

Federal Reserve Bank of Cleveland

2000 | Annual Report

**Theory Ahead of Rhetoric:
Measurement and the “New Economy”**

The Federal Reserve System is responsible for formulating and implementing U.S. monetary policy. It also supervises banks and bank holding companies, and provides financial services to depository institutions and the federal government.

The Federal Reserve Bank of Cleveland is one of 12 regional Reserve Banks in the United States that, together with the Board of Governors in Washington, D.C., comprise the Federal Reserve System.

The Federal Reserve Bank of Cleveland, including its branch offices in Cincinnati and Pittsburgh and its check processing center in Columbus, serves the Fourth Federal Reserve District (Ohio, western Pennsylvania, the northern panhandle of West Virginia, and eastern Kentucky).

It is the policy of the Federal Reserve Bank of Cleveland to provide equal employment opportunities for qualified persons regardless of race, creed, color, national origin, age, gender, or disability.

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President's Foreword

Last year at this time, the Federal Reserve Bank of Cleveland was enjoying some satisfaction over the absence of problems associated with the century date change. The prospect of serious, unforeseen events had spurred our Bank and the Federal Reserve System to work together in pursuit of a common objective. In the aftermath of that project, we found that we had forged some new relationships—and deepened some old ones—among our customers, the institutions we supervise, the public, and even our colleagues inside the Federal Reserve System. Many of our activities in 2000 revolved around strengthening those relationships and refocusing our energies on issues of importance to all of our constituents.

Our Supervision and Regulation Department prepared for a new era of financial supervision introduced by the Gramm-Leach-Bliley Act, popularly referred to as “financial modernization.” This law, long in the making, overhauled the banking and financial services industries by removing the legal barriers that had kept such businesses as banking, securities underwriting, venture capital, insurance, and real estate separate from one another. Depository and nondepository institutions alike are now reorganizing to take advantage of new business areas—and new revenue streams—that were formerly off limits. The supervisory agencies, which have the responsibility of implementing the provisions of the act, are hard at work adapting to their new charge.

The Cleveland Fed responded to the passage of the Gramm-Leach-Bliley Act by fully implementing our program for large, complex banking organizations and by identifying supervisory risks within these organizations. We also conducted a number of training programs across the Fourth District to inform financial institutions of the many provisions of the law.

Another area that is on the verge of profound change within the Federal Reserve System is retail payments. As banking organizations expand their geographic reach and develop more electronic products, retail clearing and settlement systems must evolve as well. Our Bank has leadership responsibilities within the Federal Reserve System for the Check Modernization Project—a multifaceted initiative that will reduce the ongoing cost of Federal Reserve check services, speed the distribution of new products, further automate our check services, and improve overall service quality.



David H. Hoag, chairman; Sandra Pianalto, first vice president; Robert W. Mahoney, deputy chairman; and Jerry L. Jordan, president.

The Federal Reserve's Check Modernization initiative will provide new efficiencies, not only in our paper-based check-processing operation, but also in our electronic check products and services. Under the largest component of the project, a standardized software platform will be established for all 45 of the Federal Reserve System's check-processing sites. This enhancement will serve as a natural launching pad for revamping services such as check imaging, adjustments, and electronic delivery. Major initiatives were completed in virtually every aspect of this project during the year. In addition, the Bank assumed the leadership role in developing a national electronic billing service and in assisting the U.S. Treasury with its e-commerce initiatives. We are excited about the new capabilities we are developing to deliver cost-effective services to our customers.

Internally, the Bank continues to foster a high-quality environment for employees through innovative personnel practices and management information systems. In 2000, we completely overhauled our job evaluation and salary administration policies to reward career development and to remain competitive with other employers in the marketplace. We also enhanced our balanced scorecard measuring tools, which enable employees to see how their individual performance contributes directly to the Bank's corporate goals.

The New Economy is forcing all organizations to challenge themselves in the areas of customer service, cost structure, and performance measurement. Organizations can manage only what they can measure, so they must think carefully about the accuracy and validity of their measuring systems. The same principle holds true for economic policymakers: In an economy characterized by fast-paced change in technology and business practices, policymakers must be confident they are measuring the appropriate aspects of the economy, and that their measurements are accurately gauging the economy's performance.

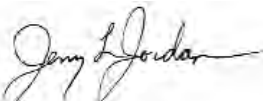
In our *1999 Annual Report*, we examined the historical evolution of the idea that monetary policy should be geared principally to control economic growth and, thereby, inflation. We cautioned that the economic rhetoric commonly used to describe the goals and operating principles of central banks has led people to believe that central banks can deliver more than should be expected of them. We urged readers to reconsider the issue, suggesting the traditional demand-management framework be put to rest and more emphasis be placed on price stability and long-term economic growth.

In the essay that follows, we continue our conversation about economic policy and economic growth: We discuss the measurement system that is used to track U.S. economic activity, and why it is not yet up to the task of effectively measuring aspects of economic activity that contribute the most to long-term economic growth. For historical reasons, our measuring system has concentrated on expenditure and output; going forward, though, it will need to gauge the true economic values of land, labor, and capital more accurately. Contemporary theories about the business cycle and economic growth indicate that conventional methods of measuring these factors fall short of what we really need to understand how our economy is operating.

We could not have accomplished all that we did in 2000 without the guidance provided by the directors of our Cincinnati, Cleveland, and Pittsburgh offices, and the members of our business and community bank advisory councils. We especially want to thank those directors who completed their terms of service on our boards in 2000. For their oversight and valuable contributions we are truly grateful. On our Cleveland Office board of directors, David S. Dahlmann (president and chief executive officer, Southwest Bank) completed his second term as a director in 2000; Mr. Dahlmann had previously served as a director of our Pittsburgh Office. For our Cincinnati Office board of directors, Judith G. Clabes (president and chief executive officer, Scripps Howard Foundation) and Wayne Shumate (chairman and chief executive officer, Kentucky Textiles, Inc.) both completed their second terms of office. And for our Pittsburgh Office board of directors, Thomas J. O'Shane (senior executive vice president, Sky Financial Group) and John T. Ryan (chairman and chief executive officer, Mine Safety Appliances Company) also completed their second terms as directors; Mr. Ryan served as chairman of the board during both terms.

A special debt of gratitude goes to David A. Daberko (chairman, National City Bank), who finished his one-year term as the Fourth District's representative to the Federal Advisory Council.

I wish to express my sincere appreciation to the officers and staff of the Federal Reserve Bank of Cleveland for their extraordinary efforts throughout 2000. Preparing our Bank and our District's depository institutions for the century date change was a challenging task that required countless hours of work and unparalleled dedication. Remarkably, we were able to handle this extraordinary responsibility and still accomplish many other significant objectives. The Bank is well positioned to fulfill its mission with distinction as we begin the twenty-first century.



Jerry L. Jordan

President



THEORY AHEAD OF RHETORIC: MEASUREMENT AND THE "NEW ECONOMY"

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	2000	2001	2002	2003	2004
Revenue	10,000	11,000	12,000	13,000	14,000
Expenses	8,000	8,500	9,000	9,500	10,000
Profit	2,000	2,500	3,000	3,500	4,000
Net Income	1,500	1,800	2,100	2,400	2,700
EPS	1.50	1.80	2.10	2.40	2.70



"[Chairman Greenspan] said yesterday that investor optimism and a bullish stock market have 'to date... more than offset' the effects of higher interest rates... There is, he said, 'little evidence that the American economy... is slowing appreciably.'"

—*Wall Street Journal*, February 18, 2000

"[Chairman Greenspan] told a House panel that recession poses a greater risk than inflation as consumer confidence continues to slide..."

—*Wall Street Journal*, February 28, 2001

In February 2000, the economic expansion that began in March 1991 became the longest cyclical upturn in U.S. history. Growth in real gross domestic product had topped 4 percent in four of the previous six years, and by the end of 2000, the string was five out of seven. On February 17, 2000, the day of Federal Reserve Chairman Alan Greenspan's testimony before Congress, the NASDAQ composite index closed just above 4500.

Though few are prepared to concede the expansion just yet, the ebullient mood of last spring has vanished. Despite impressive growth for 2000 as a whole, GDP in the fourth quarter advanced at a mere 1 percent, and for the first quarter of this year, GDP was only 1.3 percent according to current estimates. Few professional forecasters expect 2001 to yield anything near the average growth performance for the expansion as a whole. On the day of Chairman Greenspan's congressional testimony on February 28, 2001, the NASDAQ closed just over 2200.

What a difference a year makes.

Sometime between May 2000 (when the Federal Open Market Committee implemented the last in a year-long string of federal funds rate increases) and January of this year (when the Committee initiated the current string of rate decreases), the economic conversation shifted from New Economy wonder to very Old Economy anxiety. Exhortations for central bankers to throw off their traditional ways of thinking and "let growth happen" have been replaced by retrograde appeals for the Fed to *make* growth happen.



In this Bank's 1999 Annual Report, we placed our sympathies in the let-growth-happen camp.¹ In that essay, we expressed skepticism about the value of such concepts as "potential output," particularly when they are brought into the macroeconomic policy process to represent a "normal" pace of economic growth that cannot be exceeded, lest inflation accelerate. Our complaint arose partly from advances in our understanding of economic dynamics and a growing appreciation of the interconnectedness of the long run and the short run of the economy. In other words, our skepticism derived from the very economic logic that explains and supports the idea of the New Economy in the first place.

As evidence accumulates that the U.S. economy has, after several years of robust expansion, entered a period of decidedly slower growth, an essay that invokes the New Economy may seem like yesterday's news. But in our view, the term "New Economy" is shorthand for one chapter of an integrated story of economic development—a story that historical experience and the evolution of modern growth and business cycle theory have brought to light. Although the rapid expansion that characterized the end of the millennium is part of this story, so too were the "jobless recovery" of the early 1990s, the wage inequality of the early 1980s, and the productivity slowdown of the 1970s.

Few believe the New Economy has ended, or that recent softness in the U.S. economy is anything more than a deviation from "extraordinary gains in performance—including rapid productivity growth, rising incomes, low unemployment, and moderate inflation—that have resulted from [a] combination of mutually reinforcing advances in technologies, business practices, and economic policies."² This point of view was articulated by Chairman Greenspan in his latest monetary report to Congress:

The prospects for sustaining strong advances in productivity in the years ahead remain favorable. As one would expect, productivity growth has slowed along with the economy. But what is notable is that, during the second half of 2000, output per hour advanced at a pace sufficiently impressive to provide strong support for the view that the rate of growth of structural productivity remains well above its pace of a decade ago.³

Some analysts interpret this observation to mean the central bank should get on the stick—by aggressively lowering the federal funds rate—and pump the economy back up to its potential. But those who hold this opinion are missing an important point about the New Economy.

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To clarify this position, figure 1 illustrates the traditional view of monetary policy and its role in managing economic fluctuations. The straight green line represents the path of potential GDP as it moves through time, while the red wavy line represents the actual path of output. In the traditional view, a protracted period in which the red line is above the green line leads to inflation. When the red line is below the green line, the economy is performing at inefficiently low levels of output. In either case, a gap between the two is considered a problem to be managed by prudent and benevolent policymakers. The widely shared sense that the U.S. economy is operating in a region somewhere near point A is the impetus for the chorus of voices urging the Fed to get busy.

There is, to be fair, a respectable case to be made that something *like* potential GDP exists. Sometimes the economy deviates from its potential because of market frictions and inefficiencies, and monetary policy has a role in addressing those inefficiencies. What is clear, however, is that the growth of potential GDP is nothing like the straight green line depicted at left, and most of the cyclical movements (like the figure's wavy red line) represent the natural (and nonperverse) unfolding of economic activity. Consequently, the gaps depicted in figure 1 are not very useful to monetary policymakers.

In the midst of the recent expansion, we argued that advances in economics over the past three decades warrant skepticism that monetary policy should be deployed to resist above-potential

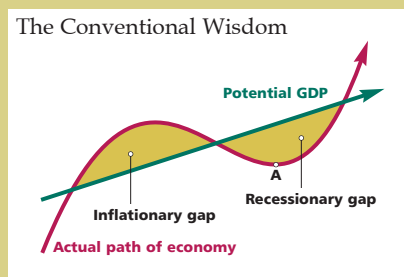
economic growth, which traditional perspectives label inflationary. The converse of that argument seems appropriate today: Just as episodes of relatively rapid growth may be part of the natural ebb and flow of economic activity, so, too, are episodes of slower growth—and aggressive countercyclical monetary policy poses significant risk.

