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WHAT ARE THE COSTS OF DISINFLATION?

Dean Croushore

Are the long-term benefits of disinflation worth the short-run costs? Can economists accurately estimate benefits or costs? Proponents of disinflation, focusing on the long run, and opponents, looking at the short run, respond to these questions differently. In fact, estimates of the costs and benefits can vary widely depending on which type of economic model is used.

BANKING AND COMMERCE: A DANGEROUS LIAISON?

Loretta J. Mester

The separation of banking and commerce dates as far back as 1694 when the act that established the Bank of England prohibited the Bank from dealing in merchandise. The earliest U.S. banks followed English tradition. Today, with the advent of entities such as nonbank banks, the lines of separation have blurred. So, why not allow commercial firms to own banks, or even banks to own commercial firms? Arguments can be made for and against the mingling of banking and commerce; however, both the costs and benefits of such a move are often exaggerated. For now, it seems that maintaining separate spheres is prudent, but as the reforms of the banking act are carried out, questions about the separation of banking and commerce may have to be reconsidered.

What Are the Costs of Disinflation?

*Dean Croushore**

The Federal Reserve can use monetary policy to reduce the inflation rate, a process known as *disinflation*. Are the benefits of disinflation worth the costs? Proponents of disinflation argue that the long-run benefits of price stability, including lower interest rates, increased economic efficiency, and perhaps faster economic growth, greatly exceed the short-run costs. Opponents, of course, claim the opposite, usually arguing that the short-run costs in terms of higher unemployment and lost output would be immense.

Recent legislation introduced into Congress would force the Fed to disinflate. The Neal Resolution, introduced in 1989, would require the Fed to reduce inflation to zero within five years. It would also make fighting inflation the Fed's only goal.

How can we evaluate the costs and benefits of disinflation? Only by writing down explicit models of the economy and seeing how the economy is likely to behave when the inflation rate is reduced. The costs of reducing inflation can then be compared with estimates of the benefits of disinflation.

Economists do not have very precise estimates of the benefits of disinflation. In addition, estimates of the costs of disinflation differ depending upon the type of economic model used.

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BENEFITS OF DISINFLATION

To examine the benefits of disinflation, let's compare an economy with an inflation rate of 0 percent to an identical economy with an inflation rate of 5 percent.¹ There are two benefits to disinflation that may be large even when the economy moves from an inflation rate of 5 percent to zero. One benefit comes from reducing the distortion to savings and investment that is caused by the interaction of the tax system with inflation. Another benefit comes from increasing the availability of mortgage loans; they are more affordable when inflation is lower, because the initial mortgage payments are lower.

Reducing the Distortion Due to the Tax System. Our tax system is not fully indexed to inflation. As a result, the effective tax rate on interest income is much higher when there is inflation than when there is none. For example, suppose that when inflation is 5 percent you put \$100 in the bank at an interest rate of 7 percent. Your nominal return is \$7, but \$5 of that return just compensates you for inflation, so your real return is only \$2. You must pay taxes, however, on your nominal, not your real, return. If your total tax rate is 30 percent, then you owe the government \$2.10 in taxes, which leaves you with an after-tax return of just \$4.90. But if we adjust for the 5 percent inflation, your after-tax *real* return is -\$0.10. In other words, your \$104.90 today buys fewer goods than your \$100 did one year ago. Because the government is actually taxing away more than you've earned

in real terms, your effective real (inflation-adjusted) tax rate is over 100%.

Throughout much of the 1970s, the effective real tax rate on interest income exceeded 100 percent. Inflation was very high, and the fact that taxes were based on nominal interest income rather than on real interest income meant that real after-tax returns were negative. Even in recent times, with inflation in the range of 3 to 5 percent, the effective real tax rate remains fairly high. Eytan Sheshinski of Hebrew University and Columbia University calculates the effective real tax rate on interest income in the U.S. at 86 percent in 1985 and 58 percent in 1989.

In addition to these effects on the rate of return to saving, the tax system contains numerous other distortions that affect the way firms behave, especially with regard to investment spending. For example, nominal (not real) interest payments are deductible, and depreciation costs are in nominal (not real) terms. So even a low inflation rate like 5 percent can reduce investment spending in the economy, both by reducing saving through a high effective real tax rate and by discouraging firms from investment spending. Reducing inflation would increase investment and lead to a rise in the nation's capital stock and its future output.

How much better off would the economy be if it could eliminate the tax system/inflation distortion? Estimates range from 0.06 percent of output to 0.62 percent of output per year.² Unfortunately, there has been no definitive study that pins down a figure within this range. As a preliminary estimate, let's assume a per-

¹Our focus here is on the costs of a constant, known level of inflation. When the inflation rate isn't constant, there are additional costs because the inflation rate is uncertain. Some research even suggests that the higher the level of the inflation rate, the greater will be its variability (see the 1990 study by Laurence Ball of Princeton University and Stephen Cecchetti of Ohio State University). But to keep things simple for this article, let's suppose that inflation can be maintained at any constant rate.

²Rao Aiyagari in a 1990 Minneapolis Fed study argues that the distortion from the interaction of the tax system with inflation is small, as low as 0.06 to 0.12 percent of GNP per year. But David Altig and Charles Carlstrom of the Cleveland Fed, building further on work in their 1991 article, suggest that the distortion may be as high as 0.62 percent of GNP per year, over 10 times as large as Aiyagari's lowest estimate.

manent gain of between 0.25 and 0.50 percent of gross national product (GNP) per year if the tax system/inflation distortion is eliminated by reducing inflation from 5 percent to 0 percent.³ This is roughly the central tendency of many different estimates of the benefit of eliminating the distortion; however, more research on measuring the size of the distortion is clearly needed.

How can this distortion be eliminated? Reducing inflation to zero is one approach. Another is to change the tax laws so that only real, not nominal, returns are taxed. But this second approach is complex, so much so that the major tax reform efforts in the 1980s were unable to address the issue. Perhaps the costs of changing the tax system exceed the benefits of doing so. Since further tax reform toward taxing real rather than nominal returns seems unlikely, the tax system/inflation distortion can most effectively be reduced by lowering inflation.

Making Mortgages More Affordable. The other major benefit to disinflation is that it would increase home ownership. When inflation occurs, there is a tilt to mortgage payments that makes it more difficult for people to buy homes. This results from the front-loading of real payments on loans when inflation is positive. For example, suppose the interest rate on a mortgage is 10 percent when inflation is 5 percent. Assuming that the nominal interest rate moves directly with inflation, suppose inflation is reduced to 0 percent and the mortgage interest rate falls to 5 percent.⁴ Consider

the effect of this change on the monthly payment on a \$100,000 30-year mortgage. At a 10 percent mortgage interest rate, the monthly payment is \$880; at a 5 percent interest rate, the payment is \$540. With a 5 percent inflation rate, the real value of the \$880 monthly payment falls over time.⁵ But at 0 percent inflation, the \$540 monthly payment remains constant in real terms. So the higher inflation rate causes repayment of the mortgage to be front-loaded earlier in the life of the loan. Inflation causes people to make higher real payments early in the life of the loan, rather than making constant real payments through time.

This effect is compounded by the fact that lower nominal interest rates make it easier for people to qualify to take out mortgage loans. Many lenders require that a mortgage payment not exceed 28 percent of a borrower's income when the loan is made. Using this guideline, at a 10 percent mortgage interest rate, a borrower's annual income would have to be more than \$37,000 to take out this loan; at a 5 percent interest rate, the lower monthly payment means that income would have to be only \$23,000. People could qualify for mortgage loans more easily if inflation were lower.

There is a way to solve this tilt problem without reducing inflation. The solution is to allow price-level-adjusted mortgages (PLAMs). PLAMs allow the principal value and monthly payment on a mortgage to move directly with the price level. They mimic the effects of having zero inflation. But people may have some trouble accepting this new type of loan because it requires negative nominal amortization—the dollar value of the mortgage rises with inflation. So after 15 years of paying off her mortgage, a homeowner might owe more (in dollar

³This doesn't mean that GNP would be 0.25 to 0.50 percent higher, but rather that the allocation of resources in the economy would be improved; the value of improving that allocation of resources is 0.25 to 0.50 percent of GNP.

⁴In this example, the real interest rate remains at 5 percent whether inflation is 5 percent or zero. Also, the example ignores the tax benefits that arise because mortgage interest is deductible on the federal income tax. Tax deductibility mitigates the tilt problem but does not eliminate it.

⁵For example, after 15 years at a 5 percent inflation rate, the \$880 nominal payment is worth only \$423 in real (inflation-adjusted) terms; but at 0 percent inflation, the \$540 nominal payment is still worth \$540 in real terms.

terms) than she did initially, although the real value of the mortgage (adjusted for inflation) would be less. Again, in considering the benefits of disinflation, we can't assume that these loans will be available and that people will use them if inflation remains high. So that leaves disinflation as the only method of reducing the tilt problem.

How big are the benefits of reducing the mortgage-tilt problem? While economists have recognized the problem's importance, there has been no concrete estimate of its cost to the economy. Since housing is such an important sector of the U.S. economy, and because the effect of the mortgage-tilt problem over a person's life cycle is so severe, a reasonable guess (assuming that the benefits here are somewhat lower than the benefits of eliminating the tax system/inflation distortion) is that eliminating it by reducing inflation from 5 percent to 0 percent would be valued at 0.15 to 0.30 percent of GNP per year. As with the tax system/inflation distortion, however, this is a very rough estimate; more research is needed to nail it down more precisely.

