Should States Fear the Effects of a Changing Dollar?
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BUSINESS REVIEW

FEDERAL RESERVE BANK OF PHILADELPHIA

Should States Fear the Effects of a Changing Dollar?

*Gerald A. Carlino**

Since the introduction of flexible exchange rates in August 1971, economists have sought to measure the effects of a changing dollar on the national economy. Recently, they have given some attention also to the effects a changing dollar has on the economic activity of states and regions.

Movements in exchange rates can have different effects across states for several reasons. Some states specialize in the production of certain goods. Some make goods that are more exportable than others. And some are better positioned geographically for foreign trade. According to recent studies, movements in the exchange rate appear to have their largest effects on states in the East North Central, West North Central, and Mountain regions.

Policymakers at the state and local levels cannot affect exchange rates directly. They can, however, influence other things that affect a state's international competitiveness. One is the productivity of a state's workers. A recent study has shown that the effect of changes in U.S. productivity relative to foreign productivity has been quite large for many states.

States often have focused attention on attracting foreign investment, promoting exports, and lobbying for protection from international

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competition. This new study suggests that state governments can also improve their foreign competitiveness by adopting policies that increase the productivity of their firms.

HOW EXCHANGE RATE MOVEMENTS AFFECT A COUNTRY'S NET EXPORTS

The nominal exchange rate is one currency's price in terms of another—for example, 1.5 German marks per U.S. dollar.[1] When the dollar appreciates in value—rising to, say, 2.0 marks—people need fewer dollars to buy a given number of marks. In the U.S., German goods become relatively less expensive than comparable goods made in the United States, and imports from Germany rise. Meanwhile, in Germany, U.S. goods become relatively more expensive than German goods, and imports from the U.S. fall.[2]

The reverse happens when the dollar depreciates in value against the mark. People need more dollars to buy marks. In the U.S., German goods become relatively more expensive than comparable U.S. goods, and imports from Germany decline. Meanwhile, in Germany, U.S. goods become relatively cheaper than German goods, and imports from the U.S. increase.

By itself, however, the nominal exchange rate does not necessarily indicate how much more (or less) expensive U.S. goods will be relative to foreign goods. If the dollar is appreciating at a time when inflation rates are higher in foreign countries than in the U.S., then some of the dollar's appreciation will merely be compensating for the higher inflation abroad.

Economists have developed the notion of the *real* exchange rate to measure a country's

competitiveness in world trade. The real exchange rate is the nominal exchange rate adjusted for the price level across countries.[3]

Productivity Differences Matter. Among other things, relative inflation rates can be influenced by changes in productivity levels across countries. When U.S. productivity increases, U.S. firms can produce more units of output with the same number of worker-hours, and the average cost of production falls, or at least rises less than it would have if productivity had not increased. The higher productivity leads to an increased supply of U.S. goods and thus to a lower price (or at least a smaller increase in price) both at home and abroad.

If productivity levels in other countries remain the same, or increase at a slower rate than in the U.S., then the prices of U.S. goods compared to foreign goods will fall at home and abroad. The relatively lower prices of U.S. goods abroad lead to higher U.S. exports to foreign countries. And in the U.S., the relatively lower prices of domestic goods lead to what is called *import substitution*, the substituting of domestic goods for imported goods. With fewer foreign goods being imported and more U.S. goods being exported, net exports increase.[4]

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[3]In the long run, any change in relative prices may be offset by changes in the nominal exchange rate that keep the real exchange rate constant. According to the purchasing-power-parity (PPP) doctrine, a country's exchange rate is linked closely to the ratio of domestic prices to foreign prices. If domestic prices rise more than foreign prices, the home nation's currency should depreciate proportionally. There is some debate about whether deviations from PPP are in fact temporary. The evidence suggests, however, that if PPP holds, it is a long-run proposition. See J.A. Whitt, "Purchasing-Power Parity and Exchange Rates in the Long Run," Federal Reserve Bank of Atlanta *Economic Review* (July/August 1989) pp. 18-32.

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[1]Except for the dollar/pound exchange rate, most exchange rates are expressed as units of foreign currency per dollar.

[2]This assumes that the home-currency prices of U.S.-produced goods relative to foreign-produced goods remain unchanged.

[4]For an extended discussion of the effects of changes in productivity on the market for foreign trade, see J.A. Tatom, "The Link Between the Value of the Dollar, U.S. Trade and Manufacturing Output: Some Recent Evidence," Federal Reserve Bank of St. Louis *Review* (November/December 1988) pp. 24-37.

REGIONS ARE AFFECTED BY CHANGES IN REAL EXCHANGE RATES

Many studies have looked at the effects of real exchange rates on the national economy, but far less is known about their effects on U.S. states and regions. The few regional studies that have been conducted find that the effects of a changing dollar are uneven across states and regions. Two factors that matter are a state's location and its industry mix.

Geographic Proximity. States that are geographically close to a major U.S. trading partner may have a relatively larger share of their total trade with this particular country. International evidence shows that a country first establishes trade relations with bordering countries. Not only are transportation costs lower, but more information is generally available about these countries, and the historical and cultural ties are closer.[5] In many instances, this may also be true for regions within a country. A region will tend to have relatively more information and closer ties—and hence a relatively larger share of total trade—with the foreign country closest to it.

If there are transportation costs associated with the shipping of goods between U.S. and foreign markets, goods may become more expensive for the states furthest from foreign markets. This is particularly true for goods, such as wheat, that have a low value per pound. For these goods, transport costs will be a larger portion of the delivered price than will be the case when a high-value-per-pound good, such as computer chips, is shipped the same distance.

In a study conducted at the Kansas City Fed, Tim Smith finds that regional export relationships are determined largely by geographic proximity to trading partners. Smith looked at nine U.S. regions' shares of manufactured exports to the nation's top 10 export destinations in 1987. The regions were chosen by grouping states with similar manufacturing activity and, where possible, by grouping states according to proximity to major ports. He found that the Great Lakes states ship around 50 percent of their manufacturing exports to Canada, while the average for the U.S. as a whole is just over 23 percent. To Mexico go about 28 percent of the Southwest states' share of manufactured exports, compared with just 6.2 percent for the nation. The Rocky Mountain states ship 20 percent, and Western states about 21 percent, of their manufactured exports to Japan, compared with about 10 percent for the nation.[6]

Since the states differ in their amount of trade with particular countries, some have been much more affected by real exchange rate declines than others. For example, in recent years the dollar has fallen more against the Deutsche mark, the British pound, and the Japanese yen than it has against the Canadian dollar. According to Smith's findings, other things equal, states that export mainly to Europe or Japan would have been affected more by changing exchange rates than have those states that export mainly to Canada.

Industry Mix. Some sectors, such as agriculture and manufacturing, are more exposed to exchange rate swings than others, either because their industries export more of their output to other countries or because their products are easily substituted for foreign prod-

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[5]See Irving B. Kravis and Robert E. Lipsey, "The Location of Overseas Production and Production for Export by U.S. Multinational Firms," *Journal of International Economics* 12 (1982) pp. 201-23.

[6]See T.R. Smith, "Regional Exports of Manufactured Products," Federal Reserve Bank of Kansas City *Economic Review* (January 1989) pp. 21-31. Smith also finds evidence that manufactured exports make varying contributions to personal income across regions. Manufactured exports as a percentage of personal income ranged from highs of 6.2 percent in the Southwest and 5.9 percent in the West to a low of 2.7 percent in the Rocky Mountain states. Thus, location may be a factor in the foreign sector's total effect on a region's economy.

ucts. And even within these sectors, some industries are more exposed than others. Among manufacturing industries, for example, producers of durable goods are more export-oriented than producers of nondurable goods.