Certainly, advances in our understanding of dynamic macroeconomic phenomena dictate caution. Our plea here, however, focuses on a much longer-term problem: It's not just that gaps between potential and actual output—to the extent they exist—are difficult to perceive. Given our current inability to measure economic activity, they may be *impossible* to perceive.

To be more precise, developments we have come to associate with the New Economy have been made comprehensible by advances in the theory of economic growth (advances partly motivated by the real-world experience that the New Economy is a part of). The new growth theory highlights aspects of economic activity that are critical to future prosperity. Unfortunately, our current data-collection and measuring systems are not yet up to the task of providing the information we would like to have.

Our problem is similar to that faced by any business: If the central bank is to conduct monetary policy appropriately, then reasonable management information systems are imperative. But the past decade—the New Economy—should have taught us this: The apparatus we currently employ for making sense of the economy—that is, the measurements we employ to distill information about the American economic enterprise into a comprehensible form—are simply inadequate to the task. Until these systems reflect the accumulated lessons of economic theory and evidence, monetary policy will struggle to deliver the successful outcomes that characterized the last two decades.

FIGURE 1



Through a Glass, Darkly

The conventional view of stabilization policy—the smoothing of the wavy line in figure 1—requires three critical elements. The first is a reasonably good assessment of the present state of the economy (where, exactly, are we on the red wavy line?). The second is an accurate sense of the “normal” trajectory to which monetary policy aspires (where, exactly, is the green line?). The third is the tools to actually minimize gaps that arise.

There is a readily available history with respect to the first requirement, and that history makes a good case for humility. Professional forecasters (including those of us in the policymaking business who participate in the exercise by necessity) have a poor track record of recognizing economic downturns, even well after they have begun. It is not unusual, for instance, to hear sources, official and otherwise, denying the existence of a recession as late as six months after one is under way.

Our inability to accurately assess the true condition of the economy has obvious operational consequences: The tools that central banks use to engage in monetary policy can be severely limited by difficulties in establishing the true state of the economy prior to the accumulation of a considerable amount of evidence. The so-called “recognition lag”—the time it takes before the need for policy action becomes apparent—combines with oft-cited “long and variable” lags (the time it takes for a particular policy course to affect the economy) to undermine the central bank’s ability to address economic problems while they are still problems.

The source of long and variable lags is not entirely clear. They are likely attributable to inflation expectations, as it is clear that

public interpretation of policy actions can affect those actions substantially.⁴ But there is another source, not mutually exclusive, that directly relates to the problem of identifying the presumed path of potential GDP. Figure 1 depicts the potential output path as stable and linear. In fact, this representation is not too far from the way the notion is applied in practice. But that is exactly the problem, because such a representation can be wildly misleading. So misleading, in fact, that gearing policy to a mistaken estimation of potential can have disastrous consequences.

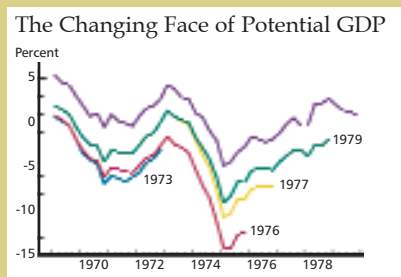
Recall the stylized policy prescription of figure 1. When the actual level of GDP falls below its potential (as many conjecture has already happened), the monetary authority is supposed to engage in expansionary monetary policy to assist recovery to the “normal” trend (a step that many have been urging the Federal Open Market Committee to take). But what if the economy’s true potential falls short of perceptions? Does aggressive easing of monetary policy, then, risk destabilizing rather than improving the situation?

The question is neither abstract nor hypothetical. Figure 2 replicates a graph first shown in Athanasios Orphanides’ “The Quest for Prosperity Without Inflation.”⁵ The figure shows the perceived gap between actual and potential GDP throughout the 1970s, with zero being the benchmark of successful policy, conventionally defined. Negative values (particularly large ones) represent situations that call for expansionary monetary policy.⁶ This picture makes it clear that the perceived shortfall of output from potential was much greater throughout the decade than was ultimately revealed over time.

Potential GDP was not, of course, treated as an unchanging constant. As figure 2 attests, the estimate of potential was often revised. Those who produced and relied on those estimates, however, believed that changes in the path of potential GDP would evolve fairly slowly and systematically.

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The failure of the central bank (and others) to calibrate monetary policy in a manner consistent with noninflationary growth was partly due to the inherently problematic nature of potential GDP. We now understand that even short-run fluctuations in GDP are a part of the normal, dynamic path of the macroeconomy. In other words, the green line in figure 1 (or potential GDP, if you like) probably looks more like the red wavy line than the straight line depicted in the figure.



SOURCE: Orphanides (2000).

FIGURE 2

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then reasonable management information systems are imperative.

But the past decade — the New Economy — should have taught us this:
The apparatus we currently employ for making sense of the economy — that is, the measurements
we employ to distill information about the American economic enterprise into
a comprehensible form — are simply inadequate to the task.

Moreover, there is a deeper, related problem to contend with, even if we concede that some (or even a relatively large) residual gap exists between potential and actual GDP at any point in time. Overestimates of cyclical shortfalls in GDP growth in the 1970s were, bottom line, a failure to understand the fundamental forces driving the dynamic path of productivity. We saw the reverse of that confusion (but with much happier results) in the arrival of the New Economy and the “mystery” of lower-than-expected inflation even as GDP growth registered well above what was considered its potential. While the story of the 1970s was unexpected declines in sustained productivity growth, the story of 1990s was just the opposite.

Why do we tend to miss changes in productivity trends so badly? Nobel laureate Robert Fogel suggested the answer in his 1999 presidential address to the American Economic Association: “We are, to some extent, entangled in concepts of the economy and in the analytical techniques that were developed during the first third or so of the century.”⁷

We Are What We Measure

The story of economic measurement in the United States really begins with the economist Simon Kuznets—the second Nobel Prize winner to enter our story—who joined the nascent National Bureau of Economic Research in 1927. Shortly thereafter, he began the efforts that led to the first systematic national income and product measures for the United States. Kuznets published his research in 1941 in *National Income and its Composition, 1919–38*, which articulated the foundation for measuring aggregate economic activity as we know it today.

In December 1941, the United States was drawn into World War II. Repeating a common theme in the history of national income accounting, the war accelerated the development of modern national income and product accounts in the United States and prompted the initiation of that development in Britain. Under the influence of the eminent John Maynard Keynes, the creators of the accounts—among them two future Nobel Prize recipients, James Meade and Richard Stone—led the way in approaching the measurement of aggregate production through the measurement of aggregate *expenditure*.

The “fundamental identity” of national income and product accounting—production equals income equals expenditure—had been well appreciated and exploited since the first recognizable national accounts were constructed in the seventeenth century. The Keynesian emphasis on measuring production by measuring expenditure, however, was not merely a matter of following historical precedent. Central to Keynes’ interpretation of the world was the presumption that industrial economies could find themselves stuck at levels of production well below what we now call potential GDP, and such events are associated with deficiencies in consumer and business spending.

The Keynesian gestalt still dominates popular thinking about aggregate production. GDP reports are never complete without “experts” intoning nuggets of wisdom along the lines of “GDP growth fell to 2 percent last quarter because investment growth moderated from its previously torrid pace.” The expenditure slant on measurement has led us into a mechanical and spuriously causal rhetoric about the dynamic evolution of the economy. Investment expenditure, for instance, is reduced to just one more element of aggregate demand, rather than a central contributor to the nation’s productive capacity.

Keynes to Solow to Kydland and Prescott— The Long and the Short of It

The Keynesian emphasis on expenditure—articulated in that economist’s *General Theory of Employment Interest and Money*—grew out of a worldview influenced by persistent economic distress in 1920s Great Britain and worldwide depression in the 1930s. That view harbored deep and, in the context of the times, understandable skepticism about the inherent stability of market economies. Keynes’ interests were unabashedly focused on the short term, but doubts about market economies’ ability to avoid sustained episodes of depression soon found expression in early models of long-run economic growth.⁸ The importance of these issues, at a time when democratic governments were competing against socialism and communism as alternatives to market-based economic systems, cannot be overemphasized.

The view that even the long run of a market economy is inherently unstable was soon challenged (and largely vanquished) by Robert Solow, who went on to win the Nobel Prize for his theory of economic growth. Solow provided the theoretical basis for believing that market economies ultimately revert to long-run growth rates that are determined by population growth and the underlying pace of technological advance.

For the most part, Solow’s theory of long-run growth⁹ and Keynes’ short-run business cycle theories remained segregated in the intellectual toolkits of economists and policymakers for nearly a quarter-century after Solow’s work was published. Ironically, Solow’s case for long-run stability reinforced the notion that cyclical fluctuations in GDP growth are somehow perverse. In the tradition that followed Keynes (which was not necessarily the tradition Keynes intended), the Solow growth path represented the benchmark—potential GDP, if you will—to which sound policy strove. Booms and busts came to be defined as fluctuations around the Solow trend, fluctuations that a talented, wise, and lucky policymaker could, and should, smooth.

The “real business cycle” theory challenged this perspective in the early 1980s. Writing in honor of Solow’s Nobel award, Ed Prescott (who, with Finn Kydland, launched the real business cycle approach¹⁰), articulated the disintegrating distance between short-run and long-run explanations of how economies work: “While [Solow’s] theory was developed to account for [long-run] growth observations..., it is surprisingly useful in organizing and understanding business cycle fluctuations as well. It leads us to focus on the co-movements of a particular set of variables: consumption, investment, labor input, capital input, factor incomes, and output.”¹¹

Kydland and Prescott’s contributions helped us to see the possibility that business cycle fluctuations can and should be viewed as part of the same dynamic process that determines the economy’s long-term growth. This is a critical insight, because it tells us that policymakers who focus on countercyclical stabilization policies may inadvertently interfere with long-term economic growth. Kydland and Prescott’s perspective also reminds us that we can learn a great deal about economic performance by looking at factor inputs (labor, capital, and land) and factor returns (wages, interest rates, profits, and rents)—a lesson that is very different from the standard Keynesian output–expenditure bill of fare.

The idea that long-run growth, business cycle fluctuations, and economic measurement are fundamentally and inextricably linked is central to the real business cycle agenda. Coincidentally, almost as soon as Kydland and Prescott’s work reintroduced the long run to the short run by wedding business cycle theory to the Solow growth framework, cracks began to appear in the latter. In the 1980s and 1990s, empirical anomalies and theoretical challenges modified the Solow model’s applicability in important ways. The accumulation of economic theory and evidence during the past few decades indicates that we must pay much closer attention to capital than we ever did before, though not in the way we are accustomed.



New Economy, New Theory

In truth, the Solow model is a pretty spare story of economic growth. The source of technological change is left unexplained, bestowed upon the agents of the model economy as manna from heaven. This is hardly a criticism, as the model's purpose was to focus attention on the long-term role of capital accumulation. The shortcuts in Solow's original formulation were well appreciated and intentional. It was not long before economists, Solow included, began to investigate growth and development in richer contexts, including those in which technology adoption required the purposeful action of firms. Through the best part of the next three decades, however, these extensions did little to supplant the basic Solow model—now known as the “neoclassical growth model”—as the central organizing structure for thinking about long-run economic dynamics. In essence, scant evidence existed that the growth phenomena of interest were all that sensitive to the simplest model's simplifying assumptions.

That changed in the 1980s, when Robert Summers and Alan Heston constructed a large and consistent data set on cross-country postwar GDP. One of the neoclassical growth model's key predictions had been that countries should grow at similar rates in the long run. After all, once the exogenous force of Providence has made technological know-how available, it is available to all.¹² Summers and Heston's data were not kind to this prediction, nor to its corollaries.