Other benefits of disinflation are likely to be quite small in reducing inflation from a moderate level like 5 percent to zero. These benefits include avoiding real losses by people who have fixed nominal incomes, reducing the implicit tax on moneyholding, reducing the "shoe-leather" costs that arise from running to the bank more often to try to avoid the implicit tax on moneyholding, and reducing menu costs (the costs of changing prices).⁶

The interaction of the tax system with inflation and the mortgage-tilt problem both reflect the inability of institutions to adjust to permanent inflation, and their effects may be substan-

tial.⁷ Reducing inflation from 5 percent to 0 percent by eliminating the interaction of the tax system with inflation would be worth an additional 0.25 to 0.50 percent of GNP, and eliminating the tilt problem may be valued at another 0.15 to 0.30 percent. And there are other, but smaller, benefits. So, in total, a rough estimate of the benefits of disinflation (that we can use as a benchmark for comparison with the costs of disinflation) is that the benefits to reducing inflation from 5 percent to zero are worth 0.4 to 0.8 percent of GNP per year. The present value of 0.4 to 0.8 percent of GNP per year forever is roughly 24 to 48 percent of 1990 GNP, when discounted at 4 percent and when GNP grows at 2.5 percent per year.⁸ It is this benefit measure that we must compare (in present-value terms) with the costs of disinflation. Notice that the benefits are *permanent*, while the costs of disinflation are *temporary*, so a relatively small benefit per year may justify fairly large one-time costs.

THE COSTS OF DISINFLATION

Measuring the costs of disinflation depends a great deal on the economic model used. Classical models show low costs, while Keynesian models show high costs. Debate over which

⁷If inflation were large enough so that these effects were severely damaging to the economy, then these institutions would probably adjust in some way. But at only 5 percent inflation, the costs of changing the institutions probably exceed the benefits of doing so, and these institutional structures persist.

⁸Mathematically, if the benefits of disinflation are β percent of GNP per year forever, if GNP grows at 2.5 percent per year, and the real interest rate is constant at 4 percent, then the present value of the benefits of disinflation as a percent of current GNP is given by the formula:

$$\sum_{i=1}^{\infty} (1.04)^{-i} \beta (1.025)^i.$$

This sum is 68.333 times β . Accounting for the fact that disinflation is not achieved for 10 years reduces this to about 60 times β .

⁶For a full discussion of these benefits of disinflation, see the 1978 study by Stanley Fischer and Franco Modigliani of MIT.

theoretical model best explains macroeconomic events has raged for many years, with no consensus.

Further complicating matters is the issue of credibility. Suppose the Federal Reserve tightens monetary policy to reduce inflation. The resulting reduction in aggregate demand in the economy causes unemployment to rise. The Classical model of the economy suggests that the economy returns to full employment fairly quickly, while the Keynesian model argues that sluggish adjustment of wages and prices will cause a long period of higher unemployment. But both models show that the speed at which the economy adjusts depends on how credible the commitment to disinflation is. If people believe that the Fed means business and that it is committed to reducing the inflation rate, they are likely to take actions that adjust wages and prices more quickly in response to Fed policy. But if people doubt that the Fed will really go through with its disinflation plan (that is, to keep monetary policy tight despite the short-run repercussions) and that it might in fact give up the battle before inflation is defeated, they will be less willing to adjust in response to the announced policy change. When policy is credible, the costs of disinflation will be lower, as the whole economy moves together to a lower rate of inflation. But if policy is not credible, people will wait to see if inflation really declines before changing their wage demands or interest-rate demands, and the economy will adjust more slowly.

If the Federal Reserve embarked on a policy of disinflation, would such a policy be very credible? Credibility might be enhanced if something like the Neal Resolution to reduce inflation to zero in five years became law. The Fed might also increase its credibility if it were to announce a planned, multiyear path for key monetary variables (the money supply and interest rates) that it was targeting and to project the macroeconomic consequences (for output and unemployment) thereof. The plan would

probably have to specify details, including how long it should take to reduce inflation, so that people could observe its progress and see how well the Fed was adhering to the plan. This would make the plan verifiable and thus more credible.

To develop such a plan, the Fed needs to know much about the economy's response to a tightening of monetary policy. If the goal is to reduce the inflation rate while minimizing the short-run costs to the economy, the Fed needs a model of the economy to measure such costs and evaluate alternative policies. It can use such a model to evaluate the optimal monetary policy over time—to find the path of interest rates and money growth that gives the smallest costs relative to the benefits of disinflation, and to find the best time period (5 years? 10 years?) over which the disinflation should occur.

MODEL-BASED MEASURES OF THE COSTS OF DISINFLATION

Some previous studies have provided estimates of the costs of disinflation.⁹ In 1980, Laurence Meyer of Washington University and Robert Rasche of Michigan State University ran simulations to determine the cost of reducing the inflation rate from 10 percent to 2.5 percent based on four simple models. They showed that a Keynesian model had costs of disinflation that were three to six times as large as those of a Classical model. They found much uncer-

⁹Some evidence on the costs of disinflation might come from looking at past data (rather than using models) to see how much output growth has changed in the past when inflation was reduced. Previous studies (see the papers by Gordon and King, Fischer, Howitt, Okun, and Scarth) find that GNP must fall 5 percent or more to reduce inflation by 1 percentage point. However, this evidence isn't necessarily relevant to evaluating the response of the economy to a gradual disinflation, since previous reductions in inflation have generally come only during recessions. It is possible theoretically to disinflate without causing a recession, at least in most models.

tainty in the estimates of both benefits and costs and suggested that additional research was needed to provide more precise estimates. In a 1982 study, Robert Gordon and Stephen King of Northwestern University found that, in a Keynesian model, reducing the inflation rate by 5 percentage points had a total cost of 29 percent of one year's GNP. However, a nonstructural (neither Keynesian nor Classical) model studied in 1985 by Craig Hakkio and Bryon Higgins of the Federal Reserve Bank of Kansas City showed that the long-run benefits of reducing inflation greatly exceeded the short-run costs. Their results suggested that the growth rate of potential GNP is significantly higher at lower levels of inflation.

Because these studies were all done some time ago, we need to update them to see if recent history might have changed their results. We attempt to do this by empirically estimating the costs of disinflation in four small macroeconomic forecasting models:¹⁰ (1) a New Classical model, in which rational expectations play a dominant role in determining the costs of disinflation; (2) a Monetarist model, in which money growth is the key determinant of inflation; (3) a Keynesian model, in which slack in the economy is needed to reduce inflation; and (4) a hybrid model called PSTAR+ that combines the Monetarist notion that money growth determines inflation with the Keynesian idea that changes in interest rates may affect real output. All of the models are small, consisting of just three or four equations to determine output growth, inflation, and one or two other variables (such as monetary velocity, interest rates, energy prices, or money growth).

This study uses forecasting models because this is a policy-evaluation exercise, one in which

the Fed must plan a path for monetary policy that will bring about disinflation and make forecasts of major macroeconomic variables along the path.¹¹ First, we estimate each of the models over the period 1959 to 1990.¹² Second, we form two forecasts for the next 10 years for each model.¹³ One forecast is based on policy designed to maintain inflation at about its current level; the other is designed to reduce inflation significantly, but without reducing real GNP growth below 1 percent at any time. To calculate the costs of disinflation, we add up the (discounted) differences over time between the two forecasts in terms of real GNP.¹⁴

The PSTAR+ Model. The PSTAR+ (pro-

¹¹One caveat is in order in performing such an exercise—it is subject to the critique of econometric policy evaluation made by Robert E. Lucas, Jr., of the University of Chicago. The Lucas critique suggests that studies like this may not be fruitful because the type of disinflation we are going to simulate has not occurred before, yet the models are estimated with past data. As a result, estimating the models on past data may yield an overestimate of the costs of a slow, gradual disinflation.

¹²The models are estimated on data ending in the second quarter of 1990. This is done, rather than using more recent data, to keep the recent recession from affecting the results.

¹³The 10-year horizon stretches out the time period somewhat, compared with the 5-year horizon of the Neal Resolution. But spreading disinflation out over a longer time span allows inflation to fall with less risk of a recession.

¹⁴Note that these costs are just the costs to the economy in terms of lost output for changing from steady, positive inflation to zero inflation. An additional cost of disinflation that we haven't discussed is that the government loses seignorage revenue (which is the profit from printing new money) when inflation is reduced; this revenue must be made up by raising taxes, which distort the economy in different ways. But the amount of lost revenue is small when inflation is as low as 5 percent, so the size of this cost is negligible.

In addition, the models used to determine the costs of disinflation are not complete enough to capture the benefits of disinflation through the channels described earlier in the paper. The benefits of disinflation come from reducing

¹⁰The exact specifications of the models can be found in my working paper, "The Short-Run Costs of Disinflation." Citations for all the research referred to in this article can be found in the "References" section at the end of this article.

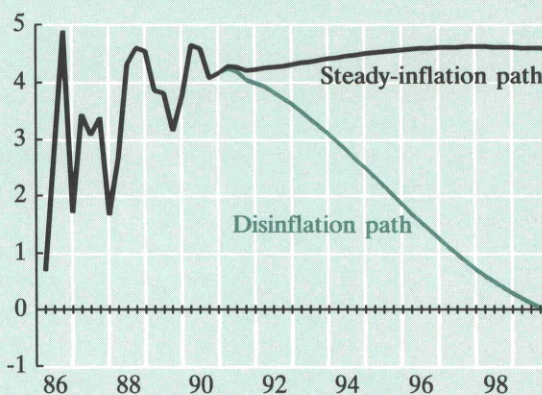
nounced P-Star-plus) model is a small macro model developed by Herb Taylor at the Federal Reserve Bank of Philadelphia. It is based on the P* model developed in 1989 by Jeffrey Hallman, Richard Porter, and David Small, all then of the staff of the Board of Governors of the Federal Reserve System, and it incorporates the interest-rate spread approach of Bob Laurent of the Federal Reserve Bank of Chicago. The P* analysis predicts future inflation using the Monetarist theory that the price level is proportional to the money supply in the long run. Laurent finds that the spread between the federal funds rate and a long-bond rate is closely related to subsequent GNP growth. This is a Keynesian idea because interest rates affect the economy's output in the short run.

