

# The U.S. Experience with a Federal Central Bank System

Adapted from a presentation made by President Santomero at the Oesterreichische Nationalbank's 30<sup>th</sup> Economics Conference, "Competition of Regions and Integration in the EMU," Vienna, June 13, 2002

BY ANTHONY M. SANTOMERO

**H**ow does a decentralized central bank work? The events of September 11 put the Federal Reserve System, the central bank of the United States, to the test and highlighted the benefits of its geographic diversification. In his quarterly message, President Santomero presents an overview of the Federal Reserve's design and explains how it helps the Fed carry out its various roles, including formulating monetary policy, regulating financial institutions, and keeping the payments system running.

The events of September 11, and the days and weeks that followed, put many aspects of the U.S. financial system to the test and demonstrated its resiliency. At the Federal Reserve, our response to those events was a coordinated effort across all areas of responsibility and across the entire Fed System. We kept the payments system operating, provided access to credit for affected banking institutions, and implemented aggressive monetary expansion. The Fed's ability to feel the pulse of financial activity across the country, operate in multiple locations, and coordinate its efforts to ensure financial stability is a testimony to its present, geographically diversified organizational design. In this message, I'd like to present an overview of that design and explain how it helps the Federal Reserve perform its roles as the central bank of the United States.

As the central bank, the Federal Reserve controls the monetary base of the economy to affect interest

rates and inflation; it provides liquidity in times of crisis; and it ensures the general integrity of our financial system. I believe the Federal Reserve's decentralized structure has been a positive force in the U.S. economy. It has proved a vital, and indeed very practical, structure for our central bank. Throughout the Fed's history, decentralization has provided the local context and contact necessary for effective policymaking.

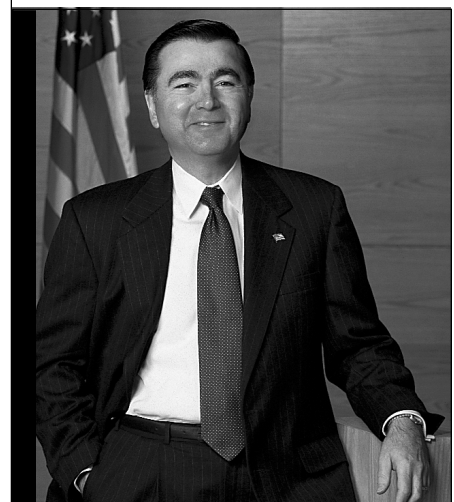
A key to the success of our decentralized structure is its flexibility. To be sure, there is no single model that works everywhere or all of the time. In fact, it is just the opposite. The structure of a central bank must fit the economic and political realities of the time, or it will not survive. It must evolve in response to the unique features of the economy it serves. This adaptation is a constant challenge with new twists and turns along the way.

## THE ESTABLISHMENT OF DECENTRALIZED CENTRAL BANKING IN THE U.S.

In 1913, the U.S. Congress established the Federal Reserve System to serve as the central bank. The System comprised 12 independently incorporated Reserve Banks spread across the United States, operating under the supervision of a Board of Governors in Washington, D.C.

Why did the central bank come along so late in the economic history of the United States? Moreover, why was it given such a decentralized structure?

The answers to these questions are interconnected. In fact, the United States had made two previous attempts to establish a central bank. The First Bank of the United States was established in 1791, and the Second Bank of the United States was established in 1816. Congress gave each an initial 20-year charter. Yet, neither was able to



**Anthony M. Santomero**, President,  
Federal Reserve Bank of Philadelphia

muster the political support to have its charter renewed. Therefore, the United States spent most of the 19th century without a central bank.

By the early 20th century, a series of financial panics and economic recessions further demonstrated the need for a central bank. It became widely recognized that the nation required a more elastic supply of money and credit to meet the fluctuating demands of the marketplace. It also needed a more efficient infrastructure for transferring funds and making payments in the everyday course of business, particularly by check.

While the need for a central bank was clear, so were the reasons to be wary of one. Many people, particularly small-business owners and farmers across the South and West, were concerned that a central bank headquartered “back East,” in either the financial center of New York City or the political center of Washington, D.C., would not be responsive to their economic needs.

In some sense, this was a replay of the broader governance issue the United States wrestled with from the

beginning of its short national history. The 13 colonies saw the need to bind together and form a nation, but they were wary of ceding power to a national government. It was out of that tension that the federal government of the United States was forged in Philadelphia with the establishment of the U.S. Constitution.

The Constitution provided for the establishment of a federal government that acknowledged and preserved the rights of the states, and a system of checks and balances within the federal government. In this way, power was not unduly concentrated in any one individual or group.

To galvanize the necessary political support to establish a central bank, President Woodrow Wilson and Congress drew on the now familiar model of a federal structure. That structure, embodied in the Federal Reserve Act of 1913, essentially remains intact today.

Overseeing the System is a seven-member Board of Governors appointed by the President of the United States and confirmed by the

United States Senate. The 12 Reserve Banks, spread across the country from Boston to San Francisco, each serve a defined geographic area, or District. Each Reserve Bank is overseen by its own local board of directors, with some elected by the local District banks and some appointed by the Board of Governors in Washington. Each Reserve Bank’s board of directors selects a president, in consultation with the Board of Governors, who serves as CEO and chief operating officer.

Our founders’ original vision was that the “central” in the central bank would be minimized. That is, the Reserve Banks would be relatively autonomous bankers’ banks providing a full array of services to the banks operating in their Districts. The Reserve Bank would extend credit directly to District banks with short-term liquidity needs on a collateralized basis through rediscounting. Banks would also maintain reserve accounts at their Federal Reserve Bank and use those accounts to clear checks, move funds, and obtain currency for their customers.

Of course, the original vision of self-contained regional banks began to erode almost as quickly as the System was established. Technological change and the dynamics of the marketplace were driving the U.S. economy, particularly its financial and payments systems, into a more fully integrated entity. The Federal Reserve System would have to integrate the activities of its various components as well. Indeed, this is exactly what has happened in the Fed over the course of its history and what continues to happen today.

This integration has occurred on all levels, from making policy decisions to managing backroom operations. It occurs through all of our central bank lines of business — monetary policy, bank supervision and regulation, and payment system support.

Yet, the integration continues to evolve within the context of the



“federal” structure established almost 90 years ago. I consider this a testament to the Federal Reserve’s flexibility and also to the value of its structure in achieving the Fed’s mission.

Let me be specific about how the Fed has evolved its decentralized structure in each area of its operations.

## MONETARY POLICY

When the Fed was founded, the notion was that local economic conditions generated local credit conditions and regional Reserve Banks would help the regional banks address them. Meanwhile, with the nation on the gold standard, the overall supply of money — and, hence, the long-run price level — was out of the central bank’s hands.

Today, we think of monetary policy as an independent tool at the central bank’s disposal to help stabilize overall economic performance. The establishment of the Federal Open Market Committee was the pivotal event in the Fed’s evolution to an independent, activist, monetary policy-making body with national macroeconomic objectives.

Although the FOMC was not formally established until 1935, its history begins in the 1920s, when regional Banks began looking for a source of revenue to cover their operating costs. As you may know, the Fed does not receive an appropriation from Congress. Instead, it funds itself from the return on its portfolio. In fact, it was with the intention of funding their operations that the Federal Reserve Banks began to purchase government securities. Eventually, these assets were managed collectively by the Federal Reserve Bank of New York. This portfolio became the System Open Market Account, through which the Fed now conducts open market operations.

Gradually, it was recognized that the Fed’s open market securities

transactions had a powerful and immediate impact on short-term interest rates and the supply of money and credit. Over time, open market operations became the central tool for carrying out monetary policy.

Congress created the structure of the FOMC in the midst of the Great Depression. The FOMC consists of the

**While there can be only one national monetary policy, making the right policy decision is the product of sharing perspectives from different regions of the country.**

seven members of the Board of Governors and the 12 Reserve Bank presidents. Because it is a mix of presidential appointees, the members of the Board of Governors, and Reserve Bank presidents, who are selected by their respective boards of directors, the FOMC is a blend of national and regional input of both public and private interests.

The fundamental insight is this: While there can be only one national monetary policy, making the right policy decision is the product of sharing perspectives from different regions of the country.

The Reserve Bank presidents provide both valuable up-to-date intelligence about economic conditions and the perspective of business people about prospects for the future. They glean these from their meetings with their Banks’ boards of directors and advisory councils, through informal “town meetings” around their Districts, as well as through the contacts they make in the everyday course of operating a Reserve Bank.

Some of this finds its way into our regional reviews, the so-called Beige Book, but even this suffers from time lags and a formulaic approach to gathering intelligence. Our real-time grassroots perspective is valuable for helping to overcome the fundamental challenge

to monetary policy — the effects of long and variable lags on its impact.

Beyond this, the Reserve Bank presidents can also bring broader perspectives on monetary policy. On a theoretical level, differences can coexist on the structure of the economy and the role of monetary policy. Some well-known examples include the monetarist

perspective championed by the St. Louis Fed and the real-business-cycle perspective supported by research at the Minneapolis Fed. On a more practical level, differences still exist in the geographic distribution of industries across our nation. The perspective of some regions gives particularly useful insight into certain parts of our economy, for example, San Francisco’s technology focus and Chicago’s heavy industry concentration.

Decisions are usually made by consensus, so unanimous decisions are usually the rule rather than the exception. Nonetheless, we do have a voting procedure. The 12 voting members make the formal decision of the FOMC. All seven Governors vote at all times, while only five of the 12 presidents vote, on a rotating basis. Philadelphia happens to be a voting member in 2002. In any case, we all participate on equal terms in the discussion and consensus building that leads to the formal policy vote.

Once the FOMC has made its decision on the appropriate target level for the federal funds rate, it is up to the Fed’s trading Desk located at the Federal Reserve Bank of New York to achieve the objective. To facilitate that process, a policy directive is drafted requesting the appropriate action by the

New York Desk to achieve the overnight borrowing rate target.

Time has shown that the structure of the FOMC uses the decentralized Federal Reserve to its best advantage. This structure allows for the generation of well-informed monetary policy decisions at the national level, plus an ability to communicate decisions and rationale to various parts of the nation. This two-way exchange of information enhances the Fed's ability to monitor the economy and build consensus for the needed policy action.

### PAYMENTS INFRASTRUCTURE

Monetary policy is the role for which central banks are best known. But the Fed also plays an integral role in the U.S. payments system. In fact, payments processing is the largest component of Fed operations. System-wide, the Federal Reserve Banks employ over 23,000 people. Of these, about 12,000 — roughly half — are involved in payments.

Over the years, the Fed's decentralized structure has given us an advantage in supporting the payments system. The U.S. has long been a nation of many small banks serving relatively limited geographic areas. Establishing a network for the efficient movement of money among them is one reason the Fed was founded. One of the Fed's first projects was setting up a check-clearing system. In that system, each Reserve Bank provided the banks in its District with a local clearinghouse and access to a national clearing network through its sister Reserve Banks.

As early as 1918, the Reserve Banks also gave banks in their Districts convenient access to a national electronic funds transfer network — Fedwire. At that time, the transfers were via telegraph connection among the Reserve Banks.

The traditional paper-based forms of payment — cash and check — still require a decentralized delivery



network. However, over time, the movements toward electronic payments and mergers in the U.S. banking industry have been driving the Fed toward greater coordination and consolidation of payments services. Accordingly, the Fed has reorganized to provide nationally managed services through the decentralized structure of the regional Reserve Banks.

First, at the strategic level, the Federal Reserve has established the Payments System Policy Advisory Committee (PSPAC). Its mission is to set the direction for Fed payments activities System-wide. Like the FOMC, PSPAC is a committee of Fed Governors and Reserve Bank presidents.

Second, at the operational level, the Reserve Banks coordinate

their payments operations through national product offices, reporting to the Financial Services Policy Committee. By this means, each payments product is centrally managed by one Reserve Bank and delivered, as appropriate, through the Reserve Bank distribution network.

## SUPERVISION AND REGULATION

I have discussed the benefits of the Federal Reserve's decentralized structure on the monetary policy decision process, as well as on its evolving role in the nation's payment system. This structure has also served us well in our third area of responsibility, bank supervision and regulation.

As I noted earlier, the U.S. has long been a nation of many small banks, serving local communities in narrow geographic areas and offering relatively limited product lines. This was primarily the result of government regulation. Long-standing state laws prohibited banks from branching across state lines and frequently other political boundaries as well. Then, in reaction to the Great Depression, the U.S. Congress passed legislation prohibiting commercial banks from engaging in investment banking or insurance activities.

During that period in our history, under delegated authority, local Reserve Banks kept a close watch on the safety and soundness of the local banks under their jurisdiction.

But, recently, in the U.S. and around the globe, a wave of deregulation has cut away the thicket of limitations on banks' activities. Now technology and the marketplace are driving banking organizations to expand their geographic reach and diversify their array of product offerings. The result has been the growth of larger and

more complex banking organizations with national or international scale and scope.

Through this process of change, the Federal Reserve's role in the regulatory structure has been expanding. Congress first entrusted the Fed with the responsibility of regulating all bank holding companies. More recently, the Fed has been assigned the additional role of "umbrella supervisor" for newly formed financial holding companies. As such, the Fed aggregates

**Since its creation almost 90 years ago, the Federal Reserve has survived, and succeeded, by evolving.**

the assessments of other regulators of the financial services industry to form an enterprise-wide view of risk and protect depository institutions.

To fulfill its responsibilities in this new environment, the Federal Reserve has been transforming its supervision and regulation function. Our focus has shifted from point-in-time financial statement reviews to continuous risk-based assessments; from on-site examinations to early warning systems; from strictly financial evaluations to ones that include increased emphasis on community lending and technology. Furthermore, in light of the shift toward broad financial holding companies, we are working in closer cooperation with other regulators in the banking and financial industry.


In addition, to properly oversee larger, more complex organizations, we

have employed new and more sophisticated analytical tools and have consolidated examination reports from geographically dispersed subsidiaries into overall financial profiles.

Our approach has been the System-wide coordination of bank supervision to achieve efficiency in staff deployment, yet still gain the benefits of specialized knowledge. Still, we have maintained face-to-face contact with the regulated institutions, as well as the use of on-site examinations. In the end, even with all the changes in the financial services industry, there is no substitute for first-hand knowledge of the organization and its leadership. The Reserve Bank network allows the Fed to have geographic proximity, which substantially improves its ability to know the institutions it regulates.

## CONCLUSION

Since its creation almost 90 years ago, the Federal Reserve has survived, and succeeded, by evolving. Through congressional mandates and its own internal restructuring, the Fed has proved an ever-changing entity, decentralized yet coordinated. The trends in the financial sector imply a continuation of the move toward a single national market, with a growing number of national and international players. As a result, further coordination and consolidation of activity is inevitable.

Yet, even as we develop into a more fully integrated organization to better address our central bank responsibilities, we continue to extract value from our decentralized structure. Today, as we have seen in both normal times and times of crisis, the regional structure of the Federal Reserve System is one of its greatest strengths. 

# The Philadelphia Fed Policy Forum: Summary of the 2001 Policy Forum and Announcement of the 2002 Policy Forum

BY LORETTA J. MESTER

**O**n November 30, 2001, the Federal Reserve Bank of Philadelphia held its first Philadelphia Fed Policy Forum, “Three Questions for Monetary Policymakers.” This event, sponsored by the Bank’s Research Department, brought together a group of highly respected academics, policymakers, and market economists, for discussion and debate about important macroeconomic and monetary policy issues the Fed needed to address in the coming year. The Policy Forum was not intended to be a traditional academic conference on monetary policy, nor was it intended to be a discussion of issues relevant to the next FOMC meeting. Rather, we took a longer term perspective and tried to engage the right people in a discussion of current macroeconomic research and its implications for monetary policy.

Last year’s Policy Forum addressed three questions facing monetary policymakers: How Should Monetary Policy React to Asset Prices?; How Should Monetary Policy and Fiscal



**Loretta J. Mester** is a senior vice president and director of research at the Federal Reserve Bank of Philadelphia.

Policy Interact?; and How Transparent Should a Central Bank Be? \* In my closing remarks, I noted that because conferences have to be planned so far in advance, there is always a danger of focusing on topics that lose their relevance as the event approaches. And the economic changes that occurred between November 2000 and November 2001 were striking, as the economy headed into recession and the September 11 tragedy unfolded. Still, in

\* Many of the presentations reviewed here are available on our web site at [www.phil.frb.org/conf/policyforum.html](http://www.phil.frb.org/conf/policyforum.html).

my view, the topics discussed at the Policy Forum turned out to be even more relevant as the economic landscape shifted, and the day’s program generated interesting debate and discussion and provided numerous insights.

President Anthony M. Santomero of the Philadelphia Fed began the day, pointing out that Chairman Greenspan moved one aspect of the first issue, “How Should Monetary Policy React to Asset Prices?” to the forefront several years ago and, in the process, introduced a new phrase into the financial lexicon. During a speech in December 1996, with the Dow at 6437, he posed the now famous question: “... how do we know when irrational exuberance has unduly escalated asset values?” As Santomero said, since that time, the Chairman’s question has gotten tougher to answer. And the follow-up questions — How do dramatic shifts in asset values affect aggregate spending? Should they figure into the Fed’s monetary policy decisions? And if so, how? — are equally tough to answer. In Santomero’s view, the Fed must take into account the potential impact of asset markets on the real economy. Meanwhile, asset market participants must take into account the Fed’s impact on financial conditions, real-sector performance, and hence the returns on their portfolios. In his view, the Fed and the asset markets are locked into a complicated game. The question is: What are the rules of that game, and how should the Fed play it?

Santomero said that the second Policy Forum question, “How Should Monetary Policy and Fiscal

Policy Interact?” has also grown more important and has become more complex. The Fed can move monetary policy quickly, but the effects of its actions unfold slowly. Fiscal policy actions usually take longer to implement, but their impact may come more quickly. (Andrew Abel, another speaker, elaborated on this point.) It is important to address how policymakers should use the two to provide steady support for the economy going forward, add strength if necessary, and ease back when appropriate.