Analyses of the Summers–Heston data revealed anomalies that coincided with a revival of theoretical challenges to the neoclassical benchmark. The most influential challenge was mounted by Robert Lucas, who emphasized the role of human capital, and Paul Romer, who emphasized the role of research and development.¹³ The ideas of Lucas and (especially) Romer were soon extended by others.¹⁴ By emphasizing innovation and technology adoption, these models formalized the ideas of Austrian economist Joseph Schumpeter and helped to launch what is reasonably referred to as neo-Schumpeterian growth theory.¹⁵

Schumpeterian perspectives received two substantial boosts from the real world in the 1990s. First, a unique source of manufacturing plant–level data collected by the Census Bureau became available; the data provided stark and explicit evidence of the magnitude of job reallocation—especially job destruction—underlying the pattern of cyclical fluctuations in the U.S. manufacturing sector.¹⁶ In other words, the Schumpeterian notion of creative destruction appeared to have solid rooting in evidence from the microeconomic structure of the U.S. economy.

The second shot in the arm was the heralded arrival of the New Economy itself. The rapid and accelerating pace of innovation tempted economists, policymakers, and pundits to speculate about the dawning of a Third Industrial Revolution. That designation, if correct, suggests analogies to the First and Second revolutions and, sure enough, comparisons to previous episodes of major technological advance indicate the designation is apt.¹⁷

These two streams of empirical observations suggest the economy is best viewed from the vantage of a growth theory in which research and development, the acquisition of labor skills, and new-capital adoption take center stage. It is a story that presents real challenges for measuring—and hence understanding—the world in which we operate.

New Economy, New Measurement

Solow's growth model emphasized capital accumulation. The New Economy, and the new growth theory that appropriately describes it, does not require us to change this focus. What is required, however, is a much broader view of capital, along with a recognition that insights gained from this broader view must expand how economists and policymakers think about measuring investment and output and, more generally, how they think about the way the economy works.

The U.S. economy's rapid evolution—which we associate with the arrival of the New Economy—has exacerbated longstanding difficulties in dealing with quality changes, the introduction of new goods, and so on.¹⁸ It is extremely important, for example, to identify the *effective* stock of capital. The most obvious example is computers—that is, a new 1.5-gigahertz computer has substantially more computing speed and power than a 266-megahertz machine. Therefore, “two” would not be a very satisfactory answer to the question, “how many computers do you have?”

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While this measurement problem is obviously most difficult for capital that directly embodies new or rapidly evolving technologies, it can make just as much of a difference when measuring nonequipment capital such as buildings or structures. New technologies such as fast elevators, new techniques for heating, ventilation, and air conditioning, and high-speed communication lines, for example, have all greatly increased the productivity of structures that are a part of the capital stock.

These difficulties, however, are well known and seemingly amenable to solutions that do not stray too far from familiar perspectives. The deeper tensions that the New Economy creates for traditional views of long-run dynamics—that is, for the Solow growth framework—may be far more subversive and far reaching. Machines and buildings constitute physical or *tangible* capital, but capital also comprises a vast amount of knowledge, or *intangible capital*. One type of intangible capital is *human capital*—that is, the capital embodied in the education and skills of a nation's workers. Just as a country can produce more output with more physical capital, it can also produce more (for the same quantity of labor) if its workers have more human capital.

Another form of intangible capital is organizational capital: *How* we combine our resources changes as new production techniques drive out less efficient business practices. Imagine two firms with the same capital and labor inputs. They may differ in their management structures or how labor and capital are combined, and, as a result, their productive capacities will differ. Unlike other types of capital, we have yet to operationalize methods of measuring organizational capital. If technological progress alters organizational capital, as it does physical and human capital, then it is subject to the process of creative destruction, with consequences for both the long- and short-run paths of economic activity. How can we understand the creation of new firms and merger activity among existing firms without understanding organizational capital?

Perhaps the most important class of intangible capital is the collection of legal, political, and cultural institutions that defines a coherent society. Hernando de Soto, in his book *The Mystery of Capital*, draws a distinction between assets and capital. Consider, for example, a house. In its simplest form, a house is an asset that provides shelter. In de Soto's view, the house becomes capital when social conditions exist that fix property rights, that provide a mechanism for the property to serve as collateral to support additional economic activity, that allow the property to serve as a centralized location to collect and disperse information that is central to economic exchange, and so on.

It is precisely those intangible conditions, de Soto argues, that have allowed Western industrial countries to prosper where other economies have lagged (in fact, he subtitled the book *Why Capitalism Triumphs in the West and Fails Everywhere Else*). There is a growing body of research in growth and development to support de Soto's thesis. In evaluating the various sources of intangible capital, Prescott concludes:

Adding [private] intangible capital does not make the neoclassical growth model a theory of international income differences... A model with a human capital producing sector fails for similar reasons... My candidate for the factor [that accounts for these differences] is the strength of adoption of new technologies and to the efficient use of currently operating technologies, and this resistance depends upon the policy arrangement a society employs.¹⁹

If we are far from incorporating human and private organizational capital into our standard measures of productivity, then we are also far from the larger concepts to which de Soto and Prescott appeal. As debates about global economic integration intensify, it is clear that legal, regulatory, and trade policies can affect economic performance and long-term growth among nations in important ways.

Why Measurement Matters

Understanding the true magnitude of physical, human, and organizational capital stocks—and the processes by which they evolve—is crucial to understanding differences in incomes and wealth across countries. But it is also crucial for understanding the economy's short-run cyclical fluctuations, a point that is often less appreciated and bears emphasis.

To appreciate how appropriate capital measurement might alter our perceptions of short-run economic performance, consider the case of human capital or, more specifically, the cyclical behavior of labor inputs. During expansions, more people enter the workforce, causing employment to rise, while the reverse occurs during contractions. It would be inappropriate, however, to consider each new worker or each hour worked identical to other workers or hours at any other time. As the economy moves from one point in the cycle to the next, the quality of the workforce changes, meaning that effective labor hours will differ over the cycle even if measured hours do not. This happens as less skilled workers are drawn into the workforce during the expansion, and they are typically the first to exit during a contraction. So a measure that simply aggregates total hours of labor is not an accurate measure of true labor input, thus producing errors when calculating labor productivity.²⁰

One way that such errors can leach into policy is the much-scrutinized unit labor cost statistics. Unit labor costs are essentially a productivity-adjusted measure of labor compensation. Although the Federal Reserve Bank of Cleveland has strongly cautioned to the contrary,²¹ unit labor cost is still widely perceived to be a real-time indicator of potential inflationary pressures. Quite apart from our skepticism about its value, proponents of the measure readily admit that systematic cyclical errors in productivity calculations seriously distort its value.

In particular, failure to accurately measure effective labor inputs causes productivity to be underestimated in periods of rapid growth (because there are fewer effective hours than measured hours) and overestimated in periods of slower growth (because there are more effective hours than measured hours). On the flip side, perceived inflationary pressures will be overestimated in periods of rapid growth and underestimated in periods of slower growth. The policy implication here is that the central bank may be too restrictive when the economy is picking up, or too expansionary when the economy is slowing down.

It Takes a Heap of Okun Gaps to Fill a Lucas Wedge

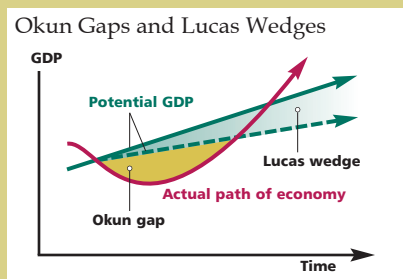
Clearly, productivity mismeasurement has contributed to egregious policy mistakes in the past—monetary policy in the 1970s appears to be the classic case study. Although discussion of that era has tended to focus on short-run cyclical issues, the key insight offered by the new business cycle and growth theories is that the distinction between the long run and the short run is blurry.

The new perspectives that we review here—including the very growth perspectives that question our ability to measure productivity today—raise the stakes on policy missteps considerably. If the interplay of institutions and public policy alters the

incentives to innovate, adopt new technologies, develop human capital, and so on (as de Soto, Prescott, and others claim), then they are intrinsic to the economy's growth potential. Small annual changes in the economy's growth trend can accumulate to very large differences over the course of a generation.

Although the rhetoric of modern central bankers never strays too far from a self-proclaimed focus on inflation and the purchasing power of money, their short-term actions are not far removed from the path of output growth relative to some presumed potential. The so-called "Taylor-rule," for instance, which purports to capture the actual behavior of the Federal Open Market Committee, assigns equal weight to an "inflation gap" and an "output gap."²²

FIGURE 3



The central bank's aversion to output fluctuations (represented by the Taylor rule) has a long tradition and has, at times, trumped longer-run worries about inflation. Such behavior is not rooted in ignorance, but in monetary policy's acknowledged role in maximizing the well-being of the citizenry. Because deviations of income and output growth from their long-run trends—sometimes referred to as "Okun gaps"—are perceived as costly to that well-being, it seems irresponsible not to risk the (presumably smaller) costs of a bit of inflation to align the economy with its potential.²³

The objective of eliminating Okun gaps has dubious value, if most cyclical fluctuations represent the economy's largely efficient dynamic allocation of resources. But even if there is a residual role for stabilization policy—even passive stabilization policy, by which we mean policies aimed at "doing no harm"—the realities of the New Economy are, at least minimally, troubling.

Taken seriously, the new growth theory indicates that existing measures of capital and labor are simply inadequate to the task—which is difficult in the best of circumstances—of accurately assessing the "trend" rate of output at any point in time. Simply put, you can't close gaps that you can't fully conceptualize, let alone can't see.

The stakes are higher if mistakes feed back, in a negative fashion, to the growth path itself. There is a growing body of evidence, for example, that financial market performance is important for economic growth and development, and that inflation has a deleterious effect on both intermediation and equity markets.²⁴ If a misplaced or imperfectly executed emphasis on smoothing output increases the price level or financial instability and lowers the trend path of the economy even a little bit, the negative consequences could overwhelm any reasonable costs that we could estimate as a result of short-run weakness in the economy.

Figure 3 illustrates the point. We have replicated, as in figure 1, a negative deviation from "potential" of the sort that policymakers are often asked to eliminate. The yellow shaded area represents the output gains from eliminating the downside gap. But suppose the cost of doing so (or attempting to do so) is increased inflation, which reduces the trend to the dotted green line in figure 3. Clearly, the long-run costs of that reduced trend (the green shaded area) can quickly vanquish whatever gains might be enjoyed from short-run stabilization efforts.

We might call the green shaded area in figure 3 a "Lucas wedge," as Robert Lucas put the point plainly: "[E]conomic instability at the level we have experienced since the Second World War is a minor problem,...certainly relative to the costs of modestly reduced rates of economic growth." Modern growth theory (for which Lucas is partially responsible) is unambiguous that we lack the information and measurement systems to effectively stabilize the economy in the short run. Not only that, the negative long-run effect of attempting to do so is a much larger gamble than is generally acknowledged.

Conclusion

In 1927, the same year that Simon Kuznets joined the National Bureau of Economic Research and embarked on the journey that would create the U.S. national income accounting system, the great Austrian physicist Werner Heisenberg published his celebrated Uncertainty Principle. Roughly speaking, the principle proved that the behavior of measured objects is not independent of the measurement process itself.

Heisenberg was, of course, describing a physical phenomenon, so analogies to the realm of social science are necessarily inexact. But economic policy is joined at the hip to economic measurement, and policy itself will, in turn, affect the future course of the economy being measured today. If the New Economy has any validity at all, those who wish to chart its course must find better ways of gauging the effects of new technologies, business practices, and economic policies on the value of land, labor, and capital. Otherwise, we are unlikely to realize the full benefits that rapid innovation can bring to our economy.

When growth was exceptional, we argued against those who saw “excessive” growth as an inflationary threat, representing prima facie evidence of the need for a relatively restrictive monetary policy...

But our argument about heavily discounting the concept of potential output is symmetric; its current implication is for caution against overly aggressive easing in light of slower-than-expected growth.

The lessons of economic theory and hard experience have taught policymakers to mistrust arguments that realized economic growth rates are—when they deviate from average experience—imperfections to be hammered out by an industrious central bank. When growth was exceptional, we argued against those who saw “excessive” growth as an inflationary threat, representing prima facie evidence of the need for a relatively restrictive monetary policy. Our position stemmed from a recognition that the boom was driven largely by firms’ desire to install new technologies by modernizing their capital stocks.

In hindsight, it is apparent that the Federal Open Market Committee bent more in this direction during the late 1990s than it would have, if it had still been in the thrall of the Keynesian orthodoxy. But our argument about heavily discounting the concept of potential output is symmetric; its current implication is for caution against overly aggressive easing in light of slower-than-expected growth. Investors, apparently, have signaled they need some time to sort out which technologies and business practices are likely to be profitable going forward. Policies designed to force growth to conform to a predetermined path may prove to be painfully optimistic.