To develop a complete macroeconomic model that combines these two approaches, Taylor adds some equations that specify other features of the economy—money growth depends on changes in short-term interest rates, and the nominal long-run interest rate moves toward the value of a fixed real rate plus an inflation premium. The model uses the federal funds rate as the tool of monetary policy; to disinflate, the Fed needs to

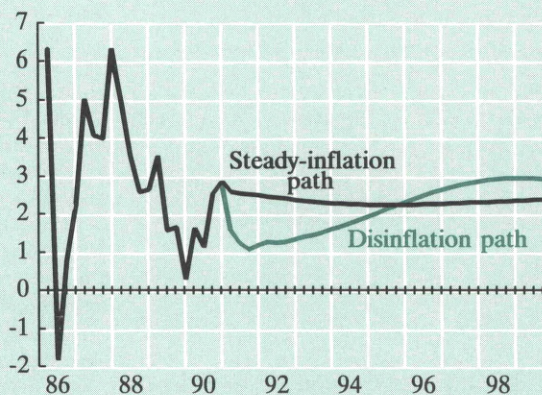
find the optimal path over time for the federal funds rate.

In the PSTAR+ model, the disinflation path is obtained by increasing the federal funds rate, thus reducing money growth and putting downward pressure on the inflation rate. This pressure is maintained until inflation is eliminated. As inflation declines, the federal funds rate declines as well, so the rise in nominal interest rates is only temporary. The results of simulating the model are shown in Figure 1. On the

FIGURE 1
PSTAR+ Model Results
Inflation Rate



Real GNP Growth Rate



distortions to the economy, which improves people's well being, but doesn't necessarily raise output in the economy. Consequently, we have dealt with the benefits separately from the costs.

steady-inflation path, inflation is maintained at about 4.5 percent. Along the disinflation path, however, inflation is gradually reduced to zero over the 10-year horizon. The disinflation process drives the real GNP growth rate down below 2 percent per year for several years. The GNP gap between the two paths looks substantial, but it is never more than 4 percent of GNP and it is eventually closed. Disinflation has no permanent effect on real GNP.

To measure the total cost of disinflation, we add up the quarterly differences between real GNP on the steady-inflation path and real GNP on the disinflation path, discounted at the long-term real interest rate, which is estimated to be 4 percent. From 1990 to 1999, these differences amount to about 22 percent of 1990 GNP. According to the PSTAR+ model, the benefits of lowering the inflation rate permanently from 4.5 percent to 0 percent must be valued at 22 percent of 1990 GNP or more for disinflation to be worthwhile.

The Monetarist Model. For a prototype Monetarist model, we use a variant of the model developed by John Tatom of the Federal Reserve Bank of St. Louis. His model is based on the well-known St. Louis model of Leonall Andersen and Jerry Jordan but differs by taking account of energy price shocks. While the shifts in M1 velocity of the early 1980s sharply reduced the predictive power of the St. Louis model, Tatom's model has performed somewhat better. In fact, it was found to be superior to many other small macro models (including the St. Louis model, some rational-expectations models, and some Phillips-curve-based Keynesian models) at a forecasting conference in 1982.¹⁵

The core of the model consists of two equations that determine nominal GNP growth and inflation. Nominal GNP growth is determined

by money growth, government expenditure growth, and changes in the relative price of energy. The inflation rate depends on money growth and on changes in the relative price of energy. In this model, the measure of the money supply M1 is the tool of monetary policy, so the Fed disinflates by slowing down the growth of M1.

The results of slowing down money growth in this model are shown in Figure 2. Along the steady-inflation path, inflation is constant at just over 3 percent,¹⁶ while real GNP settles down to a long-run growth rate of about 3.75 percent. But on the disinflation path, inflation gradually decelerates to near zero, while the benefits of disinflation show up as a higher growth rate of real GNP, which rises to nearly 5 percent. In this model, lower inflation actually raises real GNP growth.

The costs of disinflation here are very low: real GNP on the disinflation path is never less than 1 percent lower than real GNP on the steady-inflation path. Since disinflation does affect the long-run growth rate of real GNP in this model, there are benefits to disinflation that are quite high: a permanent rise of 1.25 percent in the GNP growth rate. So this model is quite favorable to disinflation. Discounted real GNP is higher on the disinflation path than on the steady-inflation path, so disinflation pays for itself.¹⁷ In addition, since the growth

¹⁶On the steady-inflation path, inflation in the Monetarist model is 3 percent, and in the PSTAR+ model it's 4.5 percent because the Monetarist model implies that the Fed's actions to reduce money-supply growth over the past few years have already put into place some future disinflation.

¹⁷Technically, this is because real GNP growth is not explicitly modeled. There are separate equations determining nominal GNP growth and inflation; real GNP growth is computed by subtracting the inflation rate from the nominal GNP growth rate. Estimation of the model yields the result that inflation is affected more than nominal GNP growth by changes in money growth. Thus, a reduction in money growth leads to an increase in real GNP growth.

¹⁵See the results in the 1983 paper edited by Laurence Meyer.

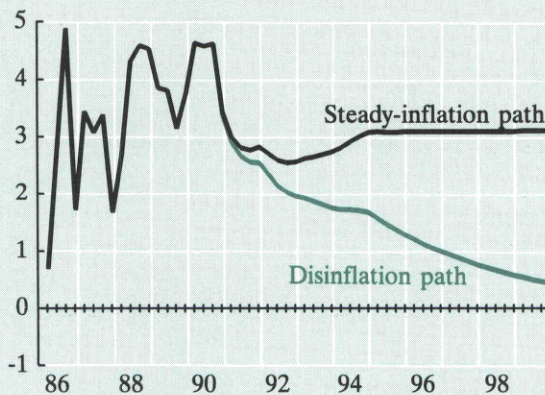
rate of real GNP is permanently higher on the disinflation path, and since it is greater than the long-term real interest rate of 4 percent, it is worth bearing any finite cost to achieve this permanently higher GNP growth rate.

The New Classical Model. Robert Barro, now at Harvard University, developed a model for testing rational-expectations hypotheses in the 1970s. He hypothesized that only unexpected changes in money growth would have

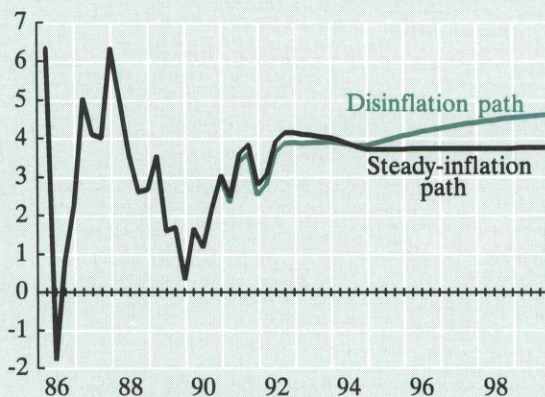
an effect on real variables. Expected money growth would affect nominal variables only; inflation simply rises by the same amount as expected money growth. Barro tested and could not reject the hypothesis using both annual and quarterly data.

We base our prototype New Classical model on the 1980 version of the model used by Barro and Mark Rush, who were then at the University of Rochester. The model's main equation forecasts money growth. The unexpected money growth variable is calculated from that equation as the difference between predicted and actual money growth. Real GNP growth depends on unexpected money growth; if money growth is unexpectedly high, then real GNP growth increases. Inflation depends partly on unexpected money growth, but it rises one-for-one with expected money growth in the absence of unexpected changes in money growth. The policy tool used in this model is the M1 growth rate. The model simulations are shown in Figure 3. Along the steady-inflation path, inflation remains at just above 3 percent.¹⁸ But the disinflation path takes advantage of the fact that an-

FIGURE 2
Monetarist Model Results
Inflation Rate



Real GNP Growth Rate



¹⁸Again, as in the Monetarist model, the slowdown in money growth over the past few years is reflected in a decline in inflation from 4.5 percent to 3 percent, even with steady monetary policy in the future.

anticipated money shocks don't affect real variables. Money growth is reduced immediately and kept constant thereafter. As a result, inflation drops immediately to zero and stays there. There is no cost in terms of lost GNP of pursuing this policy, as long as the change in monetary policy is credible and expected.

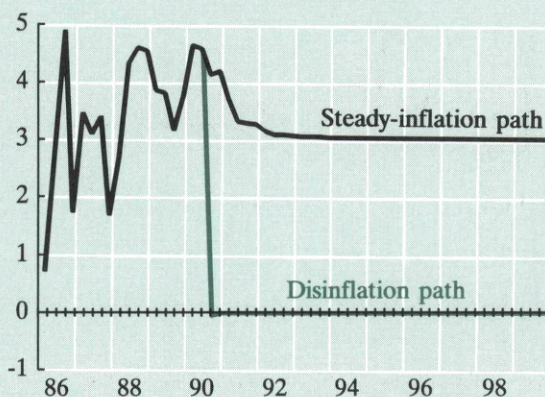
The Keynesian Model. For a prototype Keynesian model, we use a version of the model developed by Ben Friedman of Harvard University. He used the model to examine money's role as an intermediate target of the Fed and to discuss the reasons for interest rates being so high in the early 1980s. In the model, real GNP growth depends on government expenditure growth and on changes in the long-term interest rate and in import prices. Inflation is affected by real GNP growth and by import price changes. Money demand growth is determined by real GNP growth and by the change in the short-term interest rate. And there is a term structure equation relating the long-term interest rate to the short-term interest rate.