In addressing the third question, “How Transparent Should a Central Bank Be?” Santomero indicated the case for transparency is a strong one. Making the Fed transparent is one way to cut through the complex interplay between financial markets and the Fed. The Fed states its policy goals and its intended path for achieving them. Financial markets process the information efficiently and adjust accordingly. Uncertainty and the risk of confusion are minimized; efficiency is maximized. Transparency also serves the broader goal of building public confidence in the Fed as an institution. But Santomero also made the point that in assessing whether there is a need for greater transparency one must consider a tradeoff. Greater transparency can improve the Fed’s clarity and increase its accountability. But it can also limit the Fed’s resourcefulness and slow its response times. Wise and timely policy decisions are the product of frank discussion and open debate among the policymakers, and maintaining the confidentiality of those proceedings helps preserve their frank and open character. In Santomero’s view, the issue is striking the right balance of transparency and confidentiality.

In closing, Santomero made the point that the issues being discussed were relevant not only in the U.S. but to policymakers around the world.

## HOW SHOULD MONETARY POLICY REACT TO ASSET PRICES?

As pointed out by discussant Mark Watson of Princeton University, the first session’s three papers illustrate that the answer to the question “How Should Monetary Policy React to Asset Prices?” depends on the imperfections and frictions in the economy. The three papers reached different conclusions about how monetary policy should respond, since they assumed different causes for variations in asset prices.

### The optimal monetary policy depends on the level of risk aversion, since inflation facilitates risk sharing.

Fernando Alvarez of the University of Chicago presented a paper that investigated how optimal monetary policy changes when market participants’ level of risk aversion changes. In his model, stock price fluctuations arise from variations over time in the level of investors’ risk aversion. The optimal monetary policy depends on the level of risk aversion, since inflation facilitates risk sharing. Market participants trade in the market (incurring transactions costs) to insure against idiosyncratic shocks to their income. Inflation reduces the income of all economic agents, and at the margin, it compresses the distribution of income, thereby reducing the need to trade for insurance purposes. But too much inflation leads everyone to trade and incur transactions costs. The optimal inflation rate balances these two forces. Risk aversion affects the amount of trading and therefore the need for inflation to reduce cross-sectional income dispersion. When risk aversion is higher than average, the

optimal monetary policy is to choose a lower inflation rate than average; when risk aversion is less than average, the optimal monetary policy is to choose a higher inflation rate than average. Thus, high risk aversion leads to lower prices of risky assets and to lower levels of inflation, and in this sense, optimal monetary policy is procyclical.

Bill Dupor of the Wharton School, University of Pennsylvania, discussed his work on how monetary policy should optimally respond to movements in asset prices. According to his model, optimal monetary policy is contractionary in response to an inefficient boom in the stock market or in investment. Thus, in contrast to Alvarez, the optimal policy is countercyclical. In Dupor’s model, firms make investment decisions to maximize the expected present value of their real profits, but they sometimes mis-estimate the future return to their investment. These mis-estimates drive investment and asset price movements in the model. When firms overestimate future returns to capital, they increase physical investment and asset prices appreciate. Optimal monetary policy works not only to reduce nominal price fluctuations in the economy but also to reduce these nonfundamental asset price movements, since these movements indicate that firms’ investment decisions have been distorted. By running a contractionary policy in the face of inefficiently high asset prices, the monetary authority reduces the return on investment and lowers the distortion. Dupor’s model provides a formal justification for monetary policy to respond to nonfundamental movements in asset prices at the expense of nominal price stabilization.

The third presenter, Mark Gertler of New York University, summarized and updated his recent work with Ben Bernanke. Asset price bubbles can cause fluctuations in spending and inefficient business cycles,

but in designing optimal monetary policy, the central bank must remain cognizant of the fact that it cannot be confident about whether fundamentals (like an improvement in technology) or nonfundamentals (a bubble) are driving asset prices. Gertler also pointed out that even if the central bank were certain that a rise in stock prices was a bubble, there is a great deal of imprecision between high frequency moves in asset prices and spending. In Gertler's view, the best feasible policy for dealing with the harmful effects of asset price bubbles is a flexible inflation-targeting strategy in which the central bank commits explicitly or implicitly to adjust interest rates to stabilize inflation over the medium run. A central bank that follows an inflation-targeting strategy should respond to changes in asset prices only to the extent that such changes affect the central bank's forecast of inflation or deflation, or movements in the equilibrium real interest rate. This strategy would lead the central bank to accommodate asset price movements driven by fundamentals but offset nonfundamental asset price movements that generate inflationary and deflationary pressures. Thus, the central bank should not ignore asset prices; the central bank should include them in the information set with which it forecasts inflationary pressures or movements in the equilibrium real interest rate. In Gertler's view, inflation targeting provides a nominal anchor for monetary policy and has worked well in practice, although, he points out, such a strategy has not been stress tested by large swings in asset prices.

In their work, Gertler and Bernanke simulated how the economy would react to a boom and bust cycle in asset prices when the central bank practices inflation targeting, that is, when the monetary policy interest rate instrument responds primarily to changes in expected inflation. They

find that inflation targeting yields good outcomes, substantially stabilizing both output and inflation, when asset prices are volatile. As in Dupor's model, the central bank offsets purely speculative increases or decreases in stock values that are driven through aggregate demand, and it accommodates technology shocks. They found little additional gain from allowing monetary policy to respond to stock price movements over and above their implications for inflation. Gertler also pointed out that aside from the model predictions, it might be dangerous to have the central bank attempt to influence stock prices, since the effects of such attempts on market psychology are very unpredictable. Finally, Gertler presented results suggesting that there is only an imprecise link between short-term changes in asset prices and spending. While more permanent changes in asset prices, which change wealth, lead to changes in consumption spending (the wealth effect) and investment spending, the evidence indicates that short-run changes in asset prices do not have a large impact on spending. In Gertler's interpretation, this again suggests there is little to be gained following policies that target asset prices.

Mark Watson of Princeton University, the first discussant, pointed out that the three papers all conclude that monetary policy can act in a way to ensure and improve macroeconomic stability. But they differ in their recommendations of how policy should behave: Alvarez's model suggests the central bank should ease monetary policy in response to rising asset prices; Dupor's model suggests the central bank should tighten in response to rising asset prices; and Gertler-Bernanke suggest that the central bank should essentially ignore asset prices except to the extent that asset prices help forecast or signal something about the overall state of the economy or inflation. But how useful are asset prices in forecasting future

inflation or future output? As Watson points out, the answer is very mixed in the literature. Watson's comprehensive study with James Stock of Harvard University of seven countries and 38 asset prices, forecasting over two time periods (1971-1983 and 1984-1998), indicates that asset prices are useful for predicting inflation sometimes and somewhere, but there is little consistency and there is a lot of instability across time. For example, trying to rely on one or two asset prices to forecast inflation or output would be a mistake — the forecasts are too noisy. But if one combines information from many asset prices in constructing forecasts and averages across many asset price predictors, one obtains forecasts that are better than those that ignore asset prices — essentially, one can average out the noise.

Ben Bernanke of Princeton University (and current member of the Federal Reserve Board of Governors) stated that the Alvarez and Dupor papers provide nicely worked out theoretical analyses of the case for monetary policy to respond to the stock market over and above the extent implied by the market's implications for inflation. Bernanke pointed out that this is true even in the Bernanke-Gertler model, since stock market bubbles lead to excessive volatility in investment. However, in Bernanke's view the real question is whether, in practice, we have sufficient confidence in our understanding of stock market behavior and its response to monetary policy to improve over an inflation-targeting rule. He is skeptical that we do or that the Fed does, and he feels that history argues against trying to stabilize the stock market. While he strongly encourages the central bank to make emergency responses to financial crises to protect the payments system (for example, the 1987 stock market crash, the Russian default, September 11), Bernanke pointed out that past attempts



to prick stock market bubbles have led to some very bad outcomes.

Jeremy Siegel of the Wharton School, University of Pennsylvania, the session's final discussant and moderator argued that while there is some empirical evidence that asset prices might not be that informative about the economy, in his view, they are becoming increasingly informative. For example, consumer confidence is more linked to the stock market and the cost of capital is dependent on equity prices. In his view, there are signals in equity prices that the Fed should pay attention to. And he also believes that the Fed should respond to them, but not with the aim of pricking a bubble. For example, to the extent that the late 1990s stock market boom reflected an increase in productivity and therefore a rise in the potential growth rate of the economy, the equilibrium real interest rate rose. Had the Fed not raised interest rates, inflationary pressures would have built. On the other hand, if the central bank believes that the market is too high, then in Siegel's view, trying to prick the bubble can be risky because there are lags in the effect of policy and interactions between policy and the market.

### HOW SHOULD MONETARY POLICY AND FISCAL POLICY INTERACT?

A panel of four speakers addressed our second question. Andrew Abel of the Wharton School, University of Pennsylvania, started by laying out and commenting on some of the channels of interaction between monetary and fiscal policy, some of which he feels are more relevant now than others. These include financing and monetizing government deficits; the effect of inflation on tax rates and revenues; open market operations in Treasury securities; the liquidity trap; lags in monetary and fiscal policy; and short-run vs. long-run uses of policy.

The first channel, financing the government deficit, is the oldest and simplest issue, according to Abel. During World War II, the Fed cooperated with the Treasury by keeping interest rates low to reduce the Treasury's financing costs. But since the Treasury-Federal Reserve Accord of 1951, the Fed has become independent of the Treasury, which is not to say that fiscal policy has no effect on monetary policy.

Inflation affects effective tax rates, since the tax code is not indexed to inflation. Abel pointed out that Martin Feldstein estimated that a 2-percentage-point reduction in inflation would increase welfare by 1 percent of GDP per year, through its impact on effective tax rates. In Abel's view a simple and desirable way of remedying the problem would be to index the tax code.

Another issue that has become more topical is how monetary policy should be conducted in a world with shrinking government debt. Abel thinks this is an interesting question; however, he points out that over the longer run, it will be much less of an issue, since government debt will be "back with a vengeance" in the long run.

Abel said that contrary to some economists, he does not think the issue of the liquidity trap applies to the U.S. at the moment, although it might apply to Japan, where interest rates had gone so low that monetary policy had become an ineffective tool for stimulating spending. In Abel's opinion, the structural problems in Japan, for example, the weak banking sector, are quite different from those the U.S. was facing at the time of the Policy Forum.

In thinking about how monetary and fiscal policy interact, Abel outlined three types of lags. The recognition lag — how long it takes to figure out there's a need for policy action — is short for monetary policy, since the meetings are frequent, and short to medium for fiscal policy. The

decision lag — how long it takes to implement a policy change — is incredibly short for monetary policy and usually long for fiscal policy. Finally, Abel cites Milton Friedman's "long and variable lags" as a good characterization of monetary policy's action lag — how long it takes policy to affect the economy once it is implemented; the action lag for fiscal policy, Abel stated, is medium to long. Based on this lag structure, monetary policy should be used for short-run stabilization, since it generally has shorter lags. But in the long run, monetary policy should focus on keeping inflation low and stable. Fiscal policy should be used to achieve the following long-run goals. First, assess whether programs are worth what they cost; whether there are market failures that need to be corrected; and what public goods need to be provided. Then set taxes to collect sufficient revenues to fund these expenditures in a way that respects economic efficiency and equity and that minimizes distortions, and perhaps meets some redistributive goals. In Abel's view, any short-run stabilization through fiscal policy should generally occur through automatic stabilizers.

R. Glenn Hubbard, chairman of the Council of Economic Advisers, said he was also skeptical of using fiscal policy for short-run stabilization. He believes that the fiscal policy applied in 2001 was appropriate, viewing the tax rebates in the spring 2001 tax act not as a cyclical measure but as down payments on a permanent tax cut. Hubbard said the question of how fiscal and monetary policy should interact is an important one. He said the key was cooperation, not coordination. When monetary policy is made, it must consider current and future fiscal policy, and vice versa. The fiscal and monetary authorities need to understand what each is doing. At the simplest level, this means talking to one another, and there are a variety of ways

in which the Administration and the Fed do communicate with each other. This is different from coordination. Hubbard agrees that monetary policy independence is a key ingredient of good policy and benefits the economy. He pointed to the combination of monetary and fiscal policy in 2001 as an illustration of the harmonious working of monetary and fiscal policy in the U.S. And he stated that he believes that monetary policy and fiscal policy are committed to their long-term goals — for monetary policy, its long-run goal of price stability and for fiscal policy, its long-run goal of improvement in long-term budget balance.

Laurence Kotlikoff of Boston University disagreed; he thinks that monetary and fiscal policy have exactly the wrong long-term goals and direction. He does not believe monetary policy

and fiscal policy should interact; we do not want to use monetary policy as a fiscal instrument. However, Kotlikoff believes that in the U.S. they *will* interact because of the nature of our long-term fiscal problems. Based on his research, our fiscal policy is highly unsustainable. Kotlikoff and co-authors have used generational accounting to compare the size of the government's bills now and in the future to the amounts available to pay those bills now and in the future. These are not in balance in the U.S. — future generations will face a much higher tax burden than the current generation, since we are passing on a large debt to them. According to Kotlikoff's research, in the U.S. it will be difficult to achieve generational balance whereby the lifetime net tax rates of future generations equal that of the current

generation. Other countries facing a similar problem have used hyperinflation to bring about balance. Kotlikoff outlined some alternative policies that could be used to achieve generational balance in the U.S., including tax increases and cuts in transfers and government purchases. For example, according to his and his co-authors' estimates, as of summer 2001, the U.S. would need to raise federal income taxes 68 percent or all taxes (local, state, and federal) 26 percent to achieve generational balance. Alternatively, it would take a cut of 44 percent of all government transfers. Kotlikoff said that these numbers were so scary because the demographics are that bad — he stated that in 30 years the U.S. will have twice as many old people and only 15 percent more workers. Kotlikoff pointed out that some have argued that



economic growth will bail out the U.S. from this problem — as the population ages, there will be a lot of wealthy older people relative to young workers, which will lead to more capital per worker, higher real wages, and capital deepening. This would mean that we would have a higher tax base and that tax rates would not have to rise as much. Kotlikoff does not subscribe to this view. He presented the results of some simulation exercises that indicate that instead of capital deepening, the economy could experience capital shallowing during the demographic transition, since payroll tax rates might have to rise so much. In conclusion, Kotlikoff said that the menu of things the U.S. needs to do to solve its fiscal problem is very painful, but the unsustainability of our current fiscal policy should not be ignored, given the great harm that has been inflicted on other countries' economies by their pension liabilities.

In his response, Hubbard said that the government's fiscal situation is less harrowing than the version presented by Kotlikoff. He interprets Kotlikoff's research as making the important point that delay in addressing the problem is very costly; it is important to take action. In Hubbard's view, action is being taken. In his opinion, there is nonpartisan recognition of the need to shore up entitlements and avoid the crisis Kotlikoff discusses, and progress is being made.

Christopher Sims of Princeton University concluded the session by discussing his research program on what determines the price level in terms of monetary and fiscal policy jointly, the so-called fiscal theory of the price level. Sims explained that this way of thinking about the price level recognizes that monetary policy is fiscal policy; there is no clean distinction between the two. This might seem to contradict the notion of central bank independence. But in most countries, central bank

independence is a convention about which aspects of fiscal policy are handed over to the central bank. Monetary policy has a direct impact on the interest expenditure component of the federal government. A change in interest rates affects the nominal value of these expenditures, and inflation affects the real value. As Sims sees it, monetary policy independence is a convention by which the effects of monetary policy on the federal budget aren't subject to policy dispute and argument between the Treasury and the central bank. For example, the Treasury doesn't complain to the Fed that there wasn't enough seignorage this year or ask the Fed to lower interest rates because the interest component of the budget has increased. Moreover, the Fed and the public are confident that when the Fed raises interest rates, the fiscal system will absorb the costs of increased interest expenditures in the budget, for example, by cutting other expenditures or raising taxes. If this were not the case, a rise in interest rates could lead to inflation rather than having the desired dampening effect on economic activity. This convention has arisen to help control the historical tendency of fiscal authorities to systematically use seignorage and inflation as a source of revenue.

Independence is a good idea in normal times, but it is possible only over a certain range of conditions. Sims argued that if we don't understand its nature, that is, that central bank independence is a convention and monetary policy has a fiscal impact, then we can get into trouble in certain historically unusual circumstances. For example, during a liquidity trap, the central bank might have to change how it implements monetary policy in order to have an effect. Instead of buying short-term nominal government debt, it might have to purchase other assets, like long-term bonds, foreign government bonds, or loans from banks, which would

expose the central bank's balance sheet to risk. Were the central bank's balance sheet to succumb to the risk, the Treasury would need to recapitalize the central bank, and it should do so, even though this would be a breach of the usual independence between the central bank and the Treasury. Another extreme circumstance is wartime. During almost every war the U.S. has fought, a substantial fraction of the financing of the war has come from seignorage and inflation. In Sims' view, a surprise inflation that reduces the value of outstanding government debt — if used at times of fiscal stress when the alternative is increased distortionary taxes — may be a good thing to do. Sims added that it is obviously not a good thing to do regularly, and indeed, it would work only if it were a surprise.

In relating his work to the economic situation at the time of the Policy Forum, Sims said he thought it most likely that the U.S. economy would not find itself in either of these circumstances (that is, liquidity trap or fiscal exigency). However, he said that one thing we have learned is that extremely surprising things can happen. Thus, it is worthwhile having the discussion.

## HOW TRANSPARENT SHOULD A CENTRAL BANK BE?

Our final session tackled the issue of central bank transparency, that is, how the central bank communicates and explains its actions to the public. In the view of all the speakers, transparency is beneficial, and central banks have made progress toward greater transparency in just a short time. Our speakers did differ in their assessments of the amount of progress that has been made and that still needs to be made.