Looking at exchange rate effects by industry, Dallas Fed researchers Michael Cox and John Hill calculated the effects of dollar depreciation between March 1985 and June 1987 for various U.S. manufacturing industries.[7] They found that individual industries were affected far differently by the dollar's fall. When weighted to reflect a state's industrial mix, the industry responses indicated the degree to which a lower dollar affects a state's manufacturing output. The results showed manufacturing production gains in much of the Northeast, the upper Midwest, and the West exceeding the national average. Below-average production gains were found for most of the South Atlantic, the South Central, and the Northern Plains states.

CAN THE EFFECTS ON STATES BE ESTIMATED DIRECTLY?

As much as the two Fed studies reveal about the state and regional effects of exchange rate movements, they provide no direct estimates of how much a state's output or employment will change as a result. Only recently have economists attempted to estimate these effects directly.

Using a statistical (multiple regression) analysis, William Branson and James Love consider what effect the dollar's 1980-85 appreciation had on state manufacturing employment. They found that 35 states responded significantly to changes in exchange rates adjusted for unit labor costs and that the dollar's rise was a major cause of job losses in the Great Lakes states, from Ohio westward, and in the central states.[8]

But in addition to direct effects on manufacturing employment, there are indirect effects to consider. When manufacturing employment falls because of dollar appreciation, for instance, the incomes of manufacturing workers decline, and this has a multiplier effect on state output. Moreover, little is known about the international exports of industries other than manufacturing, such as financial services, and the effects of import substitution on a state's output. And finally, a state's output can be affected by subcontracting on export orders received by other states. For example, auto companies in Michigan could hire New York advertising firms to help boost sales abroad.

Relating State GSP to Exchange Rates and Productivity. An aggregate measure of state production, such as gross state product (GSP), captures both the direct and indirect effects of exchange rate movements. A Philadelphia Fed study, by Gerald Carlino, Brian Cody, and Richard Voith, looks at GSP growth to assess what effect changes in real exchange rates had on the 48 contiguous states during the period 1973-86.[9] The authors relate growth in GSP to changes in the real exchange rate, to growth of foreign income, to growth of U.S. income, and to relative growth in foreign productivity (in other words, growth in foreign manufacturing

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[7]See M.W. Cox and J.K. Hill, "Effects of the Lower Dollar on U.S. Manufacturing: Industry and State Comparisons," Federal Reserve Bank of Dallas *Economic Review* (March 1988) pp. 1-9.

[8]By adjusting for unit labor costs, Branson and Love's exchange rate variable combines the effects of changes both in exchange rates and in foreign productivity relative to U.S. productivity. See W.H. Branson and J.P. Love, "The Real Exchange Rate and Employment in U.S. Manufacturing: State and Regional Results," National Bureau of Economic Research, Working Paper 2435 (November 1987).

[9]Unlike Branson and Love, Carlino, Cody, and Voith separate the effects on GSP growth of changes in the real exchange rate and in foreign productivity relative to domestic productivity. See G.A. Carlino, B. Cody, and R. Voith, "Regional Impacts of Exchange Rate Movements," *Regional Science Perspectives* 20 (1990) pp. 89-102.

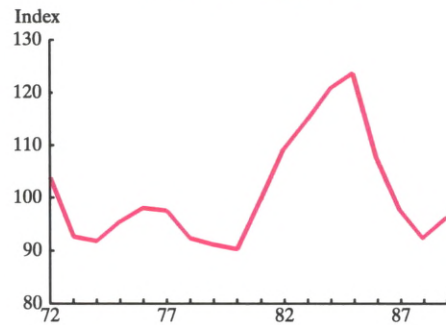productivity relative to growth in U.S. manufacturing productivity).[10]

States respond differently to changes in exchange rate movements and to changes in relative growth in foreign productivity. The size of the state's response depends on its sensitivity to changes in both variables, as well as on the extent of such changes. Moreover, state growth responds to changes in exchange rates and in the relative growth of foreign productivity in the current year, as well as to changes in these variables in the *previous* year.

Over the period covered by the study, the relative growth of foreign productivity had a bigger effect on a state's economy than did the change in the dollar's value (after controlling for changes in relative productivity growth). First, GSP growth responds more to changes in the former than the latter. Second, relative foreign productivity changed more than the exchange rate during the 1972-86 period. The dollar's trade-weighted value, though subject to short-run swings, appreciated only 2.7 percent between 1972 and 1986 (Figure 1).

During the same period, however, the growth of foreign productivity greatly exceeded the growth of U.S. productivity. In 1972, foreign manufacturing workers were only 61 percent as productive as American workers, but by 1986 this ratio had increased to 76 percent—an increase of 24.5 percent, or about 1.6 percent per year. In the period 1972-84, U.S. productivity declined relative to foreign productivity. However, in the two years that followed, U.S. productivity rebounded a bit and in recent years has kept pace with the growth of foreign productivity (Figure 2).

[10]Since the study considers the growth in aggregate GSP, the growth in *overall* foreign productivity relative to *overall* domestic productivity is the appropriate productivity measure. Since a measure of relative productivity in the service sector is not available, studies use the growth in *manufacturing* productivity at home relative to abroad as a proxy for overall productivity growth.

FIGURE 1
Real Trade-Weighted Value of the Dollar

Source: Morgan Guaranty

FIGURE 2
Foreign Productivity Grew Faster*
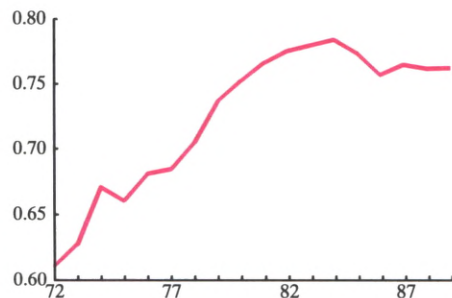
* The ratio of foreign manufacturing productivity relative to domestic manufacturing productivity

Source: Peter Hooper and Kathryn A. Larin, "International Comparisons of Labor Costs in Manufacturing," Board of Governors of the Federal Reserve System, International Finance Discussion Paper 330 (August 1988).

The Effects of Productivity Changes. According to the Philadelphia Fed study, 21 states are significantly affected by changes in relative foreign productivity. The results show that the average annual growth in GSP for these 21 states was 1.2 percentage points lower than what it would have been if foreign productivity had not grown faster than domestic productivity between 1972 and 1986 (Table 1). Fifteen states were affected negatively by the higher growth of foreign productivity. Eight of those states are located in the manufacturing belt (Figure 3).

Michigan was hit hardest by the increase in relative productivity, which reduced growth of Michigan's GSP by 2.0 percentage points per year between 1973 and 1986. This substantial reduction resulted in an actual growth rate of only 1.3 percent. During this period, eight other states experienced average annual reductions in their GSP growth rates of at least 1.5 percentage points because of relatively faster foreign productivity growth: Illinois, Indiana, Louisiana, New York, Ohio, Pennsylvania, Rhode Island, and West Virginia. Six other states—Delaware, Iowa, Kansas, Missouri, Nebraska, and South Dakota—were also affected negatively, though to a lesser extent.

The results show that the increase in relative productivity was associated with faster GSP growth rates in six states: Arizona, Colorado, Florida, Nevada, New Hampshire, and Utah. Average annual GSP growth rates in these states increased at least 0.9 percentage point during the period. Interestingly, many of these states are located in the Sunbelt (the Southwest and Florida). While these states are not major manufacturing states, all have seen their manufacturing share of GSP increase over time.[11]

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[11]See G.A. Carlino, "What Can Output Measures Tell Us About Deindustrialization in the Nation and its Regions?" this *Business Review* (January/February 1989) pp. 15-27.