The short-term interest rate is the instrument of monetary policy. To cause disinflation, the short-term interest rate must be increased, causing long-term rates to rise and reducing real GNP growth. In this model, the decline in real GNP growth then reduces inflation.

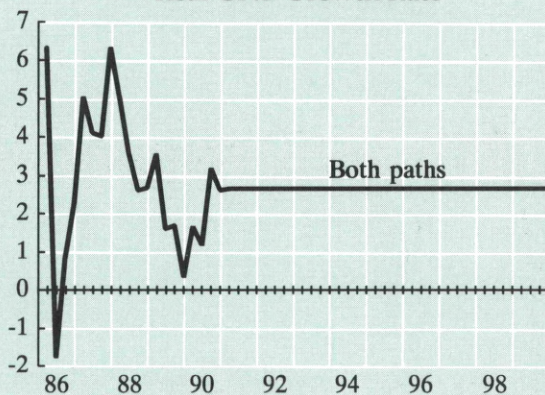
The steady-inflation path has a long-run inflation rate

of 4.5 percent, and real GNP grows at just over 3 percent (Figure 4). However, reducing inflation in this model is very difficult because it takes rising interest rates, not just high interest rates, to reduce GNP growth and inflation. On the disinflation path, raising short-term interest rates by 25 basis points each quarter (so that by 1999 the short-term interest rate is over 25 percent) reduces inflation to about 3.6 percent. Real GNP growth must be held below 2 percent

FIGURE 3
New Classical Model Results
Inflation Rate



Real GNP Growth Rate



permanently to achieve disinflation.¹⁹ The discounted value of the difference in real GNP from 1990 to 1999 is about 43 percent of 1990

GNP. Reducing inflation to zero would cost about five times as much, more than 200 percent of 1990 GNP.

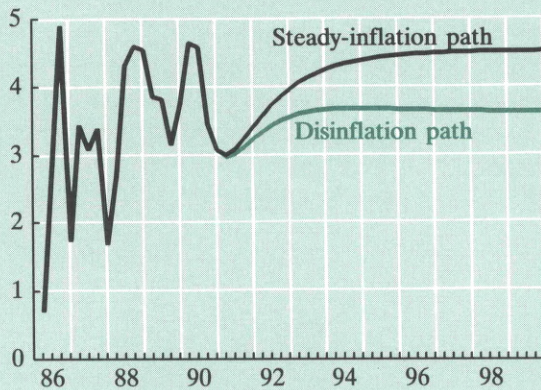
¹⁹Technically, this results because the only controllable variable that enters the inflation equation is lagged real GNP growth. In this model, even in the long run, there is a direct relationship between inflation and real GNP growth. So a permanent reduction in real GNP growth is required to reduce inflation permanently.

COMPARING COSTS AND BENEFITS

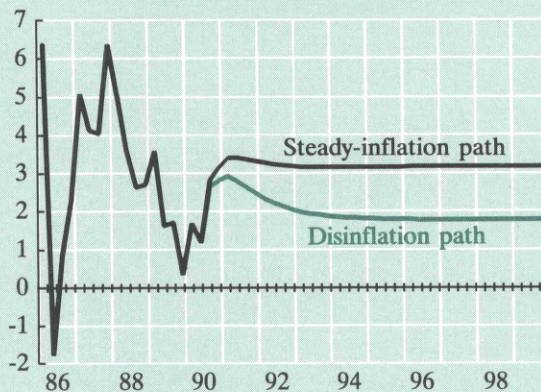
In a comparison of disinflation costs across the different models, the Monetarist-type model shows the lowest cost (actually a negative cost), the New-Classical-type model shows zero cost, the Keynesian-type model shows a high cost, and the PSTAR+ model shows a cost in between the high and low costs of the other models.

A major difference among the models, which has much to do with why they give very different costs of disinflation, is the theoretical basis for how inflation changes. The Monetarist-type and New-Classical-type models contain inflation equations that allow the inflation rate to be changed immediately with a change in money growth. There is very little inertia to inflation, so the policy prescription is simple: reduce the growth rate of the money supply promptly to reduce inflation. Furthermore, money supply growth can be reduced without major declines in real GNP. In the New-Classical-type model, there's no decline in real GNP at all, as long as the reduction in money supply growth is expected. And in the Monetarist-type model, a gradual reduction in money supply growth has only minor effects on real GNP growth.

FIGURE 4
Keynesian Model Results
Inflation Rate



Real GNP Growth Rate



At the other extreme is the Keynesian-type model. Its inflation equation contains a lot of inertia, so it takes sustained downward pressure on inflation to move it to a lower level. What's more, money growth can't directly affect inflation in the model; instead, inflation can be reduced only by reducing the growth rate of real GNP permanently. In this model, then, inflation reduction is extremely costly in terms of lost output. However, more recent Keynesian models that incorporate rational expectations and allow for credibility effects would likely show lower costs because such modifications permit faster, smoother adjustments of the economy to a change in monetary policy.

In the middle is the PSTAR+ model. There is a fair amount of inertia in its inflation equation. But inflation can be reduced in the long run by slowing money growth. Reducing money growth raises the federal funds rate, which reduces real GNP growth. The effect on real GNP is larger than in the Monetarist-type and New-Classical-type models but much smaller than in the Keynesian-type model.

How do the costs compare with the benefits? We guessed earlier that the benefits of reducing inflation from 5 percent to 0 percent were about 24 to 48 percent of 1990 GNP, although this is an imprecise estimate. This range of estimated benefits is obviously larger than the cost of disinflation in the Monetarist-type model (a negative cost) and the New-Classical-type model (zero cost). For the PSTAR+ model we found the costs of reducing inflation from 4.5 percent to 0 percent were 22 percent of 1990 GNP, so the costs of reducing inflation from 5 percent to 0 percent are likely to be about 25 percent of 1990 GNP. This is at the lower end of the range of benefits, so the benefits and costs of disinflation are close, but the benefits probably exceed the costs. In contrast, the benefits of disinflation are far lower than the costs in the Keynesian-type model (200 percent of 1990 GNP).

Is there any way for policymakers to decide

which model is best? The stagflation of the 1970s showed that many of the Keynesian models used at that time were inadequate, so Monetarist and New Classical models gained more acceptance. These more recent models of the economy have lower or no costs of disinflation. But the changing relationship between money and GNP in the 1980s has led economists to question the usefulness of these models as well. Perhaps hybrid models like the PSTAR+ model, which capture some elements of the competing theories, are more likely to be accepted. Since these models are fairly new, we need to see how they perform over time before we can confidently use them in evaluating monetary policy. Nevertheless, the thrust of economic research after the early 1970s has been on models that have lower costs of disinflation.

One critical issue that remains unresolved and that would help us assess the costs and benefits of disinflation is whether inflation affects the growth rate of the economy. If it does, then the Monetarist-type model is the most relevant because only in that model does lower inflation lead to greater economic growth. Furthermore, if lower inflation raises economic growth, the benefits of disinflation are very large and can justify any temporary cost.

Is there any convincing evidence that lower inflation raises the growth rate of GNP? A few studies, including a 1982 study by Peter Jarrett and Jack Selody of the Bank of Canada, as well as the one by Hakkio and Higgins discussed earlier, find that reducing inflation raises real GNP growth. But this result may arise not because inflation and GNP growth are directly related, but because the models were estimated using historical data that included the 1970s, when inflation was high and large oil price shocks reduced productivity and growth. The empirical literature surveyed in a recent article by Robert F. Lucas of the University of Saskatchewan suggests that inflation has *not* substantially affected real GNP growth in many countries over many time periods.

CONCLUSION

Is disinflation worth the price? Determining the costs of disinflation depends on the specific model of the economy one uses. The early econometric models of the economy were of the Keynesian type, in which the costs of disinflation are very large. Those economists who continue to use Keynesian models similar to the one discussed here are unlikely to be convinced that disinflation is worth the price. But more recent models of the economy, along with theoretical developments that suggest the economy can adjust more quickly and smoothly to changes

in monetary policy, indicate the costs of disinflation are much lower.

Determining which particular model of the economy is best for both explaining past events and forecasting the future is not easily resolved. Over time, as economists learn more about how the economy works, choosing among the alternative models and their estimated costs of disinflation should become easier. Because more recent models suggest that the costs of disinflation are not nearly as large as previously believed, support for disinflation has been growing.

REFERENCES

- Aiyagari, S. Rao. "Deflating the Case for Zero Inflation," Federal Reserve Bank of Minneapolis *Quarterly Review* (Summer 1990), pp. 2-11.
- Altig, David, and Charles T. Carlstrom. "Inflation, Personal Taxes, and Real Output: A Dynamic Analysis," *Journal of Money, Credit and Banking* 23 (part 2, August 1991), pp. 547-71.
- Ball, Laurence, and Stephen G. Cecchetti. "Inflation and Uncertainty at Short and Long Horizons," *Brookings Papers on Economic Activity* (1:1990), pp. 215-45.
- Barro, Robert J., and Mark Rush. "Unanticipated Money and Economic Activity," in *Rational Expectations and Economic Policy*. Chicago: University of Chicago Press, 1980, pp. 23-48.
- Croushore, Dean. "The Short-Run Costs of Disinflation," Federal Reserve Bank of Philadelphia Working Paper 91-8, March 1991.
- Fischer, Stanley. "Contracts, Credibility, and Disinflation," in Stanley Fischer, *Indexing, Inflation, and Economic Policy*. Cambridge, Mass.: MIT Press, 1986, pp. 221-45.
- Fischer, Stanley, and Franco Modigliani. "Towards an Understanding of the Real Effects and Costs of Inflation," *Weltwirtschaftliches Archiv* 114 (1978), pp. 810-33.
- Friedman, Benjamin M. "The Value of Intermediate Targets in Implementing Monetary Policy," in *Price Stability and Public Policy*. Federal Reserve Bank of Kansas City, 1984, pp. 169-91.
- Gordon, Robert J., and Stephen R. King. "The Output Cost of Disinflation in Traditional and Vector Autoregressive Models," *Brookings Papers on Economic Activity* (1:1982), pp. 205-42.