Many theoretical advances of the past several decades have led to better monetary policy. Contemporary understandings of economic growth trace their lineage to some of the earliest writings in economics, but during the Keynesian revolution, growth theory and stabilization theory became uncoupled. Just as the public has come to recognize that complex ecological relationships can be upset as a result of damming a river or polluting a watershed, so too should it appreciate the long-term consequences of attempting to closely manage the business cycle.

Remember the buoyant state of the U.S. economy less than a year ago? Remember those who claimed the New Economy meant the end of the business cycle? We cannot emphasize too strongly that such a prospect was never credible, and it is beside the point. The critical point of the New Economy is that the role once played by land in an agricultural economy, superceded by physical capital in the industrial economy, is rapidly being replaced by human capital and information management in the knowledge economy. New firms arise on a foundation of new capital and business practices, forcing old firms to follow suit. Creative destruction has been unleashed on a global scale, bringing manifest challenges and commensurate opportunities to everyone.

Monetary policymakers already recognize the importance of better output and price measures in a knowledge-driven economy. Equally important, we contend, will be broadening our understanding of *how* we produce in a knowledge-driven economy. The New Economy intuition that benefited U.S. monetary policy in the last decade is unlikely to persist indefinitely without a willingness and ability to measure economic activity not as gaps to be closed today, but as springboards to tomorrow.

Footnotes

- 1 This should not be confused with any particular opinion as to what these sympathies might imply about the appropriate level of the federal funds rate target at any particular time.
- 2 This passage is taken from the definition of “New Economy” offered in the *Economic Report of the President*, January 2001 (Government Printing Office, 2001), p. 23.
- 3 Testimony of Chairman Alan Greenspan, *Monetary Policy Report to the Congress*, Senate Committee on Banking, Housing, and Urban Affairs, February 13, 2001. The full text of Chairman Greenspan’s remarks is available at <http://www.federalreserve.gov/boarddocs/hh/2001/february/testimony.htm>.
- 4 This view is evidenced in several of the papers presented at the Federal Reserve Bank of Cleveland’s Workshop on Learning and Model Misspecification, held February 2–3, 2001. Those papers can be found at <http://www.clev.frb.org/Research/conf2001/learning/index.htm>.
- 5 We are indebted to Athanasios Orphanides for providing us with the data for figure 2, which appears as figure 11 in his paper (European Central Bank, Working Paper no. 15, March 2000). That paper provides a detailed analysis of the policy record of the 1970s and carefully assesses the relative impact of misunderstanding the state of the economy versus miscalculating potential GDP. Orphanides concludes the latter was the more critical source of policy errors.
- 6 A similar interpretation is applied to the recently released Index of National Economic Activity, developed by the Federal Reserve Bank of Chicago. It differs from the measures in figure 2 in that potential output is calculated relative to a broad measure of economic activity. See Jonas Fisher, “Forecasting Inflation with a Lot of Data,” Federal Reserve Bank of Chicago, *Chicago Fed Letter*, no. 151, March 2000.
- 7 Robert W. Fogel, “Catching Up with the Economy,” *American Economic Review*, vol. 89, no. 1 (March 1999), pp. 1–21.
- 8 These models, associated with the economists Evsey Domar and Richard Harrod, are generally referred to as Harrod–Domar growth models.
- 9 Solow did not, of course, develop his ideas in isolation. David Cass, Trevor Swan, and Edward Denison, in particular, are also associated with the invention of modern growth theory. Still, Solow’s name tends to be the common denominator, and we will persist in modifying the model with his name, without prejudice to other contributors.
- 10 The other seminal contribution to real business cycle theory was John Long and Charles Plosser, “Real Business Cycles,” *Journal of Political Economy*, vol. 91, no. 1 (March 1983), pp. 39–69. The Long–Plosser analysis was conducted in an input–output framework, the modern variation of which was developed as a national accounting framework in 1941 by the Nobel-honored economist Wassily Leontieff. Although Leontieff’s system shared a conceptual foundation with Kuznets’ work (and that of Nobel laureates Sir Richard Stone and James Meade in the United Kingdom), Kuznets’ survived as the standard for measuring aggregate economic activity. In the real business cycle literature, Long and Plosser’s modeling approach was largely abandoned in favor of that used by Kydland and Prescott, which became the standard largely because it was better suited to considering more general classes of problems. However, Kydland and Prescott’s model was also more tightly connected to the familiar tools and techniques for measuring national economic activity inherited from Kuznets.
- 11 Edward C. Prescott, “Robert M. Solow’s Neoclassical Growth Model: An Influential Contribution to Economics,” *Scandinavian Journal of Economics*, vol. 90., no. 1 (1988), pp. 7–12.
- 12 In her book, *Inventing the Industrial Revolution* (Cambridge, U.K.: Cambridge University Press, 1988), historian Christine Macleod notes: “Concepts of technical progress among intellectuals in the late seventeenth century were fatalistic. Improved methods of discovery gave every confidence of a wealth of new inventions to come, but progress could only be as fast as Providence allowed or dictated.” Late-eighteenth-century economists—with the notable exception, perhaps, of Adam Smith—abandoned this view in favor of one in which technological progress arises from the purposeful actions of inventors and entrepreneurs. Ironically, then, the representation of technology growth in the neoclassical framework is a throwback to ideas that had existed prior to the Enlightenment.
- 13 Extending our streak of Nobel name dropping, Lucas’ model builds on Gary Becker’s groundbreaking research on human capital.
- 14 Notably, Gene Grossman and Elhanen Helpman, and Phillip Aghion and Peter Howitt.
- 15 Schumpeter coined the phrase “creative destruction” in his 1950 book *Capitalism, Socialism, and Democracy*, wherein he described capitalism as a system “that incessantly revolutionizes the economic structure from within, incessantly destroying the old one, incessantly creating a new one.” For an overview of Schumpeter’s ideas, see “Theory Ahead of Rhetoric: Economic Policy for a ‘New Economy,’” Federal Reserve Bank of Cleveland, *1999 Annual Report*, p. 14.
- 16 See, in particular, Steven J. Davis, John C. Haltiwanger, and Scott Schuh, *Job Creation and Destruction* (Cambridge, MA: MIT Press, 1996).
- 17 See Jeremy Greenwood, “The Third Industrial Revolution: Technology, Productivity, and Income Inequality,” Federal Reserve Bank of Cleveland, *Economic Review*, vol. 35, no. 2 (1999 Quarter 2), pp. 2–12.
- 18 These themes were emphasized in Chairman Alan Greenspan’s remarks at the Washington Economic Policy Conference on the Challenge of Measuring and Modeling a Dynamic Economy, sponsored by the National Association for Business Economics, March 27, 2001. The full text of Chairman Greenspan’s remarks is available at <http://www.federalreserve.gov/boarddocs/speeches/2001/>.
- 19 Edward C. Prescott, “Needed: A Theory of Total Factor Productivity,” *International Economic Review*, vol. 39, no. 3 (August 1998), pp. 525–52.
- 20 For a detailed analysis, see Finn E. Kydland and Edward C. Prescott, “Cyclical Movements of the Labor Input and Its Implicit Real Wage,” Federal Reserve Bank of Cleveland, *Economic Review*, vol. 29, no. 2 (1993 Quarter 2), pp. 12–23.
- 21 See Gregory D. Hess and Mark E. Schweitzer, “Does Wage Inflation Cause Price Inflation?” Federal Reserve Bank of Cleveland, *Policy Discussion Papers*, no. 1, April 2000.
- 22 See Orphanides (2000) for a critical interpretation of the historical record with respect to the Taylor rule.
- 23 The costs of inflation are often represented as the loss in surplus value that a consumer suffers when the inflation rate is higher than the optimal (surplus-maximizing) level. In a simple money-demand graph, this loss is represented as a segment of the area under the demand curve, known as a “Harberger triangle.” The sentiment that the losses involved in such an analysis are too small for government work was famously expressed by Nobel laureate James Tobin, who proclaimed, “it takes a heap of Harberger triangles to fill an Okun gap.”
- 24 See, for example, Thorsten Beck, Ross Levine, and Norman Loayza, “Finance and Sources of Growth,” *Journal of Financial Economics*, vol. 58, no. 1/2 (October/November 2000), pp. 261–300; and John H. Boyd, Ross Levine, and Bruce D. Smith, “The Impact of Inflation on Financial Sector Performance,” *Journal of Monetary Economics*, forthcoming.

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January 31, 2001

To the Board of Directors of the Federal Reserve Bank of Cleveland:

The management of the Federal Reserve Bank of Cleveland (FRB Cleveland) is responsible for the preparation and fair presentation of the Statement of Financial Condition, Statement of Income, and Statement of Changes in Capital as of December 31, 2000 (the "Financial Statements"). The Financial Statements have been prepared in conformity with the accounting principles, policies, and practices established by the Board of Governors of the Federal Reserve System and set forth in the Financial Accounting Manual for the Federal Reserve Banks and, as such, include amounts, some of which are based on judgments and estimates of management.

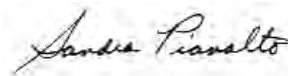
The management of the FRB Cleveland is responsible for maintaining an effective process of internal controls over financial reporting, including the safeguarding of assets as they relate to the Financial Statements. Such internal controls are designed to provide reasonable assurance to management and to the Board of Directors regarding the preparation of reliable Financial Statements. This process of internal controls contains self-monitoring mechanisms, including, but not limited to, divisions of responsibility and a code of conduct. Once identified, any material deficiencies in the process of internal controls are reported to management, and appropriate corrective measures are implemented.

Even an effective process of internal controls, no matter how well designed, has inherent limitations, including the possibility of human error, and therefore can provide only reasonable assurance with respect to the preparation of reliable financial statements.

The management of the FRB Cleveland assessed its process of internal controls over financial reporting, including the safeguarding of assets reflected in the Financial Statements, based upon criteria established in the "Internal Control – Integrated Framework" issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Based on this assessment, the management of the FRB Cleveland believes that the FRB Cleveland maintained an effective process of internal controls over financial reporting, including the safeguarding of assets as they relate to the Financial Statements.



President & Chief Executive Officer
Federal Reserve Bank of Cleveland



First Vice President & Chief Operating Officer
Federal Reserve Bank of Cleveland

Report of Independent Accountants

PricewaterhouseCoopers L.L.P.

To the Board of Directors of the Federal Reserve Bank of Cleveland:

We have examined management's assertion that the Federal Reserve Bank of Cleveland ("FRB Cleveland") maintained effective internal controls over financial reporting and the safeguarding of assets as they relate to the Financial Statements as of December 31, 2000, included in the accompanying management assertion.

Our examination was made in accordance with standards established by the American Institute of Certified Public Accountants, and accordingly, included obtaining an understanding of internal controls over financial reporting, testing, and evaluating the design and operating effectiveness of internal controls, and such other procedures as we considered necessary in the circumstances. We believe that our examination provides a reasonable basis for our opinion.

Because of inherent limitations in any internal controls, misstatements due to error or fraud may occur and not be detected. Also projections of any evaluation of internal controls over financial reporting to future periods are subject to the risk that internal controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

In our opinion, management's assertion that the FRB Cleveland maintained effective internal controls over financial reporting and over the safeguarding of assets as they relate to the Financial Statements as of December 31, 2000, is fairly stated, in all material respects, based upon criteria described in "Internal Control – Integrated Framework" issued by the Committee of Sponsoring Organizations of the Treadway Commission.



Cleveland, Ohio

March 2, 2001

Report of Independent Accountants

PricewaterhouseCoopers L.L.P.

To the Board of Governors of the Federal Reserve System
and the Board of Directors of the Federal Reserve Bank of Cleveland:

We have audited the accompanying statements of condition of the Federal Reserve Bank of Cleveland (the "Bank") as of December 31, 2000 and 1999, and the related statements of income and changes in capital for the years then ended. These financial statements are the responsibility of the Bank's management. Our responsibility is to express an opinion on the financial statements based on our audits.

