographic shifts, and so on. How one assesses the prospects for reversing a rising trend in unemployment, and what policies one advocates to help turn it around, depend crucially on whether the rise is cyclical or structural.

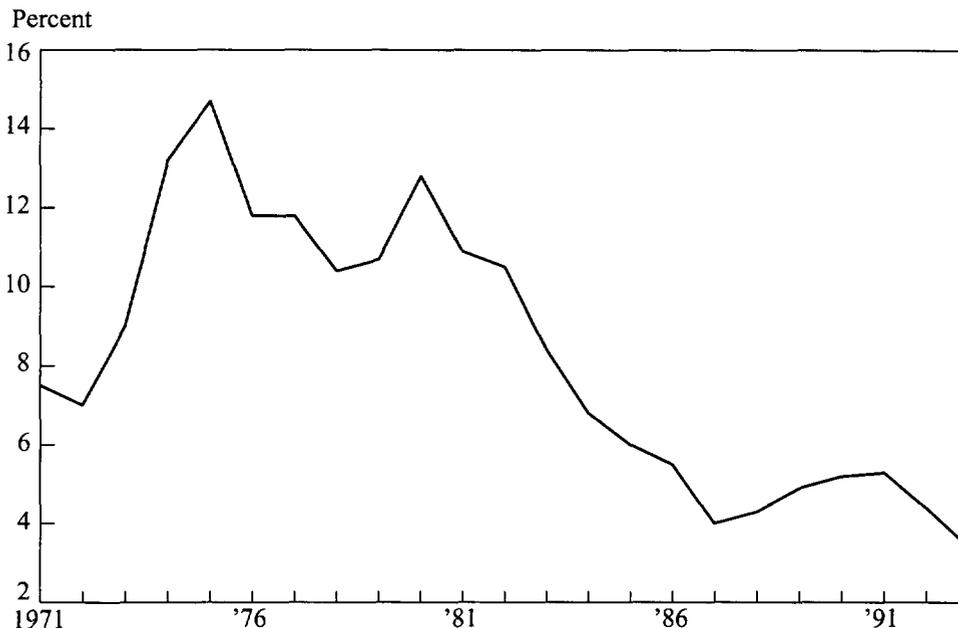
The natural rate hypothesis has received near-universal acceptance among academic economists since the 1970s.<sup>2</sup> My sense is that it is less well accepted among policymakers and journalists, who seem to regard it as an abstract idea whose very neatness makes it suspect. It is therefore worth pointing out that for the United States, at least, the

natural rate hypothesis has a very solid basis in experience.

Suppose we ask the question, is it true that inflation consistently accelerates when the unemployment rate is low, and decelerates when that rate is high? The answer is yes, it is. The consistency is particularly apparent if we look not at the overall unemployment rate, whose interpretation shifts somewhat with changes in the age and sex mix of the labor force, but at a more stable group. Table 1 compares the level of the unemployment rate among married men with the change in the rate of inflation, measured by the GDP deflator, over the subsequent year. From 1973 to 1992, the unemployment rate for married men was above 4 percent in 11 years, below that rate in eight years. If there were nothing to the natural rate hypothesis, there should be little systematic relationship between the unemployment rate and the change in the inflation rate. In fact, the correspondence is very close: in all but two years in which the reference unemployment rate was above 4 percent, inflation fell; in every year but one in which it was below 4 percent, inflation rose. In other words, the evidence is overwhelmingly consistent with the idea that the U.S. economy will suffer accelerating inflation if the unemployment rate for married men drops below about 4 percent.<sup>3</sup>

Admittedly, a simple table like this can be

Chart 2

**European Community Inflation Rate (GDP Deflator)**

constructed only for the United States among advanced countries. The reason is that the United States is unique in having no visible long-term trend in its unemployment rate, suggesting that the natural rate has been more or less constant. For other industrial countries it is necessary to attempt to estimate shifts in the natural rate as well as the relationship between deviations from the natural rate and inflation. If there were no “clean” case like that of the United States, this might raise suspicions that the hypothesis is not so much confirmed by the data as imposed on them, that economists are simply adding epicycles until their model fits. Luckily, however, the U.S. experience does provide a pretty convincing demonstration of the natural rate hypothesis.

Given that hypothesis, unfortunately, a discouraging conclusion immediately follows: most of the

upward trend in OECD unemployment rates since the early 1970s represents a rise in structural unemployment. We know this because the unemployment rates consistent with stable inflation have unambiguously risen, especially in Europe. Chart 2 shows inflation in the EC since 1960. Inflation was stable in the early 1960s, despite an average unemployment rate of little more than 2 percent; it was rising in the late 1980s, in spite of an average unemployment rate of more than 8 percent, suggesting that the natural rate of unemployment has risen by at least six percentage points. Admittedly, the deceleration of inflation in OECD countries since 1992 suggests that current unemployment rates also contain a cyclical component; most economists would agree that there is considerable room to take up economic slack in both Europe and Japan, although not at this point in the United States.

Nonetheless, the bulk of the unemployment problem clearly seems to arise from an upward trend in the natural rate, and this paper will proceed on the presumption that this is the essence of the problem.

Before doing so, however, it may be worth briefly addressing two alternative views that have, in effect, been used to argue that this pessimistic view about the prospects for reducing unemployment by expanding demand is wrong: the serious argument that the natural rate itself may be affected by the business cycle, and the silly but popular view that globalization has somehow repealed the limits on expansion of aggregate demand.

### *Hysteresis*

In an influential 1986 paper, Oliver Blanchard and Lawrence Summers argued that sustained increases in the unemployment rate due to inadequate demand get built into the natural unemployment rate, so that attempts to recover from these slumps are blocked by fears of inflation. Their formal analysis was based on a model in which unions represent only employed workers and ignore the impact of their wage demands on the employment prospects of those not currently working (a formulation which linked their work to the still influential “insider-outsider” approach of Lindbeck and Snower); temporary negative shocks to labor demand, which disenfranchise some of the work force, can therefore permanently raise real wages and reduce employment. Informally, advocates of the “hysteresis” hypothesis argue that a variety of mechanisms, including loss of skills and loss of reputation, cause the long-term unemployed to become perceived as unemployable.

After an initial period of considerable popularity, the hysteresis hypothesis has lost some of its influence. This loss of favor appears to represent an empirical judgment. We might note three particular pieces of evidence. First, the U.S. experience shows no evidence of hysteresis at work: even though the American economy passed through an extended, double-dip recession from 1979 to 1982 and did not

get back to late-1970s levels of unemployment until the late 1980s, the natural rate showed no signs of having increased during that time. Second, European nations like Sweden that managed to avoid large-scale unemployment during the 1980s and should therefore, according to the hysteresis hypothesis, have avoided a large rise in their natural rates, now show all the symptoms of full-blown Eurosclerosis. Third, as discussed below, differences in national unemployment rates seem to be fairly well explained by differences in how well countries treat their unemployed; the hysteresis story would predict a larger role for accidents of history.

I personally find the hysteresis hypothesis intellectually very appealing and suspect that Blanchard and Summers are right in arguing that some version of that hypothesis is essential in explaining earlier episodes of mass unemployment—that, for example, the Great Depression was an aggregate demand slump which was met with new institutions that in effect ratified the high level of unemployment. But its relevance to the current situation is unclear, and it will be left on one side for the rest of this paper.

### *Globalization*

Recently, there has been a vocal movement in the United States which has protested against actions by the Federal Reserve to slow demand growth as the economy approaches standard estimates of the natural rate. These critics argue that the economic realities have changed and that there is no longer any risk that a rapid recovery will set off renewed inflation.

The basic argument of these critics is that globalization—the increased openness of the United States to international trade—has changed the rules of the game. Economic expansion cannot produce bottlenecks because firms can always turn to suppliers abroad. Firms will not raise prices, no matter how hot the market, because they fear foreign competitors. And workers, constantly threatened with

loss of their jobs to other nations, will not demand higher wages no matter how low the unemployment rate goes. According to this view, internationalization has either drastically lowered the natural rate or even made the whole concept irrelevant.

Many people find this argument extremely attractive. It is hard to see, however, how anyone who has looked at recent economic experience, or is familiar with basic economic data, can take the argument seriously.

First, the whole emphasis on the importance of international competition ignores the fact that both the U.S. economy and the economy of Western Europe (considered as a unit) are still primarily in the business of producing goods and services for their own use. Imports are only 11 percent of U.S. GDP. While it is true that a somewhat wider range of goods is subject to international competition than is actually traded, at least 70 percent of each economy remains effectively insulated from foreign markets—and therefore is capable of experiencing inflation regardless of international conditions.

Second, the challenge to conventional wisdom seems to take it for granted that the United States faces a perfectly elastic supply of imports at given prices in dollars. But the United States has a floating exchange rate; and any effort to promote continued recovery by keeping interest rates low would drive down the dollar and therefore raise import prices in U.S. currency. The normal view of international macroeconomists has been that an open economy with a floating exchange rate faces a steeper tradeoff between unemployment and inflation than a closed economy (indeed, this has been the traditional rationale for policy coordination); it is hard to see why this view should suddenly be abandoned in favor of the idea that an open economy faces no tradeoff at all.

Finally, there are clear recent examples demonstrating that open economies can indeed develop inflation problems if they overexpand. The U.S. economy itself found inflation accelerating in the late 1980s as the unemployment rate dropped below 6 percent. Has the structure of the economy really changed so much in five years?

But this experience pales by comparison with the British experience. The UK is a much more open economy than the United States, so if the idea that globalization prevents inflation works anywhere it should work there. But a rapid UK boom during the late 1980s produced an explosion of inflation, forcing an abrupt U-turn in the country's economic policies.

In short, there is no reason to believe that the increased openness of advanced economies has changed the basic logic of the natural rate hypothesis, or that it should lead us to modify the conclusion that a rise in the natural rate, rather than inadequate demand, is the main source of the unemployment problem in advanced economies.

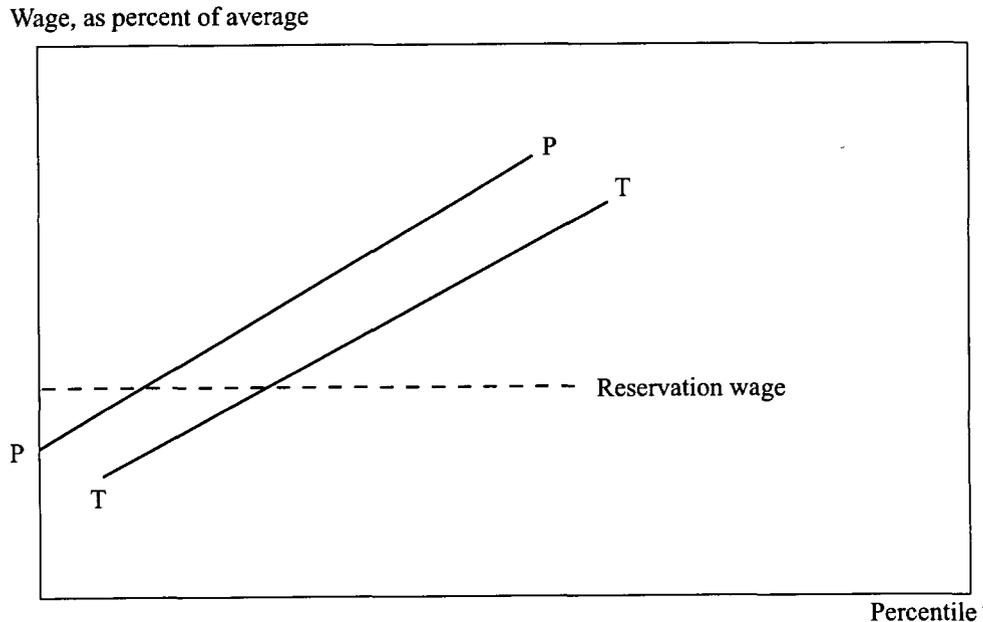
### *WHY HAS THE NATURAL RATE RISEN?*

A wide variety of explanations have been offered for the apparent rise in the natural rate of unemployment. Most papers on the issue are either careful tests of one of these explanations or comprehensive surveys of the different explanations. In this paper I will avoid being judicious and offer just one explanation, in two parts. The first part is that persistent high unemployment can be explained by the disincentive effects of welfare state policies. The second part is that market forces pushing toward greater inequality have worsened the unemployment consequences of the welfare state.

#### *The welfare state and unemployment*

A welfare state may be loosely defined as a system that collects taxes from the population at large and uses the proceeds to provide support to the poor, the unemployed, and other groups believed to need help. All advanced countries are welfare states to some degree. The extent of the redistribution, however, varies substantially across countries. In particular, by just about any measure the United States taxes less and provides less

Figure 1



support to the unemployed than European nations. The United States has also, of course, been able to avoid the upward trend in unemployment that has afflicted Europe. It is only natural to suspect that the two facts are related: that the generosity of Europe's welfare states is in some sense responsible for the rise in their unemployment rates.

How might a welfare state create unemployment? Taxes (such as required employer contributions to social insurance funds) and regulations may raise the cost to firms of offering jobs and thus reduce the wages they are willing to pay; simultaneously, benefits such as unemployment insurance may reduce the incentive for workers to accept jobs and thus raise the wages they demand.

Figure 1 presents a schematic representation of these ideas, which represents a drastic oversimplification but may prove useful as an organizing

device. In drawing the figure, I suppose that workers vary considerably in the real wage that they could earn in an unregulated market. I will, for the sake of brevity, refer to the real wage the market is willing to pay a worker as her "productivity," without necessarily committing to the view that wages actually equal marginal products. We may then calculate a schedule that relates the percentile of a worker to her relative productivity. For example, a worker who is in the 10th percentile of the wage distribution might have a productivity that is 25 percent of the average productivity for all workers, and so on. In Figure 1, *PP* represents that productivity schedule. In the absence of welfare state policies, *PP* would also represent the actual wage schedule.

But now introduce policies that include both taxes on employment and benefits to the unemployed.

*Table 2*  
*Skill Level vs. Unemployment in the UK, 1984*

<u>Occupational group</u>	<u>Unemployment rate</u>
Professional and managerial	5.3
Clerical	8.0
Other nonmanual	12.2
Skilled manual	12.6
Personal services/other manual	15.5

Source: Layard, Nickell, and Jackman.

This will have two effects. First, a wedge will be driven between the productivity of workers and their take-home pay; the take-home pay schedule is represented by TT. Second, workers will be discouraged from accepting employment; this can be represented by introducing a *reservation wage*, a floor on the wages workers will accept (or the wages that they are allowed to accept, if there are high minimum wages imposed either by law or by organized labor).

The result is obvious: all those workers whose take-home pay is less than the reservation wage will become unemployed.

Is this a reasonable picture? It implies two testable empirical propositions. First, it implies that in cross-country comparisons there should be a positive relationship between unemployment and both the level of benefits to the unemployed (which raise their reservation wage) and the tax wedge. Second, it implies that within countries unemployment should be higher among low-productivity workers, a category that should be correlated with though not necessarily exactly matched to workers with low skill.

Both propositions have some empirical support. Cross-country regressions, like those of Layard, Nickell, and Jackman, do find that measures of the level of benefits have strong positive effects on long-term averages of national unemployment rates. And it is true that within countries, unemployment rates are strongly correlated with skill levels. Table 2 provides some illustrative British data.

These are not extremely stringent tests. Nonetheless, they do confirm that a story along the lines of Figure 1 is at least broadly consistent with the evidence.

But this is a story about the level of the unemployment rate rather than its trend. It suggests that generous welfare states will tend to have higher unemployment rates than nations which allow markets to function with a greater degree of brutal freedom, a prediction that seems to accord with the situation today. It does not, however, explain why unemployment rates in Europe should have risen so much.

One reason for a rise in unemployment rates might be an increase in the generosity and cost of the welfare state. It is hard to believe, however, that

this is the key factor. While there has been a rise in the tax burden in Europe since 1970, especially in social insurance contributions, European welfare states were already notably generous in the low-employment era of the early 1970s. Most analysts have therefore looked for the explanation of the upward trend not in changed policies but in a changed environment. In particular, it has become increasingly common to argue that the upward trend in unemployment is the result of market forces that *want* to produce greater inequality of earnings. The collision between these market forces and the attempts of the welfare state to limit inequality then lead to higher unemployment.

### *Inequality and unemployment*

It is straightforward, in our stylized framework, to see how a rise in the inequality of market wages could lead to increased unemployment. An increase in inequality implies that the wages of low-paid workers fall relative to the average, while those of high-paid workers rise relative to the average. That is, it implies a rotation of the wage curve  $TT$  in Figure 1. This is shown in Figure 2 as the shift from  $TT$  to  $T'T'$ . If the reservation wage as a percentage of average wages remains unchanged, the effect is clearly to raise the fraction of workers unemployed. The logic is simple: if the wages that the market is willing to pay workers of low productivity fall relative to the average, while the level of benefits keeps up with the average, more workers will find that available pay rates are below their reservation wage.

This rise in unemployment only takes place, of course, if the reservation wage is high enough to be binding. If the reservation wage is very low, as it would be in a weak welfare state, the market push toward greater inequality will simply result in greater inequality! Conversely, in a strong welfare state the increase in underlying pressures toward inequality may not be clearly visible in the actual distribution of earned wages, since those workers

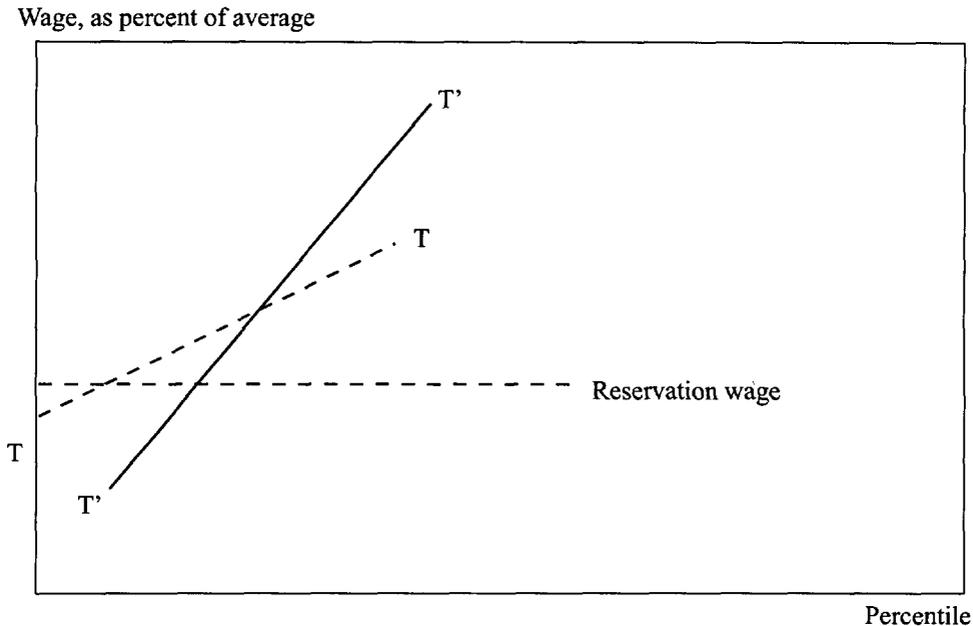
whose relative wages would have fallen the most are instead priced out of the labor market.

These observations suggest two points. First, if a tendency toward greater inequality is an important cause of rising unemployment, we might expect to see less of that trend in countries with niggardly welfare states. In other words, the difference in institutions may explain the striking contrast between U.S. and European experience, shown in Chart 1. Second, in those countries where there is no upward trend in unemployment, we should expect to see a marked rise in wage inequality.

The fact, of course, is that there has indeed been a dramatic increase in wage inequality in the United States. It is the observation of that increase which has led many observers to conclude that growing U.S. inequality and growing European unemployment are different sides of the same coin. There has been a great deal of dispute over the issue of inequality in America, for obvious political reasons, but labor economists are unanimous in finding a massive increase since 1970 both in the dispersion of wages and in the premium for skill. This increase in dispersion reversed what had appeared to be an earlier trend toward greater equality of earnings. Table 3 shows some representative numbers.

These numbers represent a dramatic change in the wage structure. It is a testimony to the flexibility of U.S. wages that the American labor market was able to accommodate such large shifts without massive disruption. Correspondingly, if the same forces were trying to produce similar results in other countries, it is not hard to believe that different and less flexible labor market institutions could easily have responded in ways that led to considerable unemployment. The obvious question, of course, is why this happened. What were these "market forces" that led to radically increased inequality in the United States and, perhaps, to greatly increased unemployment in Europe? We turn to this question shortly. First, however, it is important to stop and consider a factor that is widely believed to be crucial to employment but that does not appear to make much difference in practice.

Figure 2



### *Productivity and employment*

Nearly all official reports on long-term unemployment problems stress the importance of raising productivity. In many cases, as in the 1993 European Commission White Paper (discussed below), they call for industrial policies such as support for high technology industries that are expected to promote productivity growth as an answer to employment problems. Moreover, the rise in unemployment after the early 1970s coincided with a global slowdown in productivity growth. So it seems obvious to many policymakers that there must be a straightforward connection. But is there?

At first glance it might seem that the framework shown in Figure 1 would imply that higher productivity would imply an upward shift in the wage curve, and thus a fall in unemployment. The schedules

in Figure 1 are all drawn, however, to show wages and productivity relative to the average; an across-the-board rise in productivity, if matched by an increase in minimum wages, benefits, etc., that raises the reservation wage at the same rate will have no effect on unemployment.

In practice, welfare state economies do tend to raise benefits along with average wages, and in many cases to raise them even faster when the inequality of wages is increasing, as a way of leaning against the wind.<sup>4</sup> As a result, we should not expect to see any strong relationship between productivity growth and unemployment trends. And in fact there is no such relationship in the data. Chart 3 compares long-term productivity growth rates for advanced countries with the change in their average unemployment rates between the first half of the 1960s and the second half of the 1980s. There is no

Table 3

**Indicators of U.S. Wage Inequality**

## A. Ratio of earnings of college to high school graduates, 1-5 years experience

1964	1.59
1979	1.30
1989	1.74

Source: K. Murphy and F. Welch, "The Structure of Wages," *Quarterly Journal of Economics*, February 1992.

## B. Log difference in earnings of 90th and 10th percentile, men 35+

1940	1.45
1970	1.18
1985	1.46

Source: C. Goldin and R.A. Mayo, "The Great Compression: The Wage Structure in the United States at Mid-Century," *Quarterly Journal of Economics*, February 1992.

visible pattern in the scatter: the best unemployment performances were turned in by the country with the worst productivity performance (America) and that with the best (Japan).

The moral is that good things do not necessarily go together: high productivity growth need not imply favorable employment performance, or vice versa. There is a strong tendency on the part of policymakers to presume that the economic problem must be one-dimensional—that growth and job creation are both aspects of some underlying quality, typically labeled with words such as "competitiveness." The available evidence suggests, however, that the unemployment problem has a life of its own and is not simply part of a generalized deterioration in economic performance.