REFERENCES

(continued)

- Hakkio, Craig S., and Bryon Higgins. "Costs and Benefits of Reducing Inflation," Federal Reserve Bank of Kansas City *Economic Review* 70 (Jan. 1985), pp. 3-15.
- Hallman, Jeffrey J., Richard D. Porter, and David H. Small. "Is the Price Level Tied to the M2 Monetary Aggregate in the Long Run?" *American Economic Review* 81 (September 1991), pp. 841-58.
- Howitt, Peter. "Zero Inflation as a Long-Term Target for Monetary Policy," in Lipsey, Richard G., ed., *Zero Inflation: The Goal of Price Stability*. Ottawa, Ontario: C.D. Howe Institute, 1990, pp. 67-108.
- Jarrett, J. Peter, and Jack G. Selody. "The Productivity-Inflation Nexus in Canada, 1963-1979," *Review of Economics and Statistics* 64 (August 1982), pp. 361-67.
- Laurent, Robert D. "An Interest Rate-Based Indicator of Monetary Policy," Federal Reserve Bank of Chicago *Economic Perspectives* 12 (Jan./Feb. 1988), pp. 3-14.
- Lucas, Robert F. "The Case for Stable, But Not Zero, Inflation," in York, Robert C., ed., *Taking Aim: The Debate on Zero Inflation*. Ottawa, Ontario: C.D. Howe Institute, 1990, pp. 65-80.
- Meyer, Laurence H., ed. *A Comparison of the Predictive Performance of Small Macroeconometric Models*. Center for the Study of American Business Working Paper 78, April 1983.
- Meyer, Laurence H., and Robert H. Rasche. "On the Costs and Benefits of Anti-Inflation Policies," Federal Reserve Bank of St. Louis *Review* (Feb. 1980), pp. 3-14.
- Okun, Arthur M. "Efficient Disinflationary Policies," *American Economic Review* 68 (May 1978), pp. 348-52.
- Scarth, William. "Fighting Inflation: Are the Costs of Getting to Zero Too High?" in York, Robert C., ed., *Taking Aim: The Debate on Zero Inflation*. Ottawa, Ontario: C.D. Howe Institute, 1990, pp. 81-103.
- Sheshinski, Eytan. "Treatment of Capital Income in Recent Tax Reforms and the Cost of Capital in Industrialized Countries," in Summers, Lawrence H., ed., *Tax Policy and the Economy* 4. Cambridge, Mass.: MIT Press, 1990, pp. 25-42.
- Tatom, John A. "Energy Price Shocks in a Reduced-Form Monetarist Model," Federal Reserve Bank of St. Louis Working Paper 83-003 (1983).
- Taylor, Herb. "PSTAR+: A Model for Monetary Policy Evaluation," manuscript, 1991.

Banking and Commerce: A Dangerous Liaison?

*Loretta J. Mester**

Several of the proposals in last year's Treasury Department plan to reform the financial services industry made it into the FDIC Improvement Act passed by Congress at the end of 1991. But one of the more controversial provisions did not survive: a recommendation that commercial firms be allowed to own banks. Congress hasn't been the only group hard to

convince—a recent survey, conducted by CPA firm Grant Thornton, Chicago, of over 600 senior bank executives indicated that almost 70 percent were against commercial firms' owning banks. Why was this proposal hard to sell? And what are the costs and benefits of allowing banks and commerce to mingle?

The arguments for and against commercial ownership of banks are tied to the regulatory and deposit insurance structures. Without necessary changes to the current structures, the evidence suggests that the potential costs of allowing banking and commerce to mix out-

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weigh the potential benefits. But if recently enacted reforms work as expected, prohibitions against commercial firms' owning banks and vice versa will need to be reconsidered.¹

THE CURRENT LAW AND A BIT OF HISTORY

Current U.S. law prohibits commercial firms from owning banks and banks are prohibited from owning commercial firms. In general, banks are not allowed to engage in nonbank activities, and a bank holding company can own only 5 percent of the voting shares of any nonbank commercial corporation without regulatory approval.

The separation between banking and commerce goes all the way back to 1694, when the act establishing the Bank of England prohibited it from dealing in merchandise. There was no explanation for the prohibition, but according to researcher Bernard Shull, it might have been because merchants were suspicious that the Bank could exploit monopoly power granted to it by the Crown.² The earliest U.S. national banks followed the English tradition, so the separation has existed for nationally chartered banks in the U.S. since colonial times.

Despite this long history, there is some debate about how traditional the separation between banking and commerce actually is. While Congress may have intended to separate bank-

ing and commerce all along, it hasn't been entirely successful. Banks and firms have found ways of circumventing the policy. For one thing, individuals have always been allowed to own a controlling interest in both a bank and a commercial firm (as long as it isn't a securities firm). Also, some of the largest banks in the U.S. were state-chartered banks that actually grew out of commercial companies. The Bank of the Manhattan Company (later known as Chase Manhattan Bank) was created when New York state permitted Aaron Burr to establish a water utility company and a bank in 1799. The New York Chemical Manufacturing Company, founded in 1823, was granted banking powers in 1824.

Within a holding company structure, the Bank Holding Company Act of 1956 (BHCA) prohibited nonbank corporations from owning more than one commercial bank. But the main intention of the Act was to inhibit interstate banking rather than corporate ownership of banks. If a nonbank corporation owned only one bank, it could enter any business except securities. And there were many one-bank holding companies—W.R. Grace and Co., Macy's, and Goodyear all owned banks. Banks that converted to one-bank holding companies could own nonbank companies—for example, First National City (Citicorp) converted to a bank holding company in 1968 and entered many activities.³

In 1970 the BHCA was amended to close part of the one-bank holding company loophole by proscribing nonbanks from owning one bank and by tightening regulations on banks' "nonbanking" activities. Banks were permitted to perform only those activities that were closely related to banking and were beneficial

¹I am indebted to two articles that do an excellent job of presenting the pros and cons of mixing banking and commerce: A. Saunders, "The Separation of Banking and Commerce," New York University Salomon Center, Working Paper S-91-19, 1991, and T. Huertas, "Can Banking and Commerce Mix?" *Cato Journal* 7 (Winter 1988), pp. 743-62. Unlike me, both conclude the separation of banking and commerce should be ended.

²B. Shull has a nice historical piece, "The Separation of Banking and Commerce: Origin, Development, and Implications for Antitrust," *The Antitrust Bulletin* 28 (Spring 1983), pp. 255-79.

³R. Casey discusses the legislative history in "Banking-Commerce Ties: As American as Apple Pie," *United States Banker* 101 (January 1991), pp. 13-18.

to the public. But at the same time another loophole was opened up—Congress redefined “bank,” for the purposes of bank holding companies, to be an institution that makes commercial loans and accepts demand deposits. Banks that fulfilled one condition but not the other could be owned by any other corporation. Thus, “nonbank” banks emerged.

But in 1987 this nonbank bank loophole was closed by again redefining “bank” as any institution with FDIC deposit insurance or any institution that makes commercial loans and accepts demand deposits. Those nonbank banks already established were grandfathered with the restriction that their assets could not grow more than 7 percent in any 12-month period. There are many examples of nonbank banks: General Motors owns GMAC Mortgage Corporation, one of the largest mortgage banks; Ford Motor Company owns Associates National Bank, a credit card bank; IBM owns IBM Credit Corporation, which provides financing for other commercial firms; American Express owns three nonbank banks; and Sears, Roebuck and Company also owns several nonbank banks. Nonbank corporations are still permitted to own one thrift without growth restrictions—for example, Ford owns First Nationwide.

POSSIBLE BENEFITS OF COMMERCIAL FIRMS’ OWNING BANKS

Whatever Congress’s intent, there is historical precedent for commercial ownership of banks, and commercial firms are indeed interested in owning banks. Some firms that currently own nonbank banks would prefer to own commercial banks, which are able to fund loans with insured deposits: Sears would turn its nonbank banks into full-service commercial banks if allowed, and American Express claims that it could perform its business more efficiently if the separation of banking and commerce were ended.⁴ Presumably, this interest in owning banks stems from the firms’ belief that they could earn a better return if they

invested in banking rather than other types of activities. But will permitting commercial ownership of commercial banks be in society’s best interests?

Advocates of allowing the mix cite several social benefits such as a reduction in the number of bank failures or lower costs of producing bank and commercial products.⁵ If U.S. banks were able to become more competitive with nonbank providers of financial services and with foreign banks, then the safety and soundness of the U.S. banking system would be improved. While these benefits potentially exist, the evidence concerning their magnitude isn’t very compelling.

Additional Capital. The U.S. banking industry is going through tough times. Bank failures are at their highest level since the Depression, and regulators have increased banks’ capital requirements. Since capital serves as a cushion for loan losses at banks, extra capital lowers the expected cost to the FDIC—and so to the taxpayer—of bank failures. Increasing the capital requirements can also reduce a bank’s taste for excessively risky activities by raising the amount bank owners have at stake.

