

FEDERAL RESERVE BANK OF KANSAS CITY

# Economic Review



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*First Quarter 1993*

*China's Economic Growth with Price Stability:  
What Role for the Central Bank?*

*Intellectual Property Rights and the Uruguay Round*

*The Tenth District: Moving Ahead Slowly*

*The Farm Recovery Back on Track*

*The District's Long-Term Growth Prospects*



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*China's Economic Growth with Price Stability:  
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By Thomas M. Hoenig

The People's Bank of China is critical to the success of Chinese economic reforms. Since the reform process began in 1978, the Chinese economy has grown at an average annual rate of almost 9 percent. Continuation of this enviable growth rate relies on an ongoing commitment by the People's Bank to maintain financial stability in China.

Based on a speech President Hoenig made in Beijing, People's Republic of China, this article discusses why the emerging market economy in China and the more highly developed market economy in the United States must, by definition, ultimately function in similar fashions. The Federal Reserve System has conducted monetary policy in a rapidly changing, geographically diverse market economy. This experience may provide useful guidance to the People's Bank of China as it must now also confront the challenge of sustaining economic growth through price stability.

*Intellectual Property Rights and the Uruguay Round* 11

By Keith E. Maskus

A principal objective of the Uruguay Round of the General Agreement on Tariffs and Trade (GATT) is to update global rules covering traditional trade policies, such as tariffs, quotas, and export subsidies. More important, the pending agreement will also bring under multilateral GATT disciplines for the first time broad areas of commercial regulations that influence trade. Such areas as restrictions on services trade, foreign direct investment, and intellectual property rights are playing an increasingly important role in world trade. Unless suitable agreements on these emerging trade issues are reached in the GATT, they are likely to become the principal cause of future trade disputes.

Of these important new trade issues, intellectual property rights, or IPRs, play a critical role in economic growth and development. Currently, IPRs offer levels of protection that differ sharply across countries. Maskus describes the growing prominence of intellectual property rights in trade policy, discusses the merits of greater harmonization, and examines the likely outcome of an IPR agreement in the Uruguay Round.

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By Tim R. Smith

The Tenth District economy improved somewhat in 1992, but the pace of growth remained slow. The performance of major sectors of the region's economy was mixed. While the construction sector boomed, weak manufacturing continued to hamper economic growth across the district.

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Smith reviews the district's economic performance in 1992 and explores the outlook for 1993. The district economy will probably gather some momentum in the year ahead as the national economy picks up. District manufacturing may improve slightly, but the region's robust construction sector may lose strength. Moreover, two of the region's key industries—agriculture and energy—are likely to provide little additional economic stimulus. Overall, the district economy is expected to grow modestly in 1993.

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By Alan Barkema and Mark Drabenstott

The farm recovery regained its stride in 1992 after stumbling in 1991. Buoyed by huge crops and healthy livestock earnings, farm income made up some of the ground lost the year before. The year was hardly uneventful, though, as crop prices soared due to a weather scare and then plummeted when yields of most crops eclipsed previous records. While the farm balance sheet recorded almost no further gains, the industry ended the year in solid financial condition.

Agriculture should stay on track in 1993. Prospects for farm earnings appear relatively bright, aided by strong livestock earnings and a marked increase in government payments. The year may also prove pivotal in determining the industry's longer term prospects. The Uruguay Round of global trade negotiations is finally drawing to an end after more than six years of contentious negotiation, and the new North American Free Trade Agreement may be approved. The outcome of these negotiations will set the stage for agriculture's performance in world markets for years to come.

### *The District's Long-Term Growth Prospects*

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By Mark Drabenstott

The Tenth District's public and private leaders are concocting a recipe for long-term growth across the district. Many of the growth ingredients in this recipe—such as work force, infrastructure, and available financial capital—are basic. But economic growth is as much art as science. The magic comes from the way the ingredients are combined.

The district's long-term growth obviously depends on the performance of the U.S. economy. Nevertheless, economists agree that a region's long-run growth path *relative to other regions* depends on the quantity and quality of its growth ingredients; or to put it in economic terms, its growth assets. In this article, based on a speech he gave at the bank's annual meetings of its boards of directors, Drabenstott identifies five district growth assets: work force, education, infrastructure, fiscal climate, and financial capital. His analysis of the five growth assets points to slower growth for the district economy than for the national economy. But the district is not necessarily doomed to that growth path. There is much that the region's leaders might do to improve growth prospects.

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# China's Economic Growth with Price Stability: What Role for the Central Bank?

*By Thomas M. Hoenig*

I am honored to have the opportunity to address such a prestigious group on the matters of economic growth, price stability, and the role of central banks, particularly as they relate to the role of the People's Bank in China. I am especially pleased to be here since it was only two years ago that I visited the People's Republic of China, and I have developed a keen interest in the economic reform process in this critically important nation.

As I think about recent and prospective economic developments in China, I am not overstating matters when I say that the People's Bank is critical to the success of Chinese economic reforms. Since the reform process began in 1978, the Chinese economy has grown at an average annual rate of almost 9 percent. This is an enviable growth rate, and in my view its continuation relies importantly on an ongoing commitment by the People's Bank to maintain financial stability.

Despite dissimilar political and social systems, the emerging market economy in China and the more highly developed market economy in the United States must, by definition, ultimately func-

tion in similar fashions. In this context, the Federal Reserve System's experience in working within a rapidly changing, geographically diverse economy—its experience in balancing the pursuit of ambitious growth objectives against the dangers of inflation—may provide useful guidance to the People's Bank of China as it must now also confront these challenges in a more market-oriented environment.

As with central banks in most industrialized countries, a fundamental objective for the People's Bank is to have monetary and regulatory policies that contribute to financial stability and promote strong, consistent economic growth. Without stable, consistent growth, the market reform process in China cannot achieve its potential in improving the standard of living for the Chinese people.