### THE TENDENCY TOWARD GREATER INEQUALITY

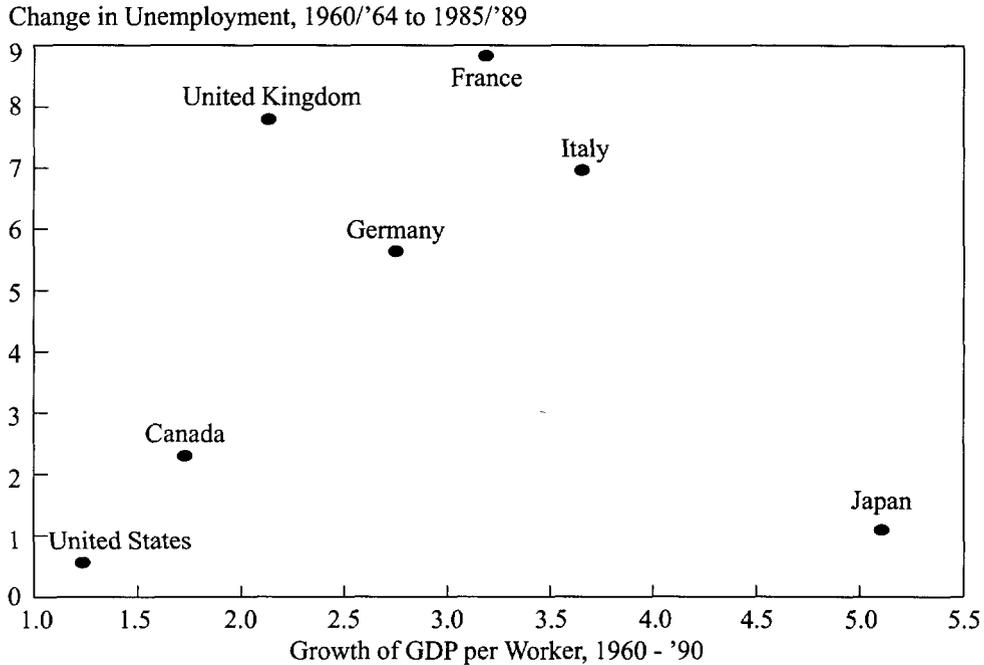
At this point we have made two main points. First, the rise in unemployment rates in the OECD

primarily represents a rise in the natural rate of unemployment. Second, a likely explanation for this rise is the collision between welfare state policies that attempt to equalize economic outcomes and market forces that are pushing toward greater inequality. But what are these market forces?

It is at this point that there is perhaps the greatest gap between professional economic research and the conventional wisdom as expressed in official reports and presentations to such prestigious forums as the Davos conference. Before turning to analysis, it may be useful to illustrate the tone of much non-professional discussion with a passage from a report that was at any rate intended to serve as the basis for European Union strategy in coping with unemployment: the European Commission's White Paper of 1993.<sup>5</sup>

The White Paper asks why European unemployment remained so high even during the business cycle recovery of 1987-90—in effect, it asks why the natural rate is so high, though without using that term—and offers four reasons:

Chart 3

**Productivity Growth Versus Unemployment**

- The role we have come to play in the new international division of labor has not been an optimum one because we have neglected future growth markets in concentrating too much on the revenues and positions established in traditional industries.
- The relatively high cost of unskilled labor is encouraging investment in rationalization and holding back job creation in services.
- Our employment systems have aged: by this term we mean the whole complex of issues made up nowadays by the labor market, labor legislation, employment policy, the possibilities of flexibility within or outside enterprises, the opportunities provided or not provided by the education and training systems, and social protection.
- Finally and more especially, other countries are becoming industrialized and competing with us—even in our own markets—at cost levels which we simply cannot match.

Of these explanations, the second essentially fits into the framework described in the last section of this paper. The third is fairly mysterious; whatever it means, it may have something to do with the incentive effects of the welfare state. The important observation, however, is that in a four-point explanation of unemployment, the Commission report offers two points related to international competition. In particular, the last explanation, which the report highlights as being the most important, explicitly blames rising European unemployment on competition from newly industrializing nations.

These views are not unrepresentative. Indeed, it is probably fair to say that many if not most intellectually minded European business and political leaders would list external competition, and especially competition from the Third World, as the single most important reason for rising unemployment in

their nations. A significant number of their American counterparts would similarly blame external competition for growing inequality and declining real wages among the less skilled. Are they right?

### *Globalization, inequality, and unemployment*

Despite the normal presumption of gains from international trade, it is possible to conceive of a number of ways in which increased competition on world markets could adversely affect economies. In a Keynesian situation, a trade deficit could depress aggregate demand and thus output. Increased foreign production of goods that compete with exports could worsen a country's terms of trade. More speculatively, foreign competition could drive a country out of industries that for some reason are especially desirable, either because capital and/or labor consistently earn more in those industries than elsewhere, or because the industries yield valuable external economies. In practice, however, these potential channels for damage seem either not to be operative for the advanced nations or to be irrelevant for the issue of unemployment. Most OECD unemployment is not Keynesian, and in any case the advanced nations as a group (and the European Union in particular) have not run consistent trade deficits.<sup>6</sup> The terms of trade of the industrial nations as a group have improved, not worsened, over the past generation. It is conceivable that Europe has been pushed out of some desirable industries, that "the role we have come to play in the new international division of labor has not been an optimum one," but this should show up as a slower growth of productivity; yet European productivity growth has continued at respectable rates, and in any case productivity and unemployment seem to be unrelated.

There is, however, one more way in which international trade could affect the economy, which could explain both the increase in U.S. inequality and the rise in European unemployment: increased trade with countries abundant in unskilled labor

could increase the premium on skill.

This idea is attractive at several levels. First, it offers a broad common explanation of what is happening on both sides of the Atlantic. Second, it ties the great labor market trends in advanced nations directly to other major trends in the world economy: the growth of international trade and the rise of newly industrializing nations. Finally, the idea that trade produces a tendency toward factor-price equalization is well grounded in economic theory, going back to seminal work by none other than Paul Samuelson. All in all, the proposition that globalization explains the simultaneous growth in inequality and unemployment makes a nice, intellectually appealing package; it is not surprising that it should command wide acceptance.

Unfortunately, empirical research is nearly unanimous in rejecting the idea that imports from the Third World have been a major factor in reducing the demand for less-skilled workers.

To understand this evidence, it is necessary to understand not just that international trade can in principle change the relative demand for skilled and unskilled labor, but how the mechanism of that change must work.

Suppose that a country in which skilled labor is relatively abundant increases its trade with another country in which it is relatively scarce. This will raise the demand for skilled labor, while reducing the demand for unskilled labor—but how? The answer is, through a change in the industry mix. The skill-abundant country will export skill-intensive goods and import labor-intensive products, and as a result will shift its production toward skill-intensive sectors and away from labor-intensive sectors.

At any given wage rates, a shift in the industry mix toward skill-intensive products raises the demand for skilled workers while reducing it for unskilled workers. This will lead to a rising real wage for skilled workers, a declining real wage for unskilled. The rising wage differential, in turn, will lead firms in *all* industries to reduce the ratio of skilled to unskilled workers in their employment. When the dust has settled, the wage differential

must rise just enough to offset the effects on labor demand of the change in industry mix.

According to this story, then, if international trade is the cause of an increase in the skill premium, the rising relative wage for skilled workers must lead all industries to employ a *lower* ratio of skilled to unskilled workers; this is necessary in order to allow the economy to shift its industry mix toward skill-intensive sectors. Or to put it differently, the skilled workers needed to expand the skill-intensive sector are made available because industries economize on their use when their relative wage rises; and conversely the shift in the industry mix ratifies the change in relative wages.

This analysis carries two clear empirical implications: if growing international trade is the main force driving increased wage inequality, then we should see the ratio of skilled to unskilled employment *declining* in all industries and a substantial shift in the mix of employment toward skill intensive industries.

In fact, the data look nothing like this prediction. A number of studies, including Bound and Johnson, Katz and Murphy, OECD, and Lawrence and Slaughter, have found either for the United States or for a broader set of countries that both propositions fail to hold. There has been little shift in the mix of employment toward skill-intensive industries; and there has been an across-the-board *increase* in the ratio of skilled to unskilled workers employed within each industry, in spite of the rise in the relative wages of the skilled. That is, the data strongly indicate that if the relative demand for skilled workers has risen, it is because of some common factor that affects all sectors, not because of forces like international trade that change the sectoral mix.<sup>7</sup>

How can the effects of such a dramatic global trend as the rise of the newly industrializing economies be so invisible in the labor market data of advanced countries? There are several answers. For one thing, although the rapidly growing economies of the Pacific Rim have attracted a great deal of attention, their role in the trade of advanced nations

is still fairly small. As late as 1990, imports from newly industrializing economies were only 8.5 percent of the total merchandise imports of the OECD nations, and imports of manufactured goods from these countries were less than 1.5 percent of GDP.

Moreover, the entry of newly industrializing countries is not the only trend affecting the relative supplies of skill-intensive and labor-intensive products in the world economy. Think about two events that are often lumped together: the emergence of China as a major manufacturing exporter, and the rapid increase in the skill level of the labor forces in other East Asian nations, including Japan. Both tend to increase exports of manufactures from East Asia, but they have opposite effects on the relative prices of skill-intensive products. When a country with abundant unskilled labor throws itself open to trade, this tends to lower the relative price of labor-intensive goods, causing other nations to shift out of these sectors. But when a country upgrades its skill level, it tends to produce more skill-intensive and fewer labor-intensive goods, which has the opposite effect. It may be useful to pose the following question: has the skill of the labor force in the average trading nation—where countries are weighted not by population, but by the value of their production—gone up or down over the past two decades? It is by no means clear what the answer is, so we should not be surprised that there is no clear effect of international trade on the skill mix of industries within advanced countries.

The evidence, then, clearly rejects the view that growing competition from the Third World has been the source either of growing inequality in the United States or of rising unemployment in Europe. But what can explain these trends?

### *Technology and the skill premium*

Economists use the word “technology” somewhat differently from normal people. Webster’s defines technology as “applied science,” which is pretty much the normal usage. When economists

speak of technological change, however, they mean “shifts in the production function”—alterations of the relationship between inputs and outputs, regardless of the reason.

In this economist’s sense, it seems undeniable that the increase in the skill premium in the advanced world is primarily the result of skill-biased technological change. Although the relative wages of skilled workers have risen, most sectors have increased the ratio of highly skilled to less-skilled workers in their labor force; this immediately indicates a change in the production function that raises the marginal product of the skilled relative to the unskilled. And virtually all of the rise in the relative demand for skilled workers seems to have been a result of this intra-industry change in demand, rather than changes in the interindustry mix of employment. In the economist’s sense, then, the growth of earnings inequality in the United States—and quite possibly therefore much of the rise in structural unemployment in Europe—has been the result of technological changes that just happen to work against unskilled workers.

This answer may, however, seem unsatisfying. It is not a tautology: it could in principle have been the case that nontechnological forces, such as international trade, were responsible for much of the growth in the skill premium. Still, one would like to relate technological change in the economist’s sense to its more normal usage: what is changing in the way that we produce goods and services that has apparently devalued less-skilled workers?

The short answer is that we do not know. There are, however, several interesting albeit conflicting pieces of evidence.

On one side, there is some evidence that some increased dispersion in earnings can be traced directly to the spread of computers. In a recent study, Krueger has found that workers who use computers achieve noticeable wage premia over workers who do not; he claims that the expansion of computer use in the 1980s can account for one-third to one-half of the rise in the rate of return to education.

On the other side, some of the professions that

have seen very large increases in incomes since the 1970s have not exactly been in fields whose practitioners are obviously made more necessary by modern technology (in the normal usage of the word): doctors, corporate executives, etc. And it is also true that the growth of inequality in the United States has a striking “fractal” quality: widening gaps between education levels and professions are mirrored by increased inequality of earnings *within* professions. Lawyers make much more compared with janitors than they did 15 years ago; but the best-paid lawyers also make much more compared with the average lawyer. Again, this is hard to reconcile with a simple story in which new computers require people who know how to use them.

It is surely hard not to suspect that the dramatic progress in information and communication technology over the past two decades has somehow played a central role in the increased premium on skill, and perhaps in the growth of European unemployment. The actual linkages are, however, not at all well understood—a point that is important to remember when we turn to policy.

### WHAT CAN BE DONE?

Robert Lucas once scathingly described the report of the McCracken Commission on inflation as being marked by “undisciplined eclecticism.” Much the same may be said about many official reports on OECD unemployment: lacking a clear vision of the nature of the problem, they offer a kind of policy salad that mixes together various proposals that seem forward-looking—building smart trains and information superhighways or promoting multimedia are treated at the same level as trade liberalization and reform of unemployment insurance. For this paper, I will perhaps err in the opposite direction, and take it as a maintained hypothesis that the European unemployment problem and the U.S. inequality problem are two sides of the same coin, and ask a narrowly focused question: what can be done about the apparent tendency of markets to

produce increasingly unequal outcomes, or to produce persistent high unemployment if this tendency toward inequality is repressed?

Once one phrases the question that way, there are a limited number of sensible strategies available.

### *Human capital*

The most optimistic viewpoint on the inequality/unemployment problem, one particularly associated in the public mind with U.S. Labor Secretary Robert Reich (Reich), is that investment in human capital—both in basic education and in retraining for older workers—can reverse the tendency toward greater inequality.

In principle, human capital investment could constitute a two-pronged assault on the problem. First, education and training could, in effect, make the 10th percentile worker more like the 90th percentile worker. If a worker who does not go to college has nonetheless received a highly effective basic education, she will be more productive not only in absolute terms but also relative to the college-educated. The same is true of a worker whose former skills have been made obsolete by technical change, but receives training that equips him with a new set of marketable skills. Thus a program of investment in human capital should work directly to flatten the wage schedule in Figures 1 and 2.

At the same time, an increase in the overall level of skill in the work force would presumably make the premium on skill smaller—and this too should flatten the wage distribution.

Investment in human capital, then, seems to be a magic bullet that solves the problems of both unemployment and inequality, without posing painful tradeoffs. What are the objections?

The big question is whether it is realistic to expect government education and training programs to make a large enough impact on the wage distribution to have any noticeable effect. A skeptic might offer several disturbing observations. First, it is unclear how much of the spread in the earnings

distribution is actually tied to formal education; the fractal quality of the increased dispersion suggests that deeper forces are at work, which may continue to yield increasingly unequal outcomes even if formal education levels are made more uniform. Second, improvements in basic education will, by definition, take a very long time to be reflected in the actual labor market. As a result, human capital optimists tend to stress retraining, which might have more immediate payoff; but there is little evidence suggesting that retraining schemes are actually particularly effective in raising worker productivity.

Above all, it is hard to see any evidence in the data that virtue in the form of good education and retraining are rewarded with good labor market performance. Americans who are self-critical about our basic education generally hold up European nations such as France and Western Germany as models, but their success in teaching students basic literacy and numeracy has not translated into sustainable low unemployment. Neither has the massive Swedish retraining scheme.

None of this constitutes a conclusive demonstration that human capital investment cannot have a favorable impact, or an argument against trying to improve education and training. It is, however, hard to escape the feeling that those who place their faith in education and training as the major solution to the problems of jobs and wages are engaging in wishful thinking, driven by an unwillingness to face up to the harshness of the tradeoffs involved.

### *Pruning the welfare state*

If investment in human capital is the feel-good answer to unemployment, scrapping or at least shrinking the welfare state is the tough, hard-nosed answer. Theory, experience, and econometric evidence all suggest that countries with high natural rates of unemployment can bring down those natural rates by reducing both the generosity and duration of benefits to the unemployed, thereby

increasing the desperation with which the unemployed must search for jobs. The gross comparison between the United States and Europe is one piece of evidence; cross-country econometric studies like the already cited work of Layard, Nickell, and Jackman are another. The experience of the United Kingdom, which has lowered its social safety net partway from European toward U.S. levels, provides something of a test case. Both anecdotal evidence and econometric estimates suggest that the UK's natural rate has in fact declined both absolutely and relative to those of its European neighbors (Elmeskov).

The problem is that this reduced unemployment does not come without a cost. While welfare states do distort incentives, they also provide real benefits to families in the lower end of the income distribution. Thus when the welfare state is scaled back, the lowest income members of society are in fact hurt. The new jobs created are, predictably, low wage (just think of running Figure 1 in reverse). And those who are still unemployed after the reduction in benefits are especially hard hit. It is surely not an accident that the United States, which combines unusually low benefits among industrial countries with an unusually favorable employment performance, also is unique by any measure in the extent of poverty—especially among families with children.

It is common in much discussion of unemployment to use euphemisms in describing policies that will in effect lower the reservation wage; to talk, for example, about increasing the flexibility of the labor market. The reasons for this desire to mask the harshness of the choice are obvious. It is therefore, however, all the more necessary for those of us who are not under political constraints to be blunt. There is a well-understood way to reduce OECD unemployment, but it involves creating more jobs at the expense of more extensive and more severe poverty. As Layard and others put it, "This is a harsh route, in which some people end up on the scrap-heap."

This is an unpleasant tradeoff. Is there any way to improve it?

### *Making the welfare state work better*

Any tax or transfer payment distorts incentives. The size of the distortion can, however, be made less if the tax or transfer scheme is well designed. To a first approximation, the welfare state can be thought of as a combined system of taxes and transfers whose objective is to help the less fortunate, but which has large incentive effects, one of whose consequences is unemployment. Without question, it should be possible to make incremental improvements in this system that would reduce its incentive cost.

An example, which receives considerable emphasis in the European Commission White Paper, is the funding of social insurance via employers' contributions. In most cases, these contributions are regressive—that is, they represent a higher share of the compensation of low-wage than of high-wage employees. This, however, means that the system discourages the employment of precisely those workers who are most likely to be driven out of employment in any case.

A meliorative approach to unemployment, then, would try to find ways in which the current levels of support for the unemployed could be provided with less distortion of incentives, and hope in this way to achieve some reduction in the natural rate of unemployment. It is unclear, however, how much improvement is possible.

### *Subsidizing employment*

Until recently, smaller European countries, and especially Sweden, seemed to have managed to escape both Eurosclerosis and the American affliction of growing inequality. The key element in Sweden's success was an "active manpower policy," in which the government was prepared to make large outlays in an effort to keep unemployment low. Unemployed workers were sent to expensive retraining programs; employers were offered substantial subsidies for hiring the long-term unemployed; and the

government itself acted as an employer of last resort. In the 1980s, expenditure on these policies was about 1 percent of GDP, which most Swedes regarded as a good bargain.

Unfortunately, this record of success ended in the 1990s. The Swedish unemployment rate, less than 2 percent in 1990, has nearly quadrupled. Some of the unravelling may be attributed to macroeconomic problems, associated with Sweden's effort to shadow the European Monetary System. More to the point, Sweden became unable to maintain its policies in full because of a fiscal crisis, which drove the public sector deficit to 14 percent of GDP in 1993 (Lindbeck and others). And many Swedes now attribute the country's slide in economic rankings, from the highest per capita GDP in the OECD in 1970 to rough parity with the UK today, to the long-term incentive effects of its social policies.

As a matter of economic principle, subsidized employment for those who would otherwise be unemployed should be a way to cut through the otherwise agonizing tradeoff between mass unemployment and mass poverty. As a practical matter of political economy, is it possible to carry out such a policy in a way that targets the groups that really need it, and thus avoids a runaway growth of expenditure? Five years ago, one might have said yes, and pointed to the Swedish example; at this point, the apparent unraveling of that model makes it difficult to argue for implementation of Swedish-style labor market policies. Nonetheless, unless Eurosclerosis goes into spontaneous remission it is likely that there will eventually be a call for a return to policies that subsidize employment.

## PROSPECTS

Predicting the future course of OECD unemployment involves assessing both the trends in market forces and the likely policy responses. In other words, this section is totally speculative. Nonetheless, it may be worth setting out a few scenarios.

## Market trends

The key question about market trends is whether the forces that have pushed toward greater inequality will continue or reverse direction.

The popular view that attributes the pressure on OECD labor markets to globalization and competition from newly industrializing countries is generally associated with a belief that things can only get worse. After all, there are still billions of workers out there, willing to work for very low wages, ready to pour their products onto world markets. As we have seen, however, the overwhelming evidence is that the pressure is in fact coming not from foreign competition but from the skill-biased nature of domestic technological change. Will this bias toward skill continue?

The short answer is that we do not know—but even that represents what may be a surprising piece of optimism. Let us consider the case for that optimism.

One point is historical. The Industrial Revolution was almost surely associated with a capital-using bias in technology, which led to a conspicuous failure of labor to share in the initial gains. From the 1920s to the 1970s, however, industrial growth was associated with an increasingly equal income distribution. The point is that technological advance need not always move the earnings distribution in the same direction; the relationship between growth and distribution has reversed sign in the past and may well do so in the future.

Let me also offer an even more speculative observation. It is generally assumed that modern technology, and especially computing technology, inevitably favors the cleverest and best educated. Robert Reich has nicely encapsulated this view by referring to the beneficiaries of technology as those who have the talent and education to work as “symbolic analysts,” rather than as manual workers. And there is no question that this is what has happened so far. Yet in the somewhat longer run it may actually be easier for computers to replace people in what are commonly regarded as high-skill occupations than in more ordinary work. As the artificial intelligence expert Marvin Minsky has pointed out:

A 1956 program solved hard problems in mathematical logic, and a 1961 program solved college-level problems in calculus. Yet not until the 1970s could we construct robot programs that could see and move well enough to arrange children's building blocks into simple towers. . . . What people vaguely call common sense is actually more intricate than most of the technical expertise we admire.

The time could well come when most tax lawyers are replaced with expert systems, but human beings are still needed—and well paid—for such truly difficult occupations as gardening and housecleaning. The high-skill professions that have done so well in the last 20 years may be the modern counterpart of early 19th century weavers, whose incomes soared after the mechanization of spinning, only to crash when the technological revolution reached their own craft.

This is pure speculation. For the time being the fact is that technological change has tended to magnify inequality and thereby impose unemployment on those countries that lack sufficient flexibility of relative wages. What are the likely policy responses?

### *Policy responses*

More often than not, the best policy forecast is for no substantive change. Surely the most reasonable forecast for the OECD economies is of no major change in their labor market policies: perhaps some reforms intended to improve incentives, perhaps some modest gestures toward active labor market policies, but no radical departure.

Would such policy drift be sustainable? At the moment, a sense of crisis has been created by two factors: the sharp rise in European unemployment rates since 1992, and the emergence of large budget deficits in countries with extensive welfare states. The very recent surge in unemployment is, however, primarily cyclical rather than structural. For what they are worth, estimates of trends in natural rates

for major European countries seem to show a flattening or even slight reversal of the upward trend by the end of the 1980s (Elmeskov, pp. 61-62). It is thus possible that an ordinary cyclical recovery could reduce the European unemployment rate to, say, its 1991 level. This would take off some of the immediate social pressure. A cyclical recovery would also improve the budget situation of the industrial nations.

It is worth recalling that policy concern with European unemployment tends to come in waves. Euroclerosis was a major issue in the mid 1980s but was nearly forgotten in the wave of "Europhoria" during the rapid growth of 1987-90. Now the consensus is that this growth was no more than a business cycle recovery, with little bearing on the structural problems—Europe's equivalent of "morning in America." Nonetheless, a solid recovery could once again cause the current focus on unemployment to recede.

What are the alternatives to drift? Leaving aside hopeful experiments with education and training, there are two main alternatives: Europe can become more like America, or it can try to become more like Sweden used to be.<sup>8</sup> That is, the welfare state can be scaled back, increasing the incentives for firms to offer and for workers to accept low-wage employment; or governments can try to subsidize employment at acceptable wage levels.