TABLE 1
Relative Growth of Foreign & U.S. Productivity Affects GSP Growth in the Long Run
1973 - 1986

	Average annual change in real GSP	Average annual change in real GSP due to the relative increase in productivity*
Arizona	5.0%	1.3%
Colorado	4.1	1.2
Delaware	1.8	-1.1
Florida	4.6	1.3
Illinois	1.3	-1.6
Indiana	1.5	-1.6
Iowa	1.9	-1.1
Kansas	2.1	-0.9
Louisiana	0.1	-1.8
Michigan	1.3	-2.0
Missouri	2.1	-1.0
Nebraska	2.2	-1.0
Nevada	5.0	1.8
New Hampshire	6.0	1.7
New York	1.5	-1.5
Ohio	1.4	-1.5
Pennsylvania	1.2	-1.6
Rhode Island	1.8	-1.5
South Dakota	2.2	-0.6
Utah	4.1	0.9
West Virginia	0.8	-1.6
21-STATE AVERAGE**	1.8	-1.2

*See Appendix for details on calculations.
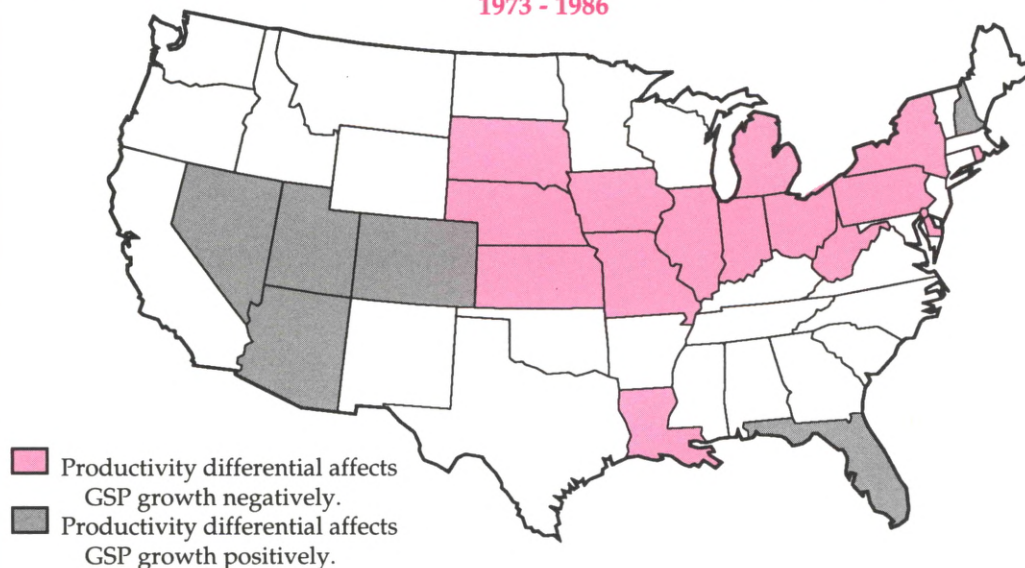
**Represents a weighted average (based on a state's GSP share in 1972) of the individual states' average annual growth rates.

FIGURE 3
Increases in Relative Productivity Affect Gross State Product
1973 - 1986

Productivity differential affects
   GSP growth negatively.

Productivity differential affects
   GSP growth positively.

Source: Carlino, Cody, and Voith (1990)

The Effects of Exchange Rate Changes. The Philadelphia Fed study, after controlling for changes in relative productivity growth, finds that fewer states—11 in all—were affected significantly by changes in the dollar's trade-weighted value (Table 2, p. 10). The results indicate that the average annual growth of GSP for these 11 states would have been only 0.05 percentage point greater if the dollar had not changed in the years from 1972 to 1986. This effect is much smaller than that found for relative productivity. Growth rates decreased in seven states, which tended to be grouped in the Midwest and Northwest—Iowa, Montana, Wyoming, North Dakota, South Dakota, Oregon, and Washington (Figure 4, p. 10). Wyoming was hit hardest by the dollar's fluctuations. On an average annual basis, Wyoming's GSP grew 0.8 percentage point more slowly than it otherwise would have.

Not all states were hurt by the changing dollar, however. For example, Massachusetts, New Hampshire, and Vermont experienced faster GSP growth during the 1973-86 period. A Boston Fed study by Jane Little argues that, within the manufacturing industries, the rising dollar caused a shift from unskilled labor-intensive industries to skilled labor-intensive industries, such as the high-tech firms employing scientists and engineers.[12] Since the New England region has a relatively large concentration of high-tech firms, it is not surprising that many of its states experienced faster GSP growth, despite the dollar's appreciation.

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[12]See J.S. Little, "The Dollar, Structural Change, and the New England Miracle," Federal Reserve Bank of Boston *New England Economic Review* (September/October 1989) pp. 47-57. Georgia's GSP growth rate also responds positively to dollar appreciation.

TABLE 2
How Flexible Exchange Rates Affected GSP Growth
1973 - 1986

	Average annual change in real GSP	Average annual change in real GSP due to the relative increase in the exchange rate*
Georgia	4.3%	0.2%
Iowa	1.9	-0.5
Massachusetts	2.9	0.2
Montana	1.7	-0.4
New Hampshire	6.0	0.4
North Dakota	2.4	-0.6
Oregon	2.5	-0.2
South Dakota	2.2	-0.3
Vermont	3.6	0.2
Washington	3.7	-0.1
Wyoming	2.4	-0.8
11-STATE AVERAGE**	3.2	-0.05

*See Appendix for details on calculations.

**Represents a weighted average (based on a state's GSP share in 1972) of the individual states' average annual growth rates.

FIGURE 4
Increases in the Exchange Rate Affect Gross State Product
1973 - 1986

Exchange rate affects GSP growth negatively.

Exchange rate affects GSP growth positively.
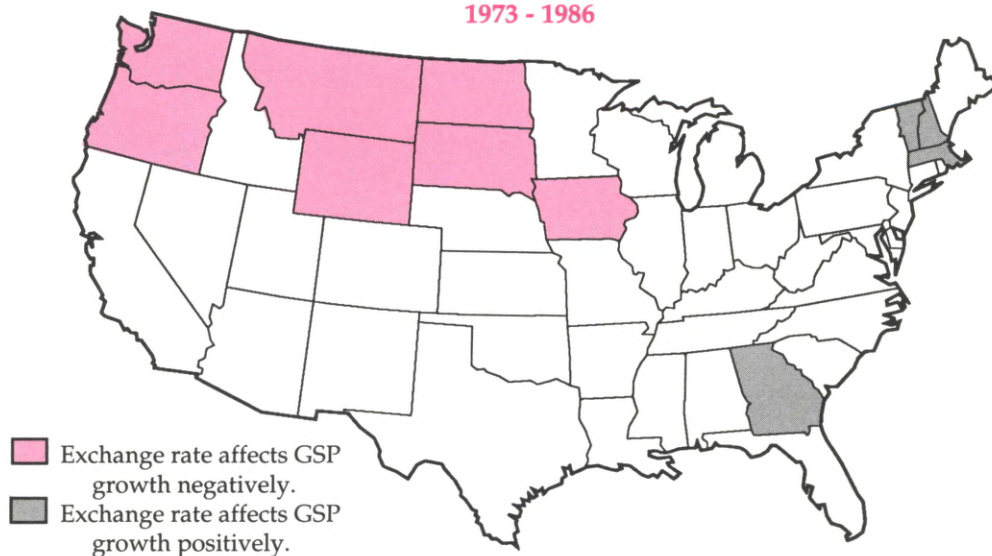
Source: Carlino, Cody, and Voith (1990)

CONCLUSION

All the recent studies on the regional effects of exchange rate movements tend to find the largest impact in the states of the East North Central region: Ohio, Indiana, Michigan, and Wisconsin. Similarly, large effects are generally found for states in the West North Central and the Mountain regions.