I realize this is a rather broad statement, so let me cite more specifically four principles that I believe are critical to a central bank's long-run success.

The first principle I would list is not the most obvious, but it is critically important. It does not focus on any one policy tool but rather on the fact that in fast-changing financial markets, a central bank's varied functions are importantly interrelated and must be carefully managed and coordinated in pursuing financial stability. For example,

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*Thomas M. Hoenig is president of the Federal Reserve Bank of Kansas City. This article is based on a speech Mr. Hoenig made to the Fourth International Economic Conference on China, in Beijing, People's Republic of China, on November 11, 1992.*

the Federal Reserve, like the People's Bank, not only conducts monetary policy but has a significant role within the payments system and is involved in supervising commercial banks. The Federal Reserve, moreover, is a participant in some of the world's most important securities markets and is keenly aware of and, to a degree, involved in foreign exchange markets. The coordination of its involvement in these activities is important to the efficient functioning of a sophisticated economic and monetary system.

Often, these multiple functions are thought of in isolation, as if they had separate and distinct purposes. When inflation is held in check, when financial markets are operating smoothly, and when financial institutions are in sound condition, the various functions seldom seem to touch one another. But in times of crises their ties to one another become critical and all too apparent. Only when one or another function is out of balance do we realize how critically important that one is to the others.

A dramatic example of the significance of the linkages among central bank functions is the U.S. stock market crash in October of 1987. Concern about U.S. inflation and uncertainty about global macroeconomic policies contributed to the erosion of confidence that started the initial wave of selling of shares in the stock market. Computerized sell programs so increased the volume of sales that funds could not be transferred rapidly enough through the payments system to clear the transactions. Because of the resulting confusion and uncertainty, commercial banks were reluctant to serve their traditional role of providing liquidity to securities firms. In short, instability in the equity market contributed to instability in the credit market and the payments system, threatening a "melt-down" of the U.S. and international financial systems.

In these circumstances, Federal Reserve officials, in conjunction with other central bankers, suddenly found themselves needing to marshal the varied resources at their command. Officials

worked to ensure that problems with clearing transactions did not lead to gridlock in the payments system. Our operation of Fedwire, the principal electronic funds transfer system in the United States, enabled us to assist securities-clearing firms swamped by an unprecedented volume of transactions.

Other Federal Reserve personnel were reminding commercial banks of their need to provide credit to securities and other firms critical to clearing financial transactions; in return, the Federal Reserve assured the banks that it stood ready to meet their liquidity needs through the discount window and open market operations. Before U.S. markets opened the next day, Chairman Greenspan of the Federal Reserve issued a statement reassuring all financial market participants and the American people as a whole that the Federal Reserve would provide liquidity as necessary to protect the safety of the financial system. Employees from virtually all functional and geographical areas in the Federal Reserve played important roles in averting a financial collapse that would have led to untold consequences for the U.S. and world economies.

What would have happened if our central bank at this critical juncture did not understand how the various pieces fit together—the payments system, securities markets, the banking system, foreign exchange markets, and macroeconomic policies? We will, of course, never know the answer to that question; nor should we want to know. My point is that during such episodes of financial crisis, the broad scope of a central bank's responsibilities serves a country well. Only in such instances do we fully appreciate the intricate linkages between the various functions performed by most central banks, and how such linkages make price stability and stability of the financial system merely different hues in the mosaic of overall financial stability.

A second principle that I believe must guide a central bank's actions is that financial stability is served best through aggregate price stability, which thus should be the focus of monetary policy.

China's own history has shown that rapid inflation or deflation leads to unnecessary social friction—between borrowers and lenders, between workers and retirees, and between landlords and renters. Price stability best minimizes these inherent frictions and enhances a country's overall standard of living in the long run.

Prices play a critical allocational role in a market economy, and they play that role best, and contribute to economic growth best, in an environment of aggregate price stability. Markets function most efficiently when prices set in those markets give proper signals to consumers and producers. When prices accurately reflect consumer preferences, resource scarcity, and existing technology, then resources will be allocated to their most desired and efficient uses. And such efficiency is essential if the economy is to achieve its maximum growth potential.

Price stability, however, is sometimes sacrificed to calls for immediate, faster growth. The Federal Reserve and other central banks may be urged by well-meaning members of the press, of academe, and of the government to adopt policies that more quickly boost the economy. After all, it is argued, if a little liquidity is good, furnishing more liquidity is better, providing the means for banks and other financial institutions to increase lending. Greater availability of credit, in turn, would enable individuals and businesses to raise their spending on goods and services, thereby raising output and employment.

The problem with this line of reasoning is that it is shortsighted. The temporary spurt of economic growth will soon be cut short by accelerating inflation and uncertainty. As this pattern emerges, the central bank finds itself needing tighter monetary policy to prevent a further spiral toward rapid inflation and financial instability.

Such erratic stop-and-go policies impair rather than enhance long-run economic growth. They create distortions that lead to a misallocation of resources, a change in investment and consumption patterns, and a consequent reduction in

the long-run output potential of an economy. For this reason, policy actions that seem to provide short-run benefits are often incompatible with sustaining the maximum rate of economic growth.

Unfortunately, the world economies periodically must relearn this lesson through bitter experience. For example, inflationary forces unleashed in the United States during the late 1960s were allowed to ratchet up throughout the 1970s. By 1979, inflation had become so ingrained in the U.S. economy that domestic and international financial markets were in turmoil as investors throughout the world lost confidence in the soundness of the U.S. dollar. Not surprisingly, U.S. economic growth was also poor through much of the 1970s.