One potential benefit of allowing commercial firms to own banks is that by expanding the field of owners, new capital might be brought to the banking industry. While this is true, it isn’t clear that additional capital is needed at the industry level—just because individual banks may be undercapitalized doesn’t mean the banking system as a whole is. Consolidation within the industry, which is beginning to happen now, will probably yield enough capital to enable the remaining banks to meet their

⁴See S. Zuckerman, “As Washington Dithers, Nonbanks Advance,” *American Banker* 156 (March 15, 1991), p. 1.

⁵See A. Saunders, “The Separation of Banking and Commerce,” and T. Huertas, “Can Banking and Commerce Mix?”

capital requirements.⁶ And the commercial firms most interested in banking probably would expand their own bank-like operations rather than buy existing full-service banks if permitted to do so. This would increase the number of commercial banks, but not the amount of capital in the industry relative to assets.

Cost Synergies. Another widely claimed benefit for permitting commercial firms to own banks is that the combination may lower the cost of providing services through scale or scope economies. If the average cost of producing financial services falls as the scale of operations increases, then large banks operate more efficiently than small banks. To the extent that commercial firms could bring additional capital into the banking industry to support larger institutions, allowing commercial firms to own banks could lead to more efficient production if there are significant economies of scale in banking.⁷ Similarly, combining commercial products with financial products might lower the cost of production if, for example, inputs are shared across the products. For instance, a manufacturing firm and a bank might be able to use the same computer to keep track of inventory and accounts. If such scope economies exist, then again it would be more efficient to allow banks and commercial firms to mix. And a move toward more efficient production would benefit society by freeing up resources for other productive activities.

While theoretically there are potential synergies between banking and commerce, the evidence to date suggests they probably aren't very significant. Most studies of scale econo-

mies in banking suggest that they are exhausted at banks of a relatively small size (at around \$100 million in deposits), or if present in larger banks, they are slight.⁸ Most studies find no evidence of scope economies between different bank products, such as commercial loans and consumer loans. Since banking and commerce have for the most part been separated, there isn't much in the way of empirical evidence on cost synergies between commercial activities and bank products. However, in a 1992 empirical study, I found diseconomies of scope between traditional commercial bank activities and nontraditional activities of loan selling and buying, which resemble investment banking activities.⁹ Thus, the evidence doesn't support the view of significant cost savings from combining banking and other activities.

Revenue Synergies. It may be that consumers would prefer one-stop shopping to save on transactions and search costs. Combining banking and commerce may yield enhanced revenue through cross-marketing of bank products and commercial firm products. There is some evidence of this—for example, many people get their financing for a new car at the dealership. But there don't seem to be significant revenue synergies or cost synergies—if there were, we'd expect to see higher profits at firms that can provide both commercial and financial activities. While competitive with commercial banks, nonbank banks have not really outpaced them. A study by Linda Aguilar, which compared large bank holding companies with nonbank banks, showed that nonbank banks' market share of finance receivables fell between 1982 and 1987, while that of bank

⁶As of December 1991, the ratio of total tier-one capital to total assets for all domestic banks was 6.6 percent, well over the required 3 percent.

⁷If banking and commerce were permitted to mix, it would be within a holding company structure, and the average asset size of banks within multibank holding companies is over 10 times that of independent banks.

⁸See L. Mester, "Production of Financial Services: Scale and Scope Economies," this *Business Review*, January/February 1987, pp. 15-25, for a review of the literature.

⁹See L. Mester, "Traditional and Nontraditional Banking: An Information-Theoretic Approach," *Journal of Banking and Finance*, forthcoming 1992.

holding companies increased. And nonbank banks have begun to experience problems with loan portfolios and profits just as banks have.¹⁰

Increased International Competitiveness. Other countries tend to be more liberal in allowing banking and commerce to mix. (See

Banking and Commerce Arrangements in Other Countries.) So to the extent that commercial and banking mixes are more efficient, U.S. banks would be at a disadvantage compared with foreign banks. But the evidence suggests that while U.S. banks are no longer on top in terms of asset or capital size, they still outperform foreign banks. According to a report by IBCA Limited, in 1990 only two U.S. banks ranked in the world's top 50 by asset size, but their average return on assets and return on equity were

¹⁰See L. Aguilar, "Still Toe-to-Toe: Banks and Nonbanks at the End of the '80s," *Economic Perspectives*, Federal Reserve Bank of Chicago, January/February 1990, pp. 12-23.

BANKING AND COMMERCE ARRANGEMENTS IN OTHER COUNTRIES

Germany: Universal banking exists here—banks can perform commercial and investment banking activities directly (no holding company structure is required) and insurance and real estate activities via subsidiaries; banks can own commercial firms directly (but in practice their ownership is small); commercial firms can own banks (but few do, given the regulations they must meet).

United Kingdom: Clearing banks, including Barclays, Lloyds, Midland, and National Westminster, engage in commercial and investment banking, and in merchant banking, insurance activities, and real estate activities via subsidiaries; there is no formal policy separating banking and commerce, but tradition has encouraged it by restraining bank investments in nonfinancial firm equity, and such investments are not common; the Bank of England must approve firms taking a 15 percent or greater stake in a U.K. bank, and individuals who own more than a 5 percent stake in a U.K. bank must report it to the Bank of England.

Japan: The banking system here was modeled on the U.S. system after World War II, and commercial and investment banking were separated then; Japanese banks can perform commercial bank activities and have minority ownership (5 percent or less) in subsidiaries that perform leasing, insurance, credit card business, and management consulting; until 1987, banks could hold up to 10 percent of the outstanding shares in any company, but through cross-holdings could effectively hold much more; a bank can be a main bank in keiretsu (a conglomerate group) and so have large ties to commercial firms.

The EEC: As of 1992, banks are allowed to do commercial and investment banking activities but not insurance activities; a bank is limited to 10 percent of its own equity as a stake in an individual commercial firm, with the total stake in commercial firm equity not to exceed 50 percent of bank capital; commercial firms may own banks if such action is considered suitable by the national regulator.

Sources: A. Saunders, "Separation of Banking and Commerce," New York University Salomon Center, Working Paper S-91-19, 1991, and A. Daskin and J. Marquardt, "The Separation of Banking from Commerce and the Securities Business in the United Kingdom, West Germany and Japan," *Issues in Bank Regulation* 7 (Summer 1983), pp. 16-24.

higher than those of foreign banks ranked in the top 50 by asset size. And when banks were ranked in terms of IBCA's real profitability index (return on equity adjusted for inflation and differences in equity-to-assets ratios), the U.S. accounted for 16 of the top 50 banks, more than any other country.¹¹ So the current separation of banking and commerce in the U.S. doesn't appear to be too much of a burden on U.S. banks.

Lower Risk of Failure. Allowing a firm to diversify into financial services and commercial production might lower the firm's risk. This would happen if profits in the commercial line of business could be used to offset losses in the financial services line of business. Lower risk would benefit society, since it would mean fewer bank failures.

The empirical evidence on such diversification benefits is mixed.¹² In one study, Anthony Saunders and Pierre Yourougou found that there is a potential for lower risk via diversification because when returns on bank stock are low, returns on commercial firm stock tend to be high, and vice versa.¹³ In another study, Robert Eisenbeis and Larry Wall found that when the returns for commercial banks are high, the returns to general merchandise stores are low, and vice versa.¹⁴ So potentially, a firm could combine banking and commerce to

achieve a less volatile total return and so be less likely to fail. But a study by John Boyd and Stanley Graham and another by these authors and R. Shawn Hewitt found that allowing bank holding companies to expand into the nonbanking activities of securities or real estate development increases the probability of failure and the volatility of the holding company's returns.¹⁵ Eisenbeis and Wall's study found that returns for commercial banks and returns for food stores are positively correlated.

Even if the potential for diversification benefits exists, it isn't clear that the management of a bank-commercial holding company would choose to diversify in ways that reduce risk. The current fixed-rate deposit insurance system and the regulatory system, which has been slow to close insolvent banks, encourage banks to take on too much risk. A bank's equity holders get all the upside benefits if the risk pays off, but they don't pay more for taking on more risk. Banks currently pay the same insurance premium regardless of the riskiness of their portfolios, and while bank supervision is supposed to control risk-taking, it hasn't been that successful. Insured depositors have no incentive to monitor a bank's risk-taking, since they are paid off whether the bank fails or not. And 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 when a large bank fails.¹⁶

¹¹See IBCA Limited, *Real Banking Profitability*, November 1991.

¹²See A. Saunders, "The Separation of Banking and Commerce," for a more detailed review of this empirical evidence.

¹³A. Saunders and P. Yourougou, "Are Banks Special: The Separation of Banking From Commerce and Interest Rate Risk," *Journal of Economics and Business* 42 (May 1990), pp. 171-82.

¹⁴R. Eisenbeis and L. Wall, "Risk Considerations in Deregulating Bank Activities," *Economic Review*, Federal Reserve Bank of Atlanta, May 1984, pp. 6-19.

¹⁵J. Boyd and S. Graham, "The Profitability and Risk Effects of Allowing Bank Holding Companies to Merge with Other Financial Firms: A Simulation Study," *Quarterly Review*, Federal Reserve Bank of Minneapolis, Spring 1988, pp. 3-20. And J. Boyd, S. Graham, and R. S. Hewitt, "Bank Holding Company Mergers with Nonbank Financial Firms: Effects on the Risk of Failure," Working Paper 417, Federal Reserve Bank of Minneapolis, January 1992.