William Poole, president of the Federal Reserve Bank of St. Louis, began the discussion, pointing out that the real questions are how, in fact, to be transparent and what being transparent

really means. Poole said that transparency means providing “the fullest explanation possible of policy actions and the considerations underlying them, in as timely a manner as possible.” One benefit of transparency is that it helps policymakers themselves develop coherent views. Having to explain things helps clarify one’s own thinking. The success of monetary policy depends on market expectations and market confidence, and those will be more accurate and complete, the better market participants understand the Fed’s actions. In Poole’s view, the macroeconomics literature supports the case for policymakers to provide as much information as it can about policy. This does not necessarily mean that all disclosures are beneficial, since meetings held in the open would yield a different type of deliberation, not necessarily better policymaking, and the public might become confused more than enlightened. But Poole said that releasing transcripts of FOMC meetings with a five-year lag, as is current practice, does not inhibit his discussion at meetings and provides a valuable record for scholars. Poole also discussed some of his research, co-authored with others at the St. Louis Fed, showing that prompt disclosure of policy actions significantly improved the accuracy of market forecasts of policy actions. Poole concluded his remarks by indicating two ways to improve Fed transparency: announcing an explicit inflation objective and reducing the statement released at the end of FOMC meetings to simple, boilerplate language (since the current statement is open to a variety of interpretations and may increase uncertainty in the market).

Michael Prell, consultant and former director of Research and Statistics at the Board of Governors of the Federal Reserve System, indicated that the amount of information released by the Fed has increased greatly over the last 30 years. Prell says this has

served several purposes, including meeting the demands of Congress, lowering the “suspicions in some circles that a secretive, non-elected body is manipulating the financial markets,” and increasing the effectiveness of policy by allowing the markets to better anticipate Fed policy actions. But in Prell’s opinion, the Fed has been wary of transparency over the years. In his view, there has been some concern that greater openness could jeopardize the Fed’s independence and that markets might overreact to indications of potential Fed policy actions, thereby causing noise that distorts the signals the Fed could otherwise draw from the market about underlying economic pressures. He does say that the challenge of transparency is greater because Fed policymakers can have disparate analytical views about the economy, but he is against trying to regiment these “many voices of the System.” Rather, he favors allowing these voices to speak, but in a clearer fashion. In his view, the post-meeting announcements by the FOMC are an advance in transparency, although they fall short of desired clarity. In conclusion, Prell says that the answer posed in the session, “How transparent should a central bank be,” is “As much as possible, without jeopardizing its mission.”

Mickey Levy, chief economist of Bank of America, provided a private-sector view. Levy believes the Fed has dramatically improved its implementation of monetary policy and its transparency, with the Fed being more straightforward and understandable. However, he thinks further improvement could be achieved. In Levy’s view, the announcements made by the Fed after FOMC meetings suffer by emphasizing current economic conditions rather than the Fed’s long-run goals. Levy discussed his analysis of 18 FOMC policy announcements made between February 2000 and November 2001. These announcements were

made after the Fed shifted from providing a statement about its “bias” to providing a “balance-of-risks” statement. In Levy’s view, these announcements fuel market speculation about near-term monetary policy, just as earlier announcements that included the bias statement did. He also said that the phrasing of the announcements could mislead the public into believing that the central bank’s objective is to limit economic growth in order to control inflation, a mistaken view of the inflation process. In Levy’s view, the Fed announcements should “reinforce its long-run objectives and establish guidelines to achieve them,” as one of the goals of transparency is to build credibility. Confusing statements can be counterproductive.

Our final presenter on the topic of transparency was Alan Blinder of Princeton University, a former vice chairman of the Federal Reserve Board of Governors. Blinder based his discussion of the “why, what, and how” of central bank transparency on a recent monograph he co-authored on transparency at central banks around the world (“How Do Central Banks Talk?” A. Blinder, C. Goodhart, P. Hildebrand, D. Lipton, and C. Wyplosz). In his view there has been a revolution in central bank thinking on the subject of transparency over the past five to 10 years — a very short period of time. Blinder and co-authors begin with the presumption that central banks should reveal almost all information; while there will be some pieces of information that should not be revealed, the central bank must have a good reason not to reveal them. In other words, the central bank should reveal enough information so that interested observers understand what it is doing, why it is doing it, and how it makes decisions, and this includes forward-looking information.

For the “why” of transparency, Blinder cited two reasons. First, transparency is important for democratic

accountability. Second, transparency aids the effectiveness of monetary policy, which works through expectations. Blinder said that in his FOMC experience, one of the more difficult parts of setting monetary policy was in understanding the transmission of changes in the fed funds rate to other interest rates and asset prices in the economy. In his view, transparency helps tighten the “gearing” between what the Fed does and what the market does in reaction to what the Fed does. The central bank should try to condition expectations and teach the markets to think like it does. Blinder thinks that theoretical arguments for mystery and surprise do not hold up well to real-world circumstances.

The “what” of transparency involves the central bank’s articulating its objectives. This is more difficult for central banks such as the Fed that have multiple objectives (price stability and sustainable economic growth), and somewhat easier for central banks with a single objective, such as inflation-targeting. Blinder said the central bank also needs to reveal its methods, including forecasts and models, for reaching policy decisions. He noted that the details of the forecast (for example, forecasts of housing starts seven quarters from now) are less important to most people than the broad contours of the outlook. He also favors the central bank giving forward-looking indicators (for example, the “balance-of-risks” or the “bias”) of future policy actions.

The “how” of transparency depends on how monetary policy decisions are made at the central bank. Blinder and co-authors categorize central banks into three types: decisions made by an individual (for example, the Reserve Bank of New Zealand); decisions made by a collegial committee that works to reach a consensus (for example, the European Central Bank);

and decisions made by an “individualistic” committee in which people vote what they believe and the majority rules (for example, the Bank of England). Blinder and co-authors believe that the modes of being transparent are different in these three cases. As a simple example, consider the question of how much to reveal in statements versus in the minutes of the meeting. When the decision is made by an individual there is no meeting and so no transcript to issue. But then it is important for the individual decision maker to explain fully his or her rationale for the decision. With an individualist committee, it is difficult to explain the diverse views in a


## Transparency aids the effectiveness of monetary policy, which works through expectations.

statement. For Blinder and his co-authors, if the committee is collegial, there is a real danger in having a cacophony of voices, which may provide a lot of noise without providing any new information. However, if the committee is an individualistic one, differences in opinions across committee members are very relevant and give forward-looking information to the market. In this case, Blinder (like Prell) thinks communication should be encouraged.

Blinder agreed with the other speakers that the Fed has become more transparent over time, pointing out that it was only in 1994 that the Fed began announcing its decision after FOMC meetings. Unlike Levy, he views the “balance-of-risks” statement as a vast improvement over the “bias” statement. He agrees with Prell that the statements

have improved over time, but he also agrees with Prell and Levy that there is further to go in making the statements more informative. And while he “philosophically” agrees with Poole that the transcripts are valuable scholarly records, he believes the cost has been too great in terms of stultifying conversation and debate; so he favors discontinuing verbatim transcripts of FOMC meetings. To conclude, Blinder laid out what he would like the Fed to do: clarify its objectives, publish its forecasts, and make fuller statements. In particular, Blinder said this will become much more important in the post-Greenspan era, when the markets have to learn and understand the Fed’s decision-making under a new Chairman.

### KEYNOTE ADDRESS: THE CENTRAL BANK OF BRAZIL: TRANSFORMATION TO TRANSPARENCY

Dr. Arminio Fraga, Governor of the Central Bank of Brazil, delivered the keynote address. Fraga presented an overview of the reforms that have been implemented by the Central Bank of Brazil to increase the level of transparency. Included in the reforms was a move to inflation targeting. Fraga discussed the steps the Central Bank has taken to announce its targets and disclose information about its policy meetings and its economic models. He also discussed the benefits of such reforms and the progress that has been made on the inflation front in Brazil since the reforms have been implemented. In Fraga’s view, over the years, Brazil has been a laboratory; it has had to deal with many of the issues research economists in the Federal Reserve System, other central banks, and academia have studied. In Fraga’s opinion, the Central Bank of Brazil’s transparency has been beneficial to the economy of Brazil. 



# The Philadelphia Fed POLICY FORUM

We will hold our second annual Philadelphia Fed Policy Forum on November 22, 2002 (the Friday before Thanksgiving). This year's topic is "Crises, Contagion, and Coordination: Monetary Policy Issues in a Global Context." At right is the program. The Policy Forum brings together a group of distinguished economists and policymakers for what we hope will be a rousing discussion and debate of the issues. For information on attending this year's event, please contact us at [PHIL.Forum@phil.frb.org](mailto:PHIL.Forum@phil.frb.org) or visit our web page at [www.phil.frb.org/conf/policyforum2002.html](http://www.phil.frb.org/conf/policyforum2002.html).



FEDERAL RESERVE BANK  
OF PHILADELPHIA

# The Philadelphia Fed Policy Forum

## *Crises, Contagion, and Coordination: Issues for Policymakers in the Global Economy*

November 22, 2002  
The Pennsylvania Convention Center, Room 113

### Presentations

#### Welcoming Remarks

Anthony M. Santomero, *President, Federal Reserve Bank of Philadelphia*

#### Financial Crises

**Moderator and Discussant:** Loretta J. Mester, *Director of Research, Federal Reserve Bank of Philadelphia*

#### “Financial Crises in Emerging Market Economies”

V. V. Chari, *University of Minnesota*

#### “Foreshadowing LTCM: The Crisis of 1763”

Hyun Song Shin, *London School of Economics*

#### Financial Contagion and Business Cycle Correlation

**Moderator and Discussant:** Sylvain Leduc, *Senior Economist, Federal Reserve Bank of Philadelphia*

#### “Financial Stability and Currency Areas”

Franklin Allen, *The Wharton School, University of Pennsylvania*

#### “Globalization of Financial Turmoil”

Graciela Kaminsky, *George Washington University*

#### Policy Coordination

**Moderator, Presenter, Discussant:** Lawrence Christiano, *Northwestern University*

#### “The Gains from International Monetary Cooperation”

Kenneth Rogoff, *Economic Counselor and Director, Research Department,  
International Monetary Fund*

#### “On the Fiscal Implications of Twin Crises”

Martin Eichenbaum, *Northwestern University*

#### “Monetary Policy After a Financial Shock”

Lawrence Christiano, *Northwestern University*

#### Policymaking in a Global Context

**Moderator and Panelist:** Anthony M. Santomero, *President, Federal Reserve Bank of Philadelphia*

#### Other Panelists:

Urban Bäckström, *Governor, Central Bank of Sweden*

Paul Jenkins, *Deputy Governor, Bank of Canada*

Robert Parry, *President, Federal Reserve Bank of San Francisco*

# Innovation in Financial Services And Payments

A Conference Sponsored by the Research Department and the Payment Cards Center  
of the Federal Reserve Bank of Philadelphia



On May 16-17, 2002, the Federal Reserve Bank of Philadelphia's Research Department and Payment Cards Center co-sponsored a conference on Innovation in Financial Services and Payments. Robert Hunt, an economist in the Research Department, put together the program, which included three distinguished addresses and four focused sessions. The conference addressed such questions as: How far has the U.S. progressed in the transition to electronic consumer payments? Does competition between payment networks stimulate innovation? These questions and others addressed at the conference do not yet have definitive answers. One goal of the conference was to encourage work in this important, but under-researched area.

President Anthony M. Santomero opened the conference, providing an overview of changes in the payment system, such as the growing role played by nonbank providers of these services. These changes have important implications for the Fed, which is both a provider of payment services and a regulator of private providers of these services.

In his address, David Balto (White and Case, formerly of the Federal Trade Commission) pointed out that in financial services, innovation often occurs through joint ventures or network arrangements, organizational forms that present a difficult challenge for antitrust analysis. He explored this

theme by reviewing the complicated history of antitrust litigation involving the credit card associations MasterCard and Visa. Balto was joined in this conversation by Alex Miller (Visa U.S.A). On Friday, Lawrence J. White (New York University), together with Scott Frame (Federal Reserve Bank of Atlanta), reviewed the existing literature on financial innovation, emphasizing how little empirical research has been done and how much more there is still to do.

The first panel examined recent trends in the use and efficiency of consumer payments in the United States. David B. Humphrey (Florida State University and Payment Cards

Center visiting scholar) documented the decline in the share of consumer transactions paid via cash or check and the corresponding rise in the share of payments accounted for by credit cards and debit cards (point of sale) since 1990. Paul Bauer, together with Patrick Higgins (both of the Federal Reserve Bank of Cleveland), found that the unit cost of the Federal Reserve System's small-dollar electronic payment network (the Automated Clearinghouse, or ACH) has fallen 75 percent since 1990 and that there is evidence of further economies of scale. The discussant, Elizabeth Klee (Board of Governors), emphasized the difficult problem taken on in the Humphrey paper because of the very limited data available. Klee also suggested it would be worthwhile to extend the analysis in the Bauer and Higgins paper to cover the most recent period to evaluate the use of ACH for electronic check conversion at the point of sale.

The second panel focused on the role of networks in financial markets. In many networks, including telephone and most payment systems, the value of participating in the network rises with the number of other participants. Sujit Chakravorti (Federal Reserve Bank of Chicago), together with Ted To (Bureau of Labor Statistics), presented a theoretical model to show that merchants accept credit cards even though they are more costly than cash or check payments because their sales will be higher if they accept credit cards than if they do not. This may increase merchants' profits in the short run but, as the authors point out, not necessarily in the long run. Gautam




Gowrisankaran (Federal Reserve Bank of San Francisco) and Joanna Stavins (Federal Reserve Bank of Boston) showed that a bank's decision to provide ACH payment services depends on the concentration of the local banking market and the extent to which neighboring banks have adopted ACH. Discussant James McAndrews (Federal Reserve Bank of New York) argued that the Chakravorti and To paper contributed to our understanding of the welfare implications of pricing in credit card networks. McAndrews said that the Gowrisankaran and Stavins paper had raised the standard for the use of statistical techniques in empirical studies of network effects in payments. He also pointed out competing alternative explanations of their results that cannot yet be ruled out.

The third panel investigated when and how firms in the industry adopt financial innovations. Scott Frame, together with Lawrence J. White and Jalal Akhavan (Moody's), reported the results of their survey of banks'

adoption of credit scoring models for use in small-business lending decisions. They found that larger banks were more likely to be early adopters of this technology, and there was some evidence of geographic clustering of adopters (specifically, in the New York Federal Reserve District). David Nickerson (Colorado State University) and Richard J. Sullivan (Federal Reserve Bank of Kansas City) with Marsha Courchane (Freddie Mac) examined the adoption of Internet banking among banks in the 10th Federal Reserve District. They found that banks that are relatively large compared with their competitors were more likely to adopt Internet banking. They also found that banks facing more concentrated rivals were less likely to adopt Internet banking. Robert DeYoung (Federal Reserve Bank of Chicago) discussed the papers, putting their results in the context of the industry's response to deregulation and new technologies introduced over the last 20 years.

In the final session of the

conference, Robert Marquez, together with Robert Hauswald (both of the University of Maryland), showed how financial innovations and intellectual property can affect lenders' incentives to engage in their traditional activities of screening and monitoring borrowers. This, in turn, will affect the pricing and availability of credit. John R. Thomas (George Washington University Law School) described the recent phenomenon of patenting methods of doing business and how this may soon affect providers of financial services. The discussant, Bob Hunt (Federal Reserve Bank of Philadelphia), described how the Hauswald and Marquez paper could be adapted to evaluate the welfare effects of extending patents to financial intermediaries and why existing criteria for evaluating patent applications might be inappropriate for this industry.

For a detailed summary of the conference and electronic copies of all the papers and presentations, please see our web site: [www.phil.frb.org/econ/conf/innovations.html](http://www.phil.frb.org/econ/conf/innovations.html). 

# Should Business Bankruptcy Be a One-Chapter Book?

BY MITCHELL BERLIN

**W**hat makes more economic sense? A bankruptcy system that auctions a firm's assets and distributes the proceeds among the creditors? Or one that allows a firm to seek to resume business after renegotiations between its stockholders and its creditors? Or is there room — or even a need — for both? Mitchell Berlin outlines current U.S. bankruptcy law and looks at recent research that has reopened the debate on the value of separate procedures for reorganizing the bankrupt firm.

Businesses sometimes go bankrupt. That's a fact of life. Bankruptcy may occur because of bad management, an economic downturn, or simply a change in consumers' preferences for the products they buy. As a society, we would like to establish laws to deal with bankrupt firms that allow the firms' managers, workers, and equipment to be deployed elsewhere as quickly and efficiently as possible if the firm is no longer viable. Alternatively, the best solution may not be to break up the firm but to have the firm draw up a new business plan and to reach a new understanding with its creditors.

In the United States, there are

two different procedures for a firm's bankruptcy. One, called Chapter 7 (the chapter refers to its location in the U.S. bankruptcy code), auctions all of the firm's assets and distributes the proceeds to the firm's creditors. The second procedure, called Chapter 11, allows the firm to go back into business once it has renegotiated existing contracts with suppliers and creditors.

For many years, critics — both legal scholars and economists — have charged that Chapter 11 is inefficient and should be eliminated. They have argued that reorganization proceedings under Chapter 11 take too long, that they reward and entrench incumbent owners and managers, and that reorganized firms end up being liquidated anyway, often after multiple attempts at reorganization. In contrast, Chapter 7's auction procedure is simpler and more efficient, according to these same critics.

Nonetheless, the U.S. has yet to close the book on Chapter 11. And

despite bankruptcy scholars' criticism of Chapter 11, other countries have reformed their own bankruptcy laws to look more like the U.S. law. For example, both England and Germany — with bankruptcy systems that were heavily biased toward the liquidation of enterprises, rather than their rehabilitation — have introduced new provisions facilitating the reorganization of firms. Do these reforms fly in the face of economic reason and experience, or have the critics of U.S. bankruptcy law been missing something important?

In fact, recent economic research has reopened the case against U.S. bankruptcy law. Researchers have shown that seemingly objectionable features of Chapter 11 — for example, the bias toward incumbent owners — may make economic sense. Further, while even proponents of using a single chapter (such as Chapter 7) have always recognized practical difficulties — for example, the possibility that distressed auctions would fetch fire-sale prices for the firm's assets — more recent research has raised new concerns about auctions as a means to sell firms' assets. Researchers have also examined ways in which auction procedures might be modified to address some of these concerns.

## U.S. BANKRUPTCY LAW

Under both Chapter 7 and Chapter 11, a bankruptcy filing triggers an *automatic stay*. Under an automatic stay, the firm's creditors — its bankers, bondholders, trade creditors, or pensioners, among others — must hold off any attempts to satisfy their claims by grabbing the firm's assets. In particular, a secured creditor, whose contract states



**Mitchell Berlin** is research officer and economist in the Research Department of the Philadelphia Fed.

that in the event of default, she has the right to take possession of one (or more) of the firm's assets (for example, a drill press), must wait until the courts decide who gets what.