Some differences across studies do emerge. The studies from the Dallas Fed and the Philadelphia Fed find that many of the New England states respond strongly to exchange rate movements, while the other studies find little or no response. Moreover, the Philadelphia Fed study finds that two of the three Mid-Atlantic states (Pennsylvania and New York, but not New Jersey) respond strongly to relative productivity changes, while the other studies looking only at changes in exchange rates find little or no response.

The findings in this article suggest that, in the long run, states have more to fear from slow productivity growth than from fluctuations in the dollar. Relative productivity constant, exchange rate changes have had small effects on most states' GSP growth. More important, however, have been changes in the relative growth of foreign productivity. In the past, state governments have focused their foreign-sector efforts on attracting foreign direct investment, promoting exports, and lobbying the federal government for protection from foreign competition. However, the importance of changes in relative productivity suggests that state governments may want to put more emphasis on policies designed specifically to improve productivity.

Numerous studies have documented the contribution of public infrastructure in increasing a state's aggregate productivity.[13] Under this category, states can adopt policies designed to improve their roads, highways, and bridges. In the long run, they can enhance the productivity of their workers by making a greater investment in education to improve their skills. Manpower-retraining programs may also be an effective way to increase worker productivity in the short run. And finally, states can develop programs to promote the technical progress of their firms.

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[13]See, for example, K.T. Duffy-Deno and R.W. Eberts, "Public Infrastructure and Regional Economic Development: A Simultaneous Equation Approach," Federal Reserve Bank of Cleveland, Working Paper 8909 (1989).

APPENDIX

This Appendix describes the method used to calculate the estimated effects of changes in relative productivity and exchange rates on state GSP growth rates reported in Tables 1 and 2. The basic empirical model, pooled cross-sectional time series for 48 contiguous states, covers the period 1973-86 and is summarized by the general form:[a]

$$\dot{g}_{jt} = \alpha_0 + \alpha_1 \dot{y}_t^* + \alpha_2 \dot{y}_t + \sum_{j=1}^{48} \beta_{j,0} S_j \dot{e}_t + \sum_{j=1}^{48} \beta_{j,1} S_j \dot{e}_{t-1}$$

$$+ \sum_{j=1}^{48} \gamma_{j,0} S_j (\dot{\omega}_t^* - \dot{\omega}_t) + \sum_{j=1}^{48} \gamma_{j,1} S_j (\dot{\omega}_{t-1}^* - \dot{\omega}_{t-1}) + \mu_t$$

where: $\dot{g}_{jt}$ = GSP growth rate in the jth state in year t

$\dot{y}_t^*$ = the growth rate of foreign gross domestic product in year t

$\dot{y}_t$ = the growth rate of U.S. gross domestic product in year t

$\dot{e}_t$ = the growth rate of the trade-weighted exchange rate in year t, adjusted for relative prices of finished manufactured goods

S_j = dummy variable for the jth state

$\dot{\omega}_t^*$ = the growth rate of output per man-hour in foreign manufacturing in year t

$\dot{\omega}_t$ = the growth rate of output per man-hour in U.S. manufacturing in year t

μ_t = random error term

Data. Real GSP data for the 48 contiguous states are obtained from the Bureau of Economic Analysis, U.S. Department of Commerce. Foreign (OECD countries excluding the U.S.) and U.S. gross domestic product variables are obtained from the OECD's *Main Economic Indicators*. The real exchange rate is Morgan Guaranty's trade-weighted index of the value of the dollar, adjusted for final goods prices, against the United States' 24 largest trading partners. The manufacturing productivity variables, measured for the national economy, are taken from a study by Hooper and Larin.[b]

The estimated parameters from this model can be used to calculate what effect the changing dollar, for example, had on the average annual GSP growth rates for each of the 11 significantly affected states during the 1973-86 period. The effect on GSP growth from a changing dollar in year t can be computed as $(\hat{\beta}_{i,0} \dot{e}_t + \hat{\beta}_{i,1} \dot{e}_{t-1})$, where $\hat{\beta}_{i,0}$ and $\hat{\beta}_{i,1}$ are the estimated parameters on the exchange rate variable for the significantly affected states. The effect on GSP growth over the entire 14-year period is given by:

$$\Pi_{i,t=1973}^{1986} [1 + (\hat{\beta}_{i,0} \dot{e}_t + \hat{\beta}_{i,1} \dot{e}_{t-1})]$$

From this expression, the changing dollar's effect on the compound average annual growth rate of real GSP is calculated and reported in column 2 of Table 2.

A similar procedure is followed to arrive at the estimated effects of changes in relative foreign productivity on the 21 significantly affected states that are reported in column 2 of Table 1.

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[a]The model was estimated using log differences. For more details, see G.A. Carlino, B. Cody, and R. Voith, "Regional Impacts of Exchange Rate Movements," *Regional Science Perspectives* 20 (1990) pp. 89-102.

[b]Peter Hooper and Kathryn A. Larin, "International Comparisons of Labor Costs in Manufacturing," Board of Governors of the Federal Reserve System, International Finance Discussion Paper 330 (August 1988).

Curing Our Ailing Deposit-Insurance System

Loretta J. Mester*

Rarely does a day go by without more bad news about the state of federal deposit insurance. Recent reports suggest that the cost of bailing out savings and loan associations and their insurance fund will be much higher than the $160 billion originally projected. In fact, in just one year, estimates have more than tripled to $500 billion.[1] And on top of the distressing news about S&Ls, other reports suggest that the fund that insures commercial banks may be running out of money as well.

What's wrong with the federal deposit-insurance system and what can be done to repair it? A forthcoming Treasury Department study may provide some answers. In the meantime, various regulators, trade groups, and econo-

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[1] Both estimates include 10 years of interest expense. The $500 billion estimate is L. William Seidman's, chairman of the FDIC and RTC. See "Seidman Says Bailout Could Cost $200 Billion Plus Interest," *American Banker* (July 31, 1990).

mists have their own proposals for reforming deposit insurance. The more radical proposals suggest taking the system away from the federal government and putting it into the hands of private insurers. Most of the proposals, however, focus on the fundamental flaws of the current system and on what can be done to repair it.

GOALS OF DEPOSIT INSURANCE

Banks serve an important role in our economy.[2] By intermediating between investors (depositors) and borrowers, they provide an efficient way to get funding to projects that would otherwise have a hard time getting capital. Typically, banks invest in assets that aren't readily marketable. An example would be a loan to fund a company's plan for expansion. Since the market isn't putting a price on the expansion plan, it is up to the bank to determine if the firm is creditworthy and if expansion makes sense given the current economic environment.

In a world without banks, the plan, even if sound and socially beneficial, might go unfunded. A small investor would probably find it too costly to do the necessary credit analysis, given the return she could expect on her investment. Moreover, it would be inefficient for each investor to do her own evaluation. Banks, however, specialize in such information-gathering, so they can usually do the analysis at a much lower cost, and only once on behalf of many depositors. Thus, the banking system provides an efficient conduit between investors and borrowers.

Banks also provide depositors with a safer investment than those they could make on their own. By pooling the funds from many depositors and making a variety of different loans, banks are able to diversify their portfolios and lower their risk.[3] Depositors, meanwhile, are promised a fixed rate of return; they get the benefit of a diversified portfolio at a lower cost than if they had to diversify on their own. And their deposits are very liquid—people can withdraw their money from the bank whenever necessary. This would not have been possible had depositors invested directly in firms' projects, which might not pay off until some future date. The payments system relies on this liquidity.

Preventing Bank Runs. But the benefits banks provide to society can be disrupted by a costly bank run. Without deposit insurance, if a depositor learned her bank had made poor investment decisions and was on the verge of insolvency, then she would have an incentive to be among the first to withdraw her deposits before the bank ran out of money. If news about the bank spread, more and more depositors would rush to take their money out of the bank as well, a situation known as a bank run. Depositors who got to the bank too late would lose their money, but those who got to the bank in time would typically redeposit their money in another bank. The bank that had mismanaged its funds would be out of business (as it should be), but the rest of the banking system and the payments system would be intact.