The Federal Reserve came to realize that monetary policy actions in the 1970s—although well-intentioned—were economically destabilizing. Regrettably, this realization came too late to prevent the painful adjustments necessary to restore confidence in U.S. monetary policy. These adjustments required a period of tight money and disinflation in the early 1980s. This led to the worst recession in the postwar period and to severe strains on financial institutions, indebted farmers, and others who had bet on continued inflation. Banks throughout the industrial world relearned the harsh lesson that real estate values can decline precipitously if a speculative, inflationary runup in prices is allowed to occur. And central bankers throughout the world were reminded anew that inflation, once unleashed, has prolonged and severe consequences, especially for financial institutions.

As for us in the United States, only when inflation began to be brought under control, at the cost of a severe recession, was the groundwork set for one of the longer U.S. expansions. And only through this painful process of recession and recovery was a consensus reestablished among central bankers worldwide that monetary policy oriented toward stable prices is the best way to ensure sustainable economic growth.

The third principle I offer for consideration concerns the central bank's need for independence. A degree of independence from other government functions is important to a central bank's ability to achieve long-run price and financial stability. Independence is particularly important if monetary policy is not to become subservient to the government's fiscal policy. Fiscal authorities have long recognized the short-term expediency of having central banks finance government spending. Yet experience in both the United States and elsewhere clearly indicates that both monetary and fiscal policies will be improved in the long run by granting the central bank a degree of independence from other government functions.

The need for an independent monetary authority is borne out by evidence from many countries. The German Bundesbank, the Swiss National Bank, and the Central Bank of Chile are generally considered to be among the most independent central banks in the world. Not coincidentally, each has an enviable record in keeping inflation under control. Indeed, empirical studies consistently find a strong negative correlation between a nation's average inflation rate and the degree of independence enjoyed by its central bank.

The most recent confirmation of this relationship comes, I regret to say, from the extremely high inflation rates in some of the emerging market-oriented economies in Eastern Europe and the former Soviet Union. As losses from state-owned enterprises swell the budget deficits in those countries, the central banks have been forced to monetize government debt—that is, government debt is converted into legal tender. Especially in Russia, the resulting inflation threatens to undermine the entire reform effort. It would be tragic indeed if the Russian people's first impression of a market economy is a debauched currency resulting from the central bank being subservient to the government's financing needs.

The founders of the Federal Reserve took steps designed to assure it at least a degree of

autonomy. Members of the Board of Governors are appointed to relatively long terms, intended to insulate them from the vicissitudes of politics. Moreover, the important monetary policy role assigned to Reserve Bank presidents and directors, none of whom are political appointees, provides further safeguards against those policies that can result when political leaders are pressed to produce quick results and are allowed to enlist the aid of the central bank in doing so. The founders of the Federal Reserve System clearly thought it prudent to have a monetary authority that is independent enough to take a longer run view of the national interest.

The final principle I offer for consideration is that, in a market economy, monetary policy necessarily evolves to become national in scope, while recognizing and allowing for regional differences. Monetary policy cannot alleviate regional imbalances in an economy that has a modern, efficient financial system. In such an economy, through price signals, financial resources flow inevitably to industries and regions where they can most productively be employed. A central bank's attempts to allocate credit to specific regions or uses are at best futile and, at worst, counterproductive. This is true for the United States today and will increasingly apply within the People's Republic as it evolves to a more fully integrated market economy.

Countries as large as the United States and China do, of course, have diverse economic conditions among regions. The district I serve, for example, experienced a serious recession in the mid-1980s as energy prices collapsed and agriculture went through wrenching changes. This occurred while other regions experienced rapid and sustained growth. In this instance, we realized that any attempt on our part to lend at rates lower in our region than in the others was bound to prove futile. These funds inevitably would have flowed to regions where the economy and loan demand were stronger. Through hundreds of channels, efforts by our Reserve Bank to provide credit on

preferential terms would be frustrated by private financial markets.

In an economy with less highly integrated and developed financial markets, there can be impediments to the flow of funds among regions, as I suspect is still somewhat the case in the People's Republic. In the early part of this century, U.S. financial markets also were more segmented and there was some constructive role for the Federal Reserve to target credit toward specific regions. On occasion loan rates among the regions differed substantially. U.S. markets obviously are now far more efficient, and region-specific monetary policy has long ceased. In a modern market economy, a single national monetary policy must necessarily be pursued.

Having said this, I hasten to add that the Federal Reserve still recognizes that economic activity differs among regions and that there is a need for regional input into national monetary policy. The presidents and boards of directors of each regional Reserve Bank bring unique information into the policymaking process by providing expertise on regional economic conditions. In deliberations establishing the Federal Reserve's discount rate, Chairman Greenspan and his colleagues on the Board of Governors give considerable weight to incoming information from these various regions. In addition, input from the 12 presidents brings a breadth of experience to monetary policy deliberations that would not be possible if all policymakers were located in the nation's capital.

As president of a regional Federal Reserve Bank, I am of course always particularly sensitive to the economy and industries in my district. I feel it is my responsibility to inform my colleagues on the Federal Open Market Committee how economic developments in my district fit into the national outlook. But it is also my responsibility to discern what monetary policy actions are appropriate for the national economy, not just for some particular region or industry.

Let me conclude by addressing briefly how I see some of these principles applying more specifi-

cally to China's People's Bank, as the country moves increasingly toward a market-based economy.

First and foremost, the People's Bank should continue to focus on price stability. As an increasing number of prices in the Chinese economy are influenced by market forces, it will be particularly important to avoid inflation. The People's Bank has demonstrated by its actions in recent years an obvious understanding of this most basic principle. As in every country, however, the efforts to control inflation will continue to exact some short-run costs.

The economic slowdown from rates exceeding 11 percent, which followed the more restrictive monetary and credit conditions implemented in 1988, may have seemed to some a regrettable interruption in the remarkable Chinese economic reform program. But it was correctly realized that inflation could not be allowed to continue accelerating as it had in 1987-88 at rates above 18 percent. Again, earlier this year it was deemed necessary to tighten credit to prevent another overheating of the Chinese economy. In each instance, the People's Bank rightly decided, I believe, that a sound currency is indispensable if the Chinese economy is to continue reaping the benefits of economic reform.