The underlying idea of the automatic stay is to blunt the strong incentive that the firm's creditors, especially secured creditors with a legal claim on particular assets, have to run to the courthouse to be first in line. While the first creditors on the courthouse steps may get paid in full and would be satisfied, this disorganized dash would probably leave creditors, as a group, worse off. For example, the drill press may fetch a higher price when sold along with the factory than if sold separately, but the creditor with the secured claim will be concerned only with whether she can sell the drill press for more than the unpaid portion of her loan. A more organized disposal of the firm's assets could ensure a higher sale price for all the firm's assets and, thus, extra dollars to share among the firm's creditors.

**Chapter 7: The Creditor Comes First.** When a firm enters Chapter 7, its owners and managers are immediately replaced by a court-appointed trustee, who acts as a representative of all claimants as a group. The trustee has two essential roles. The first role is to secure the highest possible value for the firm's assets at auction. Assets might be sold piecemeal; for example, the drill press might be sold separately from the firm's factory building (which might have higher value as a space for an indoor driving range). Alternatively, the factory building and all the machines inside might be most valuable as a single unit. In this case, the trustee would seek a bidder for all the firm's assets.

The trustee's second role is to distribute the money received for the firm's assets, that is, to evaluate and rule on competing claims.<sup>1</sup> In those cases where the firm's financial structure is

simple, this is a straightforward job.<sup>2</sup> In other cases, determining the value of various claims may be more difficult, for example, when there are bonds with different levels of priority and debt secured by assets.

Even for relatively simple financial structures, the trustee must be guided by some general principles in deciding the value of competing claims. In the U.S. and most other countries, the overarching principle is the *absolute priority rule*. According to this rule, all investors are ranked in order of priority: Creditors with claims secured by particular assets — collateral — have priority over unsecured creditors. Among the unsecured creditors, those with seniority clauses in their contracts will be paid before those without such clauses. Finally, all creditors have priority over the firm's stockholders.<sup>3</sup> Under the absolute priority rule, all creditors with higher priority must be paid the full value of their claims before those with lower priority receive a single cent.

**Chapter 11: The Last Shall Be First.** Although a trustee is also appointed in a Chapter 11 proceeding, the firm's owners remain in control of the firm until a reorganization plan has been accepted. The trustee has many roles in Chapter 11, but its main responsibility is to protect creditors' interests. In this role, for example, the trustee will have to approve large corporate expenditures to ensure that owners are not seeking to enrich themselves at creditors' expense.

---

<sup>1</sup> I've simplified the discussion by talking about money received for a firm's assets. In reality, bankruptcy claimants could receive securities rather than cash.

<sup>2</sup> Financial structure refers to a firm's mix of bonds, bank loans, and equity.

<sup>3</sup> This is simplified. Other types of claimants exist, for example, the IRS and customers with outstanding lawsuits. Throughout, I focus on the main investor groups. David Epstein's book provides a particularly clear account of the system of priorities.

Unlike the auction and distribution procedure of Chapter 7, Chapter 11 takes the form of *structured bargaining* among investor groups: the firm's owners, secured creditors, unsecured creditors, and so forth. Bargaining is structured in that Chapter 11 prescribes a set of rules under which investor groups present reorganization plans, which are then voted on by committees representing the investors.<sup>4</sup> The firm's owners — often, but not always, represented by incumbent management — have the sole right to propose plans for reorganization for the first six months. In practice, though, the court trustee has substantial discretion to extend this initial period. After six months — or if the trustee determines that the owners can't come up with an acceptable plan — a committee of creditors may then propose its own reorganization plan.

A reorganization plan is a complicated proposal that has two main elements. The first is a blueprint for deploying the firm's assets; this blueprint often calls for the sale of some businesses and the hiring of a new management team to run the remaining business.<sup>5</sup> The second element is an outline of the firm's new financial structure, in particular, how much and what types of securities the various claimants would receive. So, for example, a plan might propose that the firm's banks — whose claims are secured — receive stock and cash worth 92 percent of the value of their outstanding claims, unsecured bondholders receive stock valued at 40 percent of the face value of their outstanding bonds, and the firm's shareholders retain 7 percent of the

---

<sup>4</sup> The trustee determines the precise structure of the committees.

<sup>5</sup> A new management team is put in place 70 percent of the time, according to Edith Hotchkiss's sample. Hotchkiss reviews the evidence concerning management turnover from other studies.

reorganized firm's stock.

Note that any reorganization plan requires an estimate of the firm's ongoing value, both to permit the trustee to evaluate whether the plan serves creditors' interests and to determine precisely what mix of new securities and cash each investor group will receive.<sup>6</sup>

Note also that the payments in the example, which are in line with actual U.S. experience, do not respect absolute priority, even though the bankruptcy code explicitly calls upon trustees to follow this rule. Most strikingly, the firm's existing owners systematically retain a share of the reorganized firm, even though unsecured creditors have received much less than the outstanding value of their claims. Many commentators note that this systematic bias away from absolute priority is the predictable effect of the rules of Chapter 11. Specifically, incumbent owners have lots of power, both because they retain control of the firm and because they get to offer the initial reorganization plan. This power enables them to retain a share of the reorganized firm, even though investors with higher priority have not had their claims satisfied.

## BANKRUPTCY WITHOUT CHAPTER 11

### Let's Get Rid of Chapter 11.

In articles that have been influential among legal scholars and economists, lawyer Douglas Baird and economist Michael Jensen have argued that Chapter 7 can be used either to liquidate or to reorganize firms, and, thus, there is no need for a separate bankruptcy procedure for reorganizations.

<sup>6</sup> Stuart Gilson, Edith Hotchkiss, and Richard Ruback's article presents compelling evidence that reorganization plans have systematic biases in their estimates of firms' value. For example, the firm's priority bondholders would prefer that the court place a low dollar value on the firm, so that subordinated bondholders and stockholders would receive only a small share of the claims on the reorganized firm.

One of the key functions of a bankruptcy mechanism is to create an orderly forum for answering two related questions: (1) Are the firm's assets worth more if the firm is simply broken up? (2) Should the firm be placed under new management? But why not settle these questions by auction, with current owners and management teams bidding along with others for the firm's assets? If these assets are more valuable together, the winning bidder will propose reorganization, rather than liquidation. And if current management is the most capable, the winning bidder would not necessarily replace them with new managers.

## According to its many critics, the structured bargaining of Chapter 11 leads to systematically poor outcomes in economic terms.

A large economic literature supports the use of well-designed auctions as a mechanism for getting the largest possible value for the firm's assets and, in turn, yielding the highest payoff for a firm's creditors.<sup>7</sup>

In contrast, according to its many critics, the structured bargaining of Chapter 11 leads to systematically poor outcomes in economic terms. In addition to promoting the systematic violation of absolute priority,<sup>8</sup> Chapter 11 serves as a venue for entrenching inefficient managers (who were, after all, running the firm when it went bankrupt), and the lengthy bargaining process itself leads to increased costs, for example, lawyers' and accountants' fees and other court costs.<sup>9</sup>

<sup>7</sup> Paul Klemperer's article contains a good review of the existing theoretical literature on auctions.

<sup>8</sup> The merits of absolute priority are discussed below.

Of course, the case for Chapter 7 and against Chapter 11 is not really as clear cut as the preceding arguments would make it seem, as I'll discuss later. But underlying most economic arguments against Chapter 11 (and in favor of a single creditor's chapter like Chapter 7) is a simple but powerful economic idea about the features of a well-functioning bankruptcy mechanism. The mechanism should keep separate two issues: (1) how to get the most money for the firm's assets; and (2) how that money should be distributed.

The reason for keeping these issues separate is that while all the firm's creditors may agree on little else, they

— indeed anyone with a potential claim on the firm — would agree that all will be made better off if there is a larger pie to divide. And a substantial body of economic knowledge supports using auctions as a means of getting the largest pie. However, bargaining among investor groups over competing reorganization plans invariably mixes the issues of getting the most for the firm's assets and distributing the claims on those assets. It is unlikely that such bargaining would ever arrive at a plan that gives creditors the most money to split up.<sup>10</sup> And since bargaining takes time, the

<sup>9</sup> The evidence for systematic violations of absolute priority in Chapter 11 is voluminous. See the articles by Edith Hotchkiss for evidence about how often inefficient managers remain entrenched. See the article by Julia Franks, Kjell Nyborg, and Walter Torous for a range of estimates of the administrative costs of Chapter 11.

<sup>10</sup> Mixing the two types of issues also makes bargaining more complicated and creates stronger incentives for groups to use bankruptcy proceedings in a strategic way.

firm's assets may be declining in value while investor groups dicker.<sup>11</sup>

**The Reasons for Respecting Absolute Priority.** Chapter 11's systematic violation of absolute priority in favor of incumbent stockholders is essentially a distributional issue. If so, what is the significance of the particular distribution dictated by the absolute priority rule? Essentially, absolute priority ensures that claimants' payoffs are made in the same order of priority that would have existed had the distressed firm never entered bankruptcy at all. As argued by Thomas Jackson in his influential book, a well-designed bankruptcy mechanism avoids a race to the courthouse to prevent a disorderly — and value-destroying — assertion of creditors' rights, but it should not overturn contractual agreements that were freely negotiated by the firm and its investors. These contracts were negotiated with an eye toward keeping the firm's funding costs as low as possible and with the intention of raising the firm's value as much as possible.

Deviations from absolute priority will increase the firm's borrowing costs, since creditors who expect to lose out in bankruptcy demand compensation through a higher rate of interest.<sup>12</sup>

<sup>11</sup> Legally, the trustee may petition the court to shift the bankruptcy proceedings from Chapter 11 to Chapter 7 if he or she feels that creditor interests would be served. However, the trustee could not unilaterally choose to make this decision. Instead, the court would decide after a hearing, with all groups of claimants represented.

<sup>12</sup> This argument is not immune to criticism. Some economists have argued that freely negotiated contracts won't lead to the lowest possible financing costs, so long as the firm negotiates contracts in sequence with different investors. For example, the firm may offer collateral to a new creditor, thus reducing the value of all existing unsecured claims. Fearing this, prior investors would demand a higher interest rate or contractual protections that the prior investors — or their lawyers — must monitor closely. This line of thinking has raised questions about the desirability of absolute priority. See, for example, Lucien Bebchuck and Jesse Fried's article discussing these and related issues.

Even worse, deviations that are hard to predict with certainty raise the firm's financing costs higher still because investors require compensation for the added uncertainty.

## SOME PROBLEMS WITH CHAPTER 7

Scholarly debate following Baird's and Jensen's criticisms of Chapter 11 has taken issue with the view that an efficient bankruptcy mechanism would necessarily look like Chapter 7: an auction that gets the largest possible price for the firm's assets, followed by a distribution of the money received in line with the absolute priority rule.<sup>13</sup>

**Auctions May Not Obtain the Highest Price for a Firm's Assets.** A key feature that distinguishes an auction in bankruptcy from many other auctions is that the potential bidders include individuals with existing claims on the object to be auctioned. In addition to the firm's current owners, the firm's creditors or other investors might also choose to make competing bids. For example, vulture investors — those who buy up a distressed firm's debt at discounted prices in order to play a significant role in bankruptcy proceedings — are experts at managing and breaking up bankrupt firms.<sup>14</sup>

In a textbook auction, no

<sup>13</sup> In this article, I focus on recent theoretical work on the use of auctions in bankruptcy. I don't emphasize some important issues, for example, whether the difficulty of obtaining funding might act as a barrier for some bidders or the possibility that a distressed firm will be forced to sell assets at fire-sale prices. Both of these problems further reduce the relative attractiveness of auctions compared with structured bargaining. Oliver Hart's article discusses and evaluates some of these issues.

<sup>14</sup> Edith Hotchkiss and Robert Mooradian's article describes the activities of vulture investors.

bidder would ever choose to bid more for an asset than it was worth because the bidder has no prior claim on the auctioned item. However, this is not true if the bidder has a prior claim on the asset. Existing claimants systematically *overbid*, that is, they bid more than they think the assets are worth. An existing claimant overbids because if he loses, he gets a share of the money paid by the winning bidder. Thus, unlike in a textbook auction, the claimant gains if a competing bidder ultimately pays too much for the asset.<sup>15</sup> But this means that any potential bidder must take into account not only the possibility of high bids from someone who places a higher value on the firm's assets but also the possibility of high bids from someone whose valuation is actually lower than her own. This is a problem because some outside bidders — ones not connected with the firm — who may have superior

<sup>15</sup> Mike Burkart's article explains overbidding in the context of a model of competing bids to take over a firm, although he notes that the same ideas apply to bankruptcy proceedings.



plans for running the firm (or selling its assets) will be driven away from the auction.<sup>16</sup>

**Separating Asset Deployment Issues and Distribution Issues May Be Impossible.** One reason auctions of a firm's assets have appeared attractive to economists who think about bankruptcy is that a large literature on auctions has established that many types of auction procedures will yield the same expected revenues to the seller.<sup>17</sup> We might conclude that while existing claimants will disagree about how revenues should be distributed, they should all agree upon an auction procedure that generates the highest expected price.

But the article by Sugato Bhattacharyya and Rajdeep Singh shows that senior and junior creditors would *disagree* about the choice of auction procedures, even when the auctions yield the same expected revenues. The reason is that while we can predict the *expected revenues* for an auction, the *actual price* that will be paid by the winning bidder is uncertain. The riskiness of the bids will be important to the firm's creditors, and different types of creditors will have different risk preferences. Specifically, junior creditors will prefer auction procedures with a higher probability of both very low and very high bids because they get paid only if the senior creditors have already been paid in full.<sup>18</sup> And auction procedures that generate a wide

<sup>16</sup> Per Stromberg's article presents some empirical evidence that overbidding actually occurs in Swedish bankruptcy auctions.

<sup>17</sup> Some of the more familiar forms of auctions include the ascending-bid auction and the sealed-bid auction.

<sup>18</sup> Actually, junior creditors (like all creditors) would prefer auctions that yield only high bids most of all. To focus on different investors' preferences for different degrees of risk, Bhattacharyya and Singh compared auction procedures that have the same expected return and different amounts of dispersion

dispersion of returns increase the probability that junior creditors will get paid. By the same reasoning, senior creditors prefer auctions with a narrower range of bidding.<sup>19</sup>

One conclusion we can draw from Bhattacharyya and Singh's article is that there is *no* bankruptcy procedure — and that includes auctions — in which asset deployment and distributional issues can be completely separated, at least as long as investors hold different types of claims that yield different preferences about risk. (See *The Options Approach*, for an ingenious auction procedure that helps overcome this problem.)

## TWO CHAPTERS ARE BETTER THAN ONE

Much of the literature on bankruptcy has assumed that absolute priority is a necessary component of an efficient bankruptcy law. However, a recent article by Elazar Berkovitch and Ronen Israel explains why systematic deviations from absolute priority may make economic sense.<sup>20</sup> Their model indicates that an efficient bankruptcy system includes a number of features

<sup>19</sup> The precise result shown by Bhattacharyya and Singh is that a senior creditor strictly prefers a sealed-bid first-price auction to a sealed-bid ascending-bid auction, while a junior creditor prefers the opposite. In an ascending-bid auction, bids rise until all but one bidder has dropped out. Thus, the winner need only pay (slightly more than) the price bid by the second-highest bidder. When the ascending-bid auction is a sealed-bid auction, none of the bidders sees when the others drop out. In a sealed-bid first-price auction the winner pays his or her own bid price, rather than the price bid by the second-highest bidder. Since the bids are sealed, bidders do not see one another's bids..

<sup>20</sup> This is the most ambitious of a series of articles by Berkovitch and Israel (along with Jamie Zender) that explain why violations of absolute priority may be desirable. The common theme of these articles is that managers, with superior information, must be provided incentives to act on investors' behalf. In general, this requires that the manager receive a share of the firm's value in bankruptcy.

that resemble the different bankruptcy laws we observe around the world. In fact, their model demonstrates that some types of economies are best served by a bankruptcy mechanism with two chapters: a *creditor's* chapter with similarities to Chapter 7 and a *debtor's* chapter with similarities to Chapter 11. Thus, their model suggests that a bankruptcy mechanism like that in the U.S. does have certain desirable features. However, Berkovitch and Israel's research also suggests that other types of economies are best served by a single chapter: the *creditor's* chapter. This system resembles the traditional British bankruptcy system.

The two types of chapters differ according to who initiates the bankruptcy and whether the chapter violates absolute priority by giving incumbent stockholders a share of the reorganized firm. The debtor's chapter is initiated by the firm's stockholders and violates absolute priority. The value of violating absolute priority is that stockholders are given an incentive to voluntarily seek bankruptcy if they have information that the firm is likely to fail.

Stockholders will never voluntarily seek the protection of the bankruptcy court unless there is something to gain by doing so. Inducing stockholders to voluntarily enter bankruptcy can be valuable because the firm's owners are often the first to become aware of serious financial troubles. Postponing bankruptcy too long hurts all creditors because a troubled firm's assets typically continue to decline in value until the firm is reorganized or dissolved. Thus, even creditors would agree to give up a piece of a larger pie to shareholders if it's necessary to induce stockholders to enter bankruptcy voluntarily.

The creditor's chapter, which, as its name suggests, is initiated by creditors, respects the absolute priority rule. This chapter permits creditors that are well informed about the firm's affairs

to petition for bankruptcy without giving anything to incumbent owners. Unless the creditors are relying on the firm's owners to enter bankruptcy voluntarily, creditors would never give the owners a portion of the money received for the bankrupt firm's assets. Owners will typically work harder to make the firm profitable and avoid bankruptcy if they know they're not getting a share of the assets when the firm goes bankrupt.

#### Either System May Be

**Superior.** In an undeveloped financial market, especially one characterized by strong relationships between a borrower and its lender, Berkovitch and Israel predict that an efficient bankruptcy law will have only a creditor's chapter.<sup>21</sup>

In a relationship-driven financial market, adding a debtor's chapter would be both not very helpful and too costly. Not very helpful, because the lender's information about the borrower is likely to be good when relationships are close; thus, the creditor's chapter will enforce efficient liquidation most of the time even without using the firm's information.<sup>22</sup> Too costly, because a firm with bad news about its prospects will have a powerful incentive to use the debtor's chapter to preempt its lender from initiating proceedings, so as to capture a share of the payoffs in bankruptcy.