We conducted our audits in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

As discussed in Note 3, the financial statements were prepared in conformity with the accounting principles, policies and practices established by the Board of Governors of the Federal Reserve System. These principles, policies and practices, which were designed to meet the specialized accounting and reporting needs of the Federal Reserve System, are set forth in the "Financial Accounting Manual for Federal Reserve Banks" and constitute a comprehensive basis of accounting other than accounting principles generally accepted in the United States of America.

In our opinion, the financial statements referred to above present fairly in all material respects, the financial position of the Bank as of December 31, 2000 and 1999, and results of its operations for the years then ended, on the basis of accounting described in Note 3.



Cleveland, Ohio

March 2, 2001

Comparative Financial Statements

Statements of Condition

(in millions)

	As of December 31, 2000	As of December 31, 1999
Assets		
Gold certificates	\$ 520	\$ 566
Special drawing rights certificates	104	299
Coin	67	11
Items in process of collection	282	401
U.S. government and federal agency securities, net	29,016	28,011
Investments denominated in foreign currencies	1,083	1,081
Accrued interest receivable	338	282
Interdistrict settlement account	2,260	3,272
Bank premises and equipment, net	186	192
Other assets	50	57
Total assets	\$ 33,906	\$ 34,172
Liabilities and Capital		
Liabilities:		
Federal Reserve notes outstanding, net	\$ 31,183	\$ 31,757
Deposits:		
Depository institutions	1,249	1,118
Other deposits	4	5
Deferred credit items	349	315
Interest on Federal Reserve notes due U.S. Treasury	110	22
Accrued benefit costs	54	52
Other liabilities	13	15
Total liabilities	32,962	33,284
Capital:		
Capital paid-in	\$ 472	\$ 444
Surplus	472	444
Total capital	944	888
Total liabilities and capital	\$ 33,906	\$ 34,172

The accompanying notes are an integral part of these financial statements.

Statements of Income

(in millions)

	For the year ended December 31, 2000	For the year ended December 31, 1999
Interest income:		
Interest on U.S. government and federal agency securities	\$ 1,774	\$ 1,638
Interest on investments denominated in foreign currencies	19	15
Total interest income	\$ 1,793	\$ 1,653
Other operating income (loss):		
Income from services	\$ 59	\$ 54
Reimbursable services to government agencies	26	28
Foreign currency losses, net	(97)	(34)
U.S. government securities losses, net	(5)	(1)
Other income	4	3
Total other operating (loss) income	\$ (13)	\$ 50
Operating expenses:		
Salaries and other benefits	\$ 75	\$ 74
Occupancy expense	12	13
Equipment expense	12	11
Cost of unreimbursed Treasury services	1	1
Assessments by Board of Governors	36	40
Other expenses	73	64
Total operating expenses	\$ 209	\$ 203
Net income prior to distribution	\$ 1,571	\$ 1,500
Distribution of net income:		
Dividends paid to member banks	\$ 27	\$ 25
Transferred to surplus	287	45
Payments to U.S. Treasury as interest on Federal Reserve notes	1,257	1,430
Total distribution	\$ 1,571	\$ 1,500

Statements of Changes in Capital

(in millions)

	For the years ended December 31, 2000 and December 31, 1999		
	Capital Paid-in	Surplus	Total Capital
Balance at January 1, 1999 (8.0 million shares)	\$ 399	\$ 399	\$ 798
Net income transferred to Surplus	—	45	45
Net change in capital stock issued (0.9 million shares)	45	—	45
Balance at December 31, 1999 (8.9 million shares)	\$ 444	\$ 444	\$ 888
Net income transferred to Surplus	—	287	287
Surplus transfer to the U.S. Treasury	—	(259)	(259)
Net change in capital stock issued (0.5 million shares)	28	—	28
Balance at December 31, 2000 (9.4 million shares)	\$ 472	\$ 472	\$ 944

The accompanying notes are an integral part of these financial statements.

Notes to Financial Statements

1. ORGANIZATION:

The Federal Reserve Bank of Cleveland ("Bank") is part of the Federal Reserve System ("System") created by Congress under the Federal Reserve Act of 1913 ("Federal Reserve Act") which established the central bank of the United States. The System consists of the Board of Governors of the Federal Reserve System ("Board of Governors") and twelve Federal Reserve Banks ("Reserve Banks"). The Reserve Banks are chartered by the federal government and possess a unique set of governmental, corporate, and central bank characteristics. Other major elements of the System are the Federal Open Market Committee ("FOMC") and the Federal Advisory Council. The FOMC is composed of members of the Board of Governors, the president of the Federal Reserve Bank of New York ("FRBNY") and, on a rotating basis, four other Reserve Bank presidents.

Structure:

The Bank and its branches in Cincinnati and Pittsburgh serve the Fourth Federal Reserve District, which includes Ohio and a portion of Kentucky, Pennsylvania, and West Virginia. In accordance with the Federal Reserve Act, supervision and control of the Bank is exercised by a board of directors. Banks that are members of the System include all national banks and any state chartered bank that applies and is approved for membership in the System.

Board of Directors:

The Federal Reserve Act specifies the composition of the board of directors for each of the Reserve Banks. Each board is composed of nine members serving three-year terms: three directors, including those designated as Chairman and Deputy Chairman, are appointed by the Board of Governors, and six directors are elected by member banks. Of the six elected by member banks, three represent the public and three represent member banks. Member banks are divided into three classes according to size. Member banks in each class elect one director representing member banks and one representing the public. In any election of directors, each member bank receives one vote, regardless of the number of shares of Reserve Bank stock it holds.

2. OPERATIONS AND SERVICES:

The System performs a variety of services and operations. Functions include: formulating and conducting monetary policy; participating actively in the payments mechanism, including large-dollar transfers of funds, automated clearinghouse operations and check processing; distribution of coin and currency; fiscal agency functions for the U.S. Treasury and certain federal agencies; serving as the federal government's bank; providing short-term loans to depository institutions; serving the consumer and the community by providing educational materials and information regarding consumer laws; supervising bank holding companies and state member banks; and administering other regulations of the Board of Governors. The Board of Governors' operating costs are funded through assessments on the Reserve Banks.

The FOMC establishes policy regarding open market operations, oversees these operations, and issues authorizations and directives to the FRBNY for its execution of transactions. Authorized transaction types include direct purchase and sale of securities, matched sale-purchase transactions, the purchase of securities under agreements to resell, and the lending of U.S. government securities. The FRBNY is also authorized by the FOMC to hold balances of and to execute spot and forward foreign exchange and securities contracts in nine foreign currencies, maintain reciprocal currency arrangements ("F/X swaps") with various central banks, and "warehouse" foreign currencies for the U.S. Treasury and Exchange Stabilization Fund ("ESF") through the Reserve Banks.

3. SIGNIFICANT ACCOUNTING POLICIES:

Accounting principles for entities with the unique powers and responsibilities of the nation's central bank have not been formulated by the Financial Accounting Standards Board. The Board of Governors has developed specialized accounting principles and practices that it believes are appropriate for the significantly different nature and function of a central bank as compared to the private sector. These accounting principles and practices are documented in the "Financial Accounting Manual for Federal Reserve Banks" ("Financial Accounting Manual"), which is issued by the Board of Governors. All Reserve Banks are required to adopt and apply accounting policies and practices that are consistent with the Financial Accounting Manual.

The financial statements have been prepared in accordance with the Financial Accounting Manual. Differences exist between the accounting principles and practices of the System and generally accepted accounting principles ("GAAP"). The primary differences are the presentation of all security holdings at amortized cost, rather than at the fair value presentation requirements of GAAP, and the accounting for matched sale-purchase transactions as separate sales and purchases, rather than secured borrowings with pledged collateral, as is generally required by GAAP. In addition, the Bank has elected not to present a Statement of Cash Flows. The Statement of Cash Flows has not been included as the liquidity and cash position of the Bank are not of primary concern to the users of these financial statements. Other information regarding the Bank's activities is provided in, or may be derived from, the Statements of Condition, Income, and Changes in Capital. Therefore, a Statement of Cash Flows would not provide any additional useful information. There are no other significant differences between the policies outlined in the Financial Accounting Manual and GAAP.

The preparation of the financial statements in conformity with the Financial Accounting Manual requires management to make certain estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of income and expenses during the reporting period. Actual results could differ from those estimates. Unique accounts and significant accounting policies are explained below.

a. Gold Certificates

The Secretary of the Treasury is authorized to issue gold certificates to the Reserve Banks to monetize gold held by the U.S. Treasury. Payment for the gold certificates by the Reserve Banks is made by crediting equivalent amounts in dollars into the account established for the U.S. Treasury. These gold certificates held by the Reserve Banks are required to be backed by the gold of the U.S. Treasury. The U.S. Treasury may reacquire the gold certificates at any time and the Reserve Banks must deliver them to the U.S. Treasury. At such time, the U.S. Treasury's account is charged and the Reserve Banks' gold certificate accounts are lowered. The value of gold for purposes of backing the gold certificates is set by law at \$42.2/9 a fine troy ounce. The Board of Governors allocates the gold certificates among Reserve Banks once a year based upon Federal Reserve notes outstanding in each District at the end of the preceding year.

b. Special Drawing Rights Certificates

Special drawing rights ("SDRs") are issued by the International Monetary Fund ("Fund") to its members in proportion to each member's quota in the Fund at the time of issuance. SDRs serve as a supplement to international monetary reserves and may be transferred from one national monetary authority to another. Under the law providing for United States participation in the SDR system, the Secretary of the U.S. Treasury is authorized to issue SDR certificates, somewhat like gold certificates, to the Reserve Banks. At such time, equivalent amounts in dollars are credited to the account established for the U.S. Treasury, and the Reserve Banks' SDR certificate accounts are increased. The Reserve Banks are required to purchase SDRs, at the direction of the U.S. Treasury, for the purpose of financing SDR certificate acquisitions or for financing exchange stabilization operations. The Board of Governors allocates each SDR transaction among Reserve Banks based upon Federal Reserve notes outstanding in each District at the end of the preceding year.

c. Loans to Depository Institutions

The Depository Institutions Deregulation and Monetary Control Act of 1980 provides that all depository institutions that maintain reservable transaction accounts or nonpersonal time deposits, as defined in Regulation D issued by the Board of Governors, have borrowing privileges at the discretion of the Reserve Banks. Borrowers execute certain lending agreements and deposit sufficient collateral before credit is extended. Loans are evaluated for collectibility, and currently all are considered collectible and fully collateralized. If any loans were deemed to be uncollectible, an appropriate reserve would be established. Interest is recorded on the accrual basis and is charged at the applicable discount rate established at least every fourteen days by the Board of Directors of the Reserve Banks, subject to review by the Board of Governors. However, Reserve Banks retain the option to impose a surcharge above the basic rate in certain circumstances. There were no outstanding loans to depository institutions at December 31, 2000 and 1999, respectively.

d. U.S. Government and Federal Agency Securities and Investments Denominated in Foreign Currencies

The FOMC has designated the FRBNY to execute open market transactions on its behalf and to hold the resulting securities in the portfolio known as the System Open Market Account ("SOMA"). In addition to authorizing and directing operations in the domestic securities market, the FOMC authorizes and directs the FRBNY to execute operations in foreign markets for major currencies in order to counter disorderly conditions in exchange markets or other needs specified by the FOMC in carrying out the System's central bank responsibilities.

Purchases of securities under agreements to resell and matched sale-purchase transactions are accounted for as separate sale and purchase transactions. Purchases under agreements to resell are transactions in which the FRBNY purchases a security and sells it back at the rate specified at the commencement of the transaction. Matched sale-purchase transactions are transactions in which the FRBNY sells a security and buys it back at the rate specified at the commencement of the transaction.

Effective April 26, 1999 FRBNY was given the sole authorization by the FOMC to lend U.S. government securities held in the SOMA to U.S. government securities dealers and to banks participating in U.S. government securities clearing arrangements, in order to facilitate the effective functioning of the domestic securities market. These securities-lending transactions are fully collateralized by other U.S. government securities. FOMC policy requires FRBNY to take possession of collateral in amounts in excess of the market values of the securities loaned. The market values of the collateral and the securities loaned are monitored by FRBNY on a daily basis, with additional collateral obtained as necessary. The securities loaned continue to be accounted for in SOMA. Prior to April 26, 1999 all Reserve Banks were authorized to engage in such lending activity.