The political problems with either alternative are obvious. Attempts to scale back the protections that have discouraged employment in Europe will, indeed, already have, led to massive protests. On the other hand, if employment is to be subsidized, the money must be found somewhere, a difficult task when the budgets of many high-unemployment nations seem already to be dangerously out of control.

Unfortunately, it is hard to offer any comfortable predictions. The unemployment problem of the advanced nations has no painless solutions, and we should not expect effective action to solve that problem until or unless it becomes a true crisis.

## ENDNOTES

<sup>1</sup> Elmeskov (1993) provides a useful survey both of evidence and of the immense literature.

<sup>2</sup> Admittedly, there is a significant “real business cycle” faction among academic macroeconomists who do not believe that aggregate demand can alter unemployment even in the short run—that is, they believe in effect that the economy is always at the natural rate. I make no apologies for disregarding that view in this paper.

<sup>3</sup> Because of the changing demography of the labor force, the overall unemployment rate consistent with stable inflation has shifted around somewhat over time. In the late 1970s, with large numbers of young entrants into the labor force and a surge of women entrants with limited work experience, 4 percent unemployment among married men corresponded to about 7 percent overall unemployment; by the late 1980s, as the labor force became older and more experienced, a reasonable estimate of the natural rate had fallen to about 6 percent. Weiner (1993) provides estimates of a demographically adjusted natural rate; the track record of that rate in predicting the direction of inflation change is even better than that in Table 1.

<sup>4</sup> For a speculative model of the political economy of this tendency, based on a median-voter approach, see Krugman (1993).

<sup>5</sup> Commission of the European Communities, *Growth, Competitiveness, Employment: The Challenges and Ways Forward into the 21st Century*, Brussels, December 1993. The quotation is from page 4.

<sup>6</sup> There is a persistent belief among journalists and policymakers that competition from newly industrializing

countries, in addition to having the distributional effects discussed below, has been responsible for the declining share of manufacturing in advanced economy employment. This belief is, however, flatly rejected by the data. See Elmeskov (1993) and Krugman and Lawrence (1994).

<sup>7</sup> There has been some confusion created by several studies that attempt to measure the impacts of trade on income distribution by looking at the quantities of skilled and unskilled labor “embodied” in trade flows. Although this procedure, as implemented in such studies as Borjas, Freeman, and Katz (1991), seems plausible, it cannot be justified in any consistent trade model — nor is it possible to determine the direction of the bias. Despite the problems with their procedure, Borjas and others, and especially the update of their conclusions by Katz (1993), arrived at the same answer as other studies: that trade has played only a minor role in the trend increase in U.S. inequality. A recent study by Wood (1994) has claimed very large effects of North-South trade on income distribution. He not only relies on the “embodiment” method, however, he also uses a highly questionable procedure to get very high labor content in imports. It is hard to know what consistent economic model would justify his estimates, or how they can be reconciled with the direct evidence that there has been little change in the skill intensity of the industry mix.

<sup>8</sup> It is also possible that America will become a bit more like Europe. Clinton Administration officials have proposed both substantial increases in the minimum wage and a health care reform funded by employer mandates; both measures would substantially raise the cost of low-skill workers to employers, moving American labor markets closer to the European norm. At the moment, however, both proposals seem to be in abeyance.

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# Reducing Unemployment: Current Issues and Policy Options—A Summary of the Bank’s 1994 Symposium

*By Bryon Higgins*

**R**educing unemployment has become a top priority for economic policy in most industrialized nations. While unemployment will ebb somewhat as countries recover from the recent global recession, millions are likely to remain jobless for a variety of structural reasons. Moreover, there is a disturbing trend in many industrialized countries toward long-term unemployment, especially among low-skilled workers. This trend has had less effect on measured unemployment in the United States than in Europe in part because U.S. workers have greater incentives to accept low-wage jobs. Nonetheless, virtually all industrial countries face a jobs problem that impairs living standards and threatens a breakdown in social cohesion.

To enhance understanding of what has caused this problem and to analyze policies to address it, the Federal Reserve Bank of Kansas City sponsored a symposium entitled “Reducing Unemployment: Current Issues and Policy Options.” The symposium was held August 25-27, 1994, at Jackson Hole, Wyoming.

This article highlights the issues raised at the symposium and summarizes the papers and com-

mentary. The first section of the article identifies areas of agreement and disagreement among program participants. The remaining sections summarize the views of symposium participants and their policy recommendations.

## *SYMPOSIUM HIGHLIGHTS*

Symposium participants agreed high structural unemployment in industrial countries has resulted from the interaction between market forces and government policies. The principal change in underlying labor market forces in the past 20 years has been a decline in the demand for low-skilled workers, caused mainly by changing technology. In countries such as the United States, with limited government policies affecting labor markets, these forces have led to marginally higher unemployment but also to large increases in income inequality and poverty. In most European countries, with more extensive government policies toward labor markets, the result has been high structural unemployment, especially for low-skilled workers. Much of the increased unemployment is not merely temporary. Long-term unemployment has become a structural feature of economies in many European countries, in part because of generous government payments to the

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jobless and high payroll taxes to finance those payments. Policymakers in the industrial countries have been faced with a tradeoff between growing long-term unemployment or growing income disparities, a tradeoff Chairman Greenspan characterized in his opening comments for the symposium as both stark and dissatisfying.

Most participants felt the tradeoff could be improved—but probably only modestly—by adopting different labor market policies. The least costly improvement in Europe would be to reduce “employment protection,” that is, the laws that make it costly and time-consuming for employers to dismiss workers. Although providing job security, employment protection legislation has also made employers less willing to hire workers in the first place, especially so given the heavy payroll tax burden employers bear in Europe. Lowering payroll taxes, especially for low-wage workers, would further reduce the disincentive to job creation. To complement these policy changes, limiting the duration of unemployment benefits would provide greater incentive for the long-term unemployed to seek employment. Most participants also agreed that replacing “passive” income support payments to the unemployed with “active labor market policies” which increase employment opportunities could also reduce structural unemployment somewhat. Even with these and other changes to improve the functioning of labor markets, however, most participants concluded that substantially reducing European unemployment would necessarily entail increased income inequality and poverty so long as market forces continued to favor high-skilled over low-skilled workers.

In contrast to these broad areas of consensus, participants disagreed on several specific aspects of the unemployment problem. Some participants thought more accommodative monetary policies in Europe could contribute substantially to reducing unemployment, while others felt central banks could best contribute to job growth in the long run by continuing to focus on price stability. Nor was there complete agreement on the effectiveness of

several labor market reforms in reducing structural unemployment. Many participants, especially those from the United States, emphasized the need for paring the European “welfare state” as a prerequisite to reducing long-term unemployment. But several of the European participants questioned the effectiveness and political feasibility of doing so, especially if it resulted in growing income disparity and poverty as in the United States.

The differing degrees of emphasis on alternative policy responses reflected in part differing evaluations of the principal causes of rising unemployment. Those who believed the chief culprit has been the growth of the welfare state naturally placed more emphasis on reversing that trend, while those who believed other causes had also been important were less inclined to recommend drastic changes in the welfare state as a solution. Participants also differed on how much unemployment could be reduced in the United States and elsewhere by increased government spending on training programs, wage subsidies, and other active labor market policies. Some felt such policies could substantially improve the job prospects for low-skilled workers, but others thought they would prove too costly or ineffective.

### *EXTENT AND CAUSES OF UNEMPLOYMENT*

The first two sessions of the symposium documented the upward trend in unemployment and analyzed its causes. Topics examined included the differing degrees to which rising unemployment has affected various geographic areas and groups of workers, whether economic theories adequately explain these differences, and what factors have caused rising unemployment.

#### *Upward trend in unemployment*

John Martin presented evidence on how much unemployment had increased in countries belonging

Table 1

**Unemployment Rates in OECD Countries**  
(Standardized to conform with ILO guidelines)

	1960s	1970s	1980s	1990	1992	1994*
OECD	2.8	4.3	7.0	6.0	7.3	8.5
Canada	4.7	6.6	9.3	8.1	11.2	10.8
France	1.7	3.8	9.0	8.9	10.4	12.3
Germany	.6	1.9	5.7	4.9	4.6	10.0
Italy	3.8	4.7	7.5	8.2	8.3	11.7
Japan	1.3	1.7	2.5	2.1	2.2	2.9
United Kingdom	2.0	4.4	10.1	6.9	10.0	9.6
United States	4.7	6.1	7.2	5.4	7.3	6.3

\*Projections from *OECD Economic Outlook*, June 1, 1994.  
Source: OECD.

to the Organization for Economic Cooperation and Development (OECD). As shown in Table 1, unemployment rates have risen over the past three decades in the OECD as a whole and in each of the large industrial countries. The increase has been much more pronounced in most European countries than in the United States, Canada, or Japan. As a result of the pervasive upward trend, about 35 million persons in OECD countries were unemployed in 1994, and an additional 15 million are estimated to have given up on seeking a job or were forced to settle for a part-time job.

Martin also demonstrated that high unemployment has affected some demographic and social groups much more than others. Young people experience unemployment rates more than twice as high as do adults in most industrialized economies other than Germany, which has a strong apprenticeship system for training young workers. In half of the remaining countries in the European Community (EC), youth unemployment rates had surpassed 20

percent by 1993. The other major groups to suffer exceptionally high risk of unemployment are those with low educational qualifications. Workers who have no college experience are especially susceptible to joblessness; their relative plight worsened substantially in the 1980s in terms of both the chance of finding a job and of the wages paid when successful. In Martin's view, this latter trend provides support to the common belief that the relative demand for low-skilled workers has declined in most industrial economies—a belief shared by most symposium participants.

Another disturbing trend, in Martin's view, is rising long-term unemployment, especially in Europe. In the EC, more than 40 percent of the unemployed had been out of work for more than a year, compared to only 12 percent in North America. This difference reflects very different labor market dynamics in the two regions. U.S. workers are much more likely to lose existing jobs, but are also much more likely to find new jobs fairly

quickly, than are their European counterparts. Martin also cited evidence suggesting the long-term unemployed are “outsiders” insofar as wage-setting is concerned because increased long-term unemployment does little to restrain wage increases for the “insiders” who have jobs. In his view, this evidence bolstered the argument for targeting labor market policies to the long-term unemployed as the most effective, as well as the most equitable, way to reduce unemployment without setting off a wage-price spiral.

In his discussion of Martin’s paper, Dennis Snower reviewed theories of unemployment to determine which best explained the pattern of unemployment in OECD countries. He indicated most theories fail to explain why unemployment has risen more in Europe than in the United States. The most promising, in his view, is the insider-outsider theory discussed in Martin’s paper. Because European firms find it costly to reduce their work force due in part to employment protection laws, European workers’ jobs were secure in the face of the mild recessions typical in the 1950s and 1960s. As a result, unemployment rates remained low in Europe during this period. As the severity of recessions increased thereafter, though, firms were forced to reduce the size of their work forces. Having once incurred the high cost of doing so, firms were reluctant to hire workers back, preferring instead to invest in labor-saving capital equipment. The impediments to labor mobility in Europe help explain why high European unemployment rates persist after major recessions and why labor turnover is so much lower in Europe than in the United States. Moreover, the reluctance of European firms to rehire workers helps explain why so many long-term unemployed are outsiders without any appreciable effect on the wage demands of the insiders. Although economists are far from developing theories that explain all aspects of labor market behavior, Snower found the insider-outsider theory the best available foundation for policy recommendations to reform labor markets.

### *Causes of high unemployment*

In his paper, Paul Krugman presented a somewhat different perspective on the causes of high unemployment. He emphasized the distortions caused by the European welfare state as the principal culprit. High payroll taxes, in addition to such stringent labor market regulations as the employment protection guarantees stressed by Martin and Snower, reduce the wages firms are willing to offer to attract employees. At the same time, generous welfare benefits for the unemployed reduce their incentive to accept jobs at these low wages. The resulting wedge between what employers are willing to offer and what workers are willing to accept explains why European unemployment is so much higher than in the United States, where taxes and benefits are considerably lower.

The interaction between the welfare state and a changed economic environment, Krugman argued, can also explain why unemployment has increased so much in Europe. The change he emphasized was declining demand for low-skilled workers in industrial nations. Such a change would tend to increase income inequality by depressing the wages of low-skilled workers. But large disparities in incomes are what the European welfare state was designed to prevent. The collision of market forces pushing toward greater income inequality with government policies that prevented such inequality has resulted in growing unemployment in Europe, especially among low-skilled workers. In analyzing the reasons for declining demand for these workers, Krugman expressed skepticism about the importance of increased competition from newly industrializing nations. Although intuitively plausible, this explanation has been found to have little empirical support according to Krugman. Instead, he attributed the declining demand for low-skilled workers to technological change that devalues the market value of manual labor.

The same forces raising unemployment in Europe, Krugman claimed, have caused rising poverty and income inequality in the United States.

With less generous social service benefits, low-skilled workers in the United States have seen their real incomes decline. Krugman did not see any painless way out of the tradeoff between more poverty and more joblessness. Transforming low-skilled workers into high-skilled workers through improved education and training might seem the obvious solution. But raising education levels can be done only gradually, and government training programs are not particularly effective. Some modest improvement in Europe might result from restructuring the welfare state to reduce distortions. Only a major “pruning” of the welfare state, however, is likely to reduce European unemployment substantially, and then at the expense of increased poverty. Krugman concluded policymakers in both Europe and the United States confront the harsh choice of accepting either high unemployment or widespread poverty.

Edmond Phelps explained why he thought the causes of unemployment are more diverse than implied by Krugman’s paper. His research indicated OPEC oil shocks, increased taxes on labor, and higher real interest rates have contributed importantly over the past several years to the rise in the natural rate of unemployment—that is, the unemployment rate consistent with stable inflation. He agreed with Krugman that growth of the welfare state and a decline in demand for low-skilled workers have contributed to high unemployment in most industrial countries. He was skeptical regarding Krugman’s claim that increased competition from newly industrializing economies had not contributed importantly to the declining demand for low-skilled workers. Accordingly, he advocated redistributing the overall gains from free trade through subsidies to employers who hire such workers. The first step in this direction should be a tax credit to offset the payroll taxes paid for low-wage workers, financed in part by reducing the most distortionary elements of the welfare state. If tax credits prove insufficient, governments should consider cash subsidies to firms that employ low-skilled workers.

Like Phelps, Christopher Pissarides felt Krugman put too much of the blame for unemployment on welfare state policies. He did, however, advocate less restrictive employment protection laws in Europe. In his view, laws making it costly for firms to fire workers merely stifle necessary labor market adjustments, thus benefiting neither employers nor workers. Other improvements would be to limit the duration of unemployment compensation and to spend more on active labor market policies to help the unemployed find jobs. While such pruning of welfare benefits can and should be used to reduce European unemployment, Pissarides was emphatic that income support for low-skilled workers should remain. In his view, minimal government support for the disadvantaged, as in the United States, is a “cruel route” not to be followed in Europe.

#### *MONETARY POLICY AND UNEMPLOYMENT*

The focus of the symposium next shifted to the relation between monetary policies and unemployment. Topics addressed included whether expansionary monetary policies in Europe should be used to complement needed labor market reforms, the differences between Japanese and European labor markets, the unique legislative mandate guiding New Zealand’s monetary policy, and the pressures on central banks to pursue more stimulative monetary policies when unemployment is high.

#### *The role of monetary policy*

In his paper, Charles Bean explained what role monetary policy could play in reducing European unemployment. He argued the main reason unemployment has risen so much more in Europe than in the United States is that European labor markets create long-term persistence of unemployment. His empirical estimates show that shocks with only temporary effects on unemployment in the United

States have permanently raised unemployment in Europe. Due to various persistence mechanisms, any increase in European unemployment is quickly translated into a higher equilibrium (or natural) unemployment rate. Lasting reduction of unemployment in Europe can only be achieved with structural reforms to improve the functioning of labor markets.

Bean maintained expansionary monetary policies should nonetheless be used to complement labor market reforms. Such reforms could prove so politically unpopular they would soon be reversed unless their benefits are realized quickly. Macroeconomic policies should thus be used to ensure aggregate demand grows rapidly enough to take full advantage of the expanding aggregate supply resulting from labor market reforms. Expansionary fiscal policy is effectively precluded by the large structural budget deficits in most European countries. The responsibility for demand stimulus, therefore, falls to monetary policies. In Bean's view, European central banks should be willing to tolerate slightly higher inflation for the next few years if necessary to achieve the goal of reducing the European unemployment rate five percentage points by the end of the decade. In countries where employment growth is stifled by insiders' aggressive wage demands, a temporary incomes policy might prove a useful adjunct to labor market reforms and stimulative monetary policies.

Bean cautioned against coordinating national monetary policies to achieve exchange rate stability. If labor market reform proceeds at different rates, exchange rates may need to adjust to ensure that each country can realize the full benefit of its reforms. Exchange rate fluctuations within the current wide bands of the European Monetary System should provide adequate scope to pursue independent monetary policies. But an attempt to narrow exchange rate bands or to move rapidly to monetary union would prevent an efficient transition to lower levels of unemployment.

Stanley Fischer disagreed that tolerating higher inflation was necessary to realize the benefits of

European labor market reforms. Although real wages in Europe may need to decline modestly to reduce unemployment, this decline could occur without higher inflation. Labor market reforms will themselves increase wage flexibility enough to accomplish slower growth in wages without higher inflation. Fischer nonetheless endorsed Bean's plea that central banks in Europe accommodate the higher economic growth potential accompanying labor market reforms.

Takatoshi Ito explained how Japan has managed to avoid the high and rising unemployment observed in Europe. One important factor has been a steadfast Japanese commitment to low inflation. Ito was skeptical of Bean's contention that tolerating higher inflation could reduce European unemployment. The major reason unemployment has remained low in Japan, however, is Japanese labor market institutions have allowed shocks to be absorbed without laying off workers. Whether this will remain so in the face of a severe recession and strong yen is uncertain. Major Japanese companies have increasingly shifted production abroad, raising the prospect unemployment will trend upward in Japan in the years ahead, as it did in Europe during the 1980s.

In Allan Meltzer's view, the upward trend in European unemployment has been due almost entirely to the corrosive effects of the European welfare state. Imposing high taxes on the income of those who work, and using the proceeds to subsidize those who do not, reduces incentives to seek employment, thereby raising the measured unemployment rate. Meltzer presented evidence the European countries which had increased welfare spending most had also experienced the largest increase in unemployment. He found this a compelling reason for eschewing the monetary stimulus recommended by Bean, concentrating instead on supply-side remedies to "welfare state unemployment."

In summarizing the discussions of the first day of the symposium, Nigel Lawson also emphasized the importance of supply-side remedies for reducing unemployment. He emphasized such remedies

would be difficult politically because they would cause painful adjustment. Lawson nonetheless urged economists to be forthright in recommending the uncomfortable policy changes necessary to reduce unemployment, "because I don't know where politicians and policymakers are going to get their guidance from if these things aren't spelled out clearly."

### *The importance of price stability*

In his luncheon address, Donald Brash explained what he thought monetary policy could—and could not—contribute to reducing unemployment. In his view, monetary policy can best contribute to minimizing unemployment by maintaining price stability. He cited New Zealand's experience as support for this view. In the 1970s and early 1980s, monetary policy was used to stimulate the economy. The resulting burst of inflation caused consumer prices to increase fivefold from 1970 to 1984. This high inflation was accompanied by an upward trend in the unemployment rate. The ultimate result of stimulative monetary policy, therefore, was higher rather than lower unemployment.

This period of stagflation in New Zealand led monetary policy to be reoriented toward price stability. The new orientation was codified in 1989 with passage of a new Reserve Bank Act. The Act instructs the Reserve Bank of New Zealand to focus exclusively on achieving and maintaining stability in the general level of prices. The Government and the Reserve Bank have agreed that maintaining consumer price inflation in a range of 0 to 2 percent fulfilled that mandate. Steadfast pursuit of price stability has kept New Zealand's inflation rate in that range since 1991. Although experiencing a prolonged recession during the period of disinflation, the New Zealand economy has subsequently rebounded. The unemployment rate has already come down substantially from its recession peak and is expected to decline further. Based in part on New Zealand's experience, Brash argued that

focusing on price stability is not antithetical to reducing unemployment but is a prerequisite for doing so in a lasting way.

This unique legislative mandate for price stability has not, Brash said, entirely shielded the Reserve Bank from political pressures to pursue a more stimulative monetary policy. Critics have attacked the Reserve Bank Act for its alleged callous disregard for the unemployed. Brash views one of his most important functions to be convincing these critics that "attempting to trade-off just a little more inflation for a little less unemployment, however tempting, just isn't a workable proposition."

### *STRUCTURAL POLICIES TO REDUCE UNEMPLOYMENT*

In the next two sessions of the symposium, participants evaluated the effectiveness of alternative policy reforms in reducing structural unemployment. Among the reforms discussed were reducing unemployment insurance benefits, imposing a tax on firms that lay off workers, offering subsidies to firms that hire workers, investing more in education and training, and increasing job search assistance to dislocated workers.

### *Evaluating alternative policy reforms*

In his paper, Dale Mortensen evaluated alternative labor market policies using a theoretical model of job creation and job destruction. According to the model, unemployment could be reduced by cutting back on the generosity of government payments to the jobless or by reducing payroll taxes. The effects of other prospective policy changes are less clear. Imposing a tax on firms that lay off workers, for example, would reduce the incidence of layoffs but could also make firms less willing to hire new workers. Similarly, a tax credit for firms that hire workers would increase job creation but might also increase job destruction if firms lay off

some workers in order to get the tax credit when replacement workers are hired. The net effect of both tax credits for hiring and tax penalties for firing on the overall level of unemployment are therefore ambiguous in the theoretical model. Only by using an empirical version of the model can such ambiguities be resolved.

Mortensen thus presented numerical estimates using an empirical version of the theoretical model to evaluate prospective U.S. policy changes. Using values he considered realistic for the parameters of the model, Mortensen estimated that a firing tax would raise rather than lower unemployment. Such a tax would so impede workers' mobility that aggregate output would also suffer. In contrast, reducing unemployment benefits would be effective in substantially reducing U.S. unemployment, but only at the expense of forcing many of those who could not find jobs into poverty. Similarly, cutting such payroll taxes as the social security tax would not have a large enough beneficial effect on unemployment to justify the accompanying adverse effect of lowering pension and health care for the elderly. A more promising labor market reform in the United States, Mortensen concluded, is a hiring subsidy to employers. According to his estimates, such subsidies would substantially reduce U.S. unemployment without imposing hardships on the poor or the elderly. This and similar active labor market policies might best be financed with a payroll tax since, according to the model, such taxes have minimal disincentive effects on hiring.

Martin Feldstein was less sanguine than Mortensen about the prospective benefits of hiring subsidies. In Feldstein's view, Mortensen's model does not provide a reliable basis for estimating the likely effects of actual policy changes. Other studies have found that hiring subsidies are a waste of taxpayers' dollars. Feldstein recommended instead the U.S. unemployment insurance system be reformed to reduce structural unemployment. Such reforms, if carefully designed, could substantially increase incentives for finding a job without imposing hardships on the truly disadvantaged.