In an economy without close lending relationships, but with many

<sup>21</sup> The combination of undeveloped financial markets and strong relationships is probably a fair description of Japan until the 1980s.

<sup>22</sup> If creditors have conflicting interests — for example, if some claims are collateralized — it is possible that creditor-initiated proceedings could lead to premature liquidation. However, the automatic stay greatly reduces the possibility that any creditor could gain by pushing the firm into bankruptcy prematurely.

different individuals, analysts, and investors producing information about firms, a two-chapter system may be both feasible and desirable. In such a system, a firm can't predict with certainty what creditors know about its financial condition, since the information available to a firm's owners and the information available to market participants are different. In this case, should a firm's owners become aware of serious problems, they will not always seek court protection to pre-empt creditors from

## Many nations have introduced bankruptcy reform (and reform proposals) along the lines of the two-chapter model in the United States.


forcing the firm into bankruptcy. After all, it may turn out that the firm's creditors won't receive information that would lead them to do so. Nonetheless, the firm's owners will sometimes enter bankruptcy voluntarily, thus improving the decisions made about liquidating and reorganizing firms. In such an economy — for example, the United States — two chapters can coexist and improve on a single-creditor chapter.

Interestingly, Berkovitch and Israel's model predicts that in an economy in which firms reduce their reliance on banks and shift more of their financing toward capital markets, an efficient bankruptcy system would shift from a single-chapter system (with only the creditor's chapter) to a two-chapter system. This shift toward capital markets is a trend in many developed countries. And, as predicted, many nations have introduced bankruptcy reform (and reform proposals) along the lines of the two-chapter model in the United States.

## CONCLUSION

Recent economic scholarship on the efficiency of existing bankruptcy mechanisms has been a productive source of insights. Substantial empirical evidence holds that Chapter 11 reorganization proceedings are drawn out, costly affairs, with a significant bias toward incumbent owners that is reflected in systematic deviations from absolute priority. Some critics have suggested replacing the two-chapter bankruptcy system of the U.S., in which

auctions are used to liquidate firms in Chapter 7 and bargaining among claimants is used to reorganize firms in Chapter 11. Specifically, the critics argue that all bankruptcies, whether liquidations or reorganizations, can be handled through auctions.

These proposals have generated further debate. While the outcome of the debate is not conclusive, a number of provisional conclusions have arisen. Although critics have complained that Chapter 11 proceedings don't separate the valuation of the firm's assets from the distribution of this value to claimants, it now seems clear that auctions suffer from the same problem. Furthermore, theorists have provided explanations not only for systematic deviations from absolute priority but also for bankruptcy mechanisms with significant similarities to the two-chapter bankruptcy mechanism in the United States. 

## THE OPTIONS APPROACH

# A

s long as existing claimants on the bankrupt firm have different types of claims, decisions about how the firm's assets should be handled can't be separated from decisions about how the value of these assets should be distributed. Thus, claimants would not unanimously support efficient plans for selling the firm's assets or reorganizing under new management.

Lucien Bebchuck proposed the following approach to satisfying claimants in bankruptcy.<sup>a</sup> The basic idea is that if all creditors have the same type of claim, their interests are harmonized, and getting the most value for the firm's assets becomes everyone's objective. Bebchuck's idea is to give senior creditors all of the firm's equity. They would receive pro rata shares, according to the size of their claim on the firm. Junior creditors would receive options to buy senior creditors' shares for cash. The firm's stockholders would similarly receive options to buy out the claims of both classes of creditors.<sup>b</sup>

To get an idea how this would work, consider a highly simplified example with only *two* types of claimants. At bankruptcy, the firm has 100 bondholders, each with \$1 debt outstanding, and five shareholders, each with 20 shares of the firm's total 100 shares of stock issued. Under this scheme, the 100 shares of stock would be distributed equally among the 100 bondholders, with each receiving one share. Each stockholder would receive an option to buy up to 20 shares of stock at \$1 per share. The exercise price of the option (\$1) is set so that the firm's former bondholders are obliged to sell their current shares as long as they are offered at least as much as the face value of their original bond.<sup>c</sup>

Before individuals make decisions about whether to

exercise their options, a trustee would solicit plans for selling the firm's assets or reorganizing the firm. Participants' ability to buy and sell their options would ensure that those individuals who place the highest value on the firm could amass a majority of the firm's equity. Under this procedure, there is no need for everyone to agree that a particular plan for the firm is best; those who don't agree would sell their option to the individual who places the highest value on the firm.

If the firm's former stockholders believe that the firm is worth less than \$100 — even under the best plan — they would not exercise their options to buy the firm's shares because the cost of exercising the option exceeds the value of the firm. However, if they believe that under some plan the firm is worth, say, \$120, the firm's former stockholders *would* choose to exercise their options to buy the firm's shares for \$100. And since options can be sold, if other investors believe that they have a plan worth more than \$100, the former shareholders would gladly sell their options even if they disagree about the value of the plan.

Of course, no procedure is perfect. This approach does not overcome the problem that existing claimants have an incentive to overbid. Thus, we can't assume that bidders with the highest valued plan for the firm's reorganization or liquidation will participate. Also, as in any auction, the procedure will work well only if those who place a high value on the firm can also finance their purchase of equity or options. Furthermore, for firms with both secured debt and unsecured senior debt, the procedure may not be as straightforward as in the example. In this case, the procedure must take account not only of the value of the plan as a whole but also of the value of those assets pledged as collateral.

<sup>a</sup>Although the basic idea is Bebchuck's, Philippe Aghion, Oliver Hart, and John Moore extended Bebchuck's procedure to include a separate stage in which potential suitors propose different reorganization plans, as developed here.

<sup>b</sup>The scheme does not require that investors purchase *all* of the claims of a senior class. However, an investor (or group of investors) may need to purchase a majority of the shares of the firm to gain control of the firm to ensure that a particular reorganization plan is carried out.

<sup>c</sup>For a firm with a more complicated financial structure — with claims of many different priorities — a junior group receives options to buy out all claimants who are senior to that group. The version of Bebchuck's scheme developed here maintains absolute priority by requiring the senior claimant to sell at the exercise price. However, the scheme can be modified to permit deviations from absolute priority if so desired.



## REFERENCES

- Aghion, Philippe, Oliver Hart, and John Moore. "The Economics of Bankruptcy Reform," *Journal of Law, Economics, and Organization*, 1992, pp. 523-46.
- Baird, Douglas. "The Uneasy Case of Corporate Reorganizations," *Journal of Legal Studies*, pp. 69-98.
- Bebchuck, Lucien A. "A New Approach to Corporate Reorganizations," *Harvard Law Review*, pp. 775-804.
- Bebchuk, Lucien A., and Jesse M. Fried. "The Uneasy Case for the Priority of Secured Claims in Bankruptcy," *Yale Law Journal*, January 1996, pp. 857-934.
- Berkovitch, Elazar, and Ronen Israel. "Optimal Bankruptcy Laws Across Different Economic Systems," *Review of Financial Studies*, Spring 1999, pp. 347-77.
- Bhattacharyya, Sugato, and Rajdeep Singh. "The Resolution of Bankruptcy of Auction: Allocating the Residual Right of Design," *Journal of Financial Economics*, 1999, pp. 269-94.
- Burkart, Mike. "Initial Shareholdings and Overbidding in Takeover Contests," *Journal of Finance*, December 1995, pp. 1491-1515.
- Epstein, David G. *Bankruptcy and Other Debtor-Creditor Laws in a Nutshell*. St. Paul, MN: West Publishing, 1995.
- Franks, Julian R., Kjell G. Nyborg, and Walter N. Torous. "A Comparison of U.S., U.K., and German Insolvency Codes," *Financial Management*, Autumn 1996, pp. 86-101.
- Gilson, Stuart, Edith Hotchkiss, and Richard Ruback. "Valuation of Bankrupt Firms," *Review of Financial Studies*, Spring 2000, pp. 43-75.
- Hart, Oliver. "Different Approaches to Bankruptcy," Discussion Paper 1903, *Harvard Institute of Economic Research*, September 2000.
- Hotchkiss, Edith S. "Post-Bankruptcy Performance and Management Turnover," *Journal of Finance*, 1995, pp. 3-21.
- Hotchkiss, Edith S., and Robert M. Mooradian. "Vulture Investors and the Market for Control of Distressed Firms," *Journal of Financial Economics*, 1997, pp. 401-32.
- Jackson, Thomas. *The Logic and Limits of Bankruptcy Law*. Cambridge, MA: Harvard University Press, 1986.
- Jensen, Michael C. "Corporate Control and the Politics of Finance," *Journal of Applied Corporate Finance*, Fall 1991, pp. 13-33.
- Klemperer, Paul. "Auction Theory: A Guide to the Literature," *Journal of Economic Surveys*, July 1999, pp. 227-86.
- Pulvino, Todd C. "Do Asset Fire Sales Exist? An Empirical Investigation of Commercial Aircraft Transactions," *Journal of Finance*, June 1998, pp. 939-78.
- Stromberg, Per. "Conflicts of Interest and Market Illiquidity in Bankruptcy Auctions: Theory and Tests," *Journal of Finance*, Dec. 2000, pp. 2641-92.

# The Taylor Curve and the Unemployment-Inflation Tradeoff

BY SATYAJIT CHATTERJEE

**I**n the past, monetary policy options were described in terms of a tradeoff between the unemployment rate and the inflation rate, the so-called Phillips curve.

Macroeconomists no longer view the Phillips curve as a viable “policy menu” because its use as such is inconsistent with mainstream macroeconomic theory. In the late 1970s, John Taylor suggested an alternative set of options for policymakers to consider, one consistent with macroeconomic theory. These alternative options involve a tradeoff between the variability of output and the variability of inflation. Satyajit Chatterjee explains the logic underlying this new variability-based policy menu and discusses its implications for the conduct of monetary policy.

In thinking about how the Fed should conduct monetary policy, it's important to know what monetary policy can and cannot accomplish. Without a clear idea of what is within the reach of a central bank in terms of controlling economic activity, it's not possible to make sensible choices regarding monetary policy.

Scientific consensus on what



**Satyajit Chatterjee** is a senior economic advisor and economist in the Research Department of the Philadelphia Fed.

central banks can do has evolved over time and so have prescriptions for conducting monetary policy.<sup>1</sup> In the 1950s and 1960s, monetary policy options were formulated in terms of a tradeoff between the unemployment rate and the rate of inflation, the so-called Phillips curve.<sup>2</sup> Economists back then thought that the Fed could sustain a lower or higher rate of unemployment by bringing about a higher or lower rate of inflation. The implication was that if the unemployment rate associated with price stability (that is, zero inflation) turned out to be too high, the Fed could

<sup>1</sup> See the article by Philadelphia Fed President Anthony Santomero in the First Quarter 2002 *Business Review* for more discussion of this point.

improve economic performance by engineering some inflation in order to reduce the unemployment rate.

But by the early 1970s, scientific support for a tradeoff between the rate of inflation and the unemployment rate had ebbed. As a result of advances in monetary theory and a clearer perception of monetary facts, economists recognized that a higher inflation rate could lower the unemployment rate only temporarily. An expansionary monetary policy sustained over a long period would, in the end, generate only higher inflation with no reduction in the unemployment rate.

Currently, the conduct of monetary policy respects this circumscribed view of the effectiveness of monetary policy actions. The challenge for policymakers is to determine how best to carry out monetary policy when people know that monetary policy actions have only temporary effects on the unemployment rate.

One possibility is to refrain from exploiting the temporary tradeoff between inflation and unemployment and carry out monetary policy with some desired long-run inflation target in mind. For instance, Nobel laureate

<sup>2</sup> British economist A.W. Phillips documented an inverse relationship between the rate of wage inflation for U.K. workers and the unemployment rate in the U.K. for the years 1861-1957. In 1960, American economists Paul Samuelson and Robert Solow drew attention to the inverse relationship between the rate of price inflation in the United States and the U.S. unemployment rate, a relationship they called a “modified Phillips curve.” The qualifier “modified” has long since disappeared, and the Phillips curve is now generally understood to represent the inverse relationship between price inflation and the unemployment rate.

Milton Friedman has suggested that the Fed should endeavor to keep the money supply growing at a constant rate, one consistent with long-run price stability or a modest level of long-run inflation.<sup>3</sup>

In 1979, economist John Taylor suggested a different possibility.<sup>4</sup> Taylor pointed out that the temporary tradeoff between inflation and unemployment was consistent with a permanent tradeoff between the *variability* of inflation and the *variability* of output over time. At some point, policymakers face a choice between lowering the variability of output at the cost of more variability in the inflation rate or lowering the variability of the inflation rate at the cost of more variability in output. In his article, Taylor estimated the tradeoff between variability in inflation and output for the U.S. economy.<sup>5</sup> This “Taylor curve” displays one set of options available to policymakers when monetary policy actions have only temporary effects on the unemployment rate.

In this article, I will explain how policymakers can exploit a temporary tradeoff between the unemployment and inflation rates to consistently achieve particular inflation and output variability combinations on the Taylor curve.<sup>6</sup> Then I will discuss what lessons about the conduct of monetary policy can be drawn from the Taylor curve. Taylor has argued that the very shape of the curve reveals the general nature of the monetary policy rule that macroeconomists should recommend to policymakers. I suggest

---

<sup>3</sup> Friedman stated his views in his 1967 presidential address to the American Economic Association. The text of his address appears in his 1968 article.

<sup>4</sup> John Taylor is professor of economics at Stanford University and a renowned scholar on issues concerning monetary policy. Professor Taylor has served as a member of the President’s Council of Economic Advisers and is currently serving as Undersecretary for International Affairs at the U.S. Department of Treasury.

that macroeconomists should be cautious about recommending any particular policy rule too strongly until more is known about the effects that different combinations of inflation and output variability (on the Taylor curve) have on a typical household’s standard of living.

## A PRIMER ON THE THEORY OF THE NATURAL RATE OF UNEMPLOYMENT

The proposition that the policy choices suggested by the Phillips curve cannot be sustained is a key implication of the *theory of the natural rate of unemployment*. Since the natural rate theory is Taylor’s point of departure in his search for a sustainable tradeoff between inflation and output, it’s best to begin with a brief description of this theory and its implications for the Phillips curve.

The theory of the natural rate of unemployment centers on the determinants of the unemployment rate. The theory makes a distinction between the fundamental determinants of the unemployment rate and nonfundamental factors. Fundamental determinants are factors that change slowly over time, such as demographics, technology, laws and regulations, and social mores. These fundamental factors determine the *natural rate of unemployment*.

---

<sup>5</sup> Taylor couches his arguments in terms of variability of output rather than unemployment but this difference is not important because the two are closely related. Macroeconomists often use a rule of thumb to translate variability in output to variability in the unemployment rate. The rule of thumb is that a 1-percentage-point reduction in the unemployment rate goes hand-in-hand with a 3-percentage-point increase in output. This rule of thumb, which appeared in a 1971 article by Arthur Okun, is referred to as Okun’s Law. For the sake of comparison with the Phillips curve, later in the article I’ll couch Taylor’s arguments in terms of the variability of the unemployment rate instead of output.

<sup>6</sup> Economists refer to this tradeoff as a “policy menu.”

However, because of nonfundamental factors, the actual unemployment rate can deviate from the natural rate. The theory links these deviations to events that cause the actual inflation rate, at any given date, to diverge from the inflation rate expected for that date in earlier periods.

The reasoning underlying this link goes as follows.<sup>7</sup> In modern industrial economies, it’s common for workers to enter into employment contracts in which they agree to supply as many hours of work as demanded by their employers (within reasonable limits) for an agreed-upon wage rate or salary. This contractually fixed wage rate or salary reflects, in part, what workers and employers expect the inflation rate to be over the term of the contract. If the inflation rate turns out to be as expected, employers demand (and workers supply) the normal level of work hours, and the overall unemployment rate is close to the natural rate. If the inflation rate turns out to be higher than expected, employers buy additional work hours because the price at which they can sell their products is higher than expected but the wage they must pay for additional hours of work remains contractually fixed. In this case the utilization of labor rises, and the unemployment rate tends to fall below the natural rate. Conversely, if the inflation rate turns out to be lower than expected, firms lay some workers off because the price at which firms can sell their products is now lower than expected but the wage they must pay their workers remains contractually fixed. In this case, the utilization of labor falls, and the unemployment rate tends

---

<sup>7</sup> There are two variants of the natural rate theory. The text describes the variant formulated, in part, by Taylor, which forms the basis for Taylor’s subsequent work. Robert Lucas Jr. developed the other variant, which focuses on informational frictions rather than employment contracts. Both variants appear to be consistent with the evidence.

to rise above the natural rate.<sup>8</sup>

The architects of the natural rate theory took a stand on which events caused actual inflation to diverge from expected inflation. They attributed these discrepancies to erratic monetary policy. They argued that when the monetary authority expands the money supply unexpectedly, it makes aggregate demand for goods and services rise faster than aggregate supply. This excess demand causes the actual inflation rate to rise above the expected inflation rate, which, in turn, motivates firms to increase the utilization of all factors of production, including labor. The increase in the utilization of labor leads to a decline in the unemployment rate. Conversely, when the monetary authority unexpectedly contracts the money supply, aggregate demand falls short of aggregate supply. Now excess supply causes the actual inflation rate to fall below the expected inflation rate, which, in turn, induces firms to reduce the utilization of labor (and other factors of production) and causes the unemployment rate to rise.