Looking ahead, as China's financial economy continues its rapid development, the People's Bank will need to develop more efficient tools for influencing monetary and credit conditions. I heartily endorse the recommendation of the recent World Bank study that the People's Bank redouble its efforts to develop indirect monetary policy levers. As markets develop, expand, and become more efficient, regions within the People's Republic will become increasingly linked. Such an evolution within the economy will require that, to the greatest extent possible, monetary policy be allowed to work through its effect on prices and yields in financial markets, replacing quantitative controls now frequently used. Also, as this evolution occurs, the extent to which the People's Bank can—or should try to—influence the regional allocation of

credit in China will inevitably diminish just as it has in the United States.

As it is currently structured, the People's Bank will play a critical role in ensuring that the nascent financial markets are both safe and efficient. Instability in financial markets will on occasion disrupt the real economy in China, just as it threatened to do in the United States and other industrial countries in 1987. To minimize this possibility, the People's Bank will need to understand these markets and devote particular attention to developing laws and regulations that balance the need for open and efficient financial markets with the need for the safety and soundness of the financial system.

Finally, the People's Bank should, to some

reasonable degree, be independent in conducting monetary policy. The need for such independence is amply demonstrated by recent experience. The restrictive policy actions leading up to the Chinese recession caused increased losses by state-owned enterprises. Financing these losses, as I understand, contributed to overshooting the credit expansion plan in both 1990 and 1991. This rapid credit growth may be complicating ongoing efforts by the People's Bank to avoid another bout of accelerating inflation. Progress in achieving a more complete separation of fiscal and monetary policies is thus essential if the People's Bank is to fulfill its responsibility for long-run price stability and, most important, for long-run growth and an improved standard of living.

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# Intellectual Property Rights and the Uruguay Round

*By Keith E. Maskus*

Recent international trade negotiations have centered on completing a broad new agreement on trade rules in the Uruguay Round of the General Agreement on Tariffs and Trade (GATT). Conservative estimates show that if the pending agreement is implemented, it will stimulate world economic growth by adding over \$200 billion annually to global output (Nguyen, Perroni, and Wigle).

A principal objective of the Uruguay Round is to update global rules covering traditional trade policies, such as tariffs, quotas, and export subsidies. More important, the pending agreement will also bring under multilateral GATT disciplines for the first time broad areas of commercial regulations that influence trade. Such areas as restrictions on services trade, foreign direct investment, and intellectual property rights are playing an increasingly important role in world trade. Moreover, unless suitable agreements on these emerging trade issues are reached in the GATT, they are likely to become the principal cause of future trade disputes.

Of these important new trade issues, intellectual property rights, or IPRs, play a critical role in economic growth and development. Intellectual

property rights are patents, trademarks, and copyrights that grant exclusive rights to sell new products and thereby give incentives to undertake innovative research and creative activity. Currently, IPRs offer levels of protection that differ sharply across countries. In general, IPRs are strongest in developed countries and weakest in developing countries. As a group, developed countries are concerned that unequal protection of intellectual property results in a significant loss of revenue through unauthorized imitation and copying in various countries. In contrast, many developing countries feel that stronger IPRs would increase the costs of acquiring new technology and thus significantly raise the price of consumer products. This conflict underlies efforts to develop an international agreement on IPRs as part of the Uruguay Round.

This article examines the growing prominence of intellectual property rights in trade policy and discusses the likely outcome of an IPR agreement in the Uruguay Round. The first section of the article provides an overview of IPRs and presents evidence of their importance in international trade. The second section describes international differences in IPR policies and examines both the costs of these differences and the potential results of increased harmonization. The third section describes the likely form of an agreement on IPRs resulting from a successful completion of the Uruguay Round.

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## *AN OVERVIEW OF INTELLECTUAL PROPERTY RIGHTS*

Intellectual property rights are policies that assign and protect the rights to earn income from innovative and creative activity. IPRs provide legal authority to control the dissemination and commercialization of new information and ideas and to enforce sanctions against their unauthorized use. IPRs play a critical role in economic growth and development because they affect the profitability of industrial research and the rewards to creative activity. At the same time, IPRs are controversial because stronger protection of property rights may come at the expense of higher prices and reduced availability of products. With the growth of world trade and increased foreign direct investment in the 1980s, IPRs have become a central issue in trade policy.

### *Types of intellectual property rights*

There are two general types of intellectual property. Industrial property refers to inventions of value to industry and commerce. Artistic property relates to artistic and literary works, such as books, pieces of art, filmed works, and recorded music. While most goods and services are easily classified into one of these two categories, certain new technological innovations fall between these traditional categories and do not yet have a standardized classification.

*Industrial property.* Protection of industrial property takes several forms. A patent grants a temporary exclusive right to make, use, sell, and import a new product, or to adopt a new process and control production and use of items made from the new process. To receive a patent, an invention must be previously unknown, contain a nonobvious step, and be industrially useful.<sup>1</sup> While many industries rely on patents to earn returns on their research and development (R&D) programs, patents are especially important in pharmaceuticals, chemicals, and machinery.

Industrial property may also be protected through the registration of distinctive marks for products and firms, including trademarks, service marks, and trade names. A trademark or service mark is a distinctive symbol that identifies the producer of a good or service. It may be a pictorial emblem, a single letter or numeral, a phrase or sentence, or any combination. Trade names identify a full enterprise rather than specific goods or services. Generally, registration of marks is required to earn protection from infringement, such as duplication of marks or the use of confusingly similar marks. A few countries, such as the United States, also recognize the commercial use of a new and distinctive mark as sufficient to warrant protection without prior registration. Virtually all goods and services are marketed under trademark protection.