Subjecting unemployment insurance benefits to the income tax, which the United States now does, reduces disincentives for job seeking but does not reduce benefits for those too poor to pay taxes. A more radical reform would be to set a maximum weekly benefit of about \$200, thereby reducing the benefit levels for those who previously had a high-paying job but retaining current benefit levels for others. This type of reform would be much more effective in reducing unemployment, Feldstein argued, than would hiring subsidies.

Assar Lindbeck also expressed skepticism about the advisability of hiring subsidies. He pointed out both workers and firms would have powerful incentives to find ways to exploit the subsidies. Firms that previously transferred workers from one plant to another, for example, could benefit by splitting into two companies in order to reap the benefits of hiring subsidies to the plant that was increasing employment. Lindbeck also argued that Mortensen's policy prescription of more government involvement in labor markets through hiring subsidies and higher payroll taxes should be compared with less government involvement in labor markets before concluding how best to reduce unemployment.

### *Active labor market policies*

In his paper, Lawrence Katz evaluated the effectiveness of active labor market policies in solving the jobs problem, which he defined as "too few decent employment opportunities to go around." The problem has led to higher unemployment in Europe and to increased poverty among working families in the United States. Government programs to enhance the skills and adaptability of the work force could, in Katz's view, help solve the jobs problem on both sides of the Atlantic. He identified three key elements to such a strategy.

The first element is to create "a system of life-long learning." Katz cited several studies showing investment in human capital has large

payoffs both for the aggregate economy and for individuals. Because the jobs problem has disproportionately affected the employment prospects for less-skilled workers, government programs to improve education and training must be an integral part of any long-run solution to the problem. Keeping more young people in school, enabling less-educated adults to return to school, and encouraging employers to invest in their workers are all essential for enhancing the skill level of the work forces in America and most other industrial countries.

A second major element in solving the jobs problem, according to Katz, is to help displaced workers get new jobs. Most studies suggest job search assistance for such workers is an inexpensive way to reduce the amount of time between jobs. Helping workers start their own businesses has also been shown worthwhile for the minority of displaced workers who have both the willingness and ability to do so. Other forms of government retraining programs have been less successful in part because the programs were not well designed. Overall, Katz strongly advocated a comprehensive "reemployment system" intended to assist displaced workers in getting jobs rather than the current system of merely providing income support during the job search process.

The final element for solving the jobs problem, Katz argued, includes policies to ensure low-skilled individuals can earn more by working than by not working. One such policy is a minimum wage set high enough to increase earnings of low-skilled workers but not so high that they are priced out of the market. Direct government subsidies for the working poor, such as the earned income tax credit in the United States, can also "make work pay" for those whose earning power is minimal.

In his comments, James Heckman emphasized the importance of identifying the most effective programs for improving the lot of less-skilled workers. His reading of the evidence suggests that the returns to government training programs are generally very low. Rather than using scarce budget resources for training displaced workers, in Heckman's view,

government programs should focus on early childhood intervention to increase the chances that youth from disadvantaged backgrounds stay in school. A "super-Headstart" program for preschool children has proven effective in raising their educational attainment and reducing their criminal activity in subsequent years. Such programs would yield benefits, however, only in the long run. The short-run problems of less-skilled, adult workers might be more effectively addressed through government subsidies to their employers rather than through government training programs in part because such workers are less malleable than youth.

In his comments, John Morley emphasized the importance of striking a balance between employment growth and equitable distribution of income. The 1993 White Paper issued by the European Commission recommended supply-side obstacles to job creation be removed in a way that avoids increased wage inequality. The historical evidence is clear, Morley contended, that unfettered operation of labor markets produces wide disparities in income which are socially unacceptable in developed countries. As a result, governments in most European countries have faced serious political and social constraints on how much to deregulate labor markets. The sharp rise of wage inequality in the UK which accompanied deregulation has discouraged similar policies elsewhere in Europe. In Morley's view, how much employment growth in Europe can be achieved without unacceptable income inequality remains an open question.

#### OVERVIEW PANEL

The final session provided speakers the opportunity to give their perspective on the broad range of policy issues discussed at the symposium.

In his overview comments, Frans Andriessen outlined a plan for reducing European unemployment by reforming the European welfare state. Reforming the welfare state is necessary, in his view, if it is to survive. Yet the widespread poverty resulting

from allowing living standards to be determined mainly by unfettered labor market forces, as in the United States, is not politically or socially feasible in Europe. Andriessen concluded the welfare state must be reformed in a way that does not impose unacceptable burdens on low-skilled individuals.

Reforming tax systems, Andriessen argued, must also be an integral part of reducing European unemployment. To support the generous benefits available under the European welfare state, taxes on earned income are very high. These taxes have raised the cost of labor so much that many low-skilled individuals have been priced out of the market. Lowering the labor cost for low-skilled jobs should, in Andriessen's view, be the first priority in reducing European unemployment. This could be done, for example, by lowering taxes on low-income workers, including the payroll taxes paid by their employees. The resulting revenue loss might be offset by additional energy taxes, which would have the ancillary benefit of encouraging conservation. Especially if supplemented by active labor market policies and perhaps additional public sector jobs, this type of tax reform could substantially reduce European unemployment.

In his overview remarks, Alan Blinder discussed the role of macroeconomic policy, especially monetary policy, in reducing unemployment. While agreeing monetary policy had little if any role in reducing structural unemployment, he also pointed out monetary policy could affect short-run cyclical fluctuations in unemployment. Moreover, he argued that central banks should attempt to guide the unemployment rate to the natural rate. He thus viewed the legislative mandate calling upon the Federal Reserve to pursue both maximum employment and stable prices as being an appropriate charge for central banks. Because he considered U.S. unemployment to be near the natural rate at the time, Blinder saw little the Federal Reserve could do to reduce unemployment further.

Blinder did see a role for monetary policies in reducing European unemployment. Blinder interpreted the consensus among symposium participants

to be that macroeconomic policies might be able to pare the unemployment rate in the European Union—which was close to 11 percent at the time—by two or three percentage points in the short run without igniting inflation. In addition, the natural rate of unemployment in Europe might be further reduced two or three percentage points in the long run by structural labor market reforms. He agreed with other symposium participants that the success of structural labor market reforms could well depend on the macroeconomic environment. If so, macroeconomic policies and labor market policies should be viewed as complementary rather than unrelated approaches to reducing unemployment.

Michel Hansenne urged in his comments that the unemployment problem be viewed in a global context. He presented estimates by the International Labour Office (ILO) that 120 million persons worldwide were unemployed, of which about 85 million were in developing economies or economies in transition. Moreover, a significant reason for rising unemployment and income inequality in the industrialized economies is difficulty in adjusting to changes in the global pattern of trade and production. Despite this difficulty, Hansenne warned against resorting to protectionist trade policies in a vain attempt to resist shifts in the international division of labor.

He also warned against overzealous pursuit of employment growth at the expense of economic equity. Labor markets should not be evaluated exclusively in terms of allocative efficiency, Hansenne argued. They are also social institutions that help decent societies achieve the goals of equity and fairness. In describing the qualitative dimension of the jobs problem, Hansenne stated:

[E]mployment is not just a matter of numbers....[T]he conditions under which work is performed, the livelihood it provides, and the solidarity shown by those with work and income towards those without: these are also measures of a decent society.

In his comments, Hans Tietmeyer explained his views on how the Deutsche Bundesbank could best

contribute to lowering German unemployment. He argued that high German unemployment is predominantly a structural phenomenon. One structural problem is that generous benefits available to the unemployed reduce their incentive to work, especially for low-skilled individuals. Moreover, the high cost of dismissing workers due to employee protection laws discourages firms from recruiting new employees. In addition, the cost of labor in Germany is too high, especially for low-skilled workers. Although some progress has been made in reducing these and other structural labor market problems, Tietmeyer stressed the reforms will only gradually reduce German unemployment.

The Bundesbank's role, in Tietmeyer's view, is to create "the underlying monetary conditions that foster greater monetary stability." He rejected the contention that a considerable portion of German unemployment was cyclical and could thus be reduced by lower short-term interest rates. Pointing to uncertainty about how much of German unemployment was cyclical, Tietmeyer asserted that attempting to use monetary policy to reduce unemployment could lead to higher inflation. This would be particularly risky, he maintained, because of the German people's aversion to inflation. For these and other reasons, Tietmeyer argued the Bundes-

bank could best contribute to lowering German unemployment by reducing inflation.

At the conclusion of the symposium, George Schultz observed the discussion had focused on those who are unemployed but remain within the traditional system. He pointed out a large and growing group of unemployed persons are in a very different system: "They are in a system of crime and drugs, of no family attachments, and of gang attachments." This alternative system, Schultz said, posed a serious threat to American society. He concurred with James Heckman's assessment that early intervention might well prevent the very young from repeating the cycle which leads ultimately into the alternative system.

Despite these differences of opinion on details, a recurring theme throughout the symposium was that reducing structural unemployment would require difficult policy choices and tradeoffs. As Chairman Greenspan put it in his introductory remarks, "The job of analysts and policymakers, such as the group represented here, is to try to make the issues and tradeoffs clear to our elected representatives. For, at the end of the day, it is they who must make these very difficult choices. We, however, can play a major role by arraying the real alternatives."

**REDUCING UNEMPLOYMENT: CURRENT  
ISSUES AND POLICY OPTIONS**

*A symposium sponsored by the Federal Reserve Bank of Kansas City*

*August 25-27, 1994*

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**Session I**

Chairman

NIGEL LAWSON, Former UK Chancellor of the Exchequer

***Introductory Comments***

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ALAN GREENSPAN, Chairman, Board of Governors of the Federal Reserve System

***The Extent of High Unemployment in OECD Countries***

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JOHN MARTIN, Deputy Director, Education, Employment, Labour and Social  
Affairs Directorate, OECD

***Commentary***

DENNIS SNOWER, Professor, Birkbeck College, London

***Past and Prospective Causes of High Unemployment***

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PAUL KRUGMAN, Professor, Stanford University

***Commentary***

EDMUND PHELPS, Professor, Columbia University

CHRISTOPHER PISSARIDES, Professor, London School of Economics

***The Role of Demand Management Policies in Reducing Unemployment***

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CHARLES BEAN, Professor, London School of Economics

***Commentary***

STANLEY FISCHER, Professor, Massachusetts Institute of Technology

TAKATOSHI ITO, Senior Advisor, Research Department, International Monetary Fund

ALLAN MELTZER, Professor, Carnegie-Mellon University

***Luncheon Address:***

***The Role of Monetary Policy: Where Does Unemployment Fit In?***

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DONALD BRASH, Governor, Reserve Bank of New Zealand

**Session II**

Chairman

GEORGE SHULTZ, Former U.S. Secretary of State

***Reducing Supply-Side Disincentives to Job Creation***

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DALE MORTENSEN, Professor, Northwestern University

***Commentary***

MARTIN FELDSTEIN, President, National Bureau of Economic Research

ASSAR LINDBECK, Professor, Institute for International Economic Studies, Stockholm University

***Active Labor Market Policies to Expand Employment and Opportunity***

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LAWRENCE KATZ, Professor, Harvard University

***Commentary***

JAMES HECKMAN, Professor, University of Chicago

JOHN MORLEY, Head of Employment and Labour Market Policy Unit, Commission of the European Communities

***Overview Panel***

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FRANS ANDRIESSEN, Former Vice President, Commission of the European Communities

ALAN BLINDER, Vice Chairman, Board of Governors of the Federal Reserve System

MICHEL HANSENNE, Director-General, International Labour Office

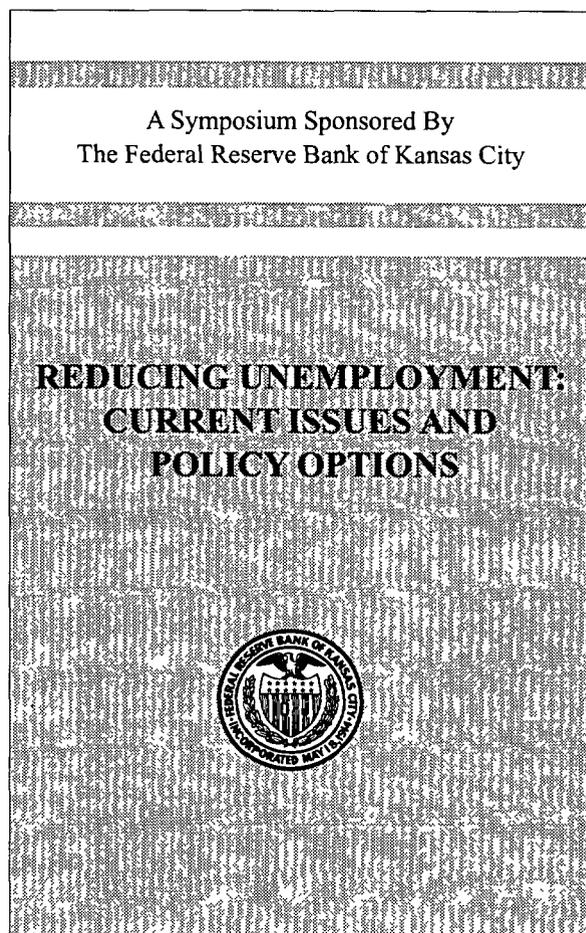
HANS TIETMEYER, President, Deutsche Bundesbank

***REDUCING UNEMPLOYMENT:  
CURRENT ISSUES AND POLICY  
OPTIONS***

Reducing unemployment has become a top priority for economic policy in most industrialized nations. While unemployment will ebb somewhat as countries recover from the recent global recession, millions are likely to remain jobless for a variety of structural reasons. Virtually all industrial countries face a jobs problem that impairs living standards and threatens a breakdown in social cohesion. To enhance understanding of what has caused this problem and to analyze policies to address it, the Federal Reserve Bank of Kansas City hosted a symposium on "Reducing Unemployment: Current Issues and Policy Options" at Jackson Hole, Wyoming, on August 25-27, 1994. The symposium proceedings will be available soon.

For a copy of the current or past symposium proceedings, please write:

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Federal Reserve Bank of Kansas City  
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# Bank Credit Growth in the Tenth District: Recent Developments

*By William R. Keeton*

**B**ank credit, the sum of loans and securities at commercial banks, is widely viewed as providing information about the current and future state of the economy. Analysts have been concerned about the behavior of bank credit during the nation's recovery from the 1990-91 recession. At first, analysts worried the recovery would be hampered because banks were making too few loans and purchasing too many securities. More recently, loan growth has picked up and securities growth has slowed, a development some analysts view as a sign the economy is growing too fast to keep inflationary pressures in check.

Bank credit growth may also shed light on the current and future state of the district economy. Trends in Tenth District bank credit may vary substantially, however, from trends in the nation as a whole. For example, district banks could be in better financial condition than banks nationwide, making district banks more willing to lend. Or district businesses and households could be more optimistic about future earnings, making them more willing to borrow.

This article describes the growth in bank credit in district states during the recovery and compares the district experience with that of the nation. The article concludes that loan growth and securities

growth followed the same pattern in the district as the nation, but that loan growth in the district was much stronger. The first section documents the acceleration in loan growth and slowdown in securities growth in the nation. The second section shows that loan growth and securities growth varied the same way in the district but that loan growth was stronger in the district. The next section shows that growth of most loan categories was stronger in the district than in the nation. The last section shows that loan growth was stronger in most district states than in the nation.

## *BANK CREDIT GROWTH IN THE UNITED STATES*

Bank credit growth in the nation has shown a clear pattern of acceleration during the recovery. In the early stages, total bank credit grew sluggishly, increasing only 2 percent on average in 1991 and 1992 (upper panel of Chart 1). But as the recovery proceeded, bank credit grew more rapidly, increasing at an average rate of 6 percent in 1993 and the first half of 1994.<sup>1</sup>

The slow growth and subsequent recovery in U.S. bank credit were due entirely to changes in bank loans. U.S. bank loans fell 3 percent in 1991 and 1 percent in 1992. Loan growth then strengthened to 5 percent in 1993 and 7 percent in the first half of 1994.

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Bank security holdings behaved in opposite fashion during most of the period, but not enough to outweigh the effect of loans on bank credit. Securities at U.S. banks rose very fast in the first two years of the recovery, growing 14 percent on average in 1991 and 1992. Securities growth then slowed to 8 percent in 1993, the same year loans began to accelerate. Securities growth slowed still further in the first half of 1994, falling to 3 percent.

These trends in loan growth and securities growth are not unusual for an economic recovery. Loans typically grow slowly during the early stages of recovery and then accelerate as the economy picks up steam. At the beginning of a recovery, businesses and households are usually too unsure about future prospects to borrow heavily. And banks are usually too worried about borrowers' ability to repay to lend aggressively. As the recovery proceeds, businesses and households become more willing to borrow and banks become more willing to lend. As a result, bank loans accelerate.

For the same reasons, security holdings usually grow rapidly at the beginning of a recovery and then slow down. When loan growth is weak, banks typically invest some of their excess funds in securities. As loans rebound, banks finance the new lending partly by drawing down security holdings.

While weak loan growth and strong securities growth were both to be expected coming out of the 1990-91 recession, most analysts agree that loan growth was unusually weak and securities growth unusually strong.<sup>2</sup> There are several reasons for this unusual behavior. First, businesses and households were especially unwilling to borrow because they overborrowed in the 1980s and wanted to clean up their balance sheets. According to this view, weak loan demand forced banks to invest less of their funds in loans and more in securities. A second reason is that banks were less willing to lend and more eager to buy securities at the start of this recovery because their heavy loan losses in the late 1980s made them and their regulators more cautious. A third reason is that the steep yield curve of the early 1990s made loans less attractive to banks

than security investments, which tend to be longer term. Finally, the new risk-based capital standards caused banks to shift more heavily from loans to securities than usual by reducing the capital requirement on securities below that on loans.<sup>3</sup>

These explanations for the unusually weak loan growth and strong securities growth during 1991-92 are consistent with the acceleration in loan growth and slowdown in securities growth in 1993-94. By 1993, businesses and households had made significant progress in cleaning up their balance sheets, suggesting they should be more willing to borrow. Also, banks had made significant progress working down their delinquent loans and building up their capital, suggesting they should be more willing to lend. The yield curve also began to flatten in early 1993, reducing the incentive banks had to shift out of short-term loans into long-term securities.<sup>4</sup> Finally, it could be argued that banks had completed their adjustment to the new risk-based capital standards by 1993, allowing loan and securities growth to return to more normal rates.<sup>5</sup>

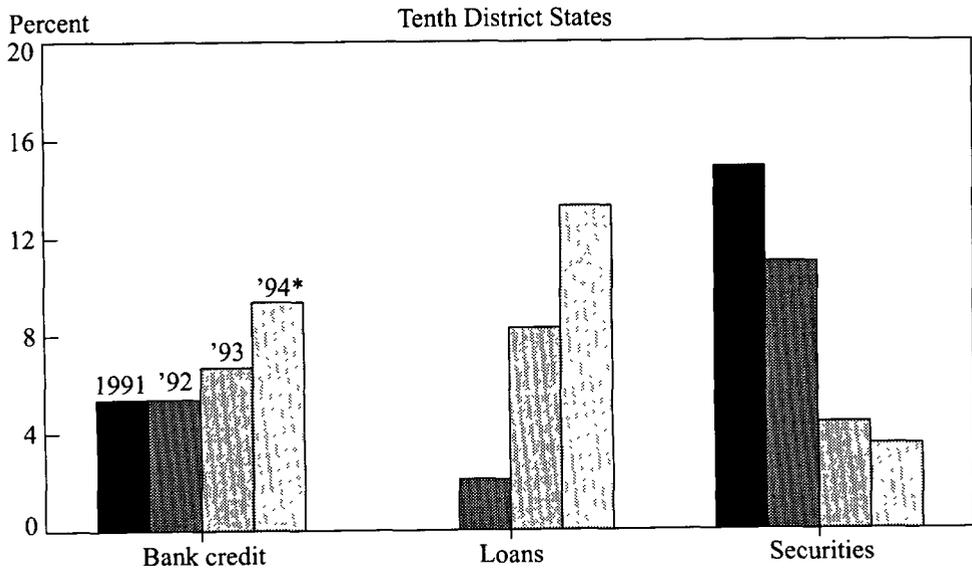
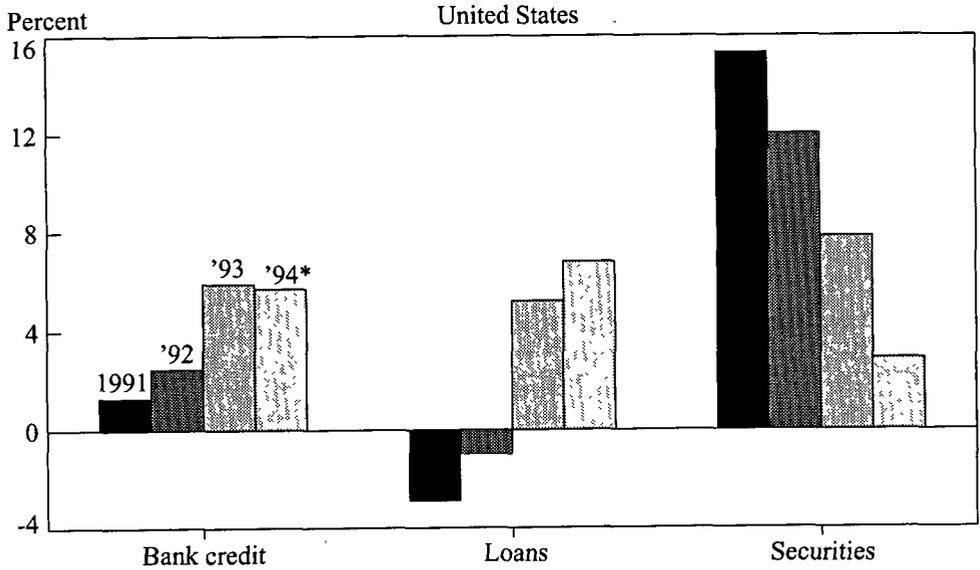
### *BANK CREDIT GROWTH IN TENTH DISTRICT STATES*

Bank credit growth increased in the district, just as in the nation, in the 1991-94 period. District growth rates, though, were higher than in the nation throughout the period (lower panel of Chart 1). Bank credit grew moderately in Tenth District states in the first two years of the recovery, increasing 5 1/2 percent in both 1991 and 1992. Bank credit growth then rose to 7 percent in 1993 and 9 1/2 percent in the first half of 1994.

As in the United States, the increase in bank credit growth in 1993-94 was due entirely to faster loan growth. District bank loans grew sluggishly in the first two years of the recovery, increasing only 1 percent on average in 1991 and 1992. Loan growth then jumped to 8 percent in 1993 and 13 percent in the first half of 1994, almost twice the national rate.

Chart 1

**Growth in Bank Credit, Loans, and Securities**



\* First half, seasonally adjusted annual rate.

Although loan growth has followed the same accelerating pattern in the district and the nation during the recovery, growth has been consistently stronger in the district. In particular, loan growth was three percentage points higher in the district than the nation in 1991-93 and over six points higher in the first half of 1994. This faster growth in district bank loans accounts for the faster growth in district bank credit during the recovery.