Foreign exchange contracts are contractual agreements between two parties to exchange specified currencies, at a specified price, on a specified date. Spot foreign contracts normally settle two days after the trade date, whereas the settlement date on forward contracts is negotiated between the contracting parties, but will extend beyond two days from the trade date. The FRBNY generally enters into spot contracts, with any forward contracts generally limited to the second leg of a swap/warehousing transaction.

The FRBNY, on behalf of the Reserve Banks, maintains renewable, short-term F/X swap arrangements with two authorized foreign central banks. The parties agree to exchange their currencies up to a pre-arranged maximum amount and for an agreed upon period of time (up to twelve months), at an agreed upon interest rate. These arrangements give the FOMC temporary access to foreign currencies that it may need for intervention operations to support the dollar and give the partner foreign central bank temporary access to dollars it may need to support its own currency. Drawings under the F/X swap arrangements can be initiated by either the FRBNY or the partner foreign central bank, and must be agreed to by the drawee. The F/X swaps are structured so that the party initiating the transaction (the drawer) bears the exchange rate risk upon maturity. The FRBNY will generally invest the foreign currency received under an F/X swap in interest-bearing instruments.

Warehousing is an arrangement under which the FOMC agrees to exchange, at the request of the Treasury, U.S. dollars for foreign currencies held by the Treasury or ESF over a limited period of time. The purpose of the warehousing facility is to supplement the U.S. dollar resources of the Treasury and ESF for financing purchases of foreign currencies and related international operations.

In connection with its foreign currency activities, the FRBNY, on behalf of the Reserve Banks, may enter into contracts which contain varying degrees of off-balance sheet market risk, because they represent contractual commitments involving future settlement, and counter-party credit risk. The FRBNY controls credit risk by obtaining credit approvals, establishing transaction limits, and performing daily monitoring procedures.

While the application of current market prices to the securities currently held in the SOMA portfolio and investments denominated in foreign currencies may result in values substantially above or below their carrying values, these unrealized changes in value would have no direct effect on the quantity of reserves available to the banking system or on the prospects for future Reserve Bank earnings or capital. Both the domestic and foreign components of the SOMA portfolio from time to time involve transactions that can result in gains or losses when holdings are sold prior to maturity. However, decisions regarding the securities and foreign currencies transactions, including their purchase and sale, are motivated by monetary policy objectives rather than profit. Accordingly, earnings and any gains or losses resulting from the sale of such currencies and securities are incidental to the open market operations and do not motivate its activities or policy decisions.

U.S. government and federal agency securities and investments denominated in foreign currencies comprising the SOMA are recorded at cost, on a settlement-date basis, and adjusted for amortization of premiums or accretion of discounts on a straight-line basis. Interest income is accrued on a straight-line basis and is reported as "Interest on U.S. government and federal agency securities" or "Interest on investments denominated in foreign currencies," as appropriate. Income earned on securities lending transactions is reported as a component of "Other income." Gains and losses resulting from sales of securities are determined by specific issues based on average cost. Gains and losses on the sales of U.S. government and federal agency securities are reported as "U.S. government securities losses, net." Foreign currency denominated assets are revalued monthly at current market exchange rates in order to report these assets in U.S. dollars. Realized and unrealized gains and losses on investments denominated in foreign currencies are reported as "Foreign currency losses, net." Foreign currencies held through F/X swaps, when initiated by the counter-party, and warehousing arrangements are revalued monthly, with the unrealized gain or loss reported by the FRBNY as a component of "Other assets" or "Other liabilities," as appropriate.

Balances of U.S. government and federal agencies securities bought outright, investments denominated in foreign currency, interest income, amortization of premiums and discounts on securities bought outright, gains and losses on sales of securities, and realized and unrealized gains and losses on investments denominated in foreign currencies, excluding those held under an F/X swap arrangement, are allocated to each Reserve Bank. Effective April 26, 1999 income from securities lending transactions undertaken by FRBNY was also allocated to each Reserve Bank. Securities purchased under agreements to resell and unrealized gains and losses on the revaluation of foreign currency holdings under F/X swaps and warehousing arrangements are allocated to the FRBNY and not to other Reserve Banks.

e. Bank Premises and Equipment

Bank premises and equipment are stated at cost less accumulated depreciation. Depreciation is calculated on a straight-line basis over estimated useful lives of assets ranging from 2 to 50 years. New assets, major alterations, renovations and improvements are capitalized at cost as additions to the asset accounts. Maintenance, repairs and minor replacements are charged to operations in the year incurred. Internally developed software is capitalized based on the cost of direct materials and services and those indirect costs associated with developing, implementing, or testing software.

f. Interdistrict Settlement Account

At the close of business each day, all Reserve Banks and branches assemble the payments due to or from other Reserve Banks and branches as a result of transactions involving accounts residing in other Districts that occurred during the day's operations. Such transactions may include funds settlement, check clearing and automated clearinghouse operations, and allocations of shared expenses. The cumulative net amount due to or from other Reserve Banks is reported as the "Interdistrict settlement account."

g. Federal Reserve Notes

Federal Reserve notes are the circulating currency of the United States. These notes are issued through the various Federal Reserve agents to the Reserve Banks upon deposit with such Agents of certain classes of collateral security, typically U.S. government securities. These notes are identified as issued to a specific Reserve Bank. The Federal Reserve Act provides that the collateral security tendered by the Reserve Bank to the Federal Reserve Agent must be equal to the sum of the notes applied for by such Reserve Bank. In accordance with the Federal Reserve Act, gold certificates, special drawing rights certificates, U.S. government and federal agency securities, triparty agreements, loans to depository institutions, and investments denominated in foreign currencies are pledged as collateral for net Federal Reserve notes outstanding. The collateral value is equal to the book value of the collateral tendered, with the exception of securities, whose collateral value is equal to the par value of the securities tendered. The Board of Governors may, at any time, call upon a Reserve Bank for additional security to adequately collateralize the Federal Reserve notes. The Reserve Banks have entered into an agreement which provides for certain assets of the Reserve Banks to be jointly pledged as collateral for the Federal Reserve notes of all Reserve Banks in order to satisfy their obligation of providing sufficient collateral for outstanding Federal Reserve notes. In the event that this collateral is insufficient, the Federal Reserve Act provides that Federal Reserve notes become a first and paramount lien on all the assets of the Reserve Banks. Finally, as obligations of the United States, Federal Reserve notes are backed by the full faith and credit of the United States government.

The "Federal Reserve notes outstanding, net" account represents Federal Reserve notes reduced by currency held in the vaults of the Bank of \$5,089 million, and \$7,158 million at December 31, 2000 and 1999, respectively.

h. Capital Paid-in

The Federal Reserve Act requires that each member bank subscribe to the capital stock of the Reserve Bank in an amount equal to 6 percent of the capital and surplus of the member bank. As a member bank's capital and surplus changes, its holdings of the Reserve Bank's stock must be adjusted. Member banks are those state-chartered banks that apply and are approved for membership in the System and all national banks. Currently, only one-half of the subscription is paid-in and the remainder is subject to call. These shares are nonvoting with a par value of \$100. They may not be transferred or hypothecated. By law, each member bank is entitled to receive an annual dividend of 6 percent on the paid-in capital stock. This cumulative dividend is paid semiannually. A member bank is liable for Reserve Bank liabilities up to twice the par value of stock subscribed by it.

i. Surplus

The Board of Governors requires Reserve Banks to maintain a surplus equal to the amount of capital paid-in as of December 31. This amount is intended to provide additional capital and reduce the possibility that the Reserve Banks would be required to call on member banks for additional capital. Reserve Banks are required by the Board of Governors to transfer to the U.S. Treasury excess earnings, after providing for the costs of operations, payment of dividends, and reservation of an amount necessary to equate surplus with capital paid-in.

The Consolidated Appropriations Act of 2000 (Public Law 106-113, Section 302) directed the Reserve Banks to transfer to the U.S. Treasury additional surplus funds of \$3,752 million during the Federal Government's 2000 fiscal year. Federal Reserve Bank of Cleveland transferred \$259 million to the U.S. Treasury during the year ended December 31, 2000. Reserve Banks were not permitted to replenish the surplus for these amounts during fiscal year 2000 which ended September 30, 2000; however, the surplus was replenished by December 31, 2000.

In the event of losses or a substantial increase in capital, payments to the U.S. Treasury are suspended until such losses or increases in capital are recovered through subsequent earnings. Weekly payments to the U.S. Treasury may vary significantly.

j. Income and Cost related to Treasury Services

The Bank is required by the Federal Reserve Act to serve as fiscal agent and depository of the United States. By statute, the Department of the Treasury is permitted, but not required, to pay for these services. The costs of providing fiscal agency and depository services to the Treasury Department that have been billed but will not be paid are reported as the "Cost of unreimbursed Treasury services."

k. Taxes

The Reserve Banks are exempt from federal, state, and local taxes, except for taxes on real property, which are reported as a component of "Occupancy expense."

4. U.S. GOVERNMENT AND FEDERAL AGENCY SECURITIES:

Securities bought outright are held in the SOMA at the FRB/BNY. An undivided interest in SOMA activity, with the exception of securities held under agreements to resell and the related premiums, discounts and income, is allocated to each Reserve Bank on a percentage basis derived from an annual settlement of interdistrict clearings. The settlement, performed in April of each year, equalizes Reserve Bank gold certificate holdings to Federal Reserve notes outstanding. The Bank's allocated share of SOMA balances was 5.596% and 5.788% at December 31, 2000 and 1999, respectively.

The Bank's allocated share of securities held in the SOMA at December 31, that were bought outright, were as follows (in millions):

	2000	1999
Par value:		
Federal agency	\$ 7	\$ 10
U.S. government:		
Bills	10,003	10,218
Notes	13,441	12,646
Bonds	5,192	4,803
Total par value	28,643	27,677
Unamortized premiums	545	527
Unaccreted discounts	(172)	(193)
Total allocated to Bank	\$ 29,016	\$ 28,011

Total SOMA securities bought outright were \$518,501 million and \$483,902 million at December 31, 2000 and 1999, respectively.

The maturity distribution of U.S. government and federal agency securities bought outright, which were allocated to the Bank at December 31, 2000, were as follows (in millions):

Maturities of Securities Held	Par value		Total
	U.S. Government Securities	Federal Agency Obligations	
Within 15 days	\$ 1,010	\$ —	\$ 1,010
16 days to 90 days	6,098	—	6,098
91 days to 1 year	7,025	—	7,025
Over 1 year to 5 years	7,431	7	7,438
Over 5 years to 10 years	3,104	—	3,104
Over 10 years	3,968	—	3,968
Total	\$ 28,636	\$ 7	\$ 28,643

At December 31, 2000 and 1999, matched sale-purchase transactions involving U.S. government securities with par values of \$21,112 million and \$39,182 million, respectively, were outstanding, of which \$1,181 million and \$2,268 million were allocated to the Bank. Matched sale-purchase transactions are generally overnight arrangements.

5. INVESTMENTS DENOMINATED IN FOREIGN CURRENCIES:

The FRB/BNY, on behalf of the Reserve Banks, holds foreign currency deposits with foreign central banks and the Bank for International Settlements and invests in foreign government debt instruments. Foreign government debt instruments held include both securities bought outright and securities held under agreements to resell. These investments are guaranteed as to principal and interest by the foreign governments.

Each Reserve Bank is allocated a share of foreign-currency-denominated assets, the related interest income, and realized and unrealized foreign currency gains and losses, with the exception of unrealized gains and losses on F/X swaps and warehousing transactions. This allocation is based on the ratio of each Reserve Bank's capital and surplus to aggregate capital and surplus at the preceding December 31. The Bank's allocated share of investments denominated in foreign currencies was approximately 6.911% and 6.696% at December 31, 2000 and 1999, respectively.

The Bank's allocated share of investments denominated in foreign currencies, valued at current exchange rates at December 31, were as follows (in millions):

	2000	1999
<i>European Union Euro:</i>		
Foreign currency deposits	\$ 320	\$ 290
Government debt instruments including agreements to resell	190	170
<i>Japanese Yen:</i>		
Foreign currency deposits	190	22
Government debt instruments including agreements to resell	380	596
Accrued interest	3	3
Total	\$ 1,083	\$ 1,081

Total investments denominated in foreign currencies were \$15,670 million and \$16,140 million at December 31, 2000 and 1999, respectively.