Occasionally, though, depositors' confidence is shaken so much that they would rather keep their money out of banks altogether. Thus, a run at one bank can spread to other banks, regardless of their health. These contagious bank runs can drive solvent banks insolvent if they have to sell assets at "fire sale" prices to meet liquidity needs.

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[2]The term "bank" will refer not only to commercial banks but to other depository institutions, including savings and loans, savings banks, and credit unions.

[3]Of course, this is not true of all depository institutions. To meet the "qualified thrift lender" test, an S&L must hold at least 70 percent of its portfolio in housing-related assets. This requirement reduces the S&L's ability to lower the riskiness of its portfolio via diversification.

Historically, most runs have been stopped before they could hurt the banking system as a whole.[4] But system-wide contagious bank runs did cause the collapse of the banking system

during the Depression, when some 9,000 banks failed in a four-year period. While the first banks to fail in the early 1930s did so because of poor-quality assets, the other, fundamentally sound banks were forced into bankruptcy as depositors rushed to withdraw their money.

Deposit insurance is one way to stop such contagious bank runs and promote the stability of the payments system (see *The History of U.S. Deposit Insurance*). If depositors are confident

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[4]For an informative summary of the historical evidence, see Chapter 2 of *Perspectives on Safe and Sound Banking: Past, Present, and Future* by George J. Benston, Robert A. Eisenbeis, Paul M. Horvitz, Edward J. Kane, and George G. Kaufman (Cambridge, MA: MIT Press, 1986).

The History of U.S. Deposit Insurance

Although the banking panic of the 1930s spurred creation of the Federal Deposit Insurance Corporation (FDIC) in 1933 and the Federal Savings and Loan Insurance Corporation (FSLIC) in 1934, the idea of deposit insurance had been around for a long time before that. The first government insurance fund was New York's Safety Fund, established in 1829. Between 1831 and 1858, Vermont, Indiana, Michigan, Ohio, and Iowa established insurance programs as well. All systems but Indiana's involved the creation of an insurance fund, to which all banks paid an assessment. In Indiana, all participating banks mutually guaranteed the liabilities of a failed bank, and special assessments were made as needed. The Ohio and Iowa programs also included this mutual-guarantee provision. These state programs faded after the Banking Act of 1863 established a national currency, legislating state-chartered banks' notes out of existence.

During the next 50 years there were several banking panics. (The Federal Reserve System was established in 1913 after a particularly severe panic in 1907.) Between 1907 and 1917, eight states adopted deposit-insurance systems, but by the early 1930s all had failed. The systems had insufficient funds to handle the numerous bank failures caused by the 1921 depression and that decade's severe agricultural problems.

Some 150 proposals for deposit insurance or guarantees were introduced into Congress between 1886 and 1933, but none came close to passage until the Banking Act of 1933. Opponents to deposit insurance included President Roosevelt's Secretary of the Treasury, William H. Woodin, some members of Congress, and part of the banking industry. They argued that the demise of the state funds showed that deposit insurance would not work. However, support for federal insurance by the Chairman of the House Banking Committee, Henry B. Steagall, and the public led to eventual passage of the Banking Act of 1933. The Act authorized a temporary FDIC—funded by the Treasury, Federal Reserve System, and premium assessments on the banks—which insured each deposit account up to $2,500. The permanent FDIC was established by the Banking Act of 1935, which also raised the amount of coverage to $5,000 per account. Subsequently, the limit was raised five more times: to $10,000 in 1950, to $15,000 in 1966, to $20,000 in 1969, to $40,000 in 1974, and to $100,000 in 1980. Similarly, insurance coverage of savings and loan deposits was increased to its current $100,000 level.

The Financial Institutions Reform, Recovery, and Enforcement Act of 1989 abolished the FSLIC and replaced it with the Savings Association Insurance Fund, which insures savings and loan deposits. This fund and the separate Bank Insurance Fund, which insures commercial bank deposits, are administered by the FDIC.

Source: *Federal Deposit Insurance Corporation: The First Fifty Years* (Washington, D.C.: FDIC, 1984).

they will be paid even if their bank fails, they feel no urgency to withdraw their money. Solvent banks won't be forced into insolvency because of rumors. And even if the rumors turn out to be true, insured depositors won't suffer losses: another goal of our federal deposit-insurance system is to protect small depositors, since they are considered less able than large depositors to evaluate the safety of their banks.

WHAT'S WRONG WITH THE CURRENT SYSTEM?

An increase in bank failures and the financial problems of the insurance funds have pointed out some fundamental problems with our federal deposit-insurance system. Up until the 1980s, the system was working well. Contagious bank runs had been eliminated and bank failures were few. But beginning in the 1980s, increased interest rate volatility, severe problems in the energy and agriculture sectors, and increased competition from nondepository institutions caused the number of bank failures to increase sharply.[5] This put a huge burden on the deposit-insurance funds—indeed, the Federal Savings and Loan Insurance Corporation's fund became insolvent in 1986.[6]

The health of the Bank Insurance Fund (BIF), which insures commercial bank deposits, is also being questioned. In 1989, the Federal Deposit Insurance Corporation (FDIC), which administers BIF, posted its second operating loss in history, and the ratio of BIF's reserves to insured deposits fell to 0.7 percent, down from 1.10 percent just two years before. If deposi-

tors' confidence in the insurance system is eroded, then the system cannot work to avert bank runs. (A recent example is the Ohio S&L crisis. In 1985, reports of losses at Home State Savings Bank in Cincinnati caused a run. When the Ohio Deposit Guarantee Fund, which insured Home, was unable to bail out the depositors, the run spread to other S&Ls insured by this state fund.) If we expect the deposit insurance system to be able to meet its goals in the future, we must repair its problems now.

Incentive Problems. Risk-taking is necessary for economic progress, and banks facilitate this by investing in risky assets. But the current deposit-insurance system encourages banks to take on more risk than is best for society. A bank's equity holders get all the benefits if the risk pays off, but they don't have to pay for taking on more risk. Insured depositors have no incentive to demand a higher rate on deposits they put in riskier banks. Often at the larger banks, large depositors, who are supposedly uninsured, don't demand much of a risk premium since typically they don't suffer losses because of the way the FDIC has chosen to close large banks. For large banks, the FDIC usually finds a buyer who takes on all the liabilities, both insured and uninsured, of the failed bank. Or the FDIC makes direct loans to the bank, again covering the bank's uninsured creditors. Also, under the current system, each bank pays a flat rate for insurance, regardless of the riskiness of its portfolio.[7] Under this flat-rate system, regulations and examinations are intended to control bank risk-taking, but they have been increasingly ineffective.[8]

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[5]In the 40 years from 1940 through 1979, only 299 insured commercial banks were closed, while in the nine years from 1980 through 1988, 879 banks were closed. (See Dwight M. Jaffee, "Symposium on Federal Deposit Insurance for S&L Institutions," *Journal of Economic Perspectives* 3 (Fall 1989) pp. 3-10.

[6]*Savings Institutions Sourcebook* (Washington, D.C.: United States League of Savings Institutions, 1989) p. 64.

[7]Before FIRREA was passed, commercial banks paid a premium of 8.3 cents per $100 of deposits. Under FIRREA, the premium is scheduled to rise to 12 cents per $100 of deposits for 1990 and to 15 cents thereafter.

[8]FSLIC's problems were exacerbated by deregulation in the early 1980s, which permitted the fatal combination of expanded S&L powers with relaxed net-worth requirements.