Securities growth moved in the opposite direction from loan growth over the period, just as it did in the nation. From an average of 13 percent in 1991 and 1992, growth in district security holdings slipped to only 4 1/2 percent in 1993 and 3 1/2 percent in the first half of 1994.<sup>6</sup> Total growth in securities over the period was about the same in the district as the nation.

Why has loan growth been stronger in the district than in the United States during the recovery? Like the national economy, the district economy suffered a downturn in 1990-91, which helps explain why district loan growth was weak in 1991 and 1992. The downturn was less severe in the district, however, helping to explain why loan growth was not as weak in the district as the nation. For example, while district employment growth slowed in late 1990 and early 1991, it slowed less than national employment growth and was stronger throughout the period (Chart 2).

A second reason loan growth was not as weak in the district as the nation was that some of the special factors depressing loan growth early in the recovery were less important in the district. As noted earlier, one such factor was the desire by overleveraged borrowers to clean up their balance sheets. During the latter half of the 1980s, however, loans grew much slower in the district than the United States. For example, from 1984 to 1990, bank loans grew at an annual rate of 8 percent in the nation but only 3 percent in the district, due in large part to the agriculture and energy slumps of the mid-1980s. Thus, as the recovery began in 1991, borrowers may have felt less need to reduce debt burdens in the district than the nation.

Another factor that depressed bank lending in the nation at the start of the recovery was the reluctance of financially weak banks to take risk. But district banks had already suffered through and recovered from a period of heavy loan losses in the mid-1980s. As a result, they came out of the 1990-91 recession in better financial condition than banks nationwide. At the end of 1990, for example, non-current loans had risen to 3.7 percent of total loans in the United States but were only 2.1 percent of total loans in the district.

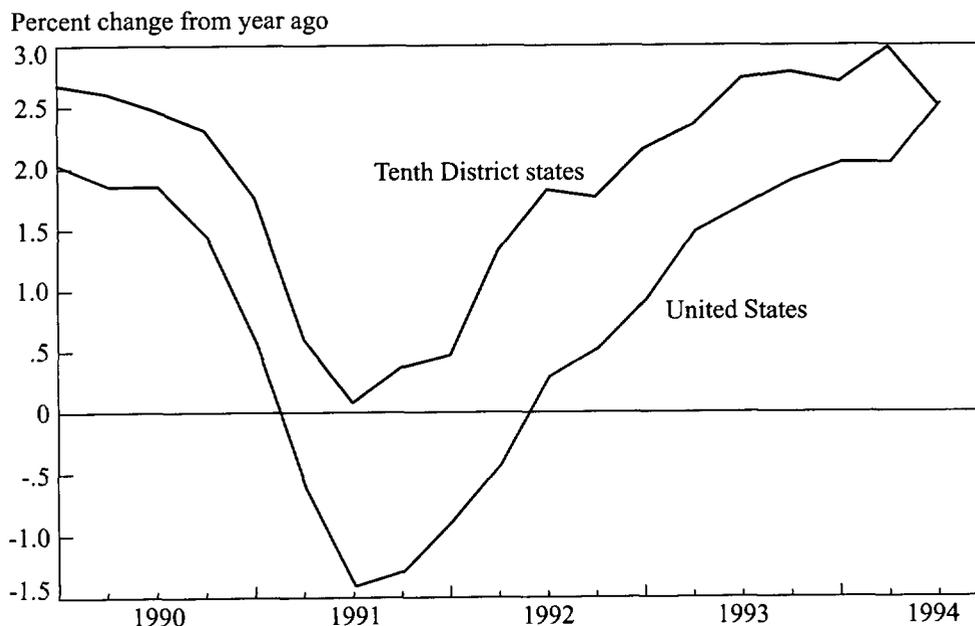
While the gap in loan growth during the first three years of the recovery is easy to explain, it is less clear why district loan growth exceeded U.S. loan growth so much in the first half of 1994. During the recent period, the district appeared to lose its lead over the nation in economic growth. For example, employment growth remained approximately unchanged in the district but increased in the United States, closing the gap between the two. Despite this convergence in economic growth, the gap in loan growth actually widened.

The sharper acceleration in district loan growth in the first half of 1994 could mean the district economy will outperform the national economy down the road. For example, loans may have risen as much as they did because district businesses and households became much more optimistic about the future and, thus, much more willing to borrow and spend. Or loans may have risen so sharply because district banks significantly eased their lending terms, making it much more attractive for district businesses and households to borrow and spend. In either case, the increased spending could cause the district economy to grow faster than the national economy in the rest of 1994 and 1995, as district firms step up production and hiring to meet the increased demand.

### *LOAN GROWTH BY CATEGORY*

Loan growth differed among types of loans but was stronger in most categories in the district than the nation. In both the United States and the district,

Chart 2  
**Employment Growth**



Source: Bureau of Labor Statistics.

commercial and industrial loans, consumer loans, and commercial real estate loans started out weak and then strengthened. However, growth was stronger in the district than the nation in all three categories, especially commercial real estate loans. Home mortgage loans and agricultural loans were the main exceptions. These two categories grew at a healthy pace throughout the recovery and showed about the same strength in the district as the nation (Chart 3).

### *Commercial and industrial loans*

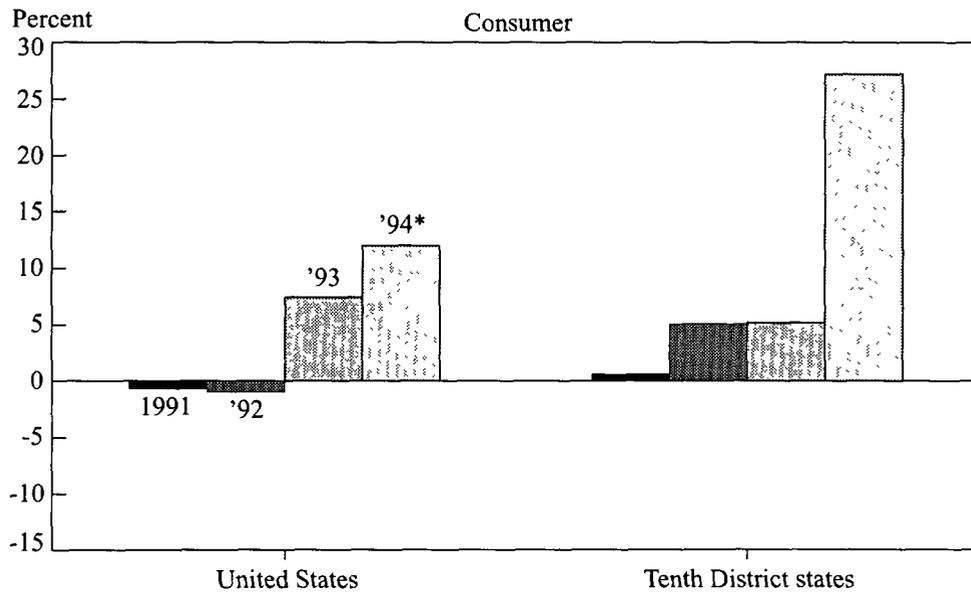
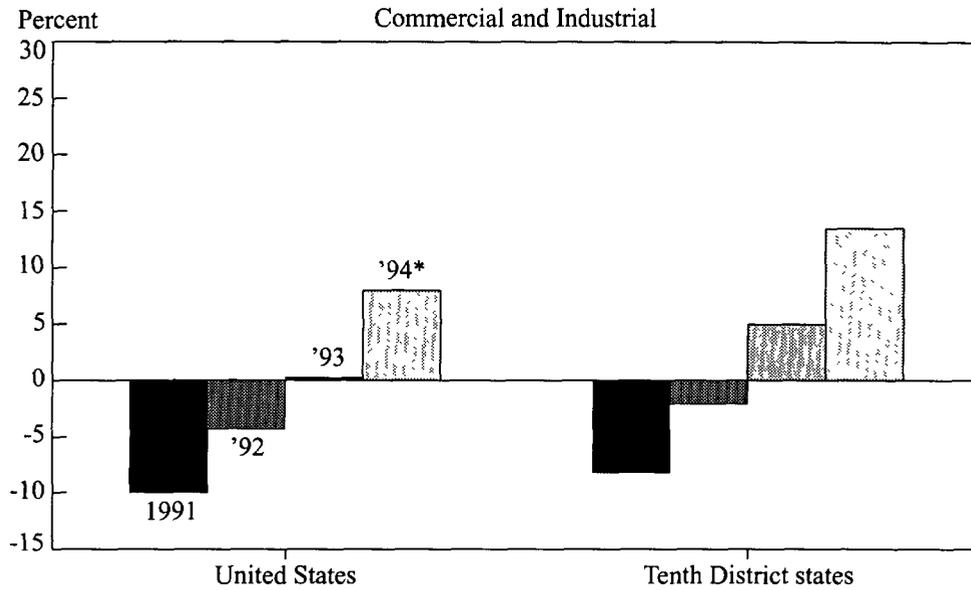
During most of the recovery, C&I loans have been the weakest loan category in the nation. Such loans fell 10 percent in 1991, declined another 4

percent in 1992, and barely increased at all in 1993. C&I loan growth finally rebounded in the first half of 1994, growing at an annual rate of 8 percent. The weakness in C&I loans in 1991-93 reflected both slow growth in total business borrowing and a shift in the composition of borrowing from bank loans and other short-term debt to long-term debt and equity.<sup>7</sup> In the first half of 1994, the strong economy boosted total business borrowing. And the rise in long-term rates and fall in stock prices early in the year induced businesses to rely more on banks and finance companies for credit. Finally, some analysts argue that banks were also bidding more aggressively for business customers in an effort to boost revenues (Knecht, Racine).

District C&I loans also fell sharply at the beginning of the recovery and rebounded later. The

Chart 3

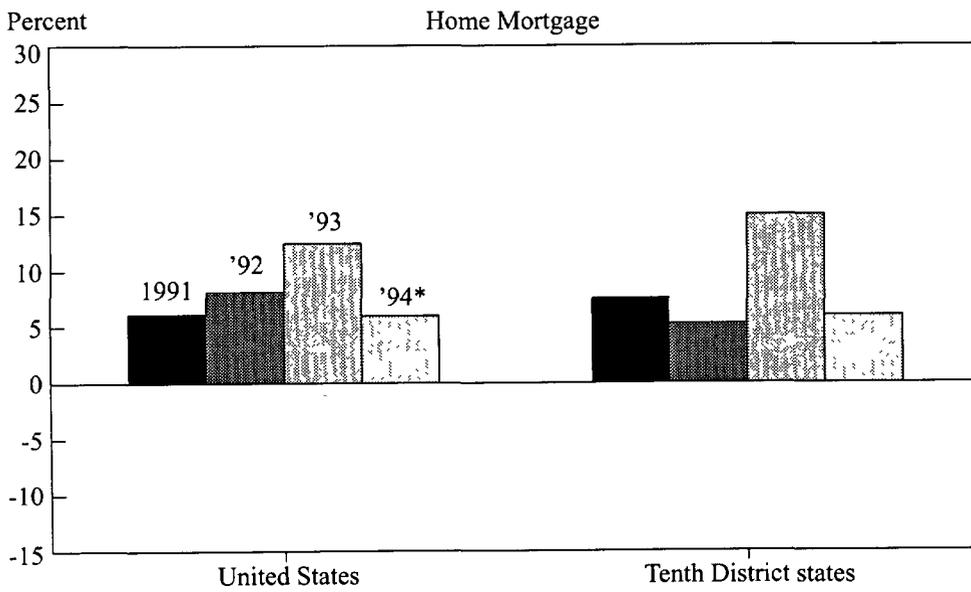
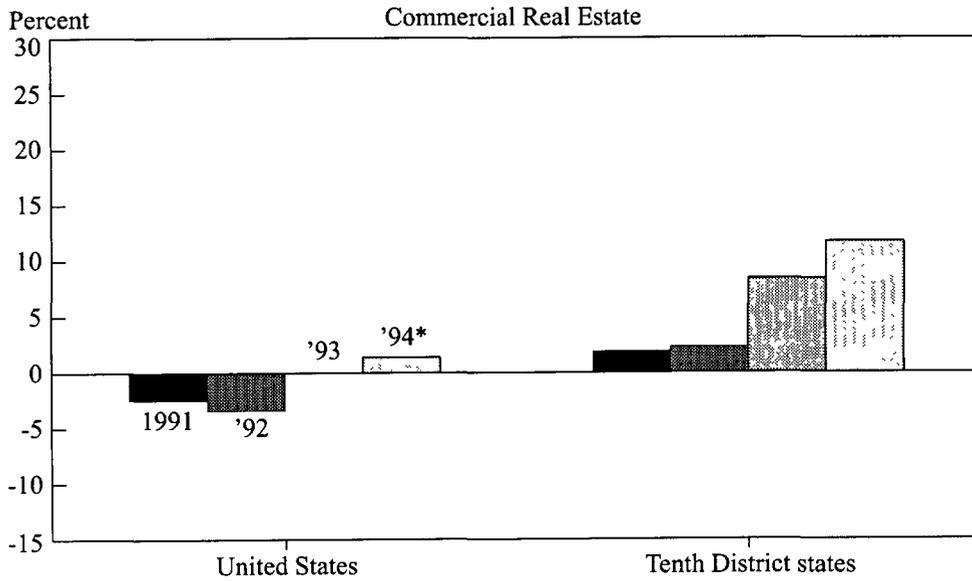
**Loan Growth by Category**



\* First half, seasonally adjusted annual rate.

Chart 3 (continued)

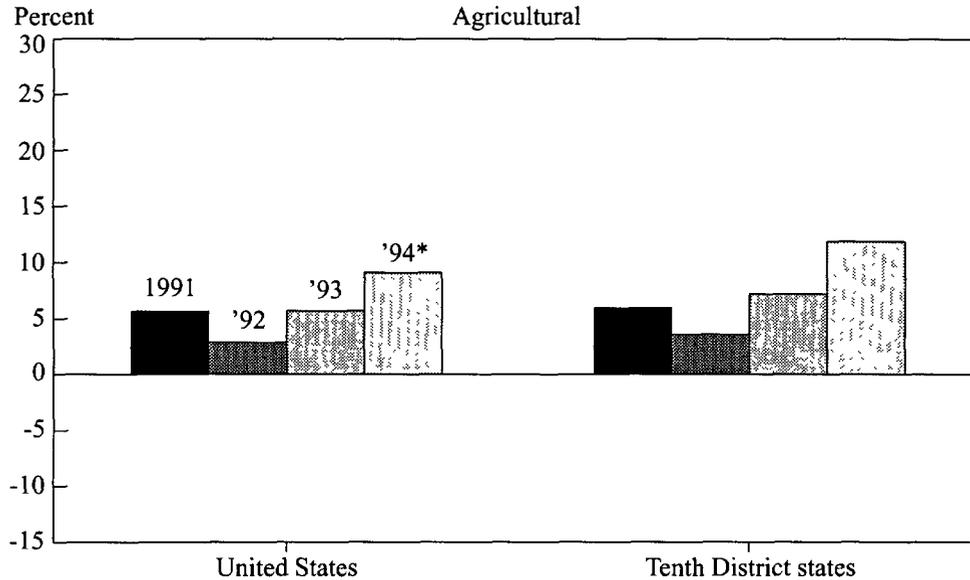
**Loan Growth by Category**



\* First half, seasonally adjusted annual rate.

Chart 3 (continued)

**Loan Growth by Category**



\* First half, seasonally adjusted annual rate.

main difference was that loan growth rebounded sooner and more strongly in the district than in the nation. After declining in both 1991 and 1992, district C&I loans grew 5 percent in 1993 and a very strong 13 1/2 percent in the first half of 1994. As in the case of total loans, the stronger growth in C&I loans in the district can be attributed to the faster economic growth in the region and the fact that district banks and businesses started the recovery in better financial condition.

*Consumer loans*

Consumer loan growth in the nation was weak in the first two years of the recovery but then rebounded strongly. After falling about 1 percent in

both 1991 and 1992, consumer loans at U.S. banks rose 7 1/2 percent in 1993 and an even stronger 12 percent in the first half of 1994. The rebound in consumer loans in 1993-94 coincided with strong growth in consumption spending, as households became more comfortable with debt service burdens and more optimistic about future income growth.

Growth in district consumer loans also started out weak and then accelerated. However, loan growth was stronger in the district than the nation most of the period, reflecting the faster job and income growth in the region. District consumer loans were flat in 1991, rose about 5 percent in both 1992 and 1993, and then grew at the exceptionally rapid rate of 27 percent rate in the first half of 1994. Some of the 1994 surge was due to the transfer of a credit card bank from outside the district. But even

without the new bank, consumer loans would have increased sharply.

### *Commercial real estate loans*

Commercial real estate loans at U.S. banks were weak the first three years of the recovery and, in contrast to C&I loans, rebounded only slightly in the first half of 1994. Commercial real estate loans fell 2 1/2 percent in 1991 and an even sharper 3 1/2 percent in 1992. Loans then leveled off in 1993 and grew a mere 1 1/2 percent in the first half of 1994. Depressed real estate prices and an excess supply of office space contributed to the weakness in commercial real estate lending. Moreover, the banks that had been most active in such lending were in the worst financial condition and thus were most reluctant to lend. By 1994, the commercial real estate market had firmed sufficiently and banks' financial condition improved enough for lending to increase modestly.

Growth in commercial real estate loans has been much faster in the district than in the nation. Such loans increased in both 1991 and 1992, albeit at the sluggish rate of 2 percent. Commercial real estate loans then jumped 8 1/2 percent in 1993 and 12 percent in the first half of 1994. One reason for the strength in commercial real estate lending during the recovery is that construction spending has grown much faster in the district than the nation.<sup>8</sup> Construction loans fell at double-digit rates in 1991-92 but then rose at double-digit rates in 1993-94. This dramatic turnaround accounts for most of the acceleration in commercial real estate loans in 1993-94, even though construction loans are only a fifth of total commercial real estate loans.

### *Home mortgage loans*

Home mortgage loans were the strongest category in the nation during the first three years of the recovery. Despite reduced demand for housing,

home mortgage loans at U.S. banks grew a healthy 6 percent in 1991 and 8 percent in 1992. Growth then jumped to 12 1/2 percent in 1993 before subsiding to 6 percent in the first half of 1994. One factor that helped sustain growth in home mortgages during the recovery was the absorption of troubled S&Ls into the banking industry and the reduced competition for borrowers from remaining S&Ls. Another factor was the high rate of mortgage refinancing during much of the period. Many households refinanced their mortgages with higher principal, using the proceeds to pay down high-cost consumer debt.

Changes in market interest rates help explain both the acceleration in loan growth in 1993 and the slowdown in 1994. As long-term interest rates came down in 1993, mortgage rates fell to their lowest levels since the early 1970s. This decline in mortgage rates not only increased the demand for new mortgages for home purchases but also further boosted the demand for refinancings. Conversely, when long-term rates went back up in 1994, refinancings and housing demand both fell, slowing the growth in home mortgage loans.

Home mortgage loans behaved much the same in the district as the nation. Loans at district banks grew 7 1/2 percent in 1991, 5 percent in 1992, and 15 percent in 1993. Growth then slowed to 6 percent in the first half of 1994, as home mortgage loans switched from the fastest growing category in the district to the slowest. The fact that loan growth varied the same way in the district as the nation over the period is not surprising, since changes in market interest rates have such a strong effect on housing demand and refinancing. However, it is surprising that district loan growth did not exceed national loan growth, given that the demand for new housing was much stronger in the district.<sup>9</sup>

### *Agricultural loans*

Agricultural loans at U.S. banks increased at a healthy pace during most of the period. Such loans

grew 6 percent in 1991, unaffected by the recession. Growth slowed to 3 percent in 1992, returned to 6 percent in 1993, and then rose to 9 percent in the first half of 1994. The healthy loan growth during the recovery mainly reflected an increase in the percent of farm debt held by banks. Total farm debt rose only 1 percent a year from the end of 1990 to the end of 1993, but banks' market share increased from 34.5 percent to 38.0 percent at the expense of other lenders (U.S. Department of Agriculture).

In the district, growth in agricultural loans followed a similar pattern but was slightly stronger. From 6 percent in 1991, growth slowed to 3 1/2 percent in 1992. District agricultural loans then increased a strong 7 percent in 1993 and an even faster 12 percent in the first half of 1994.

### *BANK CREDIT GROWTH BY STATE*

In most district states, loan growth accelerated during the recovery, just as in the nation (Chart 4). Loan growth rates were higher in most district states than in the nation throughout the period. Average loan growth in 1993-94 was strongest in Colorado, where it exceeded 20 percent, and weakest in Kansas, where it was only 4 percent.

Until recently, securities growth also followed the national pattern in most district states, starting out strong and then slowing (Chart 5). In contrast to the nation, however, securities growth increased in several states in the first half of 1994. Over the period as a whole, growth was strongest in Colorado and weakest in Nebraska and Kansas. Contrary to what might be expected, the states with the fastest securities growth were not always the ones with the slowest loan growth.

The most striking differences in bank credit trends between the district and the nation occurred in the growth of loans rather than securities. This section briefly describes loan growth in each district state in order of average loan growth in 1993-94.

### *Colorado*

Loans in Colorado, after falling in 1991 and rising only moderately in 1992, rose at a rate well above 20 percent in 1993 and the first half of 1994. Absorption of S&Ls into the banking industry accounted for much of the 1993 loan growth. But even without S&L absorption, loans would have grown a strong 11 percent in 1993. The Colorado economy grew much faster than the national economy during the recovery, helping explain why loan growth ended up so much stronger in Colorado than the nation.