¹⁶See L. Mester, "Curing Our Ailing Deposit Insurance System," this *Business Review*, September/October 1990, pp. 13-24, for a discussion of reforming federal deposit insurance.

Under recently implemented risk-based capital standards, banks are required to hold more capital against riskier assets. While a move in the right direction, the risk-based capital requirements are not a complete remedy to excessive risk-taking on the part of banks, since the four risk categories considered are very broadly defined—for example, all commercial and industrial loans are assigned to the same risk category. The recently passed FDIC Improvement Act includes changes to remedy some of the risk-distorting problems in the current system. But several of these changes won't be implemented immediately. (The FDIC will be required to charge different insurance premiums based on the riskiness of the bank, but risk-based premiums don't have to begin until 1994. Recently, however, the FDIC announced that it plans to implement risk-based premiums next year.) Until the changes are made, banks will still have the incentive to take on more risk than is best for society.

POSSIBLE COSTS

Opponents of allowing banking and commerce to mix cite the concentration of resources this would entail and the risks posed to the "safety net," which includes the deposit insurance system, the electronic payments system, and borrowing at the discount window. Most of these costs apply not only to allowing commercial firms to own banks but also to any expansion of a bank's permitted activities. We have heard the safety net arguments before in the debate about whether banks should be permitted to underwrite securities.¹⁷ The difference here is that if commercial firms were allowed to own banks, a new set of firms would become part of the financial services system. The banking system has been undergoing a

restructuring that has required regulatory reform to stem abuses. Until the restructuring and reform are complete, it may make sense to delay extending the system. This is perhaps the best argument in favor of the status quo for the time being; other arguments against mixing banking and commerce just aren't as strong.

Monopoly Power. One argument for disallowing the entrance of commercial firms into banking is that it may end up concentrating banking in the hands of a few large corporations. These large commerce and banking conglomerates would exploit their monopoly power, so the argument goes, harming their corporate competitors by denying them the credit they need to do business and harming consumers by offering low deposit rates and high loan rates. Moreover, consumers wishing to purchase just the banking or just the commercial product from the conglomerate might be forced to purchase the other product as well.

Again, the empirical evidence on economies of scale and scope can be brought into the argument, but this time against this potential cost. There is little evidence that the banking industry would become monopolized if commercial firms could own banks. None of the scale and scope studies suggest that banking services could be most efficiently produced with a very few large banks. While commercial ownership may allow banks to grow larger and may lead to some consolidation in the industry, it is unlikely to lead to overconcentration. Even in smaller local markets there is likely to be a number of banks competing for business (especially since there are already bank regulations that guard against monopolization). And global competition would help keep the industry competitive.¹⁸

As corporations would have access to other banks and to nonbank credit sources such as the

¹⁷See A. Saunders, "Securities Activities of Commercial Banks: The Problem of Conflicts of Interest," this *Business Review*, July/August 1985, pp. 17-27.

¹⁸See A. Saunders, "The Separation of Banking and Commerce," for a discussion of this point.

commercial paper market, the commercially owned bank couldn't effectively restrict credit to its competitors. Consumers would also be able to get loans or make deposits at other institutions, and tie-ins wouldn't be a problem as long as the firm was not a monopolist in the market for its commercial product. (If it was, then the antitrust laws could be used to curb any anticompetitive problems.) In fact, experience from the nonbank banks already suggests that tie-ins wouldn't be a problem. All three finance subsidiaries owned by the U.S. automakers, for example, make loans for their competitors' products.¹⁹

Other arguments against mixing banking and commerce are not as easy to dismiss as the monopoly power argument, at least until financial system reforms are completed.

Extending the Problem of "Too-Big-to-Fail." Because failures of large banks could potentially disrupt the payments system, regulators often treat these failures differently from failures of small banks. Despite an explicit insurance ceiling of \$100,000 per deposit, the FDIC often, de facto, insures the large depositors and uninsured creditors of large banks and so bears most of the cost of excessively risky actions by these banks. This gives large banks an incentive to take on more risk than they would otherwise. The recently enacted FDIC Improvement Act will curb some of the problem by restricting the FDIC's ability to protect uninsured depositors or creditors if it would mean a loss to the insurance fund. But the provision won't take effect until 1995, and market participants will have to see some large banks actually fail before they believe "too-big-to-fail" is truly dead. Until then, expanding the size of banks, which is likely to occur at least to some extent under commercial ownership, may be costly.

Increased Risk From Affiliate Transactions.

Although some argue that allowing commercial firms to own banks would lower risk, others claim it would raise risk, lead to more bank failures, and increase the FDIC's costs. If a commercial firm persuades a bank it owns to pay very large dividends or management fees to the commercial firm owner or even make loans to prop up the owner, the bank could be weakened at the benefit of the commercial owner. The bank would also suffer if the owner could make the bank purchase low-quality assets from other affiliates.²⁰ In this way the commercial holding company would be able to take advantage of the bank's creditors and the FDIC, since the holding company would have limited liability if the bank failed.

How likely are these scenarios? Two strategies regulators have for dealing with potential conflicts of interest between the holding company and its banks are "firewalls" and the "source-of-strength" doctrine.

Firewalls. Current provisions of the Federal Reserve Act (Sections 23A and 23B) limit transactions between affiliates. Section 23A limits loans to an affiliate to 10 percent of the bank's capital, and loans to all affiliates combined to 20 percent of capital. And these loans must be fully collateralized. Section 23B restricts all interaffiliate transfers to be on the same terms as those with nonaffiliates—in other words, to be arm's-length transactions.

In general, these restrictions seem to be working. But the question is whether these firewalls will be disregarded in times of stress and whether they will need to be strengthened if commercial firms are permitted to own banks. Even with currently permitted activities, the firewalls have crumbled at times. Continental Illinois extended loans to its options subsidiary over agreed-to limits when the subsidiary got

¹⁹T. Paré, "Tough Birds That Quack Like Banks," *Fortune*, March 11, 1991, pp. 79-84.

²⁰See A. Saunders, "The Separation of Banking and Commerce," for more on these types of transfers.

into trouble during the October 1987 stock market crash. Hamilton National Bank of Chattanooga failed in 1976 after an illegally large amount of poor-quality real estate loans was transferred from its mortgage bank affiliate to the commercial bank.²¹

Restrictions on transactions between a bank and its owner or affiliates are hard for regulators to enforce, since they have less information than the bank or its holding company. It's difficult for a regulator to determine whether the management fees paid by a bank are excessive or whether the transactions are on terms fair to the bank. Perhaps all transactions between a bank and its nonbank affiliates could be banned to stem possible abuses, but if the firewalls are strengthened too much, any potential synergies and benefits of product diversification would be defeated.²²

Source of Strength. Another way the Federal Reserve, regulator of bank holding companies, has chosen to alleviate potential conflicts of interest between a bank and its affiliates is the "source-of-strength" doctrine. Under this policy, a bank holding company must serve as a source of financial strength to its subsidiary banks and must have adequate capital itself. The rationale runs this way: if the holding company knows its funds would be used to prop up its bank in trouble, then it would have no incentive to move funds from the bank to the holding company. Although the FDIC Improvement Act moves toward Congressional

authorization of the source of strength doctrine (see *The Source-of-Strength Doctrine*, pp. 26-27), the courts have not been very receptive to it, since this doctrine runs counter to the concept of corporate separateness. A premise of corporate law is that each affiliate of a holding company is a separate corporate entity with limited liability: if one affiliate gets into trouble, the resources of another don't need to prop up the failing affiliate.

Extending the Deposit Insurance Subsidy. Even if they didn't weaken the bank, transactions between a bank and its corporate parent would still need to be controlled to prevent the FDIC from subsidizing the risky activities of commercial firms. Until the new provisions of the FDIC Improvement Act take effect, banks can continue to invest in risky activities without paying a risk premium for their funds. If commercial firms had access to bank deposits by affiliate transactions, then the deposit insurance subsidy would be extended to the owners, creditors, and customers of the commercial firm. To prevent this, regulators would have to tighten firewalls or keep a close eye on the risky activities of the holding company until the subsidy is removed by reform of the deposit insurance system. Of course, such extended regulation may make bank ownership unpalatable to commercial firms.

Contagion From Affiliates to Bank. Even without the source-of-strength doctrine, evidence suggests that the market views a bank holding company as a single corporate entity, and indeed, holding companies tend to behave this way. Management studies suggest that the management of a parent and its subsidiaries is usually centralized, and banks have acted to prop up ailing affiliates even when under no legal obligation.²³ Last year, when rating agen-

²¹See A. Cornyn, G. Hanweck, S. Rhoades, and J. Rose, "An Analysis of the Concept of Corporate Separateness in BHC Regulation from an Economic Perspective," *Proceedings of a Conference on Bank Structure and Competition*, Federal Reserve Bank of Chicago (May 1986), pp. 174-212.

²²The FDIC Improvement Act calls for the Federal Reserve Board to prescribe standards, effective in a year, to limit the risks posed by a bank's exposure to another bank via interbank transactions, such as credit extensions, interbank deposits, and purchases of securities.

²³In the mid-1970s, banks put funds into the real estate investment trusts they sponsored when the REITs got into trouble.

The Source-of-strength Doctrine

Although the Fed has followed a source-of-strength policy since the Bank Holding Company Act was enacted in 1956, the doctrine became official only in 1983. According to Regulation Y:

"A bank holding company shall serve as a source of financial and managerial strength to its subsidiary banks and shall not conduct its operation in an unsafe or unsound manner."

As explained in an April 1987 policy statement, the rationale behind the policy is as follows:

"A bank holding company derives certain benefits at the corporate level that result, in part, from the ownership of an institution that can issue federally insured deposits and has access to Federal Reserve credit."