**The Natural Rate and the Phillips Curve.** Under certain conditions, the natural rate theory can explain why the data on inflation and unemployment can take the form of a Phillips curve. Recall that the Phillips curve refers to a negative relationship between the inflation rate and the unemployment rate: During years in which the inflation rate is high, the unemployment rate tends to be low; during years in which the unemployment rate is high, the inflation rate tends to be low. If the

<sup>8</sup> If employers indexed wage rates or salaries to future inflation outcomes, the incentives to demand additional work hours when the inflation rate is higher than expected and to reduce work hours when the inflation rate is lower than expected would disappear. Thus, Taylor's variant of the natural rate theory leans rather heavily on the fact that most employers do not appear to index wage-rate or salary contracts to inflation outcomes in the future.

average of unemployment rates over time is a good proxy for the natural unemployment rate and if the average of inflation rates over time is a good proxy for the expected inflation rate, the natural rate theory implies that a plot of the *actual* annual rates of inflation and unemployment should trace out an inverse relationship. According to the theory, a year with a higher-than-expected inflation rate should be a year

## The natural rate theory can explain why the data on inflation and unemployment can take the form of a Phillips curve but implies that the Phillips curve shows a short-run tradeoff between inflation and unemployment.

with an unemployment rate lower than the natural rate, which, using averages of the two rates over time, implies that a year with a higher-than-average inflation rate should also be a year with a lower-than-average unemployment rate. In other words, there should be a negative relationship between the inflation and the unemployment rates.<sup>9</sup>

Figure 1 reproduces Paul Samuelson and Robert Solow's original estimate of the "modified" U.S. Phillips curve for the period 1933-58. The curve shows a negative relationship between the average annual rate of inflation and the annual unemployment rate. For instance, at point B on the curve, an inflation rate of 4.5 percent accompanies an unemployment rate of 3 percent; at point A, an inflation rate of zero accompanies an unemployment rate of 5.5 percent.

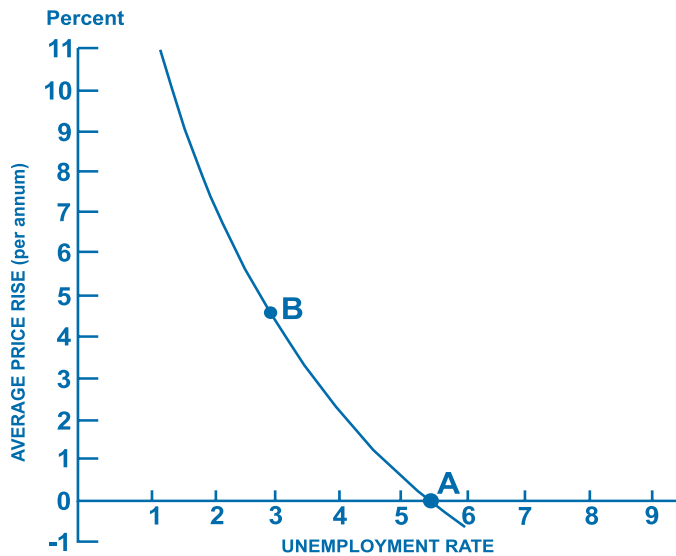
From the perspective of the natural rate theory, however, the most

<sup>9</sup> It's worth noting that the prediction of the natural rate theory concerning Phillips curves holds up when the natural unemployment rate and the expected inflation rate are proxied by formulas more sophisticated than simple averages of the rates over time. See, for instance, Figure 1.5 in Thomas Sargent's 1999 book on U.S. inflation.

interesting aspect of the figure is the authors' labeling of the curve. As noted at the bottom of the figure, Samuelson and Solow thought that this curve "shows the menu of choice between different degrees of unemployment and price stability." The authors' labeling suggests that if policymakers find the 5.5 percent unemployment rate corresponding to price stability (point A on the curve) unacceptably high, monetary

policy actions could lower the unemployment rate to 3 percent at the cost of an annual inflation rate of 4.5 percent (that is, move the economy from point A to point B on the curve).

Although the natural rate theory accounts for the existence of a Phillips curve in the data, the theory also implies that the Phillips curve shows a short-run tradeoff between inflation and unemployment, not one that can be sustained over the long run. To see why, suppose that the natural rate of unemployment in the economy of Figure 1 is 5 percent, and suppose that policymakers want to lower the unemployment rate to 3 percent. According to the natural rate theory, the only way in which the monetary authority can sustain an unemployment rate of 3 percent is by generating actual inflation that's higher than *expected* inflation. Initially, the monetary authority may succeed in generating higher-than-expected inflation and get the unemployment rate below the natural rate. But eventually people will catch on to the fact that the monetary authority is generating more than the expected amount of inflation, and employment contracts will begin to take the new

**FIGURE 1****Phillips Curve for U.S.**

This figure shows the menu of choice between different degrees of unemployment and price stability, as roughly estimated from American data from 1933-58. Adapted from Paul A. Samuelson and Robert Solow, "Analytical Aspects of Anti-Inflation Policy," *American Economic Review (Papers and Proceedings)*, 50, May 1960, pp. 177-94. Used with permission.

higher rate of inflation into account. Once that discrepancy between actual and expected inflation disappears, the unemployment rate will rise again to 5 percent. Thus, unless the inflation rate is continuously different from what people expect, the unemployment rate will return to the natural rate.

The natural rate theory implies that for the monetary authority to keep the unemployment rate permanently below the natural rate, it must continually stay ahead of people's expectations of rising inflation by generating inflation at an ever-rising rate. Put differently, the only unemployment rate that's consistent with nonaccelerating or nondecelerating price inflation is the natural unemployment rate. This also implies that the inflation rate associated with the natural rate is a matter of policy choice. Within limits, it can be anything the monetary authority wants it to be, since once people come to expect the

chosen inflation rate, it will be consistent with the natural rate of unemployment.

To summarize, the genesis of the Phillips curve lies in studies of the historical relationship between the growth rates of wages and prices and the unemployment rate. Although the negative relationship between inflation and unemployment exists in the historical data (for that matter, in more recent data as well), macroeconomists no longer believe in a long-run policy tradeoff between inflation and unemployment. The natural rate theory persuaded most macroeconomists that it's impossible for a monetary authority to achieve any unemployment rate other than the natural rate without eventually having either accelerating or decelerating inflation. Although the Phillips curve describes a genuine pattern in the data, the reason underlying the pattern implies it cannot be viewed as a policy menu.

### THE TAYLOR CURVE: A TRADEOFF CONSISTENT WITH NATURAL RATE THEORY

If the Phillips curve cannot be used as a policy tool, is there any tradeoff between inflation and unemployment that can? Taylor argues that there is. Like the Phillips curve, this alternative curve also concerns the relationship between inflation and unemployment but focuses on the variability of inflation and the variability of unemployment.

To develop these variability-based combinations, Taylor takes the view that there are other nonfundamental events, besides erratic changes in monetary policy, that cause the actual unemployment rate to deviate from the natural rate. For instance, if consumers become unduly pessimistic about their prospects for future income and, consequently, reduce their spending, the economy can end up in a situation where aggregate supply will exceed aggregate demand at prices that firms expected to prevail. In this situation, the downward pressure on prices will make the actual inflation rate fall below the expected inflation rate and the utilization of factors of production will fall and the unemployment rate will rise. Conversely, if consumers become unduly optimistic about prospects for future income and, consequently, increase their spending substantially, prices will be higher than expected and the utilization of factors of production will rise and the unemployment rate will fall.

Given the possibility of such events, the central idea underlying Taylor's variability-based tradeoff is that policymakers can choose the degree to which monetary policy is used to *buffer* the unemployment rate against nonfundamental disturbances. For instance, if consumers become unduly pessimistic about the future and the actual inflation rate turns out to be lower than expected, the monetary authority can then expand the money

supply to counteract the higher unemployment that results from the disinflationary shock. Similarly, if consumers become unduly optimistic about the future and the actual inflation rate rises faster than expected, the monetary authority can then contract the money supply to counteract the negative unemployment effect of the inflationary shock.

The important point to note is that such buffering is not inconsistent with the natural rate theory because the monetary authority is not trying to create unexpected inflation or deflation on a sustained basis. On the contrary, the monetary authority is acting to offset variability in unemployment caused by a discrepancy between actual and expected inflation. Various events can cause actual inflation to deviate from expected inflation, so there is a scope for beneficial monetary policy actions that's entirely consistent with the natural rate theory.

**The Unemployment-Inflation Variability Tradeoff.** Taylor notes that successful buffering of the unemployment rate against nonfundamental disturbances can dampen the variability of both the inflation and the unemployment rate. However, he also argues that at some point, further reduction in the variability of the unemployment rate can come only at the expense of more variability in the inflation rate.

The problem is that a change in the inflation rate tends to persist over time. For instance, if the inflation rate rises because of some unexpected event, all else remaining the same, the inflation rate will tend to be higher in the future. This means that even if the monetary authority undertakes monetary policy action to fully offset the unemployment effects of, say, a positive inflation shock, it's left facing a path of *future* inflation that's higher than the path that everyone expected to prevail prior to the shock. To nudge the inflation rate back

down toward the previously expected path, the monetary authority has to tighten monetary policy more than what would be needed to keep the unemployment rate at the natural rate. The additional monetary restraint raises the unemployment rate above the natural rate and, therefore, *adds* to the variability of the unemployment rate. But it also works to bring the inflation rate back toward the pre-shock level and therefore serves to lower the variability of the inflation rate. Furthermore, the more quickly the monetary authority aims to bring the inflation rate back down to the pre-shock level, the more variability it will inflict on the unemployment rate.

This then is the tradeoff facing policymakers, according to Taylor's theory. To reduce the variability of the inflation rate, the monetary authority must be willing to tolerate increased variability in the unemployment rate. Two ingredients seem necessary for such a tradeoff to exist. First, there must be disturbances (other than erratic monetary policy actions) that cause the actual inflation rate to deviate from the expected inflation rate.<sup>10</sup> Second, any change in the inflation rate must tend to be persistent. It's this property of persistence that leads to a situation where the variability of the inflation rate can be lowered only at the expense of greater variability in the unemployment rate.

To summarize, Taylor has developed an inflation and output tradeoff consistent with the natural rate theory. His tradeoff involves the variability of the inflation rate and the variability of output, which, recall, is closely related to the variability of the unemployment rate. Figure 2 shows what this tradeoff looks like for the U.S.

<sup>10</sup> Such disturbances could be due to consumers' undue optimism or pessimism about their future earning prospects. More generally, any disturbance that results in pricing mistakes by businesses would qualify.

By choosing how aggressively to combat variability in the inflation rate, the monetary authority determines where on this curve to locate. A policy of aggressively combating deviations in the inflation rate from a given target path will put the economy on a point like B, where the variability of output is relatively high but the variability of the inflation rate is low. Conversely, a less aggressive policy of combating deviations in the inflation rate from a given target path will put the economy on a point like A, where the variability in output is low but variability in the inflation rate is relatively high.<sup>11</sup>

## THE TAYLOR CURVE AND THE CONDUCT OF MONETARY POLICY

Taylor posed the problem of the best way to conduct monetary policy in the following way.<sup>12</sup> Is there any particular point on the Taylor curve that's likely to be acceptable to all policymakers?

Suppose that some policymakers are more concerned about variability in the inflation rate and others about variability in the unemployment rate. In that case, the point where Figure 2 curves sharply, point C, is the variability combination for which there is likely to be consensus. The reasoning goes as follows. Policymakers more concerned about output variability are not likely to agree on variability combinations that lie to the northwest of point C because they would be giving up a lot in terms of

<sup>11</sup> The bowed-in shape of the curve indicates that policymakers face a form of "diminishing returns." To bring about a given level of decline in output variability, policymakers must accept larger and larger amounts of inflation variability (and vice versa). The existence of such "diminishing returns" seems plausible, although the exact reasons for it lie in the character of the macroeconomic model used by Taylor.

<sup>12</sup> This description draws on Taylor's 1999 article.

output variability for meager gains in inflation stability. Analogously, policymakers more concerned about inflation variability are not likely to agree on variability combinations that lie to the southeast of point C because they would be giving up a lot in terms of higher inflation variability for meager gains in output stability. Consequently, as long as there is some diversity of views about the relative demerits of inflation and output variability, the combination for which there is likely to be consensus is somewhere in the vicinity of point C.

Taylor recommended a policy rule that gives equal weight to stabilizing inflation and output. In particular, his rule recommends that the Fed lower the fed funds rate by half a percentage point when real GDP falls below potential GDP by 1 percent and that it raise the fed funds rate by half a percentage point if actual inflation rises above its target path (of 2 percent) by 1 percentage point. This policy rule has come to be known as the Taylor rule. Taylor recommended this rule, in part, because it was simple. As he notes in his 1999 article (p. 47), this “[p]olicy rule was purposely chosen to be simple. Clearly, the equal weights on inflation and the GDP gap are an approximation reflecting the finding that neither variable should be given negligible weight.”<sup>13</sup>

Taylor’s policy recommendation hinges on two important assumptions. His first assumption is that the selection of a policy rule (or, equivalently, the selection of a variability combination on the Taylor curve) will occur through a democratic process. Given this assumption, Taylor views the economist’s job as proposing a policy rule that’s most likely to command consensus. His second assumption is that he takes for granted that some

policymakers are more leery of inflation volatility and others more leery of volatility in the unemployment rate.

This second assumption, however, is troublesome. In effect, Taylor treats a policymaker’s preferences for inflation stability over output stability or vice versa in the same way an economist would treat a person’s innate preferences for, say, apples over oranges. But surely preferences about inflation and output variability must derive from some understanding of the relative merits of output and inflation stability, an understanding that ultimately must (or should!) have some connection to how output and inflation variability affects the welfare of working households.

This consideration suggests that the derivation of the variability tradeoff is an important first step for the satisfactory resolution of the question of which monetary policy rule to adopt. Taylor’s variability tradeoff defines the choices that a monetary authority faces, choices that are consistent with the

natural rate theory. But there remains a second, equally important, step: to determine how the economic welfare of the typical household varies across different points on the Taylor curve.

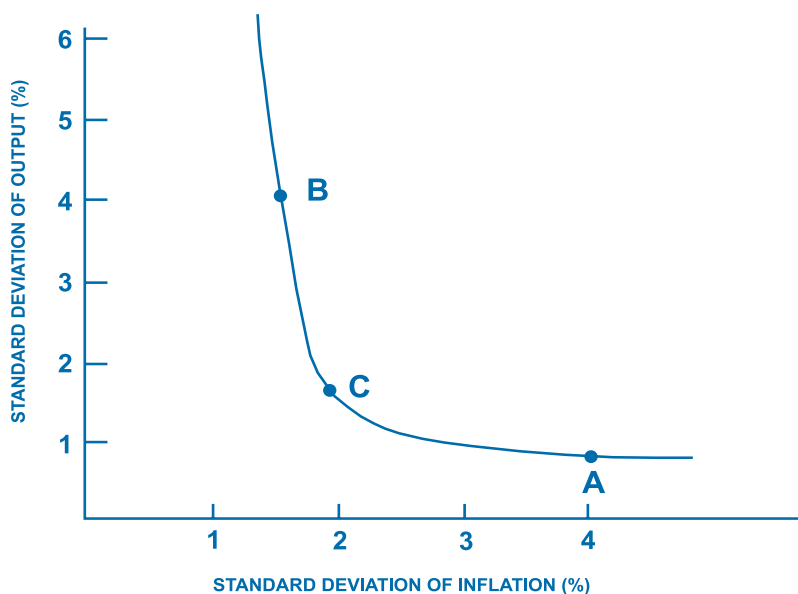
## VARIABILITY AND ECONOMIC WELFARE

At present, not much is known about the economic welfare consequences of different variability combinations on the Taylor curve. Furthermore, the connection between economic welfare and different degrees of variability of inflation and output is sufficiently complex that we cannot be certain how economic welfare will change as we move from a point like A on the Taylor curve to points like B or C.

Turning first to the economic welfare effects of inflation variability, observe that variability of the inflation rate will be most harmful if it affects the real value, or purchasing power, of a household’s earnings. During periods of higher-than-expected inflation, growth

**FIGURE 2**

### The Taylor Curve



Adapted from John B. Taylor, “Estimation and Control of a Macroeconomic Model with Rational Expectations,” *Econometrica*, 47 (5), 1979, pp. 1267-86. Used with permission.

<sup>13</sup> This rule will not put the economy on point C on the Taylor curve, but it will deliver similar variability in inflation and output.

in nominal compensation will lag growth in the general level of prices, and real compensation will decline (recall that this decline in real compensation is the reason firms expand hiring during periods of surprise inflation). Conversely, during periods of lower-than-expected inflation, households will experience faster growth in real compensation.

These fluctuations in real income inflicted by variability in unexpected inflation cannot be good for households. But how bothersome variability in inflation is depends on how much variability in unexpected inflation it leads to. The important point here is that the high variability of inflation at a point like A in Figure 2 need not imply a high variability of unexpected inflation. The logic of the Taylor curve suggests that some of it will come from variability in expected inflation. But variability in expected inflation need not have the same effect on economic welfare as variability in unexpected inflation. For one thing, firms and workers have the opportunity to alter compensation terms in response to changes in inflation that are expected to happen. Arguably, the disruption caused by changes in inflation that are expected to happen is likely to be less than the disruptions caused by unexpected changes in inflation. Therefore, to assess the effects of inflation variability on households, we need information on how the mix between expected and unexpected inflation variability varies as we go from a point like B on the Taylor curve to a point like A. At present, this knowledge is lacking.

Turning to the economic welfare effects of output variability, consider, again, points A and B on the Taylor curve. At point A, variability in output is much lower than at point B. Why is this relevant? One obvious answer is that output variability goes hand-in-hand with variability in the unemployment rate, which is of immediate concern to households. If we

use Okun's rule of thumb that a 1-percentage-point increase in the unemployment rate corresponds to a 3-percentage-point drop in output from trend, points A and B on the Taylor curve would roughly correspond to unemployment rate variability of about 1/3 and 1-1/3 percent, respectively.

Fluctuations in the unemployment rate affect households in two ways: the probability of job loss for employed members and the probability of job gain for unemployed members. For instance, during a recession, when the unemployment rate is relatively high, the probability of job loss for employed workers is also relatively high, and the probability of job gain for unemployed individuals is relatively low. Thus, all individuals face a higher risk of unemployment. Conversely, during an economic expansion, the probability of job loss for employed workers is relatively low, and the probability of job gain for unemployed workers is relatively high. Hence, all individuals face a lower risk of unemployment. If a policy rule reduces the variability of the unemployment rate, it will reduce fluctuations in the risk of unemployment.

To make matters concrete, let's suppose that the monetary authority is comparing two policy rules with the following properties. Under the first policy, the unemployment rate is predicted to be (almost) constant at, say, 5 percent, and under the second policy it's predicted to fluctuate, with equal probability, between 6 percent and 4 percent from one period to the next. Observe that the average unemployment rate is 5 percent under the second policy as well.