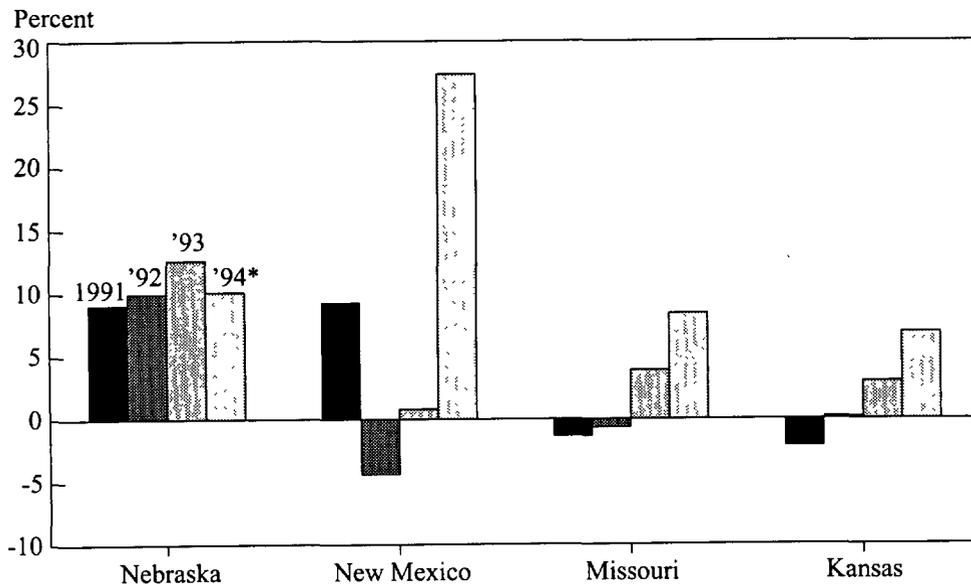
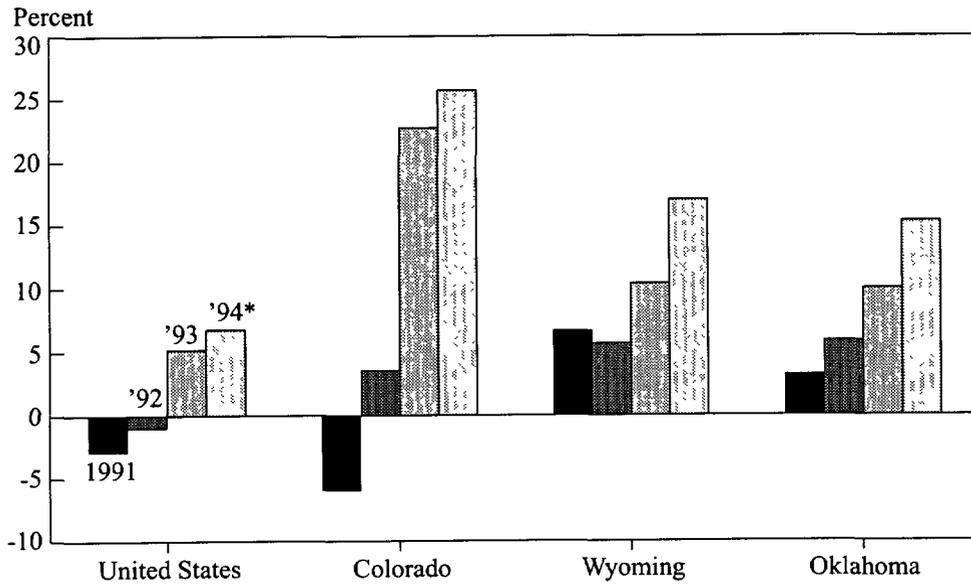
The rebound in loan growth in 1993-94 was widespread across categories, with home mortgage loans and commercial real estate loans showing special strength. Not all of the growth in these two categories was due to the absorption of S&Ls. Strong population growth boosted demand for home mortgages by increasing housing demand. Residential and nonresidential construction were also very strong, increasing the demand for construction loans. Also, the office vacancy rate in Denver continued to fall, helping revive the demand for commercial mortgages.

### *Wyoming*

Loans grew at a healthy pace the first two years of the recovery and then accelerated. From an average of 6 percent in 1991-92, loan growth jumped to 10 percent in 1993 and 17 percent in the first half of 1994, far exceeding national loan growth. Some of the difference in loan growth between Wyoming and the nation reflected a catching-up process. Due to slow loan growth in the latter half of the 1980s, Wyoming banks began the recovery with a loan-asset ratio of only 45 percent, well below that of most other states.

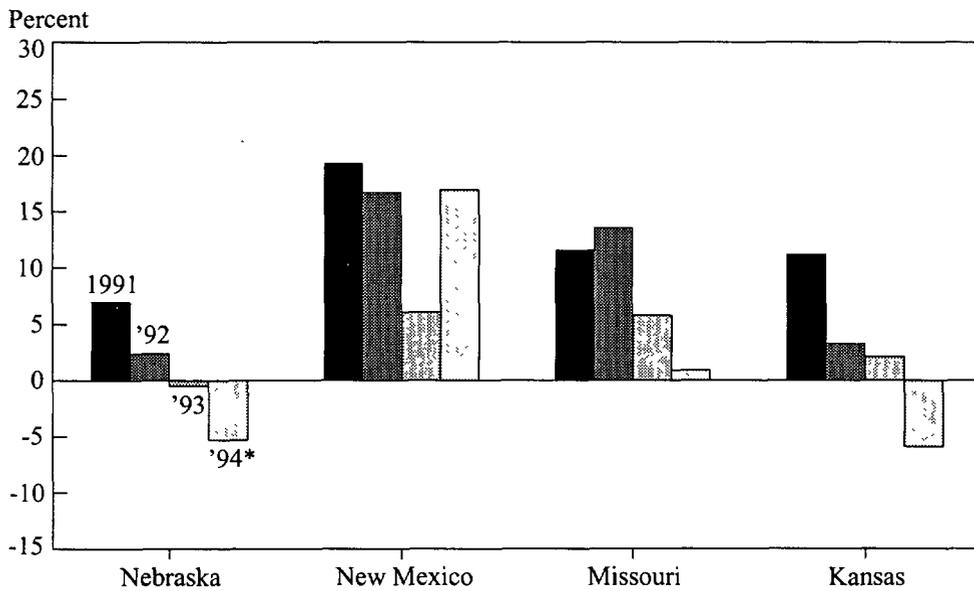
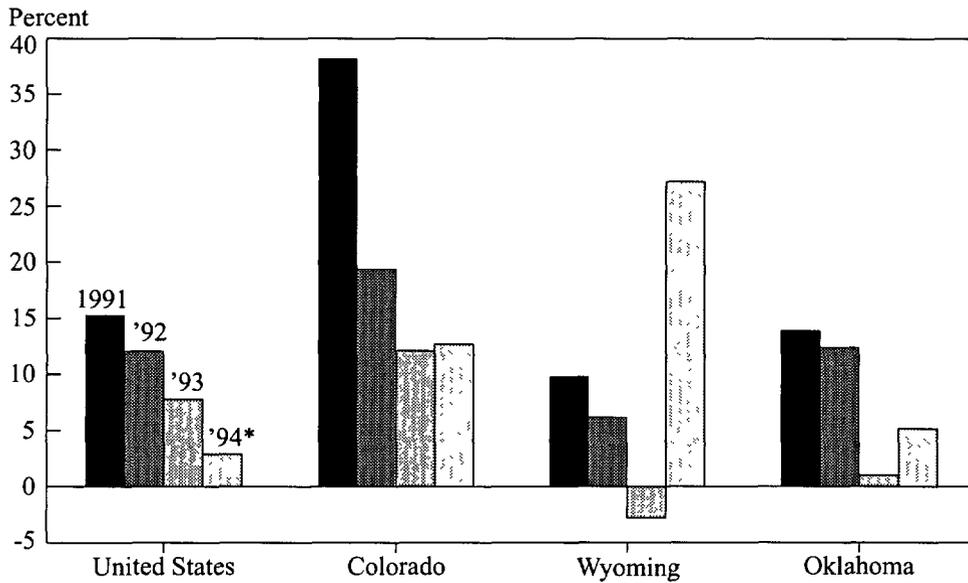
Commercial real estate loans, home mortgage loans, and agricultural loans were all strong, increasing at rates close to or above 20 percent in 1993-94. The only weak category was C&I loans,

Chart 4  
Growth in Loans



\* First half, seasonally adjusted annual rate.

**Chart 5**  
**Growth in Securities**



\* First half, seasonally adjusted annual rate.

which grew slower than in the nation during most of the recovery. These loans fell sharply in 1991, stayed flat the next two years, and increased at only a 2 1/2 percent rate in the first half of 1994.

### *Oklahoma*

Loan growth started out at a modest but positive rate and then increased steadily. Loan growth reached 10 percent in 1993 and rose to 15 percent in the first half of 1994, more than twice the national rate. As in Wyoming, one reason for the rapid loan growth was that Oklahoma banks began the recovery with a loan-asset ratio of only 46 percent due to exceptionally slow loan growth in the mid-to-late 1980s.

Growth was strong in all loan categories but especially in commercial real estate. These loans grew 12 percent in 1993 and 19 percent in the first half of 1994. Strong construction activity in the state boosted the demand for construction loans. Commercial mortgages also grew rapidly despite persistently high office vacancy rates in Oklahoma City.

### *Nebraska*

Loan growth has been strong in Nebraska throughout the recovery. Nebraska was the only state where loan growth slowed in the first half of 1994. At 10 percent, however, loan growth still exceeded the national average by several percentage points. The faster loan growth in Nebraska cannot be explained by faster economic growth, because the Nebraska economy grew somewhat slower than the national economy after 1992. Nor did the rapid loan growth represent a catching-up process. Nebraska banks began the recovery with a loan-asset ratio of 54 percent, a little above the district average, and ended up with a ratio of 61 percent, far above the district average.

While all loan categories grew rapidly, home

mortgage loans were especially strong. These loans fell slightly in the first half of 1994, but only after surging 26 percent in 1992 and 50 percent in 1993. Although housing demand was not any stronger than in the nation, the growth in home mortgages brought holdings by Nebraska banks more in line with other states.<sup>10</sup>

### *New Mexico*

Loan growth fluctuated sharply in New Mexico due partly to special factors. Loans grew a strong 9 percent in the first year of the recovery due to the absorption of two failed S&Ls. But in contrast to the nation and the district, loan growth then slowed sharply in 1992-93. Loans ended the period by rebounding strongly, growing at a 27 percent rate in the first half of 1994. The transfer of a large credit card bank from outside the district accounted for much of the surge. Even without the new bank, however, loans would have grown at a rate of 11 percent in the first half of 1994, a marked improvement from the previous two years. Economic growth has been much higher in New Mexico than the United States, helping explain the fast loan growth in the state at the end of the period but not the slow growth earlier.

While total loans behaved erratically over the period, C&I loans, consumer loans, and commercial real estate loans all started out weak and steadily improved. Growth in the first half of 1994 was especially strong for C&I loans, which rose at a 21 percent rate, and for consumer loans, which increased at a 102 percent rate. Although most of the explosive growth in consumer loans was due to the new credit card bank, consumer loans would have risen at the rapid rate of 16 percent even without the bank. Home mortgage loans showed the most unusual behavior. These loans surged 57 percent in 1991 due to the absorption of the failed S&Ls. Home mortgage loans then declined the next two years, recovering only partially in the first half of 1994.

## *Missouri*

Loan growth in Missouri closely matched national trends during the period. Loans started out weak and then rebounded to 4 percent in 1993 and over 8 percent in the first half of 1994. The similarity in loan growth between Missouri and the nation is not surprising, given that the Missouri and national economies have grown at about the same rate.

While total loans have grown at similar rates in Missouri and the nation, commercial real estate loans have been much stronger in Missouri and home mortgage loans much weaker. Commercial real estate loans grew 4 percent in 1993 and 8 1/2 percent in the first half of 1994, well above the national average. On the other hand, home mortgage loans grew only 2 percent a year throughout the recovery. These differences in loan growth cannot be explained by differences in economic activity. Growth in housing permits has not been any weaker in Missouri than the nation, while growth in construction jobs and construction contracts has been only marginally higher.

## *Kansas*

Loans grew about the same in Kansas as the nation during the recovery. Loan growth got off to a weak start but improved to 3 percent in 1993 and 7 percent in the first half of 1994. Before slowing in the first half of 1994, the Kansas economy tracked the national economy fairly closely, helping explain why loan growth has been so similar.

The only loan category in which Kansas has failed to keep up with the nation is home mortgage loans. Such loans grew three percentage points below the national average in 1993 and then fell in the first half of 1994, while loans nationwide were rising. As in the case of Missouri, the weaker growth in home mortgage loans cannot be attributed

to weaker housing demand, as housing permits have moved in lockstep with the nation.

## *CONCLUSIONS*

During the current recovery, bank credit trends in Tenth District states have matched national trends in some ways but differed in others. In both the district and the nation, loan growth started out weak and then accelerated as the recovery proceeded. Total security holdings also behaved about the same in the district as the nation, growing fast at the beginning of the recovery and then slowing sharply in 1993-94. The district differed from the nation in that it enjoyed stronger loan growth throughout the period. The gap in loan growth was evident in several categories but was greatest for commercial real estate loans, which rebounded sharply in the district in 1993-94 but remained weak in the nation.

While loan growth accelerated and securities growth slowed in almost all district states during the recovery, loan growth was stronger in some states than others. By 1993-94, loan growth was close to the national average in Kansas and Missouri but well above the national average in Colorado, Wyoming, Oklahoma, Nebraska, and New Mexico. Average loan growth in 1993-94 was especially strong in Colorado, where loans grew four times faster than in the nation.

The stronger loan growth in the district than the nation is explained by several factors. The district economy suffered a milder recession than the nation, and as a result, economic growth remained stronger through the end of 1993. District banks and borrowers also started the period in better financial health than their counterparts in the rest of the nation, having already suffered through and recovered from the agriculture and energy slumps of the mid-1980s. Finally, the sharper acceleration in district loan growth in the first half of 1994 could be a sign that the district economy remains fundamentally stronger than the national economy and will grow faster than the national economy in the rest of 1994 and 1995.

*APPENDIX*  
*GROWTH IN BANK CREDIT, LOANS, AND SECURITIES*  
*(Percent, annual rate)*

United States				
	1991	1992	1993	H1 1994
Bank credit	1.3	2.5	5.9	5.7
Loans	-2.9	-1.0	5.2	6.8
C&I	-10.0	-4.3	.2	8.0
Consumer	-.7	-1.0	7.4	12.0
Commercial R.E.	-2.5	-3.4	-.0	1.4
Home mortgage	6.2	8.2	12.5	6.0
Agricultural	5.7	2.9	5.7	9.1
Securities	15.3	12.1	7.8	2.9
Memo: Nonfarm employment	-.9	.9	2.0	3.0
Tenth District States				
Bank credit	5.4	5.4	6.7	9.4
Loans	.4	2.1	8.3	13.3
C&I	-8.2	-2.1	5.0	13.5
Consumer	.6	5.1	5.2	27.2
Commercial R.E.	1.9	2.3	8.4	11.7
Home mortgage	7.6	5.3	15.0	6.0
Agricultural	6.0	3.6	7.2	11.9
Securities	14.9	11.0	4.4	3.5
Memo: Nonfarm employment	.5	2.2	2.7	2.8
Colorado				
Bank credit	7.2	9.6	18.2	20.4
Loans	-6.0	3.6	22.7	25.7
C&I	-8.3	-4.9	10.0	23.3
Consumer	-4.2	11.0	-2.4	48.5
Commercial R.E.	-11.3	1.5	26.2	19.2
Home mortgage	-1.1	6.7	61.5	18.6
Agricultural	-2.8	1.3	6.7	13.6
Securities	38.2	19.4	12.1	12.7
Memo: Nonfarm employment	1.8	3.9	4.0	2.7

## GROWTH IN BANK CREDIT, LOANS, AND SECURITIES (continued)

Kansas				
	1991	1992	1993	H1 1994
Bank credit	3.1	1.5	2.6	1.3
Loans	-2.2	.2	3.0	6.9
C&I	-10.5	-7.6	-1.0	11.9
Consumer	-5.0	-.4	6.4	16.7
Commercial R.E.	1.8	2.5	-.8	3.9
Home mortgage	4.1	5.0	9.6	-1.6
Agricultural	2.1	3.1	5.3	6.1
Securities	11.2	3.3	2.1	-5.9
Memo: Nonfarm employment	.8	1.6	2.3	1.4
Missouri				
Bank credit	2.5	3.9	4.6	5.7
Loans	-1.4	-.7	3.9	8.4
C&I	-7.8	-3.6	4.2	9.7
Consumer	-4.7	-.2	7.7	21.0
Commercial R.E.	6.2	-.7	4.1	8.5
Home mortgage	2.3	1.5	1.6	2.4
Agricultural	10.1	3.1	4.8	10.3
Securities	11.6	13.6	5.8	.9
Memo: Nonfarm employment	-1.0	1.3	3.3	3.2
Nebraska				
Bank credit	8.4	7.3	8.2	5.2
Loans	9.1	10.0	12.6	10.1
C&I	-4.7	9.2	7.3	11.9
Consumer	22.2	11.5	5.7	10.3
Commercial R.E.	5.6	11.5	11.1	12.7
Home mortgage	7.4	26.0	50.2	-1.3
Agricultural	10.3	5.4	7.6	16.2
Securities	7.0	2.4	-5	-5.3
Memo: Nonfarm employment	.6	2.2	1.7	.3

## GROWTH IN BANK CREDIT, LOANS, AND SECURITIES (continued)

New Mexico				
	1991	1992	1993	H1 1994
Bank credit	12.5	2.8	2.9	23.1
Loans	9.3	-4.4	.8	27.4
C&I	-14.5	-5.7	-2.0	21.3
Consumer	-5.2	1.0	4.6	101.7
Commercial R.E.	-4.3	3.3	7.6	9.2
Home mortgage	56.5	-5.2	-6.3	4.9
Agricultural	6.4	-5.6	6.0	1.4
Securities	19.3	16.7	6.1	16.9
Memo: Nonfarm employment	.7	3.9	3.3	6.6
Oklahoma				
Bank credit	7.7	8.8	5.9	10.7
Loans	3.2	5.9	10.0	15.3
C&I	-5.0	4.4	10.8	16.6
Consumer	5.9	9.0	8.5	19.1
Commercial R.E.	6.3	7.6	11.7	18.5
Home mortgage	8.5	13.9	11.6	10.3
Agricultural	2.6	3.7	11.4	14.4
Securities	13.9	12.4	1.0	5.2
Memo: Nonfarm employment	1.1	1.3	.5	3.6
Wyoming				
Bank credit	8.1	5.9	4.2	21.4
Loans	6.7	5.7	10.4	17.0
C&I	-15.1	1.2	-1.1	2.4
Consumer	11.6	3.9	7.3	11.4
Commercial R.E.	-9	4.2	24.1	32.9
Home mortgage	36.0	11.1	14.0	23.5
Agricultural	13.3	7.3	17.9	17.9
Securities	9.8	6.2	-2.8	27.2
Memo: Nonfarm employment	1.7	1.7	2.3	-2

Notes: For bank credit, growth rates are December over December for 1991-93 and June over December for 1994:H1. For employment, growth rates are fourth quarter over fourth quarter for 1991-93 and second quarter over fourth quarter for 1994:H1. Data for 1994:H1 are seasonally adjusted. Trading account securities are excluded. Consumer loans include home equity loans, and C&I loans include acceptances of other banks.

## ENDNOTES

<sup>1</sup> All figures are from the detailed tables in the Appendix. The data are based on the Reports of Income and Condition filed by commercial banks and are for domestic offices of U.S. chartered banks. Data for the first half of 1994 have been seasonally adjusted by the author using the X-11 procedure. Growth rates for 1991 are for the entire year, even though the recovery did not officially begin until March. None of the conclusions would be affected by using the later starting point.

<sup>2</sup> Analysts have reached this conclusion by estimating how much of the weakness in loans and strength in securities can be explained by past behavior over the business cycle (Bernanke and Lown; Cantor and Wenninger; Federal Reserve Bank of New York; Johnson; Keeton; Rodriguez).

<sup>3</sup> Analysts disagree on the relative importance of these different explanations. For example, Baer and McElravey, Berger and Udell, and Hancock and Wilcox argue that risk-based capital requirements had little effect on loan and securities growth, while Haubrich and Wachtel, Jacklin, and Laderman argue the opposite.

<sup>4</sup> The average spread between the 30-year Treasury bond rate and the 3-month Treasury bill rate fell from 4.5 percentage points in the fourth quarter of 1992 to 3.1 points in the fourth quarter of 1993. The spread edged back up to 3.4 points in the second quarter of 1994, which was high for that stage of the business cycle but still below the previous peak.

<sup>5</sup> Another factor that contributed to the slowdown in securities growth in 1994 was a change in accounting rules that forced banks to record more of their securities at market value rather

than historical cost. This accounting change reduced the rate of securities growth in the first half of 1994 by about 1 1/2 percentage points.

<sup>6</sup> The change in accounting rules mentioned in note 5 reduced the rate of securities growth in the district by about 1 1/2 percentage points in the first half of 1994.

<sup>7</sup> Empirical studies differ on whether C&I loans were unusually weak given the behavior of the economy. In a recent study by the Federal Reserve Bank of New York, Mosser and Steindel found that new lending by banks and thrifts to nonfinancial corporations was much weaker in 1991 and the first half of 1992 than expected given cash flow, plant and equipment spending, and inventory investment. Using different methodology, however, Lown and Wenninger found that growth in C&I loans by banks in 1990 and 1991 was about the same as expected given economic activity.

<sup>8</sup> From 1990 to 1993, for example, the value of construction contracts increased 37 percent in the district but only 7 percent in the nation. Over the same period, construction employment rose 12 percent in the district but fell 10 percent in the nation.

<sup>9</sup> For example, from 1990 to 1993, single-family housing permits increased 75 percent in the district but only 27 percent in the nation.

<sup>10</sup> At the end of 1990, home mortgages accounted for only 6 percent of assets, one of the lowest shares in the nation. By mid-1994, the share had risen to 9 1/2 percent, still low but closer to the rest of the nation.

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# Is the Debit Card Revolution Finally Here?

*By John P. Caskey and Gordon H. Sellon, Jr.*

**F**or three decades, experts on payments systems have forecast the imminent arrival of a completely electronic, paperless payment system. In this vision of the future, households, businesses, and government agencies would replace paper transactions with faster, more efficient electronic payments. The centerpiece of this new payment world is the debit card, a magnetically encoded plastic card that would eliminate the use of cash, checks, and even credit cards by consumers in most retail transactions.

While some parts of this payment revolution have arrived, in many respects the forecasts have proved to be overly optimistic. Some of the most notable successes in moving from paper to electronic payment are the development of Fedwire and the Clearing House Interbank Payment System (CHIPS) for large-value payments, the automated clearing house (ACH) system for payroll and other repeated contractual payments, and automated teller machines (ATMs), which enable consumers to have remote access to their bank accounts. The biggest disappointment, thus far, is the debit card. Despite

claims of cost savings and greater efficiency, consumers and merchants have been reluctant to switch from traditional payment methods to the debit card. As a result, until recently, use of debit cards has been limited to a narrow geographic and specialized merchant base.

This article analyzes the factors that have limited the debit card's success and examines prospects for future growth. Much of the reason debit cards have not lived up to their potential can be traced to two important economic barriers: first, coordination issues among payments system participants that affect incentives to adopt a new payment technology, and second, the inefficient pricing of existing means of payment. The first set of barriers has become less important over time, which will enable debit cards to become a more prominent part of the payment system landscape over the next few years. However, the inefficient pricing of payment methods could continue to inhibit debit card growth so long as consumers have little financial incentive to use the debit card over other payment methods. As a result, debit cards are likely to experience strongest growth where consumers find them more convenient than other payment methods, where merchants find them to be cost effective, and where consumers do not have access to a full range of payment alternatives.

The first section of this article describes debit

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cards and their current role in the payments system. The following two sections show how coordination issues and the pricing of payment methods have impeded debit card growth. The fourth section examines conditions under which debit cards are most likely to be successful.

### *AN OVERVIEW OF DEBIT CARDS*

Debit cards are important because they could potentially replace cash, checks, and credit cards in most retail transactions. Despite rapid growth in availability and use of debit cards in the last few years, they remain a minor part of the payments system, largely confined to specialized merchants and a limited geographic area.

#### *Types of debit cards*

Debit cards are machine-readable, magnetically encoded plastic cards, similar in appearance to credit cards or cards used to access automated teller machines (ATMs). In fact, it is common for ATM cards to function as debit cards, meaning that they can be used to make retail payments as well as to access ATM machines. What makes an ATM card a debit card is the availability of a specialized card reader/processor at a retail merchant. Indeed, merchants increasingly list ATM logos on their storefront windows to indicate that customers can use their ATM cards to make purchases.

As a generic term, "debit card" includes three distinct transaction technologies: on-line debit cards, off-line debit cards, and prepaid debit cards. The three types of debit cards differ greatly in their operation and their availability to consumers.