The Supreme Court was expected to rule on the validity of the Fed's source-of-strength doctrine when it considered the case of MCorp, a Texas-based bank holding company, during its 1991-92 session. After 20 of MCorp's 25 subsidiary banks failed in 1989, the Fed charged that MCorp had failed to act as a source of strength to its remaining subsidiary banks. The case reached the Fifth Circuit Court of Appeals, which ruled that the Fed had no authority to assert the source-of-strength doctrine under the Bank Holding Company Act and could not order the holding company to transfer funds downstream to troubled subsidiary banks. On December 3, 1991, the Supreme Court overturned the Appeals Court's decision but did not rule on the validity of source of strength. Instead, the Court decided the case on the grounds of jurisdiction, ruling that the federal courts cannot block Fed proceedings before the agency issues a final order. The Court indicated that MCorp can still challenge the source-of-strength doctrine after the Fed completes its enforcement actions.

The Federal Deposit Insurance Corporation Improvement Act of 1991 moves toward Congressional authorization of source of strength. An undercapitalized bank is required to adopt an

acceptable capital restoration plan, and the bank's holding company must guarantee compliance with the plan. The holding company liability is limited to the lesser of 5 percent of the bank's total assets at the time the bank became undercapitalized or the amount necessary to bring the bank into compliance with its capital requirement as of the time the bank falls out of compliance with its recapitalization plan.

Several arguments have been made against the Fed's source-of-strength doctrine. The policy would seem to run counter to the idea that insolvent banks should be closed as soon as possible to limit the FDIC's losses. To avoid this inconsistency, the policy could be amended to make the bank holding companies legally liable for any losses incurred by the FDIC in closing or liquidating their banks, but not force the holding companies to recapitalize their troubled banks to keep them open*.

Another potential problem is that the policy may deter corporations, once they are permitted to do so, from investing in banks or deter bank holding companies from diversifying into nonbank activities. However, if the diversification reduces risk, then the risk-based insurance premiums and capital requirements for the well-diversified firm would be lower, encouraging the diversification.

A third problem with the policy is that it runs counter to the idea of corporate separateness. By encouraging the market to treat a holding company and a bank as a single entity, the policy might increase the potential for contagion.

*This was suggested in the House Government Operations Committee 1987 report. Under a cross-guarantee provision of the Financial Institutions Reform, Recovery, and Enforcement Act of 1989, when a depository institution in a holding company fails, the other depository institutions in the holding company can be required to reimburse the FDIC for any losses it incurs in resolving the failed institution. However, the FDIC can waive these cross guarantees. See W. Keeton, "Bank Holding Companies, Cross-Bank Guarantees, and Source of Strength," *Economic Review*, Federal Reserve Bank of Kansas City, May/June 1990, pp. 54-67.

cies lowered Chrysler Corporation's debt rating, Chrysler Financial's credit rating was lowered too. If the market views management as being the same, then it would view problems in one affiliate as signaling problems in other affiliates. This is a problem when one of the affiliates is a bank because troubles in nonbank affiliates may cause depositor runs at the bank, which would jeopardize the payments system. Runs on individual banks are costly if they result in the failure of an otherwise healthy bank, and they are even more dangerous if they are contagious, causing depositors to lose all confidence in the banking system itself.

We have evidence of the first type of run. In 1973, Beverly Hills Bancorp, parent of Beverly Hills National Bank, defaulted on its commercial paper, causing large-scale runs on the bank,

which led to its failure. More recently, Sunbelt Bank and Trust failed in 1984 after some of its nonbank affiliates failed.²⁴ Less evidence of contagious bank runs exists, but the savings and loan crises in Maryland and Ohio are examples.²⁵ And Continental Illinois' troubles

²⁴Both examples are from A. Cornyn, et al.

²⁵In March 1985, news of losses at Home State Savings Bank in Cincinnati caused a run at the bank. When the private state insurance fund that insured Home, the Ohio Deposit Guarantee Fund, was unable to bail out Home's depositors, the run spread to other S&Ls insured by this private fund. A similar panic occurred in Maryland in May 1985. When losses at two S&Ls exceeded the reserves of the private Maryland Savings-Share Insurance Corporation which insured them, depositor runs began at other institutions insured by this fund.

in the spring of 1984 raised the insolvency risk of other banks by raising their cost of obtaining large CDs and Eurodeposits.²⁶

To use contagion effects as an argument against *commercial firm* ownership of banks presumes that commercial firms are more likely to fail and so more likely to threaten an affiliate bank than a financial firm affiliate would be. Though this could be true, the evidence is weak. Corporate bond defaults for commercial firms have not been higher than those for finan-

²⁶See A. Saunders, "Bank Holding Companies: Structure, Performance, and Reform," pp. 156-202 in *Restructuring Banking and Financial Services in America*, W. Haraf and R. Kushmeider, eds. (American Enterprise Institute: Washington, D.C., 1988).

cial firms. But having a large parent hasn't prevented some securities firms from having more trouble than their smaller, independent siblings.²⁷

Contagion From Affiliates to the Electronic Payments System. If problems in a nonbank affiliate cannot be isolated from the bank, they may be transmitted to the electronic settlements system, which is becoming an increasingly important part of the payments system. At any point during the day, a bank may have transferred more money out of the settlements system than it has received. These daylight

²⁷W. Power, "Struggling Securities Firms Increasingly Being Bailed Out by Their Rich Owners," *Wall Street Journal*, November 14, 1990, p. C 7.

overdrafts, which currently exceed \$140 billion a day, pose a risk to the financial system, since the failure of one bank to settle its position could start a chain reaction in which the creditors of the first bank are pushed into net debit positions and eventual default, which causes its creditors to default and so on down the line. To avoid the reaction, the Fed would need to intervene and assure payments to all involved. The potential losses for the Fed would be large. In effect, the Fed would be rescuing the affiliated bank, and indirectly its troubled corporate owner, to the extent that funds given to the bank could be transferred to the parent.

One way to protect the payments system is to control overdrafts. Plans for doing so exist, but they have not yet been fully implemented. In 1986, the Fed began a program in which banks set voluntary caps on their intraday credit exposure on the Fed's electronic settlements system. In 1989, the Fed proposed to price these daylight overdrafts and will probably start charging banks for their overdrafts sometime in 1993. Until the programs for controlling payments-systems risk are up and running and can be evaluated, the potential exists for problems in nonbank affiliates to spread to the payments system. This is true for all nonbank affiliates, not just commercial affili-

ates. But extending ownership of banks to commercial firms would involve a possible extension of the safety net to commercial firms, and is probably cause to delay corporate ownership of banks.

CONCLUSIONS

Although included in the Treasury's proposal to reform the financial services industry, commercial firm ownership of banks did not make it into the recently passed FDIC Improvement Act. I have examined several arguments for and against commercial ownership of banks. Similarly, bank ownership of commercial firms is also arguable. (See *Should Banks Own Commercial Firms?*) In many cases, validity of these arguments depends on the ability of regulators to control possible abuses of the financial system by its participants. Without necessary changes to the current system, the potential costs of allowing banking and commerce to mix outweigh the potential benefits. However, as the reforms contained in the new banking act, such as risk-based deposit insurance premiums and limits on "too-big-to-fail," are implemented, the prohibitions against commercial firms' owning banks and vice versa will need to be reconsidered.

Should Banks Own Commercial Firms?

Currently, banks are not allowed to engage in nonbank activities. Bank holding companies can hold, at most, 5 percent of the shares of any nonbank commercial corporation and cannot simultaneously lend to a commercial firm and hold its equity. As with commercial firm ownership of banks, a cost-benefit analysis suggests it would be prudent to wait until the FDIC Improvement Act's reforms to the financial services industry are in place and working before considering bank ownership of commercial firms.

Potential Benefits. Some argue that allowing banks to own equity would lower the firm's funding costs and benefit society by permitting more investment and economic growth. If a bank owns equity in a firm it has lent to, then it is less likely to force the firm into bankruptcy when it encounters temporary financial problems, because equity ownership gives the bank a share of the upside gain should the firm turn around in the future. Since the firm's chance of bankruptcy would be lower, the firm's debtors would charge a lower risk premium, and the firm would thus pay less to fund its activities.

Equity ownership would also make the bank an insider and so privy to more information than outside lenders would have. This would make it easier for the bank to monitor the firm, and it would pass along some of its cost savings to the firm in the form of a lower loan rate. Also, being an insider, the bank would have a greater say in the management of the firm. In the event the firm does fail, the actual bankruptcy costs would be lower, since the assets of the firm needn't change hands.

Some empirical evidence supports this view. Albert Ando and Alan Auerbach found that in Japan, where banks have been allowed to hold large equity positions in commercial firms, the cost of capital may have been as little as half of that in the U.S. in the 1967-88 period.^a And according to Sun Bae Kim, large Japanese firms avoid bankruptcies in situations that would have meant bankruptcy in the U.S., and when bankruptcy does occur, reorganizations are less disruptive than in the U.S.^b

Potential Costs. The danger of allowing banks to own equities stems from equities' being riskier investments than debt. Extending the set of permissible activities to include riskier ones increases banks' opportunity to take on too much risk, which will continue to be a problem until recent reforms have an impact.

Also, unless the banks have some kind of expertise in the businesses they own, being an insider may not be beneficial.

^aA. Ando and A. Auerbach, "The Cost of Capital in Japan: Recent Evidence and Further Results," *Journal of the Japanese and International Economies* 4 (1990), pp. 323-50.

^bS. Kim, "Banking and Commerce," *Weekly Letter*, Federal Reserve Bank of San Francisco, March 29, 1991.



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