Similar protections extend to industrial designs and indications of source. Industrial designs are the distinctive and aesthetic aspects of product style and packaging. Indications of source signify a geographical region of origin and identify product characteristics specific to that region. Most often, these identify the geographical origins of wines and spirits.

Industrial property is further protected in many countries by domestic laws against unfair business competition. The definition of "unfair competition" varies across countries but may cover a large number of business practices, including industrial espionage, dumping, bribery, and disclosure of technical information. The most significant protection is provided to trade secrets, which are unpatented proprietary technical knowledge, such as a chemical formula. Many firms consider trade secrets an important form of strategic competition, and thus legal protection from unauthorized disclosure is seen as crucial.

*Artistic property.* Artistic property is protected by copyrights and related mechanisms. Copyrights give an exclusive right to exploit the expression—such as a book, recording, or film—of an idea rather than the idea itself. Thus, with limited excep-

tions, artistic expressions cannot be copied without authorization. The creator's protection, however, does not extend to the idea of writing a biography or painting a particular scene. To be copyrighted, the expression must be an original creation of the artist or author, regardless of the quality of the work. Further, the expression must be placed in tangible form, such as a book or recording, before it can be protected.

Copyrights may extend to "moral rights," which give the creator the right to prevent later distortions to his work after its rights have been sold. A growing number of countries also grant "neighboring rights," which protect performers and broadcasters from unauthorized reproduction and communication of their work.

*New issues.* Questions have emerged in recent years about the ability of traditional IPRs to protect certain kinds of technological innovation. For example, many countries protect computer software with copyrights, since programs are tangible expressions of creative ideas. However, programs may be easily imitated without necessarily violating traditional copyright laws by rearranging lines in the programming code. For this reason, the United States and the European Community have moved toward providing stronger protection based on patent principles.<sup>2</sup>

Similar issues are involved in the design of computer chips and databases. Because the designs of computer chips are easily copied, most developed countries have established a unique form of protection that combines copyright and patent principles. For information databases, on the other hand, copyrights may simply protect the order of the data, which is easily changed without violating the law. The loose protection for databases may call for stronger protection.

Significant questions also arise over the patentability of biotechnological innovations, such as new microbiological plants and animals with industrial value. Some observers have argued that it is unethical to provide exclusive rights to exploit living organisms, even if they were developed by

creativity. Among industrialized nations, however, a consensus has emerged that such organisms are patentable, which has helped spur the development of the biotechnology industry.<sup>3</sup>

### *THE ECONOMICS OF INTELLECTUAL PROPERTY RIGHTS*

Because technological advance is a major determinant of the growth of economic activity and living standards, countries have an interest in promoting creative work. In doing so, however, policymakers face difficult tradeoffs between the need to promote innovation and the need to ensure wide dissemination of new information. IPRs provide a reasonably balanced, but decidedly imperfect, solution to these problems.

The act of innovation incurs development costs and runs risks that the outcomes will not succeed. Without compensation for these costs and risks, incentives for such work are absent. Private markets frequently cannot provide this compensation. If an innovation has economic value but is also easily imitated, competing firms would copy and sell it, earning a share of the potential profits. In perfectly competitive markets, enough duplication would emerge to eliminate all profits.<sup>4</sup> Expecting this outcome, innovative firms would not undertake the research and development in the first place. Societies would lose the benefits of new technology development, product variety, and cultural enrichment. Over time, economic growth would be dampened.

Intellectual property rights attempt to correct this problem by providing an exclusive right, or monopoly, to the innovative firm to sell or use the product or technology.<sup>5</sup> Patents, trademarks, copyrights, and other IPRs limit market access to the innovation and raise its price. In principle, they are designed to enable the inventor or creative artist to cover development costs plus earn a normal profit.

At the same time, IPRs impose costs to society that must be balanced against these gains. The

higher prices resulting from IPR protection may reduce the availability and affordability of products incorporating new technology. For example, the high prices of some patented drugs may limit their availability. Thus, by providing a monopoly, IPRs substitute the current market failure of restricted supply in order to overcome the future market failure of inadequate innovation. The current welfare losses from protecting intellectual property may be viewed as society's investment in promoting creative activities.

The existence of this tradeoff complicates the choice of appropriate levels of IPR protection. If protection is too weak, innovation and creative activity may be discouraged. If protection is too strong, excessive market power through restricted supply may be created.

The choice of appropriate protection levels is further complicated by measurement problems. In principle, IPRs should be set so that monopoly profits exactly compensate firms for R&D costs, including some provision for risk. To determine the best protection level for each potential innovation, policymakers would need to know a variety of technical and market parameters, such as how easy unauthorized duplication might be, how competitive the industry is, how important a new technology will be in lowering costs in other industries, and how responsive demand is to price changes. But in practice, information this detailed is impossible to obtain.

Existing IPRs reflect a balancing of these difficulties. Because of measurement problems, IPR protection is standardized by property type rather than tailored to specific products. These standards, in turn, reflect a compromise between the need to invent new products and the need to use them.

The U.S. systems of patent and trademark protection provide good examples of these tradeoffs. American patents generally last for 17 years from the date of application.<sup>6</sup> For many products and technologies this period is longer than that needed to pay back R&D costs, suggesting that excessive market power is created. Furthermore,

a patent may prove socially damaging if the firm owning it chooses not to license a key technology or product very widely. At the same time, however, U.S. patents are relatively narrow in specifying the precise characteristics of an invention that are protected from imitation. Patent applications must include detailed descriptions of the new technology embodied in a product or process. These descriptions are published in order to promote the diffusion of the technologies to firms hoping to improve on them without violating the terms of the patent protection. The narrow scope of patent applications encourages widespread use of new technical information. But, by providing weak protection, the narrow scope may also limit incentives for innovation. Thus, the balancing of length and breadth of patent protection represents a compromise between the need to invent new products and the need to use them.<sup>7</sup>

Trademark protection reflects a similar compromise. Trademarks benefit society by encouraging the development of new products and increasing product quality. If consumers consider a trademark to be a dependable indicator of high quality, they will be willing to pay a premium price for the goods it designates because they are saved the expense of searching for quality. To sustain this premium, firms must work to maintain a constant or improving degree of quality and to introduce new products under the trademark. Thus, trademarks protect the reputations of firms and induce greater variety in product development. If competing firms were allowed to use the same, or confusingly similar, marks in selling their products, the original firm's market reputation would suffer and the rate of introduction of new goods could be diminished.