Currently, most debit cards are on-line cards, meaning that when a consumer makes a purchase using the card, funds are immediately deducted from the consumer's deposit account. The immediate debiting of the consumer's bank account distinguishes the on-line card from both checks and credit

cards, which involve delayed payment. Because there is no extension of credit with an on-line card, it can be offered to anyone with a transaction account. However, since the on-line feature allows direct access to the customer's bank account, the customer must personally authorize each transaction. Thus, a second distinguishing feature of on-line cards is the use of a specialized card reader with the ability to accept a personal identification number (PIN).

ATM cards generally function as on-line cards, with funds authorization and transfer operating through the regional bank ATM network. Most on-line debit cards can only be used regionally through a merchant base that is directly linked to the relevant regional ATM network. However, the bankcard organizations, Visa and MasterCard, also issue on-line debit cards through their Interlink and Maestro programs that can be used nationwide at any merchant that displays these logos.

The distinguishing feature of *off-line* debit cards is delayed settlement. When a customer uses an off-line card to make a purchase, the transaction is authorized electronically as with a credit card. The customer's account is then automatically debited and the merchant's account is credited after a delay of two to three days from the time of purchase. Because of this delay, use of an off-line debit card is similar to the use of a check or credit card in that the customer receives a short-term extension of credit. Consequently, the off-line card can be offered only to bank customers with good credit records, thereby restricting the percentage of the population that might carry it. A second feature of the off-line card is that it generally does not require the merchant to purchase equipment to accept PIN number authorization. In fact, the same equipment used for credit card authorization can also be used for off-line debit cards. Currently, off-line debit cards are only available through Visa and MasterCard under their "Visa Check" and "Master Money" programs.

The third type of debit card, the *prepaid* card, comes in two forms, a special purpose card and a so-called "smart card." Both types of prepaid cards share a common feature that distinguishes them

from on-line and off-line cards: they are not directly linked to a card holder's deposit account. When the consumer uses either type of card to make a purchase, the card reader deducts the amount of the transaction from the prepaid electronic balance shown on the card. Thus, for a prepaid card, the card and not the customer's bank account is debited at the time of the transaction.

The two forms of prepaid debit cards differ in the type of technology used in their construction and in their range of uses. The special purpose card uses a magnetic strip that is programmed to report a balance prepaid by the customer to the issuer of the card. This technology is similar to that employed on credit cards and ATM cards. The limiting feature of this technology is the relatively small amount of information that can be stored on the magnetic strip. In contrast, a smart card employs a micro chip that is capable of being programmed to hold considerably more information.

Special purpose cards also tend to have a more limited range of uses than smart cards. Generally, issuers of special purpose debit cards are providers of a specific service, such as local mass transit, self-service photocopying, or long-distance telephone calls. These cards can usually be used only to purchase these specific services. In contrast, smart cards can generally be used in any retail location that is equipped to accept debit cards. At present, special purpose cards are only in limited use in the United States. Smart cards, while available in some European countries, have not yet been issued on a commercial basis in the United States because of high production costs.

### *How debit cards work*

Both on-line and off-line cards require the coordination of a number of parties to complete a debit transaction. The simplest example involves five parties: the retail customer, the merchant, the customer's bank, the merchant's bank, and the operator of an electronic network linking the banks to the

merchant's debit card reader.

In a typical on-line debit card payment, the merchant enters the amount of the sale into a keyboard and swipes the debit card through a terminal with a magnetic code reader, which records the customer's bank and account number. The customer then enters his PIN number into a keyboard connected to the terminal to authorize the transaction. The terminal transfers this information to a computer, which relays the information to the appropriate electronic network linking the merchant's bank with the bank that issued the customer's debit card. This network, which in most areas is a regional ATM network, contacts the customer's bank and verifies that there are sufficient funds in the account to honor the payment. If there are, a transaction approval is relayed to the merchant's terminal, the customer's bank debits his account for the amount of the purchase, and the merchant's bank credits the merchant's account. Despite the large number of parties involved, the electronic technology employed makes the transaction instantaneous.

A typical off-line debit card transaction follows a similar procedure with three exceptions. First, as with a credit card transaction, the customer generally signs a paper slip to authorize the purchase rather than entering a PIN number. Second, in order to approve the transaction, the network checks whether the customer's total purchases over the previous two or three days are within some preset limit, rather than verifying that there are sufficient funds in the customer's account to cover the payment. Third, the customer's account is debited and the merchant's account credited two to three days after the purchase.

The mechanics of prepaid cards are considerably simpler. Indeed, for special purpose cards, all that is required is a terminal to dispense cards and a merchant base with specialized card readers. Banks need not be involved since the cards are prepaid and the card, rather than the customer's bank account, is debited at the point of sale. When the balance on the card is depleted, the consumer may dispose of the card or, in some cases, may be

able to replenish the balance by paying an additional fee.

In countries that use smart cards, banks are typically the issuers. Card holders commonly load value to their card by withdrawing funds from their bank account at an ATM machine. When the card holder makes a retail purchase, the merchant's card reader electronically reduces the balance on the card and transfers the amount of the purchase to the card reader for later deposit into the merchant's bank account.

### *Role in the payments system*

While the concept of a debit card goes back many years, before the mid-1980s the debit card was used almost exclusively in local pilot programs designed to gauge consumer and merchant acceptance.<sup>1</sup> Stimulus for the growth of on-line debit cards came from regional ATM networks, which saw the growth of debit transactions as a way to enhance network fee income. Support also came from Visa and MasterCard, which saw the possibility of using their national ATM networks, PLUS and CIRBUS, as a means of establishing a nationwide debit program. Visa and MasterCard have also been the principal stimulus behind off-line programs because off-line cards use existing credit-card authorization equipment for debit transactions and can be the source of additional fee income.

After a slow start, use of debit cards has grown impressively in recent years (Chart 1). From 1990 to 1993, the number of both on-line and off-line debit transactions grew at an average annualized rate of 30 percent to a total of over 700 million transactions in 1993. An important stimulus to the recent growth of on-line transactions is the greater willingness of merchants to install the specialized equipment needed to process on-line transactions. Indeed, from 1990 to 1993 the number of on-line terminals increased threefold, and in 1994 alone the number of installed terminals more than doubled to 344,000 units (Chart 2). Because off-line debit

transactions can be processed using existing credit card authorization equipment, terminal growth has not been as important a factor for off-line cards. Rather, off-line debit growth has been driven by increased availability of off-line cards as both Visa and MasterCard have undertaken promotional programs.

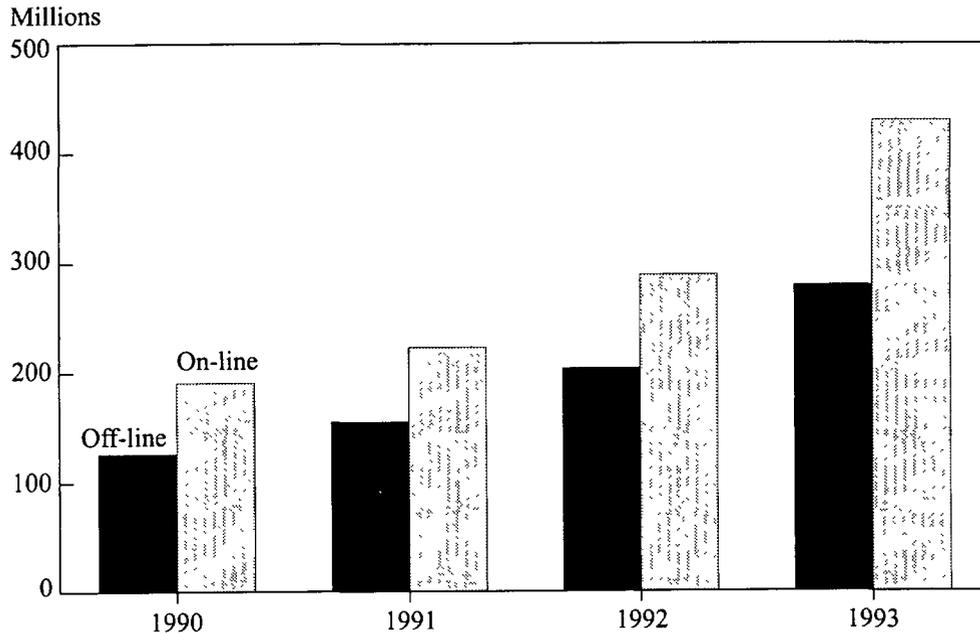
Despite these impressive growth rates, the debit card is currently used in only a small percentage of retail transactions. In 1993, the consulting firm, Payment Systems Inc., conducted a national survey of 540 merchants in six retail categories: oil and gas, restaurants, hotels/motels, durable goods (hardware, furniture, etc.), grocery and convenience stores, and specialty retailers. According to this survey, cash, checks, and credit cards continue to be the dominant means of retail payment. Indeed, customers at these businesses used cash for over half of all transactions, while checks and credit cards accounted for most of the remaining payments (Chart 3). Customers at surveyed firms used debit cards for only 2 percent of transactions.

Debit card use is also highly concentrated by type of business and geographic location (Chart 4). The vast majority of on-line terminals are located in just three business categories: grocery stores, gas stations, and convenience stores. And, use of debit cards is most prevalent on the West Coast, in the Northeast, and in Florida. In fact, California, where debit programs are most advanced, accounts for one-half of all on-line transactions.

### *NETWORK EFFECTS AS A BARRIER TO DEBIT CARD GROWTH*

The slow acceptance of debit as a means of payment can be traced partly to problems inherent in any attempt to make a major change in the payments system. Economic models of network effects stress how insufficient standardization, compatibility, and leadership can serve as barriers to change in situations where adopting a new product involves the interrelated decisions of many con-

Chart 1

**Increase in Debit Transactions**

Source: Bank Network News.

sumers and producers. As a consequence of structural changes in the banking system, however, these technological barriers to debit growth will become less important in the future.

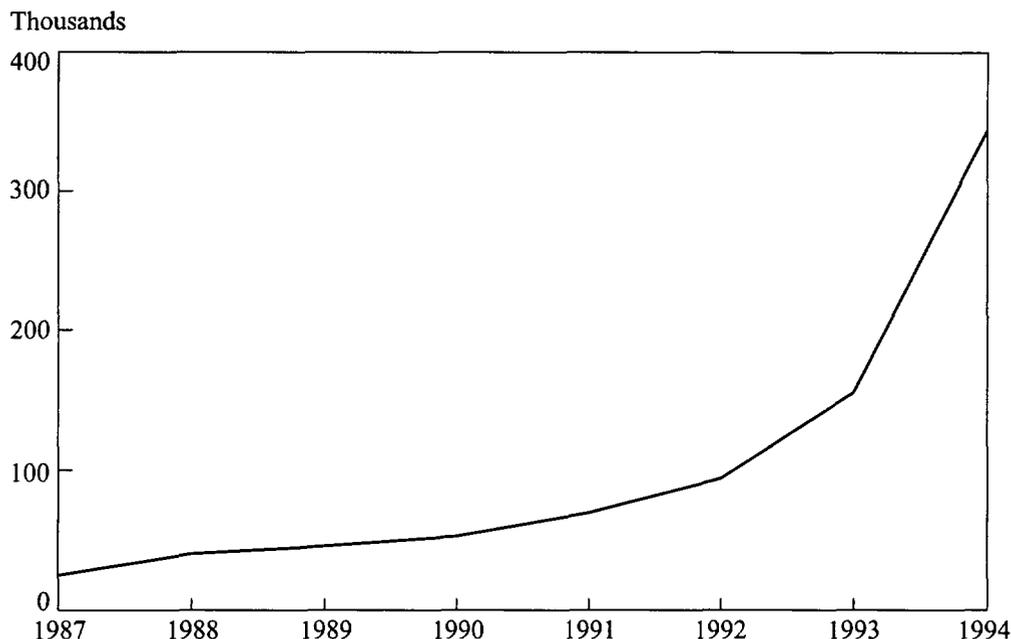
*Network effects and product development*

Economists use the term “externality” to describe situations in which one individual’s behavior has spillover effects on others. A positive “network externality” exists if the benefit an individual derives from using a product increases as the number of other individuals using that product increases

(Farrell and Saloner; Katz and Shapiro). There can be various causes of such an effect. In some cases, the usefulness of a product, such as the telephone, can depend on how many other people also have telephones. In other cases, benefits may occur because certain goods have complementary uses. For example, the usefulness of a personal computer depends on the range of software available for the computer. The more people who own a particular type of computer, the more likely it is that there will be a wide range of software written for that computer.

A large number of products have been cited as subject to network externalities. Important examples are communication equipment, such as telephones

Chart 2

**Number of Debit Terminals**

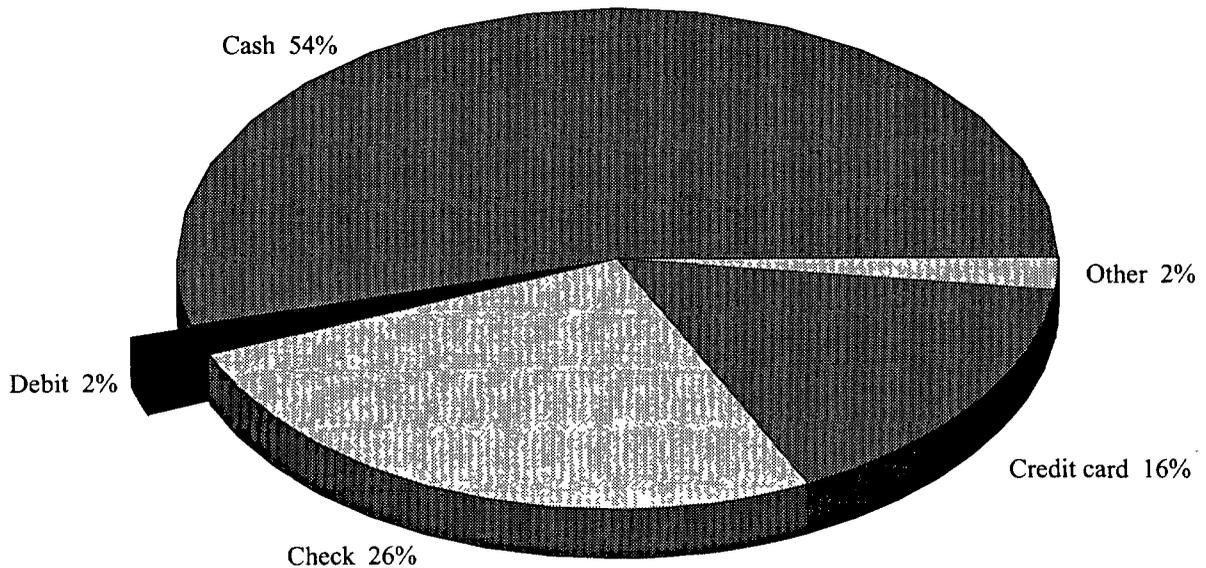
Source: POS News.

or fax machines, personal computers, compact disc players, and video cassette recorders. Payments system products may also exhibit network externalities. For example, individuals carrying a popular credit card can benefit because the card is likely to be widely accepted by merchants. Similarly, the benefit an individual derives from carrying an ATM card will depend on the geographic dispersion of ATM machines that accept the card. This dispersion in turn is likely to be a function of the number of people belonging to the ATM network (McAndrews; Saloner and Shepard).

When such externalities are significant, they can act as a barrier to the adoption of new technologies (Carlton and Klamer). For example, if there are

several producers of a product subject to positive network externalities, people may resist using the product unless some or all producers agree to use compatible technological standards. Without such compatibility, the network of users for each producer's product might be too small to make the product sufficiently useful. Another consequence of network externalities is that many potential users of the product might decide to wait for it to attain some initial success before entering the market. This delay occurs because early adopters will see few benefits from the product until its use is widespread. If a sufficient number of consumers adopt a wait-and-see attitude, there may be insufficient demand to launch the product successfully.<sup>2</sup>

Chart 3

**Means of Payment at Retail Stores**

Source: Payment Systems, Inc. (1993).

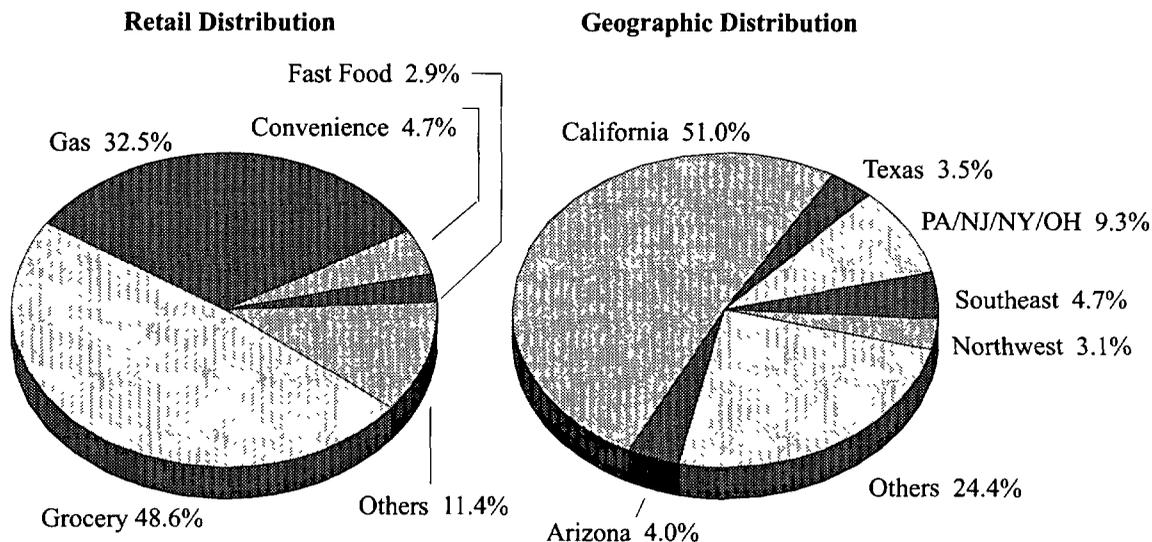
***A constraint on debit card acceptance***

Such network externalities provide one explanation for the slow growth in the use of debit cards in the 1980s. Because ATM cards can also function as on-line debit cards, the widespread use of ATM cards to obtain cash in the 1980s meant that debit card availability was probably not a limiting factor. Instead, the absence of retail locations that would accept ATM cards for consumer purchases was the key impediment.<sup>3</sup>

The lack of retail acceptance can be explained by the way ATM networks evolved. As discussed earlier, an on-line debit card system essentially piggybacks on an existing ATM system. An ATM

card becomes a debit card when a merchant installs a debit terminal that is linked to an ATM network and permits a customer to make a retail purchase using the card. Initially, most ATM systems were proprietary; that is, cards could only be used in machines owned by the bank issuing the card. Moreover, the different proprietary systems used different equipment and software, and so were generally not technically compatible. In this situation, a retailer interested in installing a debit card system would have to choose from different, competing ATM systems, knowing that a choice would exclude a potentially large group of customers with competing cards. The alternative, installing different equipment for each ATM system, would be

## Chart 4

**Debit Card Use**

Source: POS News (1993).

prohibitively expensive. Thus, retailers would have a strong incentive to install debit card readers only in areas where one bank's ATM cards enjoyed a significant market share.

As ATM systems evolved, however, compatibility and standardization problems diminished. A key development was the growth of shared ATM networks. In the early 1980s, banks began to form and join shared networks as they realized that their customers would prefer an ATM card that could be used to obtain cash at a wide range of locations. While only about half of ATM terminals were shared in the mid-1980s, almost all ATM machines belonged to a regional network by 1993.

These networks facilitated the launching of

on-line debit cards since they had already electronically linked large numbers of banks in a region, set interbank settlement procedures, and led the banks to issue ATM cards with compatible standards. It was a natural step for these regional ATM networks to promote the use of the ATM card for point-of-sale payments.<sup>4</sup> In areas where one large regional ATM network dominated, merchants could install a terminal capable of reading almost all of the ATM cards carried by their customers and linked to a network connecting the vast majority banks in the region. Thus, it is not surprising that the on-line debit card has enjoyed the most success in California and Pennsylvania and some surrounding states. In these geographic areas, there

were large, well-established, shared ATM networks by the mid 1980s, making it easier to coordinate the introduction of the debit card.

### *Future impact of network externalities*

Network effects are likely to be even less of an impediment to debit card acceptance in the future. These barriers are being further reduced by mergers between regional ATM networks and by the consolidation of the banking industry.<sup>5</sup> As ATM networks combine, greater coordination on technical issues is possible since one network's technical specifications are typically chosen as the new network standard. A similar process occurs when banks merge. As a result, merchants may be more likely to adopt debit as a payment alternative in the future to the extent that increased standardization lowers costs and increases likely consumer usage.

An additional factor that may have an important effect in lowering network externalities is a greater government role in electronic payments. Network externalities are most difficult to overcome when there are a large number of decision-makers whose interests must be coordinated to guarantee the success of a new product. In this situation, a dominant player can provide leadership that improves coordination and speeds up product adoption. Over the past few years, some state governments have provided low-income households with debit cards linked to deposit accounts. The governments then use these accounts to distribute financial assistance electronically. More recently, the federal government has expressed interest in developing a national electronic benefits transfer (EBT) program in an effort to reduce costs and curtail fraud in existing transfer programs. Extensive government involvement in the distribution of benefits through debit cards could spur debit card growth in two ways. Government involvement could increase industry standardization and provide subsidies or other incentives for merchants to install debit card readers.

### *PRICING: A CONTINUING BARRIER TO DEBIT CARD GROWTH*

As these technical barriers to debit acceptance continue to fall, future growth is likely to depend on whether consumers and retailers have an economic incentive to use debit in place of traditional payment methods. Unfortunately, the current system of pricing payment services may mute this incentive. Because consumers do not directly bear the costs of alternative payment methods, they are unlikely to choose debit over alternative payment methods based on cost.<sup>6</sup> For merchants, in contrast, debit pricing may be a crucial factor in to promote debit card use.

### *Pricing of existing payment services*

Banks are the major providers of payment services for retail transactions. To cover the operating costs of cash, checks, and credit cards, banks charge fees both to consumers and to merchants. Banks price these services in two ways. In some cases, they levy a fee for each transaction. A bank might charge a depositor for each check written, for example, or it might charge a merchant for each cash deposit or bundle of checks. In other cases, banks impose account fees rather than transaction fees. Some banks charge customers a flat monthly fee for maintaining a deposit account but permit the depositor to write an unlimited number of free checks. Similarly, banks generally charge consumers an annual fee for a credit card rather than a fee for each transaction.

The distinction between transaction-based fees and account-based fees has important implications for a consumer's or merchant's willingness to use a particular payment means. For example, if a consumer faces an explicit charge for a transaction, he is more likely to weigh this cost in deciding to use a particular payment method. In contrast, if payment pricing is account-based, the consumer is likely to see the marginal cost of a transaction as

zero and his choice of payment method is more likely to be based on factors other than cost.<sup>7</sup>

Currently, consumers have little incentive to choose a payment method based on price. At the time of a retail transaction, for example, a consumer typically pays the same price for a purchase regardless of whether cash, a check, or a credit card is used.<sup>8</sup> There is a cost to each means of payment, of course, but this cost is only loosely related to the level of usage.