Thus, neither the regulators nor the insured depositors demand that banks pay more for taking on more risk. As a bank gets closer to bankruptcy, there is a tendency for stockholders to "bet the bank," since they have everything to gain and little to lose. If the risk doesn't pay off, the deposit insurer takes the loss.

CAN WE FIX IT?

The S&L crisis threw into bold relief the shortcomings of our federal deposit-insurance system. To avoid another crisis, we could take one of two paths: find another way to avert bank runs and ensure the stability of the financial system, or retain federal deposit insurance but reduce the incentives it creates for excessive bank risk-taking. In the near term, the first path seems infeasible.

Loans From the Lender of Last Resort. Some feel that federal deposit insurance is not the best way to avert systemic bank runs. They argue that the Federal Reserve, as lender of last resort, could play a much bigger role than it currently does in stabilizing the payments system. Bank runs are costly when they cause solvent banks to fail and disrupt the payments system. These banks have good assets, but they aren't liquid enough to satisfy depositor demand during a run. Rather than having to liquidate their assets at fire-sale prices, these banks might be allowed to pledge the assets as collateral for loans from the Fed. The loans would solve the temporary liquidity problems, preventing runs from sending these banks into insolvency. According to this view, deposit insurance could play a much smaller role in such a design and might even be privately administered.[9]

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[9]Anna J. Schwartz makes this argument in "Financial Stability and the Federal Safety Net," Chapter 2 of *Restructuring Banking and Financial Services in America*, William S. Haraf and Rose M. Kushmeider, eds. (Washington, D.C.: American Enterprise Institute, 1988).

Opponents of this approach fear the Fed would not act swiftly enough to prevent the ill effects of a run once it started. To support this view, they point to the banking crisis of the 1930s, when the Fed failed to provide the needed liquidity. Increasing the Fed's role in providing liquidity to solvent banks experiencing temporary problems is desirable, but information problems probably preclude it from being the sole source of stability. To avoid extending loans to truly insolvent banks, the Fed would need very good information about the quality of the assets being pledged as collateral. If a bank that had taken on too much risk and had gotten itself into trouble found it easy to borrow from the Fed, then the Fed would, in effect, be subsidizing excessive risk-taking.

Private Insurance. It is unlikely that deposit insurance can be totally private rather than government sponsored. First, private insurance lacks the credibility of federal insurance. The federal government, unlike private insurers, can impose taxes to maintain the solvency of the insurance fund. (The bailout of FSLIC is a case in point.) This credibility is essential if insurance is to prevent bank runs. Second, it isn't clear that private insurers will be able to obtain as much capital as is necessary to support such insurance, since the level of deposits to be insured is so large—total deposits in commercial banks averaged over $2 trillion in 1989. And unless private insurers were given sufficient powers to close insolvent banks, the number of these banks permitted to remain open and engage in risky behavior is likely to be higher in private-insurance schemes, exposing the funds to larger losses. Finally, since the social benefits of a stable financial system do not accrue to individual banks, a totally private insurance system would probably provide too little insurance for the system.

Narrow Banks. Another alternative to the current system of federal deposit insurance is the "narrow bank" plan. This plan would reduce the need for deposit insurance by re-

stricting the activities a bank could fund with insured deposits. A bank would provide transactions services by investing deposits in virtually riskless assets.[10] Essentially, the narrow bank could invest in short-term Treasury and federal-agency securities, the least risky assets available. Under this setup, the narrow bank could be one affiliate of a bank holding company. All other bank activities would be placed in other affiliates and funded with uninsured funds. Actually, because of the safeness of the narrow banks' assets, there would be little need for deposit insurance to cover losses from credit risk or interest rate risk. However, insurance might still be offered to cover losses from fraud or mismanagement.

While on the surface the narrow-bank plan seems a feasible way to solve the problem of banks using insured deposits to fund excessively risky activities, it actually just shifts the problem of potential payments system instability to the non-narrow-bank affiliates of the holding company. The uninsured liabilities of the non-narrow-bank affiliates are likely to become a significant part of the payments system because banks will be willing to pay higher rates for these funds since they fund the more profitable activities. If so, the government would want to prevent runs on these affiliates as well. Thus, the narrow-bank proposal would probably not solve the problem.[11]

These economic arguments, along with the political infeasibility of doing away with federal deposit insurance, suggest we should concentrate, at least in the immediate future, on reforming the system.

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[10]Robert E. Litan is the major proponent of the "narrow bank" plan. See his *What Should Banks Do?* (Washington, D.C.: Brookings Institution, 1987).

[11]George J. Benston and George G. Kaufman make these arguments in "Regulating Bank Safety and Performance," Chapter 3 of *Restructuring Banking and Financial Services in America*.

REFORMING FEDERAL DEPOSIT INSURANCE

Under the current system, bank risk-taking is not being priced by insured depositors, nor do regulators impose a high enough cost on it. Accordingly, banks have an incentive to invest in assets that are too risky from society's point of view. If risk-taking carried a higher cost, banks would take on less risk than they currently do. And less risk-taking by banks would reduce the insurance fund's exposure to excessive losses, bolstering depositors' confidence in the fund and making it easier for the fund to achieve its goals. The current proposals for reforming the deposit-insurance system focus on ways to discipline bank managers from excessive risk-taking.

Depositor Discipline

Adjusted Ceilings. Some proposals for reforming the deposit-insurance system focus on depositors providing market discipline (see *Key Provisions of Key Proposals*). Proposals to lower the ceiling for insured deposits to as low as $10,000, from $100,000, or to impose co-insurance (insuring only a certain percentage of deposits) are intended to have depositors discipline banks by demanding a risk premium for placing deposits in riskier banks. This would curb risk-taking by increasing the price a bank must pay for engaging in risky activities. Some argue, too, that the ceiling should be lowered on the grounds that depositors with $100,000 are not the small depositors deposit insurance was intended to protect.

A major problem with this approach is that it isn't clear whether small depositors have enough information to discipline banks effectively. Rather than try to assess the health of their bank, depositors might find it easier just to withdraw their money if they suspected (correctly or not) any trouble. As a result, we might end up with more bank runs—something deposit insurance was intended to avoid in the first place.

Key Provisions of Key Proposals

American Bankers Association[a]
- Leave insurance coverage ceiling at $100,000
- End "too big to fail" by using the "final-settlement-payment" method to resolve insolvent bank cases—a "haircut" would be imposed on uninsured depositors and unsecured creditors of failed banks
- Close banks as soon as equity capital equals zero
- Improve examination and supervision of banks

The Conference of State Bank Supervisors[b]
- Leave insurance coverage ceiling at $100,000
- End "too big to fail"
- FDIC should impose risk-based premiums based on the amount of risk-based capital a bank has and on its latest CAMEL rating

Independent Bankers Association of America[c]
- Insure all depositors—remove the $100,000 ceiling on coverage
- Banks should pay premiums to the FDIC on nondeposit liabilities and foreign deposits

New York Clearing House Association[d]
- Leave insurance coverage ceiling at $100,000
- End "too big to fail" via the ABA's "haircut" or some other modified payout procedure
- Brokered deposits should be allowed for healthy banks; they pose a problem only if used by undercapitalized banks

Federal Reserve Bank of Cleveland[e]
- Lower insurance coverage ceiling, perhaps to as low as $10,000
- End "too big to fail"
- Encourage quick closure of insolvent banks

Federal Reserve Bank of Minneapolis[f]
- Limit coverage to $10,000 per depositor
- End "too big to fail" via "haircut"
- Increase capital requirements

Federal Reserve Bank of San Francisco[g]
- Leave insurance coverage ceiling at $100,000
- End "too big to fail"
- Increase capital requirements
- Use market-value accounting when possible
- Encourage quick closure of insolvent or nearly insolvent banks

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[a]American Bankers Association, *Federal Deposit Insurance: A Program for Reform*, Washington, D.C. (March 1990); [b]The Conference of State Bank Supervisors, *Comments on Federal Deposit Insurance Reform*, Washington, D.C. (March 9, 1990); [c]Independent Bankers Association of America, *Protecting the Federal Deposit Insurance System*, Washington, D.C. (February 1990); [d]John R. McGillicuddy, Chairman of the New York Clearing House Association, "Insurance Reform Alone Can't Save Bank Industry," *American Banker* (April 5, 1990); [e]Federal Reserve Bank of Cleveland, 1988 Annual Report; [f]Federal Reserve Bank of Minneapolis, 1988 Annual Report; [g]Robert T. Parry, President of the Federal Reserve Bank of San Francisco, "Insurance Reform Can Stop 'Bet-the-Bank' Syndrome," *American Banker* (April 19, 1990).