At the same time, trademarks impose costs by protecting monopoly profits in certain brands. Examples include consumer items, such as cosmetics, athletic shoes, watches, and over-the-counter drugs. For these goods, prices are typically much higher than current production costs, making them vulnerable to imitation. Furthermore, the

existence of trademarks may encourage excessive spending on advertising and differentiation of products. Critics argue that these problems make trademarks less desirable than other forms of IPRs, especially in low-income nations.

The terms of trademark protection also balance the length and breadth of protection.<sup>8</sup> Because firms are expected to live indefinitely, trademarks can be reregistered without limit. This permits a permanent monopoly on the use of a particular emblematic designation but does not prevent other firms from designing distinctive marks for their competing goods. Because the potential supply of such marks is limitless, permanent registration is unlikely to restrain trade seriously.

#### *The importance of IPRs in international business*

The 1980s saw an enormous expansion in world trade that elevated IPRs to new prominence in trade policy. Innovative firms turned increasingly to foreign markets to earn economic returns on their intellectual property assets. Thus, trade increased considerably in products and services protected by patents, trademarks, or copyrights. In addition, many firms chose to invest directly in overseas production facilities and service markets through local sales of products produced with a protected technology.<sup>9</sup> Other firms sold or rented licensing rights to produce goods under their trademark or copyright to both affiliates and unrelated firms in foreign countries.<sup>10</sup>

It is difficult to measure directly the importance of IPRs in world trade. Rough estimates can be made, however, by examining the value of goods and services that contain a strong IPR component and by looking at international flows of royalties and license fees. These data show that IPR-related trade is very important to both developed and developing countries. At the same time, because countries differ in comparative trade advantages and in their stage of economic development, they may be led to support very different

types and levels of IPR protection.

IPRs are particularly important for industrialized countries, such as the United States and Japan. In 1989, the United States exported some \$58.8 billion and imported some \$87.9 billion in a limited set of products that embody a prominent component of IPRs (Table 1).<sup>11</sup> In comparison, U.S. trade in all agricultural products in 1989 amounted to \$35.2 billion in exports and \$24.9 billion in imports.<sup>12</sup> Furthermore, these products are important components of aggregate trade. Exports and imports of the goods in Table 1 were 16.1 percent and 17.8 percent of total U.S. merchandise exports and imports, respectively. Similarly, Japanese imports and exports contain a high proportion of these goods.<sup>13</sup>

IPRs are also a significant factor in the trade of developing countries. For example, while Brazil's trade in IPR-intensive goods was substantially smaller in absolute terms than in the United States and Japan, its imports of these goods still amounted to 13.1 percent of its total imports (Table 1).

Another rough measure of trade in intellectual property is the flow of receipts and payments on technology trade. These are defined as royalties and license fees for the use of technological information, such as patented processes and new products under patents and trademarks. By this measure, the United States remains the overwhelming net world supplier of technology, with a significant inflow of payments (Table 2). In contrast, both highly industrialized Japan and less-industrialized Spain make net payments for licensing foreign technologies.<sup>14</sup>

The data also suggest that because countries differ in the relative presence of IPRs in their imports and exports, they might prefer different international IPR regimes to protect their interests. Indeed, countries with a strong net export position in a specific sector generally support strong IPR protection in export markets to prevent unauthorized copying and imitation. In contrast, countries that rely heavily on imported technology typically

Table 1

**Exports and Imports for Selected Countries in Certain Goods Sensitive to IPRs, 1989**  
(Millions of dollars)

IPR type	United States		Japan		Brazil	
	Exports	Imports	Exports	Imports	Exports	Imports
Patent goods	26,784	22,305	23,607	7,055	1,081	1,547
Copyright goods	13,989	13,663	10,613	2,911	51	268
Trademark goods	18,022	51,095	13,005	11,658	833	589
Total (billions of dollars)	58.8	87.9	47.2	21.7	2.0	2.4
Percent of total	16.1	17.8	17.1	10.2	5.8	13.1

Note: Patent goods include pharmaceuticals, plastics, special machinery, machine tools, automatic data processing equipment, electrical medical equipment, and measuring instruments. Copyright goods include semiconductors, books and magazines, and sound recordings and blank tapes. Trademark goods include alcoholic beverages, cosmetics, auto parts, furniture, luggage, clothing, and watches.

Source: United Nations, *Yearbook of International Trade Statistics*.

prefer weaker protection to increase the affordability and availability of products. Also, protection levels tend to be low in the poorest countries and tend to rise with the state of economic development.<sup>15</sup>

Highly industrialized countries like the United States and Japan have similar interests in strong IPR protection. For example, the United States has a strong comparative advantage in producing many patent goods, such as pharmaceuticals, plastic products, automatic data processing machinery, and measuring instruments, as well as in some copyright goods, such as printed matter and sound recordings. The main intellectual-property interest of U.S. firms in these sectors lies in strengthened foreign measures to prevent local copying and imports of infringing goods from elsewhere. Japan also has comparative advantages in most of the patent-intensive goods and, in addition, is a strong

net exporter of copyright goods (especially semiconductors).<sup>16</sup> As a result, Japan has a relatively strong interest in foreign laws preventing the unapproved duplication of computer chips and recordings.