The maturity distribution of investments denominated in foreign currencies that were allocated to the Bank at December 31, 2000, were as follows (in millions):

<u>Maturities of Investments Denominated in Foreign Currencies</u>	
Within 1 year	\$ 1,016
Over 1 year to 5 years	29
Over 5 years to 10 years	30
Over 10 years	8
Total	\$ 1,083

At December 31, 2000 and 1999, there were no open foreign exchange contracts or outstanding F/X swaps.

At December 31, 2000 and 1999, the warehousing facility was \$5,000 million, with no balance outstanding.

6. BANK PREMISES AND EQUIPMENT:

A summary of bank premises and equipment at December 31 is as follows (in millions):

	2000	1999
<i>Bank premises and equipment:</i>		
Land	\$ 7	\$ 7
Buildings	149	148
Building machinery and equipment	42	41
Construction in progress	1	1
Furniture and equipment	73	71
	272	268
Accumulated depreciation	(86)	(76)
Bank premises and equipment, net	\$ 186	\$ 192

Depreciation expense was \$12 million for each of the years ended December 31, 2000 and 1999, respectively.

The Bank leases unused space to outside tenants. Those leases have terms ranging from 1 to 15 years. Rental income from such leases was \$1.3 million and \$934 thousand for the years ended December 31, 2000 and 1999, respectively. Future minimum lease payments under noncancelable agreements in existence at December 31, 2000, were (in millions):

2001	\$ 1
2002	1
2003	1
2004	1
2005	1
Thereafter	8
	\$ 13

7. COMMITMENTS AND CONTINGENCIES:

At December 31, 2000, the Bank was obligated under noncancelable leases for premises and equipment with terms ranging from 1 to approximately 3 years. These leases provide for increased rentals based upon increases in real estate taxes, operating costs or selected price indices.

Rental expense under operating leases for certain operating facilities, warehouses, and data processing and office equipment (including taxes, insurance and maintenance when included in rent), net of sublease rentals, was \$552 thousand and \$452 thousand for each of the years ended December 31, 2000 and 1999, respectively. Certain of the Bank's leases have options to renew.

Future minimum rental payments under noncancelable operating leases and capital leases, net of sublease rentals, with terms of one year or more, at December 31, 2000, were not material.

Under the Insurance Agreement of the Federal Reserve Banks dated as of March 2, 1999, each of the Reserve Banks has agreed to bear, on a per incident basis, a pro rata share of losses in excess of 1 percent of the capital paid-in of the claiming Reserve Bank, up to 50 percent of the total capital paid-in of all Reserve Banks. Losses are borne in the ratio that a Reserve Bank's capital paid-in bears to the total capital paid-in of all Reserve Banks at the beginning of the calendar year in which the loss is shared. No claims were outstanding under such agreement at December 31, 2000 or 1999.

The Bank is involved in certain legal actions and claims arising in the ordinary course of business. Although it is difficult to predict the ultimate outcome of these actions, in management's opinion, based on discussions with counsel, the aforementioned litigation and claims will be resolved without material adverse effect on the financial position or results of operations of the Bank.

At December 31, 2000, the Bank acting on behalf of the Reserve Banks, had contractual commitments through the year 2005 totaling \$122.2 million. These contracts represent equipment, maintenance, software, and other miscellaneous costs for Check operations and the Check Modernization project, which will be allocated annually to other Reserve Banks. It is estimated that the Bank's allocated share will be \$25.5 million.

8. RETIREMENT AND THRIFT PLANS:

Retirement Plans:

The Bank currently offers two defined benefit retirement plans to its employees, based on length of service and level of compensation. Substantially all of the Bank's employees participate in the Retirement Plan for Employees of the Federal Reserve System ("System Plan") and the Benefit Equalization Retirement Plan ("BEP"). The System Plan is a multi-employer plan with contributions fully funded by participating employers. No separate accounting is maintained of assets contributed by the participating employers. The Bank's projected benefit obligation and net pension costs for the BEP at December 31, 2000 and 1999, and for the years then ended, are not material.

Thrift Plan:

Employees of the Bank may also participate in the defined contribution Thrift Plan for Employees of the Federal Reserve System ("Thrift Plan"). The Bank's Thrift Plan contributions totaled \$2 million for each of the years ended December 31, 2000 and 1999, and are reported as a component of "Salaries and other benefits."

9. POSTRETIREMENT BENEFITS OTHER THAN PENSIONS AND POSTEMPLOYMENT BENEFITS:

Postretirement Benefits other than Pensions:

In addition to the Bank's retirement plans, employees who have met certain age and length of service requirements are eligible for both medical benefits and life insurance coverage during retirement.

The Bank funds benefits payable under the medical and life insurance plans as due and, accordingly, has no plan assets. Net postretirement benefit costs are actuarially determined using a January 1 measurement date.

Following is a reconciliation of beginning and ending balances of the benefit obligation (in millions):

	2000	1999
Accumulated postretirement benefit obligation at January 1	\$ 37.2	\$ 44.2
Service cost-benefits earned during the period	1.0	1.1
Interest cost of accumulated benefit obligation	2.6	2.3
Actuarial (gain)	(0.1)	(9.3)
Contributions by plan participants	0.2	0.2
Benefits paid	(1.5)	(1.3)
Accumulated postretirement benefit obligation at December 31	\$ 39.4	\$ 37.2

Following is a reconciliation of the beginning and ending balance of the plan assets, the unfunded postretirement benefit obligation, and the accrued postretirement benefit costs (in millions):

	2000	1999
Fair value of plan assets at January 1	\$ —	\$ —
Actual return on plan assets	—	—
Contributions by the employer	1.3	1.1
Contributions by plan participants	0.2	0.2
Benefits paid	(1.5)	(1.3)
Fair value of plan assets at December 31	\$ —	\$ —
Unfunded postretirement benefit obligation	\$ 39.4	\$ 37.2
Unrecognized prior service cost	—	—
Unrecognized net actuarial gain	9.1	9.5
Accrued postretirement benefit cost	\$ 48.5	\$ 46.7

Accrued postretirement benefit costs are reported as a component of "Accrued benefit costs."

At December 31, 2000 and 1999, the weighted-average assumption used in developing the postretirement benefit obligation was 7.5 percent.

For measurement purposes, an 8.75 percent annual rate of increase in the cost of covered health care benefits was assumed for 2001. Ultimately, the health care cost trend rate is expected to decrease gradually to 5.50 percent by 2008, and remain at that level thereafter.

Assumed health care cost trend rates have a significant effect on the amounts reported for health care plans. A one percentage point change in assumed health care cost trend rates would have the following effects for the year ended December 31, 2000 (in millions):

	1 Percentage Point Increase	1 Percentage Point Decrease
Effect on aggregate of service and interest cost components of net periodic postretirement benefit costs	\$ 0.9	\$ (0.7)
Effect on accumulated postretirement benefit obligation	6.8	(5.6)

The following is a summary of the components of net periodic postretirement benefit costs for the years ended December 31 (in millions):

	2000	1999
Service cost-benefits earned during the period	\$ 1.0	\$ 1.1
Interest cost of accumulated benefit obligation	2.6	2.3
Amortization of prior service cost	—	—
Recognized net actuarial loss	(0.4)	(0.1)
Net periodic postretirement benefit cost	\$ 3.2	\$ 3.3

Net periodic postretirement benefit cost is reported as a component of "Salaries and other benefits."

Postemployment Benefits:

The Bank offers benefits to former or inactive employees. Postemployment benefit costs are actuarially determined and include the cost of medical and dental insurance, survivor income, and disability benefits. Costs were projected using the same discount rate and health care trend rates as were used for projecting postretirement costs. The accrued postemployment benefit costs recognized by the Bank at December 31, 2000 and 1999, were \$6 million and \$5 million, respectively. This cost is included as a component of "Accrued benefit costs." Net periodic postemployment benefit costs included in 2000 and 1999 operating expenses were \$1 million for each of the years ended December 31, 2000 and 1999, respectively.

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BUSINESS ADVISORY COUNCIL
AND
COMMUNITY BANK ADVISORY COUNCIL

Officers and Consultants

As of December 31, 2000

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Sandra Pianalto

First Vice President & Chief Operating Officer

David E. Altig

Vice President & Economist
Research

Terry N. Bennett

Vice President
Information Technology Services

Raymond L. Brinkman

Vice President
Savings Bonds

Andrew C. Burkle, Jr.

Vice President
Supervision and Regulation

Barbara B. Henshaw

Vice President
Cincinnati Location Officer,
Protection, Business Continuity

David P. Jager

Vice President
Cash, Treasury Services, Electronic Payments

Stephen H. Jenkins

Vice President
Supervision and Regulation

Douglas A. Banks

Assistant Vice President
Supervision and Regulation

James A. Blake

Consultant
IPS Development

Michael F. Bryan

Assistant Vice President & Economist
Research

Ruth M. Clevenger

Assistant Vice President & Community Affairs Officer
Corporate Communications and Community Affairs

William D. Fosnight

Assistant Vice President & Assistant General Counsel
Legal

Stephen J. Geers

Assistant Vice President
Marketing

Kenneth J. Good

Assistant Vice President
Pittsburgh Check Operations

Lawrence Cuy

Senior Vice President
Financial Management Services, Strategic Planning,
Information Technology, COSO

R. Chris Moore

Senior Vice President
Supervision and Regulation, Credit Risk Management,
Data Services

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Senior Vice President
Retail Product Office, Check Automation
and Operations

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Vice President
Financial Management

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Senior Consultant
Information Technology Services

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Marketing, Sales

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Retail Product Office, Marketing

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Pittsburgh Location Officer, Check Operations,
Protection, Business Continuity

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Audit

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Vice President
Credit Risk Management, Data Services

Joseph G. Haubrich

Consultant & Economist
Research

Suzanne M. Howe

Assistant Vice President
Electronic Payments

Jon C. Jeswald

Assistant Vice President
Retail Product Office

Paul E. Kaboth

Assistant Vice President
Supervision and Regulation

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Information Technology Services

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Cleveland Check Operations

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Assistant Vice President & Corporate Secretary
Corporate Communications and Community Affairs

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Senior Vice President
Cash, Treasury Services, Savings Bonds, Facilities,
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Check, Marketing, Electronic Payments

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Vice President & Economist
Research

Joseph C. Thorp

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Vice President
Human Resources, Quality, EEO Officer

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Vice President & General Counsel
Legal, Ethics

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Vice President
Cincinnati and Columbus Check Operations

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Accounting, Billing

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Assistant Vice President
Facilities, Business Continuity

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Consultant
Supervision and Regulation

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Assistant Vice President
Cincinnati Check Operations

Henry P. Trolio

Assistant Vice President
Information Technology Services

Anthony Turcinov

Assistant Vice President
Cleveland Check Operations

Michael Vangelos

Assistant Vice President
Information Security

Consultants are highly skilled employees who contribute to attaining the Bank's goals through their specialized professional or technical skills.

Directors

As of December 31, 2000

Cleveland

David H. Hoag

Chairman
Retired Chairman
The LTV Corporation
Cleveland, Ohio

Robert W. Mahoney

Deputy Chairman
Retired Chairman
Diebold, Inc.
Uniontown, Ohio

John R. Cochran

Chairman & CEO
FirstMerit Corporation
Akron, Ohio

Phillip R. Cox

President & CEO
Cox Financial Corporation
Cincinnati, Ohio

David S. Dahlmann

President & CEO
Southwest Bank
Greensburg, Pennsylvania

Wayne R. Embry

Consultant
Cleveland Cavaliers
Cleveland, Ohio

Cheryl L. Krueger-Horn

President & CEO
Cheryl&Co.
Westerville, Ohio

Tiney M. McComb

Chairman & President
Heartland Bancorp
Gahanna, Ohio

David L. Nichols

President & COO
Rich's/Lazarus/Goldsmith's
Atlanta, Georgia

Cincinnati

George C. Juilfs

Chairman
President & CEO
SENCORP
Newport, Kentucky

Judith G. Clabes

President & CEO
Scripps Howard Foundation
Cincinnati, Ohio

Jean R. Hale

Chairman & CEO
Community Trust Bancorp, Inc.
Pikeville, Kentucky

V. Daniel Radford

Executive Secretary-Treasurer
Cincinnati AFL-CIO Labor Council
Cincinnati, Ohio

Thomas Revely, III

President & CEO
CBS Technologies, LLC
Cincinnati, Ohio

Wayne Shumate

President & CEO
Kentucky Textiles, Inc.
Paris, Kentucky

Stephen P. Wilson

Chairman, President & CEO
Lebanon Citizens National Bank
Lebanon, Ohio

Pittsburgh

John T. Ryan III

Chairman
Chairman & CEO
Mine Safety Appliances Company
Pittsburgh, Pennsylvania

Georgia Berner

President
Berner International Corporation
New Castle, Pennsylvania

Charles E. Bunch

Executive Vice President
PPG Industries, Inc.
Pittsburgh, Pennsylvania

Gretchen R. Haggerty

Vice President
Accounting and Finance
U. S. Steel Group
Pittsburgh, Pennsylvania

Thomas J. O'Shane

President & CEO
Mid Am Bank
Toledo, Ohio

Edward V. Randall, Jr.