The effects of these two policies on economic well-being will depend on exactly how these policies affect an individual's probability of experiencing unemployment. Suppose that a lower or higher unemployment rate implies that all households face a proportionately lower or higher prob-

ability of experiencing unemployment. If we ignore for now the inflation variability effects of the two policies, it follows that all households will benefit under the second policy, relative to the first, when the unemployment rate is 4 percent but will lose under the second policy, relative to the first, when the unemployment rate is 6 percent. Economic research has shown that the gain will be less than the loss so that, overall, households will be economically worse off under the second policy as compared to the first. However, this research has also shown that the predicted loss can be quite small.<sup>14</sup> If this is the case, the important consideration in comparing the two policies may turn out to be the policies' effects on inflation variability rather than unemployment rate, or output, variability.

But this is not, by any means, the only possibility. The economic welfare effects of unemployment rate variability depend importantly on the details of how the fluctuations in the unemployment rate affect an individual's probability of experiencing unemployment. If we drop the assumption that a lower or higher unemployment rate implies that all households face a proportionately lower or higher probability of experiencing unemployment, the outcome may be different. In particular, if an increase or decrease in the unemployment rate makes the probability of experiencing unemployment rise or fall proportionately more for people who are currently jobless, the loss in economic welfare from following the second policy will be larger. Also, unemployment rate variability may not be the only important consequence of output variability; greater output variability may adversely affect the investment decision of firms and thereby reduce the long-term growth rate of worker productivity and wages.

<sup>14</sup> For details on this point, see my *Business Review* article.




## CONCLUSION

An intelligent choice of monetary policy requires knowledge about what monetary policy can or cannot accomplish. In the past, monetary policy options were described in terms of a tradeoff between the unemployment rate and the inflation rate, the so-called Phillips curve. Macroeconomists no longer view the Phillips curve as a viable “policy menu” because its use as such is inconsistent with mainstream macroeconomic theory. In the late 1970s, John Taylor suggested an alternative tradeoff for policymakers to consider. Like that

suggested by the Phillips curve, Taylor’s tradeoff is also concerned with unemployment and inflation, but it focused on the variability of both the unemployment rate and the inflation rate. (Actually, Taylor focused on output variability instead of unemployment rate variability, but the two are very closely related.)

In particular, Taylor argued that policymakers face a tradeoff between the variability of inflation and the variability of the unemployment rate. Unlike the Phillips curve, the Taylor curve displays a tradeoff consistent with mainstream macro-

economic theory. Taylor’s development and elucidation of this variability-based tradeoff is clearly an important advance in monetary policy thought. Still, the Taylor curve does not resolve the question of which monetary policy rule to adopt. That decision requires some understanding of how the welfare of working households is affected by the different combinations (of variability of inflation and unemployment rates) on the Taylor curve, an understanding that, at present, is lacking. We hope that future research will fill in this gap in our knowledge. 

## REFERENCES

Chatterjee, Satyajit. “Why Does Countercyclical Monetary Policy Matter?” Federal Reserve Bank of Philadelphia, *Business Review*, Second Quarter, 2001.

Friedman, Milton. “The Role of Monetary Policy,” *American Economic Review*, 58, March 1968, pp. 1-17.

Okun, Arthur M. “Potential GNP: Its Measurement and Significance,” in *Proceedings of the Business and Economics Statistics Section*; reprinted in Arthur M. Okun, *The Political Economy of Prosperity*. Washington DC: The Brookings Institution, 1970.

Phillips, A.W. “The Relation Between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom, 1861-1957,” *Economica*, November 1958, pp. 283-99.

Samuelson, Paul A., and Robert M. Solow. “Analytical Aspects of Anti-Inflation Policy,” *American Economic Review* (Papers and Proceedings), 50, May 1960, pp. 177-94.

Santomero, Anthony M. “What Monetary Policy Can and Cannot Do,” Federal Reserve Bank of Philadelphia, *Business Review*, First Quarter, 2002.

Sargent, Thomas J. *The Conquest of American Inflation*. Princeton, NJ: Princeton University Press, 1999.

Taylor, John B. “Estimation and Control of a Macroeconomic Model with Rational Expectations,” *Econometrica*, 47 (5), 1979, pp. 1267-86.

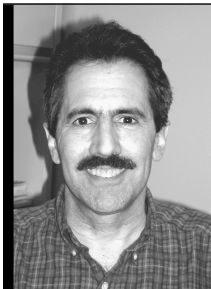
Taylor, John B. “Monetary Policy Guidelines for Inflation and Output Stability,” in Benjamin F. Friedman, ed., *Inflation, Unemployment, and Monetary Policy*. Cambridge, MA: MIT Press, 1999.

# Does Lower Unemployment Reduce Poverty?

BY ROBERT H. DEFINA

**I**s the link between unemployment and poverty as strong as many people think it is? Possibly not. How strong the link is depends critically on how we measure poverty. And during the past two decades, researchers have identified numerous shortcomings in the government's official procedures for determining the extent of poverty. In this article, Bob DeFina presents empirical evidence that improved measures of poverty are less strongly related to changes in unemployment than the headcount rate.

The record-setting U.S. expansion of the 1990s, especially the torrid growth in the latter half of the decade, helped push the unemployment rate down to its lowest level in 30 years. By October 2000, the jobless rate had hit 3.9 percent, about 3 percentage points below its previous peak. Such a remarkable decline, when sustainable, is to be celebrated for many reasons. In part, an improving labor market signals that the economy's overall prosperity is being more widely shared. These improvements are especially welcome



**Bob DeFina** is the John A. Murphy Professor of Economics, Villanova University, Villanova, Pennsylvania. When he wrote this article, he was a visiting

scholar in the Research Department of the Philadelphia Fed.

when they help the country's most financially vulnerable population — the poor.

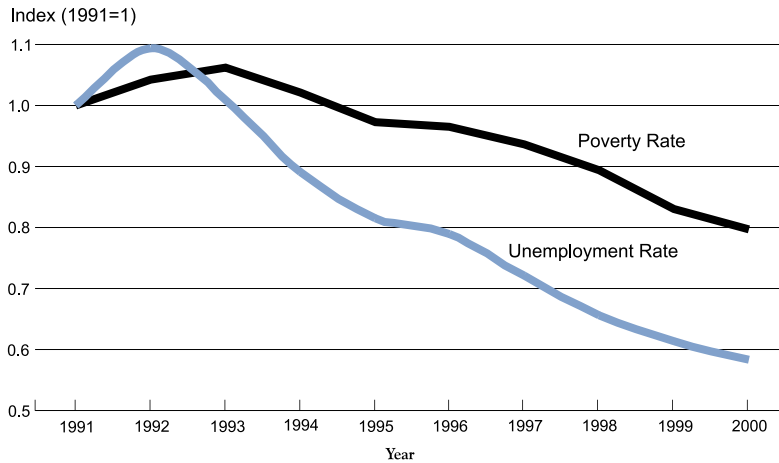
As in most countries, the extent of poverty in the United States is officially gauged using a headcount rate, which is the fraction of the population that is poor. To determine how many people are poor, government statisticians estimate the income needed for a minimally decent life; that number is called a poverty threshold. A person is considered poor if he or she lives in a household with an income less than the poverty threshold. Having counted the number of poor individuals, statisticians then divide that number by the total population, which yields the headcount rate. In 2000, about 31.1 million individuals were classified as poor. With a population of 275.9 million at the time, the headcount rate was  $31.1/275.9$ , or 11.3 percent.

A tightening labor market, indicated by falling unemployment, potentially reduces the headcount rate

in several ways. Temporary and long-lived changes in unemployment alter job availability, work hours, promotion possibilities, and real wages. These, in turn, influence families' financial positions and their likelihood of falling above or below official poverty thresholds. The impact on the headcount rate need not be immediate or, at times, even strong. Other labor market developments, perhaps specific to population sub-groups, might interfere with the benefits of a generally prosperous economy. Still, analyses of historical data, based on both national and state-level data, indicate that changes in the unemployment rate are related to significant reductions in the fraction of the population that is officially poor, especially once other factors are accounted for.<sup>1</sup> For example, the strong economy of the past decade coincided with a substantial decline in the headcount rate (Figure 1).

While seemingly intuitive and straightforward, the link between unemployment and poverty may not be as strong as it has traditionally been thought to be. Any conclusions about how unemployment affects poverty depend critically on the particular way in which poverty is measured. And during the past two decades, researchers have identified numerous shortcomings in the government's official procedures for determining the headcount rate. They have suggested improvements, both in the way individuals are iden-

<sup>1</sup>Examples can be found in the articles by Rebecca Blank (1996 and 2000) and the articles by Blank and Alan Blinder; David Cutler and William Katz; Blank and David Card; Robert Haveman and John Schwabish; and Paul Romer.

**FIGURE 1****The Unemployment and Poverty Rates**

tified as poor and in the characteristics of the poor population used to measure the extent of poverty.<sup>2</sup>

On the basis of empirical evidence presented in this article, improved measures of poverty are less strongly related to changes in unemployment than the headcount rate. The unemployment rate declines of the 1990s were not related at all to some alternative poverty indicators.

### HOW IS POVERTY MEASURED IN THE UNITED STATES?

Poverty in the United States is measured by the Census Bureau, which uses an approach developed in the early 1960s.<sup>3</sup> The procedure begins with a benchmark income threshold meant to gauge the resources an individual needs to purchase a minimally acceptable bundle of goods and services. In 2000,

<sup>2</sup> There are also variants on the way unemployment is measured. The headline unemployment rate, which measures unemployed workers aged 16 years or older as a percentage of the civilian labor force and which I use in my analysis described below, is one of several measures compiled by the Bureau of Labor Statistics.

<sup>3</sup> The procedure is detailed in Mollie Orshansky's article and in the article by Gary Fisher.

the baseline threshold (for a single, nonelderly adult) was \$8959.

The individual baseline threshold is then adjusted to account for different family sizes and for the number of children versus adults. The adjustments recognize that all material needs do not rise proportionately with the number of family members. Whether a family has two or three individuals, it is likely to have, say, only one refrigerator. The less-than-proportional increases in need show up in the official thresholds: for example, moving from a family with one nonelderly adult to a family with two nonelderly adults causes the official 2000 poverty line to rise from \$8959 to \$11,531, a 29 percent increase. The adjustment factors for different family sizes and types are known as equivalence scales because they are meant to yield an amount of income necessary to leave families of different size or composition with an equivalent standard of living.

The resulting thresholds are increased annually for consumer price inflation nationwide, with the aim of keeping the purchasing power of the poverty level unchanged over time. A lack of data prevents an accounting for differences in the cost of living in

different regions of the United States. No adjustment is made for changes in real living standards, such as raising threshold levels in line with increases in the average real income of families.

To identify who is poor, the Census Bureau compares a family's actual pre-tax cash income (including cash payments from the government) with its appropriate poverty threshold. Members of families whose income is below their threshold are deemed poor. The extent of poverty is then gauged by simply summing the number of poor individuals and expressing the result as a fraction of the population, that is, the headcount rate.

The headcount rate is measured retrospectively once a year. The Census Bureau collects the needed data in its March Current Population Survey, which asks questions about the income that individuals received in the preceding year. The March survey covers about 60,000 households. Thus, the Census Bureau does not literally compare the incomes of every U.S. family to its relevant threshold. Instead, it makes the comparison for a large random sample of U.S. families, then uses the information to statistically estimate the national headcount rate.

### PROBLEMS WITH THE OFFICIAL MEASURE

The official poverty measure is not without critics. Indeed, the Census Bureau's approach has widely recognized shortcomings that concern the way individuals are officially *identified* as poor and the way *the extent of poverty* is measured. Because various studies have provided comprehensive discussions of these concerns, only the most important ones are touched on here.<sup>4</sup>

<sup>4</sup> *Measuring Poverty: A New Approach*, prepared by the Panel on Poverty and Family Assistance, contains a thorough analysis of identification issues. See the article by B. Zheng, for a discussion of aggregation concerns.

**Problems Identifying Who Is Poor...** Numerous researchers have argued that the baseline poverty threshold is too low. As mentioned earlier, the poverty threshold for a family of two adults is \$11,531, a fairly meager sum. A more glaring example perhaps is the official threshold for a family of eight adults: \$31,704, or less than \$4000 a person. The official adjustments to the baseline for different family sizes and compositions have also come under fire. Critics argue that the adjustments are inconsistent and counterintuitive. Essentially, the changes in thresholds assigned to families as their size and composition change seem somewhat judgmental, with no clear, discernable pattern. These nonsystematic adjustments call into question the extent to which the resulting poverty thresholds represent equivalent standards of living for families of different size or composition.

Poverty analysts and budget experts have prepared alternative thresholds that are 30 percent to 100 percent above the official ones.<sup>5</sup> These suggested increases are based on updated and more complete analyses of budget data and family spending patterns.

The measure of family income that is compared to poverty thresholds is also problematic. Official calculations use a concept called census income, which includes all the money income received by a family before any income taxes are deducted. Money income includes wages and salaries, interest income, government income support payments like unemployment insurance, or even a cash birthday gift.

Researchers have found the concept of census income confusing. On the one hand, it includes the portion of a family's income that may come from

<sup>5</sup> Many of these alternative budgets are discussed in *Measuring Poverty: A New Approach*.

some government programs — the cash income support payments from unemployment insurance, Social Security, and the like. On the other hand, it excludes that part of a family's income that may come from other government programs — those providing in-kind payments like food stamps and subsidized housing — even though the in-kind payments represent real purchasing power to families. Census income also ignores the income taxes that families pay, monies obviously not available for spending. A more consistent approach would either (1) ignore all government payments and taxes in order to measure poverty before any government intervention; or (2) recognize them all in order to gauge poverty after the government's actions are taken into account. It would also deduct any work-related expenses, since these decrease a family's spendable income regardless of the government's policy actions.

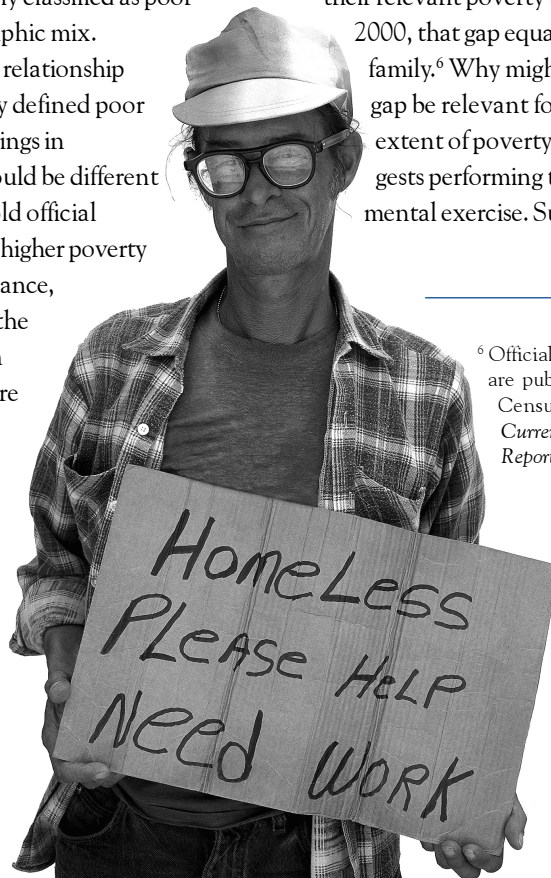
Addressing these shortcomings in the way poor individuals are identified would alter both the number of individuals officially classified as poor and their demographic mix. Consequently, the relationship between the newly defined poor population and swings in unemployment could be different from that for the old official population. Using higher poverty thresholds, for instance, would mean that the poverty population would include more full-time workers, albeit ones with relatively low wages. The poverty status of such individuals would probably be less sensitive to changes in unemployment, since they would

be deemed poor whether or not they work. Correcting the other problems in the official procedure would also change the sensitivity of poverty to unemployment, although the net impact of all the recommended changes is unclear.

**...And Problems Determining What the Extent of Poverty Is.** The official method for gauging the total degree of poverty has also been criticized, essentially because it neglects characteristics of the poor population other than the number of poor individuals. That is, the official procedure equates the extent of poverty with the headcount rate. But since publication of the landmark work of Nobel Prize-winning economist Amartya Sen, many researchers feel that the official approach is too restrictive. They argue that, at a minimum, any assessment of the degree of poverty should also take into account the *average poverty gap* and *income dispersion among poor individuals*.

The average poverty gap represents the average dollar difference between the income of poor families and their relevant poverty thresholds. In 2000, that gap equaled \$6820 per family.<sup>6</sup> Why might the poverty gap be relevant for gauging the extent of poverty? Sen suggests performing the following mental exercise. Suppose that

<sup>6</sup> Official poverty data are published in the Census Bureau's *Current Population Reports*, P-60 series.



the number of poor individuals remains unchanged, but each poor family has its income cut in half. Now ask yourself, “Has poverty increased as a result?” Intuitively, many people would answer “yes” because each family now suffers greater financial hardship. Notice that the headcount rate, which is based only on the number of poor individuals, indicates that the extent of poverty has not changed.

Related logic suggests that including income dispersion among poor individuals is important in measuring the degree of poverty. To see why, perform another mental exercise. Suppose that both the number of poor individuals and the average poverty gap remain unchanged. Now, take a dollar from the poor person with the lowest income and give it to the poor person with the highest income. This monetary transfer increases income dispersion among poor individuals, since, other things being equal, poor individuals at the extremes of the income distribution move farther apart. Once again, ask yourself, “Has poverty increased as a result?”

According to Sen, the answer is “yes” because a dollar is worth more to the poorest person than to the least poor person. Essentially, Sen accords greater social weight to the financial situation of the poorest person compared to that of the least poor person. The loss to the poorest person thus outweighs the gain to the least poor person. In this view, greater inequality among the poor, other things equal, suggests a greater degree of poverty. The official headcount rate, by contrast, is unaffected.

Sen’s assessment certainly can be debated. For example, one can reasonably argue that poor individuals are in sufficiently similar circumstances that a dollar in the hands of each should be given equal weight. Still, his framework cannot be dismissed out of hand and, in fact, has been championed by many prominent poverty analysts. During the past two decades, they have

developed new poverty indexes that incorporate and expand upon Sen’s original work.