With a comparative disadvantage in many trademark goods, such as alcoholic beverages, furniture, luggage, and clothing, the United States might be expected to be less concerned with IPR protection in these areas. Production-location decisions in these goods depend largely on such factors as the abundance of grape-growing land and availability of unskilled labor. Thus, the United States tends to import them. Nevertheless, as suggested in Table 2, ownership of the trademark may well reside in countries that do not produce the products. Thus, American firms owning trademarks in these sectors would favor foreign laws to prevent production and export of goods imitating those trademarks as well as U.S. border measures to

Table 2

**Receipts and Payments and Balance on Technology Trade, 1988***(Millions of dollars)*

<u>Country</u>	<u>Receipts</u>	<u>Payments</u>	<u>Balance</u>
United States	10,858	2,054	8,804
Japan	1,956	2,480	-424
Spain	187	1,416	-1,229

Source: Organization for Economic Cooperation and Development, *Basic Science and Technology Statistics*.

deter such imports.

Less-industrialized countries such as Brazil may have different interests. Brazil's trade pattern demonstrates the typical situation for a developing country. In most patent-intensive goods, Brazil has clear disadvantages because of a limited technological base relative to the industrial nations. But in some goods subject to trademark protection, such as furniture, luggage, and clothing, it has net-export positions. Brazilian firms currently may perceive some advantage in having laws that weakly protect the intellectual property of foreign competitors, allowing local firms to imitate foreign goods and technologies. Over time, as Brazil's technological sophistication and per capita incomes grow, the country could see greater advantages to establishing stronger laws.

### **INTELLECTUAL PROPERTY RIGHTS AS A TRADE ISSUE**

As suggested by the data on trade and income flows, protection of intellectual property rights varies widely across countries.<sup>17</sup> These differences may be costly both to the international trading system and to individual firms. Attempts to harmonize IPR policies, however, must reflect differ-

ing weights attached to the tradeoff between growth and product availability.

### *Differences in international policy regimes*

The widespread support of IPRs in industrial countries reflects the belief that IPRs provide future benefits that will outweigh current monopolization problems. The use of patents, copyrights, and trademarks, for example, can enhance economic growth and more closely match consumer preferences by increasing product variety and quality.

Rapidly industrializing nations, such as Mexico, Korea, and Turkey, also have compelling interests in upgrading their protection of property rights. These countries are building technological capabilities and labor skills. Stronger IPR protection would assist their economic development by ensuring access to foreign technologies and promoting expanding domestic innovation. Indeed, many industrializing nations have enacted stronger IPR legislation since 1986, in part because of this recognition.

The least-developed nations remain wary of providing strong IPRs. Because these countries have little domestic capacity for technological innovation and product development, they rely on

imports of these items for growth. They fear that providing stronger patents to foreign firms and enforcing laws against domestic imitation would raise prices for key inputs and consumption goods while simply transferring profits outside the country. At least for some time, few long-run benefits would emerge to offset these short-run costs.<sup>18</sup>

Differences in IPR policies have led to significant trade disputes in at least four areas. First, it has been common in numerous countries to allow domestic firms to engage in counterfeiting, or "piracy." For example, bootleg copies of copyrighted movies and tapes are sold without permission, and consumer goods are marketed with the unauthorized use of prominent foreign trademarks. The temptation to do this is great, given the large gap between the price of, say, a legitimate perfume or luxury watch and its actual cost of production. The counterfeit goods are typically cheaper and of lower quality, which provides some benefits to lower income consumers so long as the products do not endanger public safety.<sup>19</sup> However, firms owning the trademark suffer lost sales and a diminution in their reputation for quality to the extent that consumers are confused about the actual origin of the goods.

Second, most developing countries and several industrial nations restrict the patentability of pharmaceutical drugs. Because drugs can be copied so easily, pharmaceutical firms depend critically on patents in major markets to recover their substantial R&D costs. Such patents, however, often result in high prices for some medicines, reducing their affordability. As a matter of social policy, many countries see little sense in allowing foreign drug firms to charge similarly high prices in their markets. This is especially true in developing countries where purchasing power is low, government budgets are constrained, and local firms have limited ability to invent around drug patents legitimately. To keep drugs affordable, these governments frequently adopt policies that combine limited or no patentability for drugs,

compulsory licenses, and price controls.<sup>20</sup> Most countries allow firms to patent their pharmaceutical processes, as opposed to *products*, but this is of limited value to foreign firms because they find it hard to prove infringement of a chemical process.

Third, countries differ in their protection of computer software. The United States and the European Community have begun to grant patents for key industrial applications, which is such a strong standard that it invites concern over monopolization of information technologies. Most other industrial and middle-income nations agree on the need for copyright protection, which, as noted earlier, may not be strong enough in some instances. Few poor nations have provided such protection yet, which explains the prevalence of program piracy in certain markets. Again, the reason is simply that it is cheaper to disseminate software through copying, even at the risk of encouraging low-quality imitation programs and viruses.

Fourth, patent procedures differ greatly, even among industrial nations. Only the United States awards patents to the entity that can prove it was the first to invent a technology or product. This policy is supposed to encourage early disclosure and professional scrutiny of new discoveries in the technical literature without fear by inventors that publication will allow someone else to procure the patent. All other developed countries, however, award patents to the entities that are first to file for them. This avoids disputes over who actually developed the innovation but tends to encourage excessive filing for patents to cover an entire range of potential discoveries. This practice is perhaps most noticeable in Japan, where firms apply for many more patents per capita than in other markets.<sup>21</sup> These differences in policies can be critical to firms in choosing their strategies for patenting and disclosing technical information.<sup>22</sup>

### *Costs of differing levels of IPR protection*

Differences in the protection of property rights impose potentially significant costs on the interna-

tional trading system and on private businesses. Unfortunately, reliable information on the magnitude of these costs is not yet available. The social costs are inherently difficult to measure, while industry and academic estimates of private costs are quite different.