It also isn't clear that $100,000 is really that much money anymore. Adjusted for inflation, the $100,000 limit on coverage today is nearly equivalent to the $40,000 limit that was in effect in 1974, and the coverage relative to per capita GNP is less.[12] (Today's $100,000 level of coverage would have been equivalent to $43,000 of coverage in 1974.) Finally, now is probably not the right time to lower the level of coverage, with depositor confidence already shaken by the S&L crisis.[13]

Individuals Versus Accounts. A less radical proposal is to keep the insurance ceiling at $100,000, but enforce it by insuring each *individual* rather than each *account* up to the ceiling. The Minneapolis Fed suggests allowing each depositor to designate one particular account as her insured account; the deposits in her other accounts would be uninsured.[14] Under the current system, which insures each account up to the $100,000 limit, brokers can collect large investors' deposits, break them up into $100,000 bundles, and move them around in search of the highest deposit rates, all the while getting full coverage.

One benefit of these "brokered deposits" is that they ease temporary liquidity problems at solvent banks. However, they also allow large depositors to be fully insured, mitigating any incentive these depositors have to monitor the riskiness of their banks. That is, without the deposit-insurance coverage, large depositors

[12]See Alex J. Pollock, "Deposit-Insurance Debate Should Consider Inflation," *American Banker* (February 5, 1990).

[13]Edward G. Boehne, President of the Federal Reserve Bank of Philadelphia, made this point in "Banking in the 1990s," Remarks to the Annual Convention of the Pennsylvania Bankers Association, Philadelphia, May 22, 1990, as did Federal Reserve Board Chairman Alan Greenspan in testimony before the Senate Committee on Banking, Housing, and Urban Affairs, July 12, 1990.

[14]See the Federal Reserve Bank of Minneapolis's 1988 Annual Report.

would demand higher deposit rates at these banks. Insuring individuals rather than accounts would prevent coverage of brokered deposits and reduce their attractiveness. The Fed, provided it had sufficient information about the bank, could play a larger role in providing temporary liquidity.

"Too Big to Fail." But covering individuals rather than accounts won't increase depositor discipline as long as the "too big to fail" doctrine is in place. The FDIC is required to resolve insolvent bank cases in the most cost-effective way. For small banks this is often with a "deposit payout"—depositors with $100,000 or less are paid off in full and larger depositors suffer losses. However, with larger banks, the FDIC usually uses either the purchase and assumption (P&A) method or direct assistance.

In a P&A, another institution purchases some or all of the assets and assumes all the deposits (insured and uninsured) and all the other debts of the failed bank. Thus, even those depositors with more than $100,000 in the failed bank suffer no losses. Since there is de facto 100 percent insurance coverage in the P&A method, large depositors have no incentive to monitor their banks.

In some cases with very large banks, the FDIC may deem that allowing the bank to fail would risk a major disruption to the payments system—that is, the FDIC may decide that the bank is "too big to fail." If so, then the FDIC is permitted to make loans to or purchase assets from the failing bank to keep it afloat. (This is what the FDIC chose to do in 1984 with Continental Illinois. Uninsured depositors and general creditors were given explicit guarantees that they would not lose any money.) Since large-bank failures have a higher potential of disrupting the payments system, the FDIC is more likely to use direct assistance with large banks than to let them fail. Thus, larger depositors and other creditors at large banks have little incentive to monitor their bank.

To remedy this, the American Bankers Association proposes that the FDIC impose a "haircut" on the uninsured depositors and other creditors at a failed bank before it is sold to another institution. Rather than being paid the full book value of their deposits and debt, these creditors would receive a "final-settlement-payment" from the FDIC equal to the average amount likely to be recovered in the bank's sale. The ABA estimates that, given the FDIC's recent experience, the uninsured creditors would receive about 88 percent of the book value of their debt.[15] If an uninsured depositor knew she would suffer a loss if her bank failed, she would have an incentive to keep a watchful eye on the bank. The assumption here, of course, is that larger depositors (who are uninsured) are more sophisticated than smaller depositors, having access to more information concerning their banks. It's also assumed that the FDIC will be able to close the bank quickly, before these large depositors can run the bank and avoid the haircut.[16]

Equity Holder and Nondepositor Discipline

Capital Requirements. A danger of relying on depositors to discipline banks is that bank runs might become more common if depositors find it too costly to assess the condition of their banks. Recognizing this possibility, other proposals emphasize discipline from banks' equity holders or from nondepositor creditors, essentially through higher equity requirements, subordinated debt requirements, or both. Increasing banks' equity-capital requirement would have two desirable effects. First, higher capital means that shareholders have more at risk and may exert more discipline on bank managers to be prudent. Second, higher capital reduces the expected loss to the insurer by reducing the chances that the bank will become insolvent—capital acts like a deductible cushioning the insurer from losses.

Banks currently must hold capital equal to at least 6 percent of their assets. However, under the Basle Accord, U.S. and European banks will be required to hold capital equal to at least 8 percent of their risk-weighted assets by the end of 1992.[17] Although this will require the typical bank to increase the amount of capital it holds, bank capital ratios will still be well under the average 12 percent equity-to-asset ratio that prevailed in the late 1920s.[18]

Subordinated Debt. In addition to increasing the equity-capital requirement, requiring the use of subordinated debt could also increase market discipline.[19] The claims of these debthold-

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[15]See American Bankers Association, *Federal Deposit Insurance: A Program for Reform*, Washington, D.C. (March 1990).

[16]One group that doesn't believe "too big to fail" can be done away with is the Independent Bankers Association of America (IBAA), which represents smaller, community banks. They favor de jure as well as de facto 100 percent deposit insurance coverage at all size banks. Since deposits in banks' offshore offices would now have explicit insurance coverage, banks would be required to pay premiums on these foreign deposits, something that currently is not required. See IBAA, *Protecting the Federal Deposit Insurance System*, Washington, D.C. (February 1990).

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[17]The risk-weighted capital standard requires banks to hold more capital against riskier assets. A bank's assets are assigned to one of four different risk categories, weighted according to their category's risk, and then summed to determine the bank's risk-weighted asset level. See Neil S. Millard and Brian W. Semkow, "The New Risk-Based Capital Framework and Its Application to Letters of Credit," *Banking Law Journal* 106 (November-December 1989) pp. 500-14.

[18]Alan Greenspan, "Subsidies and Powers in Commercial Banking," Remarks before the Annual Conference on Bank Structure and Competition, Federal Reserve Bank of Chicago, May 10, 1990. Also see the Chairman's testimony before the Senate Committee on Banking, Housing, and Urban Affairs, July 12, 1990.