Accounting for both the average poverty gap and income dispersion among the poor when gauging poverty conceivably could alter the perceived benefits of declines in unemployment. It is possible, for instance, that lower unemployment results in a lower average poverty gap without affecting the number of poor individuals. Such an outcome would occur if an unemployed person got a job

of how the unemployment declines of the 1990s were related to the headcount rate and nine alternative poverty indicators.<sup>7</sup> The alternatives incorporate suggested improvements for identifying who is poor and for measuring the extent of poverty. To keep the discussion manageable, I will provide details on the results for only three of the alternatives and simply mention in passing some of the other findings. The results for these three alternatives are, however, representative of the findings for the others.

## Accounting for both the average poverty gap and income dispersion ... when gauging poverty conceivably could alter the perceived benefits of declines in unemployment.

that paid poverty-level wages. The person would remain officially poor, but the income from the job could reduce his poverty gap. Consequently, lower unemployment would reduce a broader measure of poverty but leave the headcount rate unchanged. Alternatively, lower unemployment might result in fewer poor individuals but leave the average poverty gap unchanged. This would happen, for instance, if the individuals no longer deemed poor had poverty gaps close to the average gap.

In sum, recommended improvements in the way poor individuals are identified and grouped potentially affect the relationship between changes in the unemployment rate and changes in measures of poverty. It is, of course, impossible to know in advance how the suggested changes will actually affect the relationship.

### AN EMPIRICAL ANALYSIS OF ALTERNATIVE POVERTY INDICATORS

To explore the practical importance of the suggested improvements, I conducted an empirical analysis

**Three Alternative Indicators.** The first alternative indicator is a revised headcount rate, for which poor individuals are identified using higher poverty thresholds, an improved set of equivalence scales, and a pre-tax measure of family income that excludes all government cash and in-kind payments and subtracts an estimate of work-related expenses. The new thresholds and equivalence scales are consistent with the recommendations of the Panel on Poverty and Family Assistance, a group of experts who worked on improving procedures for measuring poverty.<sup>8</sup>

The second alternative indicator is the average poverty gap. To make the gap calculations more meaningful, I express each family’s

<sup>7</sup> See my working paper.

<sup>8</sup> The new thresholds were set 30 percent higher than the official ones. The new equivalence scales were computed using the poverty threshold of a single adult as the benchmark.

income shortfall as a fraction of its associated poverty threshold. Doing so is a standard procedure. The methods for identifying poor individuals and for measuring income are the same as for the alternative headcount rate.

The third alternative indicator is a gauge of income dispersion among the poor. I use the coefficient of variation, which equals the standard deviation of income among poor individuals divided by the average income of the poor.<sup>9</sup> Once again, the procedures for identifying poor individuals and for measuring income are the same as for the alternative headcount rate.

**An Analysis of State-Level Data.** My analysis is based on data from all 50 U.S. states (plus Washington, D.C.) covering the years 1991 to 1998. The data come from the Census Bureau's March Current Population Survey, the same information used to calculate the official headcount rate. Using state-level data, as opposed to national data, allows me to increase the number of observations used in the study. It also permits me to control for a variety of demographic influences on the poverty indicators not possible with national data. These other variables will serve as controls to better isolate the particular relationship with unemployment.

I computed state averages for all of the indicators and other variables in each of the years. Following Census Bureau guidelines for handling state-level data, I then calculated two-year averages for the years 1991/1992, 1993/1994, 1995/1996, and 1997/1998. Thus, my data set has 204 state-level values for each variable in the study: one for each of the 51 "states" in each of the four time periods.

<sup>9</sup> This is a standard way of measuring income dispersion, although others, such as the so-called Gini coefficient, are available. See the 1995 *Business Review* article by Martin Asher and me.

Average period values for the four poverty indicators are presented in Figure 2. As can be seen, both the official and revised headcount poverty rates initially rose and then fell substantially during the nineties. The decline in the official poverty rate was greater. By contrast the poverty income gap and the dispersion of income among the poor fell much less. Indeed, the level of income dispersion ended the study period higher than where it began. These very different profiles suggest that the relationship of each indicator to unemployment will vary.

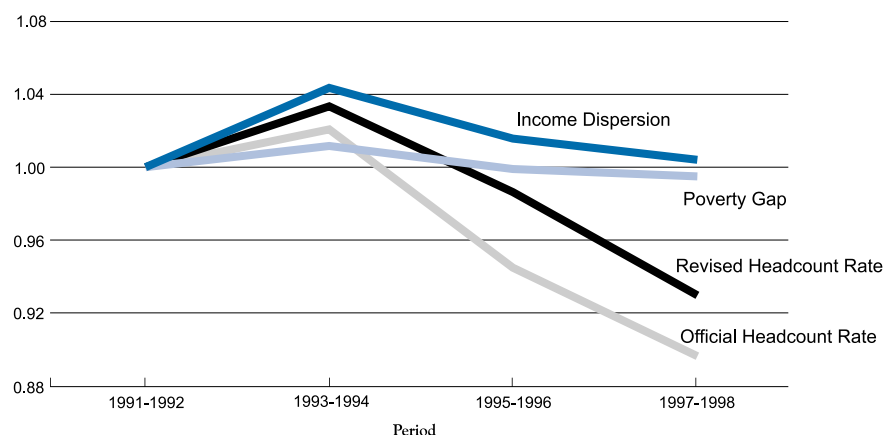
It is also useful to examine how closely the different poverty indicators correlate with one another across states and time periods. The degree of correlation suggests whether each poverty indicator provides substantially different information. To measure the degree of correlation, I used a statistic known as a correlation coefficient, where a value of 1 indicates perfect correlation. For the official and alternative headcount rate, the value of the correlation coefficient is 0.92. That is, despite the different techniques used for identifying poor individuals, the

patterns of variation in the alternative headcount rates across states and over time are quite similar. By contrast, the correlation coefficients between the poverty gap and the headcount rates and between income dispersion and the headcount rates are much lower. These range between 0.25 and 0.35. Thus, the poverty gap and income dispersion measures appear to provide a different view of the extent of poverty than the headcount rates. Finally, the poverty gap and income dispersion are themselves quite highly correlated, with a coefficient value of 0.96.

**Statistical Models of the Poverty Indicators.** What is the relationship between the unemployment rate and each of the indicators? To answer the question, I estimated statistical models in which the movements in each poverty indicator are related to movements in the unemployment rate and the other control variables. The control variables are ones that have been used in other studies. Two of these are meant to account for changes in wages and hours that are not correlated with the unemployment rate: median state real

**FIGURE 2**

**Four Poverty Indicators**



Average poverty indicators for 50 states + Washington, D.C., each divided by its average level in the 1991-1992 period.

per capita income and the standard deviation in state real per capita income. The others are demographic variables that have been found to vary systematically with poverty indicators: the percent of the population aged 16 years to 19 years, the percent 65 years and older, the percent in female-headed families, the percent black, the percent residing in metropolitan areas, the percent with at least a college degree, and the percent not in the labor force.<sup>10</sup> The model also controlled for determinants of poverty that are unique to each state and year but that are not captured by the other variables.<sup>11</sup>

Results of the estimations are represented in Figures 3 through 6. Each figure shows the relationship between the unemployment rate and the particular poverty indicator, after statistically controlling for the influences of all the other variables in the model, based on 51 “states” and 4 two-year periods. As mentioned before, controlling for the other influences allows the link between unemployment and each poverty indicator to be seen more clearly. In statistical terms, the figures show the partial correlation between the unemployment rate and the poverty indicators.

---

<sup>10</sup> In theory, the use of the demographic control variables can hinder estimation of the relationship between the unemployment rate and the poverty indicators if the variables are highly correlated with the unemployment rate. This is not an actual concern in the present study. The correlation coefficients between each of the demographic variables and the unemployment rate are small, the largest being about 0.34.

<sup>11</sup> The approach I have used is technically known as a fixed-effects regression. Rebecca Blank and David Card’s study also used a fixed-effects regression model to study the relationship between unemployment and poverty. Also, all the nondemographic variables are expressed as natural logarithms. Expressing the variables as natural logs allows the estimated relationship between the unemployment rate and the poverty indicators to be interpreted as an elasticity – the percentage change in the poverty indicator associated with a 1 percent change in the unemployment rate.

Figure 3 displays the relationship between the unemployment rate and the official headcount rate. The points in the scatterplot indicate a generally positive relationship: As unemployment rates rise, official headcount rates tend to rise as well, even after accounting for all other influences on the headcount rates. The upward-sloping line fitted through the points gives the average relationship: Each 1 percent increase in the unemployment rate is associated with about a 0.12 percent increase in poverty. The estimated magnitude of the response is consistent with that found by other researchers using state-level data. While there is clearly variation in this relationship — not all points lie exactly on the line — the points are clustered closely enough for the relationship to be statistically significant.

Figure 4 presents the results for the revised headcount rate. As is true for the official rate, the revised rate has a clear positive relationship with the unemployment rate, after accounting for the other influences. The points are rather closely clustered around the average response line, and the relationship is statistically significant. The size of the estimated average response is smaller, though, by about half. Further investigation revealed that the smaller response is due mainly to the use of a higher poverty threshold. As noted earlier, the higher thresholds capture more individuals who remain poor whether they work or not.

In contrast to the headcount rates, neither the poverty gap nor income dispersion among the poor is significantly related to unemployment. The relationship between the unemployment rate and the poverty gap is illustrated in Figure 5. The points in Figure 5 suggest a weakly positive relationship. Indeed, the average response line barely slopes upward. Moreover, the points are widely dispersed around the line and are noticeably less clustered

than those in Figures 3 and 4. The large amount of dispersion means that both large and small poverty gaps occurred regardless of whether unemployment rates were low or high. Indeed, a formal statistical test confirms the lack of a significant link between the unemployment rate and the poverty gap.

A similar picture emerges for income dispersion among the poor (Figure 6). The average relationship between the unemployment rate and the adjusted income dispersion measure is upward sloping, but less so than that for the headcount rates. And as with the poverty gap, the points in the scatterplot are widely dispersed around the line. A formal test indicates a statistically insignificant link between unemployment and income dispersion.

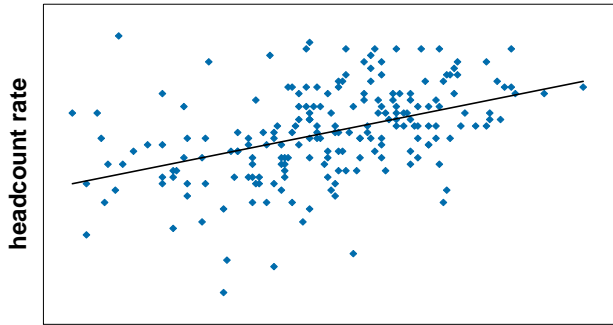
The results just described appear to hold up under further study. I redid the preceding analysis using a different income definition to compute the three indicators and the conclusions were the same.<sup>12</sup> Namely, the revised headcount rate exhibits a significant link with the unemployment rate, but of a smaller magnitude than does the official headcount rate. Neither the recomputed poverty gap nor recomputed income dispersion among the poor had a statistically significant relationship with the unemployment rate. I also explored the relationship between the unemployment rate and a comprehensive poverty index, developed by James Foster, Joel Greer and Erik Thorbecke, that simultaneously includes the headcount rate, the average poverty gap, and income dispersion among the poor. No significant link emerged, regardless of the income definition used.

---

<sup>12</sup> The other income concept starts with all private-sector income, subtracts all income taxes paid, and adds in all government cash and in-kind payments. It also subtracts an estimate of work expenses.

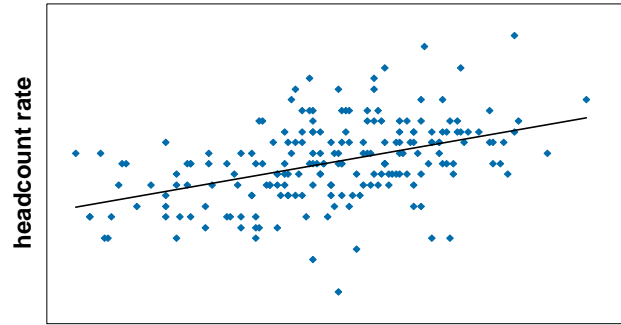
## FIGURES 3, 4, 5, AND 6

**Unemployment and the Official Headcount Rate (Figure 3)**



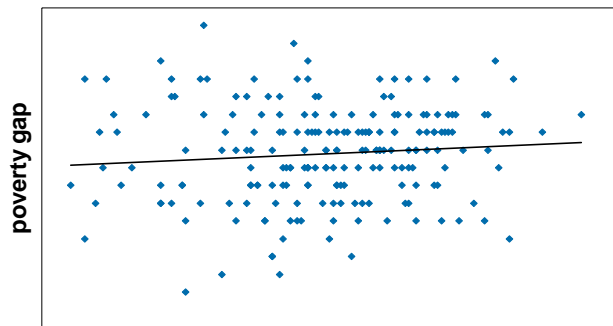
unemployment rate

**Unemployment and the Revised Headcount Rate (Figure 4)**



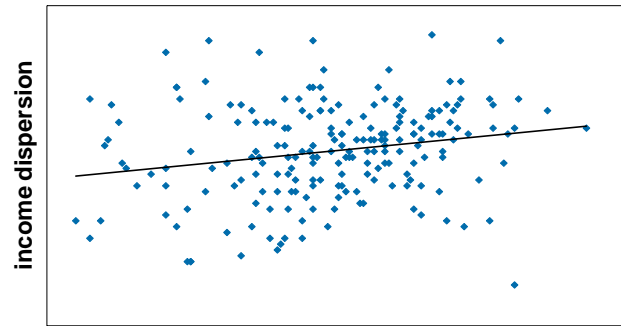
unemployment rate

**Unemployment and the Poverty Gap (Figure 5)**



unemployment rate

**Unemployment and Income Dispersion Among the Poor (Figure 6)**



unemployment rate

**Note:** All variables are in logarithms. The variable on each vertical axis has been adjusted to account for variables in the model other than the unemployment rate. Thus, each figure shows the partial correlation between the unemployment rate and a particular poverty indicator.

### CONCLUSION

Historically, the official headcount rate has generally moved with changes in unemployment, rising as unemployment rose and vice versa. This sympathetic relationship offered one more reason to cheer a strengthening labor market — not only did the

average person gain but so did society's most vulnerable.

It is widely recognized, however, that the method by which poverty is officially gauged has a variety of shortcomings. These shortcomings include the methods for identifying who is poor and for measuring the extent of


poverty. During the past two decades, researchers have suggested numerous improvements in poverty measurement, including the use of higher poverty thresholds, better equivalence scales, more coherent income definitions, and additional indicators that reflect information beyond simply the number



of poor individuals. Should these improvements be implemented, it is quite possible that the measured link between poverty and unemployment could change.

Indeed, my research on the experience of the 1990s reveals that the relationship between unemployment

and the revised poverty headcount rate was much weaker than that between the unemployment and the official poverty rate. The revised headcount rate did decline significantly as unemployment fell, but 40 percent less than the official headcount rate did. Moreover, the unemployment rate

showed no significant statistical link to either the average poverty gap or income dispersion among the poor. Taken together, the findings caution against overreliance on lower unemployment as an anti-poverty strategy. While helpful in some regards, its impact could well be overstated. 

## REFERENCES

Asher, Martin A., and Robert H. DeFina. "Has Deunionization Led to Higher Earnings Inequality?" Federal Reserve Bank of Philadelphia *Business Review*, November/December 1995.

Blank, Rebecca. "Why Were Poverty Rates So High in the 1980s?" in D. Papadimitriou and E. Wolff, eds., *Poverty and Prosperity in the USA in the Late Twentieth Century*. London: Macmillan, 1993.

Blank, Rebecca. "Why Has Economic Growth Been Such an Ineffective Tool Against Poverty in Recent Years?" in J. Neill, ed., *Poverty and Inequality, The Political Economy of Redistribution*. Kalamazoo: W.E. Upjohn Institute, 1996.

Blank, Rebecca. "Fighting Poverty: Lessons From Recent U.S. History," *Journal of Economic Perspectives*, 14, 2000, pp. 3-19.

Blank, Rebecca, and Alan Blinder. "Poverty and the Macroeconomy," in Sheldon Danziger and Daniel Weinberg, eds., *Challenging Poverty: What Works and What Doesn't*. Cambridge, MA: Harvard University Press, 1987.

Blank, Rebecca, and David Card. "Poverty, Income Distribution, and Growth: Are They Still Connected?" *Brookings Papers on Economic Activity*, 2, 1993, pp. 285-339.

Cutler, David, and William Katz. "Macroeconomic Performance and the Disadvantaged," *Brookings Papers on Economic Activity*, 2, 1991, pp. 1-74.

DeFina, Robert. "The Impact of Unemployment on Alternative Poverty Measures," Federal Reserve Bank of Philadelphia Working Paper 02-8, May 2002.

Fisher, Gary. "The Development and History of the Poverty Thresholds," *Social Security Bulletin*, 55, 1992, pp. 3-14.

Foster, J.E., J. Greer, and E. Thorbecke. "A Class of Decomposable Poverty Measures," *Econometrica*, 52, 1984, pp. 761-66.

Haveman, Robert, and John Schwabish. "Has Macroeconomic Performance Regained Its Anti-Poverty Bite?" *Contemporary Economic Policy*, 18, 2000, pp. 415-27.

Orshansky, Mollie. "Counting the Poor: Another Look at Poverty," *Social Security Bulletin*, 28, 1965, pp. 3-29.

Panel on Poverty and Family Assistance. *Measuring Poverty: A New Approach*. Washington, D.C.: National Academy Press, 1995.

Romer, Paul. "Poverty and Macroeconomic Activity," Federal Reserve Bank of Kansas City *Economic Review*, First Quarter 2000, pp. 1-13.

Sen, Amartya. "Poverty: An Ordinal Approach to Measurement," *Econometrica*, 44, 1976, pp. 219-31.

Sen, Amartya. *Poverty and Famines: An Essay on Entitlement and Deprivation*. Oxford: Oxford University Press, 1981.

B. Zheng. "Aggregate Poverty Measures," *Journal of Economic Surveys*, 11, 1997, pp. 123-62.