Management Advisor & Consultant
Rundle & Associates
Pittsburgh, Pennsylvania

Peter N. Stephans

Chairman & CEO
Trigon, Incorporated
McMurray, Pennsylvania



David A. Daberko
Federal Advisory Council Representative
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National City Corporation
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Operational Highlights



The Federal Reserve Bank of Cleveland's major responsibilities fall into three principal categories: the provision of financial services to banking institutions and the U.S. Treasury, supervision and regulation of banking organizations, and economic research and monetary policy. The Bank's activities and undertakings in these areas are carried out with the high degree of public purpose and commitment that is the proud tradition of the Federal Reserve System. This section describes some of the Bank's achievements in 2000 in each of its major areas of responsibility.

Payments Services *The Federal Reserve Bank of Cleveland maintained its strong performance in 2000, meeting all financial targets and most performance objectives and significantly expanding its contributions to the Federal Reserve System. Increased competition, industry consolidation, and emerging payments technologies were just a few of the issues confronting Fourth District financial institutions in 2000. In a technology-driven financial services industry in which rapid change is the only constant, the Cleveland Fed fulfilled its responsibilities to Fourth District depository institutions by delivering efficiently produced financial services and by meeting the standards of quality that we expect of ourselves and that our customers desire.*

The Cleveland Fed directly supported the System's financial goals by exceeding its target for local net revenue and by posting the lowest expense growth of all Reserve Banks. Our Bank ranked second among the 12 Reserve Banks in the cross-sectional unit-cost index, a Systemwide comparison of efficiency. All financial services—retail payments, wholesale payments, and cash—ranked in the top quartile for lowest unit cost.

The Bank's largest priced service, check processing, saw productivity rise 8.3 percent over 1999. The Check function surpassed its cost/revenue target (94.4 percent) to achieve a recovery rate of 101.4 percent. It exceeded its local net revenue target—the difference between revenue generated in the Fourth District and the Bank's total operating and float costs—significantly assisting the Federal Reserve System in meeting its national cost-recovery targets.

The Bank played an important System leadership role in developing the FedLine® for Windows® project, a new infrastructure and operating system that responds to customers' needs for

highly secure and flexible electronic-transaction software. The Federal Reserve System's FedLine for Windows Installation Center, housed in Cleveland, began startup operations in preparation for the FedLine 2001 rollout. This facility will provide implementation and security software components for the installation of FedLine for Windows nationwide.

In partnership with the Federal Reserve Bank of Atlanta, the Cleveland Fed continued to lead the Retail Product Office, which manages check-processing and automated clearing-house operations for the Federal Reserve System. Cleveland staff are managing the Check Modernization Project, a four-year Systemwide initiative that will standardize check processing at all 45 Reserve Bank offices, adopt a common software for processing and researching check-adjustment cases, create a national check-image archive and retrieval system, and deliver check services to customers on a Web-based platform. The Retail Product Office successfully standardized forward- and return-item services across Reserve Banks and developed a series of comprehensive management information reports to compare the Reserve Banks' product mix, pricing, and contribution margins. As part of the Check Modernization Project, the Bank has entered into a systemwide contract with PricewaterhouseCoopers (PwC) for management consulting services. Expenditures for these services during the year 2000 totaled \$0.8 million. The term of this contract extends to 2003 with total expected payments in future years of \$2.5 million. PwC is also under contract with the Board of Governors of the Federal Reserve System to audit each Reserve Bank's financial statements. The Bank's board of directors has considered and concluded that the consulting contract is not incompatible with PwC's financial statement audit responsibilities and should not affect the auditor's independence.

®Fedline is a registered trademark of the Federal Reserve System.

The Cash Department ranked first in the System for high-speed currency-processing productivity, and it helped to relieve System backlogs by processing 253 million notes from other Federal Reserve Districts. Returns of Y2K currency and the closing of strategic inventory locations in the Fourth District were handled appropriately. New coin-terminal arrangements were set up to reduce costs to the Reserve Banks and to depository institutions.

The Cleveland Fed led the Standard Cash Automation Project, a new software application that will automate cash accounting, control, and reporting functions. The system will be used nationwide by all Federal Reserve cash facilities.

The Bank continued to direct the System's online cash-ordering software application—FedLine Cash Web—and served as the software development site for the U.S. Treasury's Savings Bond Architecture Project, which will increase the System's five savings bond processing sites' ability to provide uniform products and services.

The U.S. Treasury designated the Cleveland Fed to assist with its e-commerce initiatives. The Bank is providing the processing support for a major component of the Web-based application *pay.gov*, which will authorize and settle government payments over the Internet.

One of the Bank's key priorities is providing depository institutions with top-notch customer service. Strengthening customer satisfaction was a major commitment for the Cleveland Fed in 2000. The Bank's account executives focused on building customer relationships by increasing their volume of customer contacts and visits to banks throughout the Fourth District. The Check function set up help desks to provide customers solutions to questions and problems, enhanced proficiency training programs for customer service representatives, and implemented an automated customer service information system to log interactions with customers, track problems from initial phone call to resolution, and provide staff with customer profile information.

Supervision and Regulation *Technological advances are quickly transforming the face of the community banks and bank holding companies we supervise, changing the nature of their operations and introducing new risks. To meet our responsibilities in the face of this change, in 2000 we continued to enhance our supervisory processes, exploit new technologies, enhance staff development, and improve communication flows to bankers and to the public. We believe our actions in these areas have made our supervision more effective, more efficient, and less burdensome.*

The Bank fully implemented its program for large, complex banking organizations and continued to refine its procedures for identifying supervisory risks within these organizations. To this end, teams were established to monitor and direct supervision activities for companies with assets over \$10 billion.

The Supervision and Regulation Department shared its expertise by participating as instructors and presenters in Federal Reserve examiner training programs, including the System's Technology Risk Integration course.

The Bank placed particular emphasis on making greater use of technology through SuperLink, the Supervision and Regulation Department's knowledge-management system. This initiative produced a performance database that tracks the Bank's strategic initiatives and corporate balanced scorecards to make these business practices more effective.

Changes at banking organizations necessitate rigorous updating of our supervisory processes. To meet our mandate of promoting a safe and sound banking system, the Cleveland Fed continued to integrate risk-focused processes into its examinations. In 2000, the Supervision and Regulation function was successful in providing a comprehensive supervisory process to address existing and emerging risks within information systems supervision.

The Bank strengthened its network of global relationships by engaging in international training and supervisory activities. We deepened our relationships with foreign monetary authorities by hosting visitors from the People's Bank of China.

The function placed strong emphasis on increasing communication, outreach programs, and training efforts with community bankers and the public. The department released a new publication (available on the Bank's Web site), *Fourth District Conditions*, to feature current trends and emerging risks affecting Fourth District financial institutions. Supervision and Regulation staff conducted seminars to update bankers on new privacy regulations under the Gramm-Leach-Bliley Act, the Real Estate Settlement Procedures Act, and Regulation Z. A joint training session on the examination process was held in collaboration with the State of Ohio, and a number of meetings were held with the Federal Home Loan Banks in Cincinnati and Pittsburgh to ensure strong relationships with key industry-funding sources.

The Federal Reserve Bank of Cleveland is a strong advocate of fair lending, community economic development, and economic and workforce-readiness education. In support of these goals, the Bank's Community Affairs Office produced a microenterprise video and training kit designed for educators and technical-assistance providers to use during small-business orientation and instruction sessions. The Community Affairs Office also published a special report on predatory lending and home equity fraud, along with its regular issues of *CR Forum* (the Community Affairs newsletter) and three comprehensive community reports profiling economic indicators, access to credit, and affordable housing in Lima, Ohio, New Martinsville, West Virginia, and Clay, Jackson, and Rockcastle counties in Kentucky.

Economic Research and Monetary Policy Events in today's dynamic global economy are transforming the environment for monetary policy. Despite extraordinary economic developments in the past several years, one certainty remains—things will change. Looking ahead, economic policymakers will face new and different obstacles to promoting our nation's welfare. Anticipating and preparing for such changes are important aspects of the Bank's responsibility to the Fourth District and to the nation.

The Research Department contributed to public policy discussions by publishing a sizeable body of original research, writing about current policy issues in a focused manner, and taking part in central bank conferences around the world. Research staff published numerous articles and papers on monetary, economic, and banking topics in the Bank's *Economic Commentary* and *Economic Review* series and placed a substantial quantity of papers in academic journals and other scholarly volumes.

The Research staff established the structure and direction for its Central Bank Institute, a new enterprise designed to promote greater understanding of the origins, evolution, and future of central banking practices and institutions. Currently, monetary policy, supervision and regulation, and payments system design are treated as separate and distinct areas of study. The Institute will encourage integrated research on these topics, increase communication among academic economists and central bank practitioners from around the world, and sponsor activities to explore the connections between these central bank functions.

In 2000, the Bank broadened its role as a facilitator of discussion and analysis of important public policy issues by convening conferences and colloquia. A highlight of these activities was the June conference on "Global Monetary Integration" (cosponsored with the *Journal of Money, Credit, and Banking*), which brought together prominent economists to explore dollarization and monetary integration. An earlier

conference, "Central Banking and Payments," addressed broad themes such as sharing the risk of settlement failure and payments-system design in deterministic and private-information environments. A winter workshop examined the concept of "Financial Fragility" and discussed topics such as balance sheet effects, bailout guarantees, and financial crises.

The Cleveland Reserve Bank addressed urban economic matters by sponsoring a conference on "Regulation in Housing Finance" with the *Journal of Real Estate Finance and Economics*. Discussion sessions focused on the Real Estate Settlement Procedures Act, primary and secondary mortgage market interactions, credit-market access, and the effects of the Community Reinvestment Act. A workshop on "Controlling GSE Subsidies" drew academic economists and policymakers from the Federal Home Loan Mortgage Corporation and the Office of Federal Housing Enterprise Oversight, as well as experts from the American Bankers Association and the Federal Home Loan Bank of Chicago.

In the area of economic education, the Bank again sponsored the Fed Challenge competition, in which teams of high school students participate in a mock Federal Open Market Committee meeting. The program, which entails extensive study of present-day economic conditions and monetary policymaking, grew substantially in 2000 and was attended by 190 students from Fourth District high schools. The Bank expanded its contributions to economic education by sponsoring the second annual "Essays in Economics" contest, which encourages junior- and senior-level college students to apply economic reasoning to current policy issues. The Bank also developed plans for a Learning Center, an effort that will educate students about the Federal Reserve's role in our economy as an administrator of monetary policy, a supervisor of financial markets, and a facilitator of national payments systems.

Quality Improvements *The Cleveland Fed furthered its progress in implementing and refining its strategic management framework. The Bank remains committed to its strategic vision—to become the best example of a private enterprise serving the public interest—and to its four corporate goals: efficiency and effectiveness, customer culture, alignment, and leadership. These efforts propelled the Bank into the final year of its existing strategic plan, and work is under way to develop a new plan that will further strengthen the organization's effectiveness in meeting the needs of its customers and stakeholders.*

To monitor progress, the Bank relies on its balanced scorecard to ensure that its strategic direction is aligned with Bank activities, expenditures, and the expectations of its customers. The balanced scorecard was automated in 2000 to provide Bank management with real-time access to strategic information.

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This annual report was prepared by the Corporate Communications and Community Affairs Department and the Research Department of the Federal Reserve Bank of Cleveland.

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The annual report is also available electronically through the Cleveland Fed's home page, www.clev.frb.org.

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