[19]Benston and others suggest that banks be required to hold subordinated notes equal to about 3 to 5 percent of deposits, in *Perspectives on Safe and Sound Banking*, p. 193.

ers would be subordinate to those of the uninsured depositors and the deposit insurer. Because these debtholders (unlike the equity holders) do not share in the upside benefits of risk-taking, they might be expected to exert even more discipline on the bank than equity holders if the bank's failure exposed them to risk. Currently, in the typical P&A method of liquidation, these debtholders don't suffer losses. But if they were treated like equity holders in the P&A, the possibility of a loss would encourage their monitoring of the bank. Potential debtholders would buy a riskier bank's issues only if promised a higher rate. This "higher cost for higher risk-taking" would tend to discipline the bank, and the rate the bank promises for new issues of subordinated debt would provide a signal to regulators about the bank's health.

Regulatory Discipline

Risk-related Premiums. To discourage excessive risk-taking, regulators might also begin charging riskier banks higher premiums for their insurance coverage. With the current flat-rate premium, regulators have to control risk-taking via supervision and regulation rather than price. In theory, if riskier banks had to pay more for insurance coverage, making risk-taking more costly, some of their risk-taking behavior would be discouraged. However, implementing the right set of premiums—that is, the premiums that would induce the correct amount of risk-taking from society's point of view—is easier said than done. For one thing, it is hard to measure risk until it is too late. Did loans to Brazil look as risky in 1978 as they did in 1985?

Also, activity-specific risk-related premiums miss the point that risk should refer to the riskiness of the bank's entire portfolio, not just to the risk of individual assets. For example, suppose cash flows from trust services are high when cash flows from commercial loans are low, and vice versa (that is, the flows are negatively correlated). Then, even if the cash flows from trust services are more volatile than those from commercial loans, adding them to the bank's portfolio would reduce the risk of the entire portfolio.

Categorizing assets into risk-classes and charging higher premiums for banks with more high-risk assets might not be the best way to implement risk-related premiums, since this does not correctly measure the portfolio's credit risk. This method also would miss the bank's exposure to interest rate risk. Banks and thrifts are exposed to interest rate risk to the extent that interest rate changes have a different effect on the cash flows from their assets than on the cash outlays on their liabilities. The typical S&L mainly funds long-term, fixed-rate mortgages, using short-term deposits. So when interest rates rise unexpectedly, the S&L pays more for deposits than it makes on its assets. Ideally, risk-related insurance premiums would take into account the institution's interest rate risk as well as its credit risk.

As an alternative, premiums might be related to how a bank fares relative to bankruptcy-prediction models, or to its CAMEL rating. (The CAMEL rating is given by the bank examiner and reflects the overall health of the bank, taking into account the bank's capital, asset quality, management, earnings, and liquidity. Thus, the rating should reflect the riskiness of the bank's portfolio, including interest rate risk.) A proposal by the Conference of State Bank Supervisors would relate premiums to a bank's latest CAMEL rating and to its level of risk-based capital.[20] While CAMEL

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[20]Risk-based capital could play a role similar to that of risk-based insurance premiums. However, one advantage of risk-based insurance premiums over risk-based capital requirements is that, with risk-based premiums, banks can be rewarded for operating with more capital than the required minimum. See Lawrence J. White, "The Reform of Federal Deposit Insurance," *Journal of Economic Perspectives* 3 (Fall 1989) p. 22.

ratings aren't a perfect measure of risk, the proposal seems a workable way to implement risk-based premiums.

Increased Supervision. While it is very important that we change the incentives of bankers, it is equally important that regulators be able (and be encouraged) to close failed banks quickly.[21] If regulators closed banks before banks' equity were exhausted, then the insurance fund's costs would be minimized. The largest claims on the insurance fund have come from fraud and from risky gambles made by banks allowed to stay open while insolvent.[22] Part of the problem was caused by regulators practicing "forbearance" in the 1980s and deliberately allowing insolvent thrifts to remain open, hoping that their condition would improve with time. With hindsight, this policy was ill-advised.

But even without such a policy, it is difficult for a regulator to know when equity is exhausted and it is time to close a bank. Since most banks aren't publicly traded companies, the stock price can't be used to estimate the value of the bank's equity. And, by the nature of banking, a bank's assets tend to be illiquid—there is no market on which these assets are frequently repriced. So the book value of a commercial loan may grossly overstate its market value. However, with certain assets, such as traded securities, market-value accounting is easy and should be encouraged. The estimates of the market value of the bank's other assets would not be perfect but would be at least as accurate as their historical book values. Well-run banks make such estimates now, so these measurements are feasible.

More frequent and thorough supervision of financial institutions will make it easier for regulators to measure banks' net worth accurately. Because changes in economic circumstances can quickly cause solvent banks to become insolvent, banks should be closed when their capital is small but still positive.[23] Closing a bank before its net worth turns negative would circumvent the ability of banks with little at stake to "bet the bank," reducing the losses to the insurance fund. This, in turn, would increase depositor confidence in the fund and, accordingly, the fund's efficacy in maintaining a stable financial system.

Rebates. The solvency of the insurance fund could also be secured if the current system of rebates were abolished.[24] Presently, banks will be rebated any premiums they have paid into the fund after its reserves reach 1.25 percent of insured deposits. However, if the FDIC believes it faces a significant risk of future losses, it is permitted to suspend the rebates and impose higher premiums until the fund's reserves reach 1.5 percent of insured deposits. The experience over the last several years suggests that the fund can be depleted very quickly. It would make more sense to build up the fund in years when banks are healthy and can afford to do so, rather than wait until multiple bank failures cause a depletion of the fund and require the FDIC to make a special assessment at the time when banks can least afford to pay it.

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[21]Leonard Nakamura discusses bank closure in "Closing Troubled Financial Institutions: What Are the Issues?" this *Business Review* (May/June 1990) pp.15-24.

[22]See Chapter 10, "Supervision and Examination," in Benston and others, *Perspectives on Safe and Sound Banking.*

[23]Benston and Kaufman suggest closing a bank when its capital-to-asset ratio, measured at market values, falls to 3 percent. See Chapter 3 of *Restructuring Banking and Financial Services in America.* Closing a bank means the bank's ownership is transferred to the FDIC, which then sells, merges, or liquidates the bank.

[24]Even with the higher premiums mandated by FIRREA, there is a significant probability that the fund will become insolvent at some point during the next 55 years. See Sherrill Shaffer, "Aggregate Deposit Insurance Funding and Taxpayer Bailouts," Working Paper 90-14, Federal Reserve Bank of Philadelphia (April 1990).

CHANGES WILL HAVE TO BE MADE

The savings and loan debacle pointed out some basic problems with our federal deposit-insurance system that must be corrected if we are to avoid a similar crisis in the future. Under the current system, banks have an incentive to take on more risk than is prudent from society's point of view. This is especially true as a bank approaches bankruptcy and is betting with other people's money.

Proposals to remedy this incentive problem seek to increase market and regulatory discipline on bank risk-taking. Several reforms seem desirable. If capital requirements were increased, equity holders would have more at stake and so would behave more prudently. Moreover, the increased capital would provide a cushion between the insurance fund and banks' losses. In addition, making subordinated debtholders and other nondeposit creditors face greater risk of losses were their bank to fail would give them incentives to monitor their bank and to discipline the bank into behaving more cautiously. This could be accomplished by using some sort of "haircut" when paying off creditors of failed banks, thereby invalidating the assumption that some banks are "too big to fail." Enforcing the current deposit-insurance ceiling of $100,000 by insuring individuals rather than accounts and ending "too big to fail" would increase discipline by large depositors. Small depositors would still be protected and so would have no incentive to run the bank.

The cost of risk-taking could also be increased if riskier banks had to pay higher deposit-insurance premiums or hold more capital. One of the least complicated ways to implement risk-based premiums would be to link the premium to a bank's CAMEL rating. In order to protect the insurance fund from excessive losses, regulators must have the ability to close banks before equity is exhausted. More frequent examinations and a move to market-value accounting, where feasible, would enhance this ability. Finally, for the proposed reforms to work, it is essential that regulators do their job. Oversight by other government bodies may help in this regard.

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