Payment methods are not differentiated by price for two reasons. First, largely for historical reasons, almost all bank charges to consumers are account-based rather than transaction-based.<sup>9</sup> For example, most consumers do not face a per-check fee for the use of checks. Instead it is common for banks to charge a flat monthly account maintenance fee which is often waived if the customer maintains a minimum balance.<sup>10</sup> Similarly, consumers who pay their credit card balance each month pay only an annual account fee, if they pay any fee at all. And, in the case of cash, while there can be a cost to obtaining cash through an ATM machine or a check-cashing outlet, this cost is not incurred at the time of a retail purchase.<sup>11</sup>

Second, payment fees assessed by banks on merchants are rarely passed directly to consumers in the form of transaction charges. That is, retailers generally do not charge consumers different prices based on their choice of payment method (Barron and others). Rather, the cost is reflected in the general price structure of a retailer's goods and services, and all customers bear these costs regardless of the payment method they select.

While consumers are unlikely to be sensitive to the cost of alternative payment methods, price may be an important factor in a merchant's decision as to whether to offer a particular payment method. This occurs because merchants are more exposed to transaction-based pricing. For example, merchants' banks typically charge them for cash withdrawals and deposits, with the fee based on the currency and coin composition of a withdrawal and on the sorting a merchant does prior to the deposit. Similarly, merchants' banks charge a fee for pro-

cessing each check as well as a fee for depositing a group of checks.<sup>12</sup> In the case of credit cards, the link to transactions is even more direct because merchants who accept credit cards pay a fee based on the value of the transaction.<sup>13</sup> Differences in these transaction costs can explain why some merchants refuse to accept checks or credit cards for retail payments.<sup>14</sup>

The current system of payment pricing has two important consequences. First, since consumers do not bear payments system costs directly, they have no financial incentive to select the lowest cost payment technology (Murphy 1977, 1991). Indeed, a consumer's choice of cash, check, or credit card for a retail transaction is unlikely to be dictated by a perceived difference in transactions costs. Second, because merchants often face transaction-based fees, their decision to accept or promote a given means of payment is more likely to be sensitive to the relative cost of payment alternatives.

### *How pricing may limit debit card growth*

For the debit card to replace existing payment means, merchants have to accept it and consumers must be willing to use it for retail purchases. Debit card proponents have argued the card is likely to succeed because it is a more efficient, cost-effective means of payment. For example, processing a debit card payment would be less costly than a check since debit is completely electronic, while a payment by check requires considerably more processing and handling.

Nevertheless, this cost advantage is no guarantee the debit card will be used. Because of the way payment services have traditionally been priced, debit card promoters are unlikely to be able to use debit's cost advantage in gaining consumer acceptance. Existing payment methods cost so little for the consumer to use that it is difficult to establish a lower price for debit without an outright subsidy for its use.<sup>15</sup> Moreover, since existing consumer payment methods are largely account-based, any at-

tempt to institute a per-transaction charge for debit would probably discourage its use. But, if debit pricing is also account-based, it will have no marginal cost advantage over alternative means, and the consumer's choice of payment methods will not be based on their relative costs.

In contrast, debit card pricing could be a key factor in promoting merchant acceptance. Because many merchants face transaction-based pricing for existing payment services, similar pricing of debit could encourage merchant acceptance. Indeed, a recent survey of payment costs faced by food retailers suggests that debit can compete favorably with other payment methods (Food Marketing Institute). This study of 46 food retailers, ranging from single store operators to large national chains, provides estimates of bank charges for different payment methods as well as estimates of other costs associated with accepting each method of payment (Table 1). According to the study, while bank charges for debit exceed those for checks, savings from faster checkout time and "other direct costs," such as bad check losses, make debit cheaper overall than checks or credit cards but considerably more expensive than cash.

The difficulty in developing a competitive pricing strategy for debit cards is reflected in the wide range of pricing practices presently employed. Currently, some banks do not levy any debit fees on either consumers or merchants. These banks are absorbing the initial costs of setting up and operating a debit system in an attempt to promote use of debit cards. Banks that charge for debit, fall into two groups: those that levy fees primarily on consumers and those that rely on merchant fees. Some banks using consumer fees charge a per-transaction fee, averaging \$0.25 per debit transaction, while others charge a monthly account-based fee of \$1 to \$2 (Bank Network News). Banks placing debit fees on merchants tend to use a transactions approach. For example, in the survey of food retailers cited above, the average bank charge to merchants was \$0.16 per debit transaction.<sup>16</sup>

Of these two approaches, the discussion in this

section suggests that the second approach is more likely to promote debit growth. Because it places transaction fees on the merchant rather than on the consumer, it promotes a fee structure that is more consistent and competitive with existing payment methods.<sup>17</sup>

### *THE OUTLOOK FOR DEBIT CARDS*

The recent growth in debit cards should continue as more and more large, shared ATM networks promote their use. Because of the pricing barrier, however, debit cards are unlikely to replace existing payment methods completely. Debit cards are most likely to gain a significant share of the payments system in specific circumstances where consumers value its convenience and merchants see it as lowering costs or enhancing sales. In addition, debit cards could become a particularly important payment method for consumers with limited access to existing payments media. Future growth of debit is also likely to depend on promotional efforts, technological change, and changes in the pricing of existing payment services.

#### *Keys to consumer and merchant acceptance*

Because of the difficulty of developing a competitive pricing strategy for debit cards, most consumers will base their decision to use a debit card on nonprice factors such as convenience and availability. A direct comparison of debit with cash, checks, and credit cards suggests that for the average consumer, debit cards are more likely to replace checks and some cash transactions rather than credit card transactions.

Compared to cash, debit cards have both advantages and disadvantages. For example, some consumers may find that carrying a debit card for payments is more secure.<sup>18</sup> In addition, if cash is used for purchases, consumers must devote time to replenishing cash stocks through trips to a bank or

Table 1

**Costs of Alternative Payments Methods Based on a Survey of Supermarkets***(Mean response)*

<u>Cost per transaction</u>	<u>Cash</u>	<u>Check</u>	<u>Electronically verified check</u>	<u>Credit card</u>	<u>On-line debit</u>
Checkout time	\$.0638	\$.1719	\$.1968	\$.1553	\$.1386
Back room time	.0031	.0213	.0213	.0000	.0000
Bank charges	.0040	.0508	.1308	.6350	.1600
Other direct costs	.0007	.1816	.0227	.0177	.0000
Total	.072	.426	.372	.808	.299
Cost per \$100 sale	.52	1.20	1.05	2.27	.94
Average sale	13.83	35.32	35.32	35.56	31.61

Source: Food Marketing Institute (1993)

ATM machine. On the other hand, cash transactions are more rapid than debit card transactions. This suggests that consumers will use debit cards to avoid carrying around large amounts of cash or to avoid frequent trips to a bank or ATM machine. If so, debit is likely to replace mostly large cash transactions, not small cash payments.<sup>19</sup>

Debit cards also have a number of advantages and disadvantages compared to checks. Some consumers may find the debit card more convenient than checks if it means that they do not have to carry checkbooks. The checkout time with a debit card can also be faster than the checkout time with a check, particularly where use of a check requires approval. Alternatively, some consumers may prefer checks since an on-line debit card transaction results in an instant debiting of their deposit account, while a check payment usually will not clear for about three days. For consumers with account balances near a bank-specified minimum balance level or near a zero balance at the end of the pay period,

a three-day delay could be significant. Checks also permit more detailed record keeping, since the check-writer can note the purpose of the payment or other such information on the face of the check. Thus, for most consumers, the choice between on-line debit and checks may come down to weighing the delayed payment of checks versus the time saved using debit. While there is less of a tradeoff between an off-line debit card and a check, since both involve delayed payment, many consumers will not have access to an off-line card.

For most consumers with credit cards, debit cards are less likely to be an attractive alternative. Consumers who use credit cards for the line of credit are unlikely to be interested in a debit card. Some convenience users of credit cards could find advantages to the debit card, however. Since the consumer's account is automatically debited in the case of debit card payments, the consumer would not need to write a check at the end of the month to clear a credit card balance. Some convenience users

might also find it easier to enforce personal budgets with the debit card since it limits them to spending what they have in their deposit account. In addition, many food markets and some other retail stores permit debit card users to obtain cash at the point of sale. This is rarely permitted with credit cards. On the other hand, credit cards generally offer convenience users interest-free grace periods of about a month and do not limit the consumer to spending only what is in his or her deposit account.

While the debit card is likely to offer some convenience advantages to almost all consumers, it could be particularly useful for those consumers who do not have access to the complete range of existing payment services. Only about two-thirds of families currently have access to an unsecured bank credit card. Moreover, 12.5 percent of families do not have a transaction account (Kennickell and Starr-McCluer). A debit card could free those without credit cards from the occasional need to carry large amounts of cash for major purchases where checks are not accepted. For those without a transaction account, a prepaid debit card or government-sponsored debit account could provide relatively inexpensive payment services that are more secure than cash transactions.

In addition to consumer acceptance, the success of debit cards will also depend on merchant willingness to offer debit as a payment alternative. As discussed above, the merchant's decision is more likely to depend on the economics of debit. If banks can position debit as a cost-effective payment method, merchants are more likely to be receptive. In addition, many merchants focus on sales volume. If debit cards are seen as a way of attracting additional sales or as a competitive necessity to maintain market share, they may be adopted even with a cost disadvantage.

#### *Other factors influencing debit growth*

Debit card growth is also likely to depend on how effectively it is promoted, on technical changes

in the payment system, and on possible changes in the pricing of existing payments services. For most consumers, the mechanics of a debit card operation are still unfamiliar. And, as long as consumers are uncertain about the mechanics or the cost of a debit transaction, they may be reluctant to use debit. Thus, promotional programs that are truly informative and educational may be a key factor in the speed with which debit is adopted.

Future changes in payments system technology are also likely to affect debit card growth. In recent years, technology has been an important factor stimulating debit acceptance by merchants. For example, the falling cost of debit card readers has been a factor in merchants' decisions to offer debit. And, falling production costs of "smart cards" appear likely to speed their introduction in the United States. At the same time, technological change could slow debit adoption by lowering the costs of alternative payment methods. In recent years, credit card systems have moved from paperbased to almost entirely electronic, reducing the cost of this payment method. The advent of check imaging and truncation makes it likely that the check system will also become increasingly automated. If so, falling costs of existing payments systems may erode some of the advantages of a debit system.

Payments system pricing may also change in the future in ways that both inhibit and encourage debit card growth. In the case of credit cards, for example, recent competitive pressures have reduced credit card interest rates and annual fees and have spurred the proliferation of incentive programs for credit card use. These changes make it less likely that consumers will switch from credit cards to debit for retail payments. In contrast, a continued increase in ATM fees could stimulate greater debit usage among those consumers who rely on frequent trips to an ATM machine to replenish cash holdings. And if the demand for ATM services declines, some ATM machines might be removed, increasing the incentive to use debit. More generally, many banks and other depository institutions have increased account fees and service charges in recent years

(Hannan). To the extent that this represents a move toward a more rational pricing structure for the payment system, it may facilitate the introduction of debit.<sup>20</sup>

## SUMMARY AND CONCLUSIONS

Debit cards have begun to turn the corner of consumer and merchant acceptance. Debit transactions have increased rapidly in recent years, stimulated in part by a rise in the number of retail locations accepting debit cards as a means of payment. Debit now appears well on the way to moving beyond its

traditional geographic and specialized merchant base. Thus, after years of unfulfilled promise, the debit card revolution may finally be at hand.

Some impediments to debit card growth remain, however. In particular, the competitive pricing of debit relative to alternative payments methods is likely to be the biggest hurdle to widespread debit acceptance. The analysis presented in this paper suggests that debit is most likely to grow rapidly where consumers find it more convenient than other payment options, and where merchants find it cost effective. In addition, those consumers without full access to existing payment methods may find debit cards particularly attractive.

## ENDNOTES

<sup>1</sup> In the United States, the first debit card pilot program was initiated by the Bank of Delaware in 1966 (van der Velde 1985). Several other banks experimented with pilot programs through the mid-1970s, but serious efforts to launch debit cards on a large scale did not develop prior to the early 1980s.

<sup>2</sup> Caskey and St. Laurent, for example, argue that aside from its design flaws the Susan B. Anthony dollar coin was probably destined to fail because the government did not take such behavior into account. The government believed that the coin would speed small retail payments and would facilitate purchases from vending machines. This would only be true, however, if a large share of the population became sufficiently familiar with the coin to distinguish it quickly and if vending machines were converted to accept it. It would pay for automated vendors to convert their machines only if people would carry the coin. Since anyone who used the coin before others were familiar with it or who altered a vending machine to accept it before the coin was widely carried would initially see no benefit, many decided to wait until it was in widespread use before adapting to it. This approach was sufficiently common that the coin failed to circulate.

<sup>3</sup> This discussion focuses on on-line debit cards. While network externalities can also be used to explain the slow growth of off-line cards, the argument is different from the on-line case. Indeed, because off-line cards can be used at any credit card terminal, the limited availability of off-line cards was probably a more important constraint on merchant and consumer acceptance.

<sup>4</sup> ATM networks had two incentives to promote debit cards. First, an increased volume of transactions flowing through

the network could take advantage of economies of scale and lower processing costs. Second, debit transactions could be a source of additional fee income.

<sup>5</sup> As a result of mergers, in 1993, the top four ATM networks had a 53 percent market share and the top ten had an 84 percent market share (BNN). The role of banking consolidation in the spread of electronic payments technology has been emphasized by Berger and Humphrey.

<sup>6</sup> A detailed discussion of the pricing of payment services can be found in Humphrey and Berger.

<sup>7</sup> A complicating factor in determining the cost of a payments method is the tendency for banks to bundle payments services. A bank often varies its fees for payment services if a customer uses other services provided by the bank. Many banks, for example, will waive fees on payment services if the customer maintains sufficient funds in a deposit account. Such a "bundling" of bank services can make it difficult to identify the price of a payment service.

<sup>8</sup> There are occasional exceptions to this statement. For example, merchants may sometimes impose charges on particular types of transactions or impose other restrictions. The most notable example is the case of gas stations which may offer a lower price for cash purchases. Also, some merchants impose a per-check charge or require minimum purchases for credit card use.

<sup>9</sup> One explanation for this approach is that, prior to the 1980s, most banks could not pay interest on checkable deposits

and they commonly offered free payment services as a way to attract deposits. In addition, prior to the 1980s, the Federal Reserve did not directly price payments services to member banks and so banks were not under pressure to pass on payment costs to customers. Because bank customers have become accustomed to writing checks without transaction fees, they are likely to resist a change in this practice.

<sup>10</sup> Recent information on checking account fees can be found in Hannan.

<sup>11</sup> Individuals who use check-cashing outlets commonly pay about 2 percent of the face value of the check (Caskey). A survey of bank fees by the Board of Governors found that, in 1993, 76 percent of banks surveyed charged customers for withdrawals made at ATMs owned by another financial institution ("foreign" withdrawals) with an average fee of 92 cents per transaction. However, only 3.6 percent charged for withdrawals from machines owned by the bank issuing the card.

<sup>12</sup> In many cases these bank fees are bundled into an overall "bank service" fee or are adjusted based on compensating balances. To the extent this occurs, the link between the use of a payment method and its cost may be broken. In addition to bank charges, there are other costs to the merchant of accepting checks. As with cash, there is a cost associated with the time taken during the payment process. This is usually longer than in the case of a cash payment since the customer must fill out the check and many merchants request identification to reduce the chances of accepting bad checks. Merchants must also sort their checks at the end of the day. Since some share of checks will be unpayable because they are fraudulent or because there are insufficient funds in the account, merchants must also include this cost as part of the cost of check payments. Merchants can reduce these costs by subscribing to a check verification or check guarantee service, but they must pay a fee for this service.

<sup>13</sup> This fee is usually termed a "merchant discount." If a merchant pays a 2 percent discount fee, that means that its deposit account is credited with \$98 for every \$100 of sales. In the case of the bank-issued credit cards, MasterCard and Visa, this discount fee is negotiated between the bank and the merchant, but it is generally closely tied to the interchange fee that the merchant's bank, known as the "acquiring" bank, must pay the bank that issued the card to the customer, known as the "issuing" bank. The interchange rate is set annually by Visa and MasterCard and it has varied over time. The 1993 interchange rate varied by the type of equipment the merchant used to process the transaction, more technically sophisticated equipment was subject to a lower rate, and by type of merchant. Interchange rates on supermarkets, for example, were lower than on other merchants to encourage food retailers to accept credit cards. In 1994, Visa's standard

interchange rate, which applied to merchants using manual authorization procedures, was 2 percent of the transaction plus \$0.11. MasterCard's was 2.18 percent plus \$0.10 (*American Banker*, July 22, 1993).

<sup>14</sup> Cost enters as just one element in the decision as to which means of payment merchants will accept. An equally important, if not more important, element in the decision is whether accepting an additional means of payment is likely to generate additional sales (Curtin).

<sup>15</sup> Some banks may decide to subsidize the use of debit cards in the early stages of development. Such an approach would encourage merchants to install equipment to accept the card even if few customers use it. In addition, banks may be able to recoup the short-run losses from the subsidies if the average cost of debit transactions falls over time because of "learning by doing," general technological advances, and an increasing volume of transactions handled by a fixed capital infrastructure.

<sup>16</sup> These differences in debit pricing are largely driven by the pricing policies of the ATM networks used to process the debit transaction. Traditionally, banks that issue the ATM card used in an ATM transaction are required to make payments to cover the operating expenses incurred by the bank that owns the terminal used in the transaction. Issuing banks have commonly passed on part or all of these charges to depositors using their ATM cards at terminals owned by other banks. Those ATM networks that have modeled debit card pricing on this model have required debit card issuing banks to make payments to the bank of the merchant accepting the debit card. Thus, banks in these networks have tended to charge consumers directly for the use of their debit card. Other ATM networks have adopted a debit card pricing model based on the way credit card transactions are priced. In the credit card system, the merchant's bank makes a payment to cover the operating expenses incurred by the card-issuing bank, the reverse of the ATM model. The merchant's bank then passes this charge back to the merchant. In a debit card pricing system based on this model, the merchant rather than the consumer is generally charged for the debit transaction.

<sup>17</sup> In fact, more ATM networks appear to be switching to the credit card model. A driving force behind this shift is a recent decision by Visa and MasterCard to price their off-line debit cards using the credit card pricing model. To remain competitive, some of the ATM networks have adopted the same model for their on-line cards.

<sup>18</sup> The debit card does have some potentially serious security concerns for consumers. If cash is stolen, the consumer's loss is limited to the amount stolen. If a credit card is stolen, the consumer's loss is limited to \$50. But, unauthorized use of a

debit card could lead to greater liability. The consumer's loss is limited to \$50 only if the loss is reported within two business days. If the loss of the card is not reported within two days, maximum liability increases to \$500. And, if notification is not given to a financial institution within 60 days after receiving a statement showing unauthorized withdrawals, the consumer may be liable for all unauthorized use after the 60th day.

<sup>19</sup> There are other reasons that consumers may continue to favor cash. They might value the anonymity of cash payments and some may find it easier to budget their expenditures with

cash by following simple rules of thumb, such as restricting themselves to withdrawing \$100 a week from the ATM.

<sup>20</sup> Debit growth could also be encouraged by merchants' positioning of debit relative to alternatives. For example, if debit is priced cheaper than checks, merchants could offer faster service for customers who pay with a debit card, could start charging for checks to discourage their use, or could refuse to accept checks. Debit programs could also provide incentives for debit use similar to current incentive programs for credit cards.

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Monetary Transmission Channels in Major Foreign Industrial Countries: A Comment Craig S. Hakkio	RWP 92-12	Business Cycle Durations Andrew J. Filardo and Stephen F. Gordon	RWP 93-11
Business Fixed Investment Spending: A Critical Survey of Modeling Strategies, Empirical Results, and Policy Implications Robert S. Chirinko	RWP 93-01	The Marginal Income Tax Rate Schedule from 1930 to 1990 Craig S. Hakkio, Mark Rush, and Timothy J. Schmidt	RWP 93-12
Determinants of the Decline in Union COLA's Stuart E. Weiner	RWP 93-02	Why Does Liquidity Matter in Investment Equations? Robert S. Chirinko and Huntley Schaller	WP 93-13

Business Cycle Phases and Their Transitional Dynamics Andrew J. Filardo	RWP 93-14	Liquidity of the Treasury Bill Market and the Term Structure of Interest Rates Pu Shen and Ross M. Starr	RWP 94-02
Inflation, Inflation Uncertainty, and Relative Price Variability: A Survey John E. Golob	RWP 93-15	The Distribution of Exchange Rates in the EMS Charles Engel and Craig S. Hakkio	RWP 94-03
Bank Monitoring Mitigates Agency Problems: New Evidence Using the Financial Covenants in Bank Loan Commitments Donald P. Morgan	RWP 93-16	A Comparison of Two Approaches to Measuring Common and Idiosyncratic Components in Sets of Time Series Variables Todd E. Clark	RWP 94-04
The Evolution of U.S. Business Cycle Phases Andrew J. Filardo	RWP 93-17	Finance Constraints, Liquidity, and Investment Spending: Cross-Country Evidence Robert S. Chirinko	RWP 94-05
Reduced Form Evidence on the Substitutability between Bank and Nonbank Loans Sean Beckett and Charles Morris	RWP 93-18	The Predictive Failure of the Baba, Hendry and Starr Model of the Demand for M1 in the United States Gregory D. Hess, Christopher S. Jones, and Richard D. Porter	RWP 94-06
Pricing Bid-Ask Spreads in Common Stocks, Liquidity Premium and the Small Firm Effect Pu Shen	RWP 93-19	Has Inflation Become More Predictable? John Golob	RWP 94-07
The Role of the Discount Rate in Monetary Policy Mark Rush, Gordon Sellon, and Li Zhu	RWP 94-01		



*1994 Index*  
*Economic Review*

- Achieving Price Stability: A 1993 Report Card
  - Financial Markets in 2020
  - Agriculture Rides Out the Storm
  - The Tenth District Economy: Picking Up the Pace
  - Fiscal Policies Aimed at Spurring Capital Formation: A Framework for Analysis
- First Quarter**
- 
- Structural Changes in the Financial Markets: Economic and Policy Significance
  - Should We Throw Sand in the Gears of Financial Markets?
  - Will the Shift to Stocks and Bonds by Households Be Destabilizing?
  - Causes of the Recent Increase in Bank Security Holdings
  - A New Agricultural Policy for a New World Market
- Second Quarter**
- 
- The Natural Rate and Inflationary Pressures
  - Nominal GDP Targeting Rules: Can They Stabilize the Economy?
  - Does Inflation Uncertainty Increase with Inflation?
  - People on the Move: Trends and Prospects in District Migration Flows
  - The Tenth District's Expanding Service Sector
  - The Rise of U.S. Exports to East Asia and Latin America
- Third Quarter**
- 
- Capacity Utilization and U.S. Inflation
  - Past and Prospective Causes of High Unemployment
  - Reducing Unemployment: Current Issues and Policy Options—A Summary of the Bank's 1994 Symposium
  - Bank Credit Growth in the Tenth District: Recent Developments
  - Is the Debit Card Revolution Finally Here?
- Fourth Quarter**

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