*Social costs.* Differing levels of protection for IPRs can impose costs on the international trading system in at least three ways. First, different regimes covering the specification and enforcement of patents, trademarks, and copyrights may distort decisions about whether to trade with specific markets and to invest in specific countries or to transfer technology to them.<sup>23</sup> The aggregate costs from such distortions could be significant.

Second, in a long-run sense, different IPR policies may cause decisions regarding technology and product development to be made on the basis of available protection, rather than expected demand in different markets. This would represent an inefficiency in the international allocation of R&D and marketing resources. Indeed, there may be an underinvestment in projects to develop products for consumer needs in developing countries with limited protection. The prototypical example is the relative scarcity of drugs to combat tropical diseases. Enhanced patent protection in those countries could induce foreign pharmaceutical firms to undertake more efforts in that direction.

Third, differences in IPR protection may be the source of trade disputes. To the extent that these disputes are unresolved and lead to compensating tariffs and other trade barriers, they may result in higher costs for goods and services worldwide.

*Private costs.* Differences in IPR policies may also impose costs on specific businesses and industries. For example, in recent years, U.S. and European firms have become increasingly concerned that these differences were eroding their potential sales and profits from innovation. One problem is that it is costly to apply for, and keep in force, patents and trademarks in many countries with differing procedures. Thus, the variability in

IPRs acts as an additional cost to firms.

Of greater concern is infringement activity. Perhaps most obvious is foreign counterfeiting, where firms in other countries produce, sell, and export products that falsely display prominent trademarks and copyrights. Equally worrisome is the loss associated with weak foreign patent protection in areas such as pharmaceuticals and food products.

Adding to the importance of this issue are new areas in which IPRs have become prevalent. Computer software, semiconductors, and biotechnological products all require substantial creative effort that calls for protection. The potential for sales and income growth over the next decade is tremendous, lending urgency to the IPR problem.

There is little reliable information on how extensive economic damages from foreign infringement of IPRs might be. The most systematic evidence comes from a 1988 study by the U. S. International Trade Commission. This survey asked several hundred American firms to estimate their lost sales, royalty fees, and the like from foreign IPRs infringement in 1986. In total, firms reported losses of \$24 billion.

Unfortunately, such reports are not very credible. Firms may be expected to overestimate their losses because they are likely to believe that, given better foreign protection, their sales would fully replace infringing sales. This would not be the case, however, if greater IPR protection resulted in significantly higher prices charged by the rights-holding firms.

In contrast to industry estimates, recent academic studies report lower costs.<sup>24</sup> For example, Feinberg and Rousslang report that U.S. firms suffer infringing sales ranging from 2.8 to 14.3 percent of worldwide sales, depending on the industry. Summing across industries, they found that infringing sales amounted to \$9.5 billion in 1986.

Perhaps more important than lost sales are foregone profits. Under a variety of assumptions about R&D and production costs and about competition between firms that own intellectual prop-

erty and firms that imitate without authorization, lost profits to innovative firms are estimated to range from \$1.3 billion to \$2.6 billion (Maskus 1990a). In a study of the impacts of pharmaceutical patent infringement in Mexico, Argentina, Brazil, and India, it was estimated that pharmaceutical firms worldwide have lost perhaps \$167 million to \$1.5 billion annually in profits due to sales of imitated drugs in those countries (Maskus and Eby-Konan).

Thus, it appears that damages to innovative firms from foreign infringement of IPRs may be substantially less than the firms themselves report. Nevertheless, public concern over such infringement is understandable in light of two facts. First, these losses are unevenly distributed across firms. The greatest damages are expected in the pharmaceutical, chemical, software, luxury-goods, and entertainment industries, because these products are easily imitated or copied. Indeed, firms in these industries have been at the forefront in lobbying for changes in foreign protective regimes. Second, the social costs from IPRs infringement may be large. Current losses in profits in the pharmaceuticals industry, for example, may reduce the scale of firms' R&D programs, thereby delaying or deterring the introduction of new drugs.

### *Harmonization of intellectual property rights?*

The international differences in property right protection have led the United States and other industrialized nations to push for greater uniformity of treatment. Unfortunately, there is no guarantee that full harmonization would be globally optimal. Indeed, resolving differences in IPR protection is likely to involve a compromise between the interests of developing and developed countries.

The United States is the strongest advocate of a globally harmonized set of IPRs in all countries.<sup>25</sup> These standards would provide strong protection for innovative firms from any country,

without discrimination, and would serve to eliminate the bulk of international infringement. The ability of countries to limit the value of IPRs for domestic purposes, by issuing compulsory licenses without full monetary compensation, for example, would be severely curtailed. Such policy changes could result in global economic benefits.<sup>26</sup>

The case for full harmonization is difficult to make, however. Standardizing regulations at strongly protective levels would bring about both benefits and costs that would be shared unevenly by trading partners. Stronger international protection may benefit firms in industrial and rapidly growing economies but cause problems in developing nations, at least for a lengthy period of time. Thus, there is no general expectation that all nations will necessarily gain or lose from harmonization.

In this way, harmonization of IPRs differs greatly from liberalizing traditional trade barriers, such as tariffs and quotas. Trade barriers are themselves market distortions that interfere with the efficient functioning of markets. While there are winners and losers within each country, economists generally agree that trade barriers harm both the country that imposes them and its trading partners. Removing them raises global income by improving economic efficiency. All countries may be expected to share in the resultant gains from greater trade (Nguyen, Perroni, and Wigle).

In contrast, intellectual property rights attempt to address the inherent failure of markets to reward innovation, but do so by imposing the additional distortion of a monopoly on the flow of new information. Each country's interests in such policies depend on a host of national characteristics, including its innovative capacity, its ability to absorb foreign technology, and its preference for quality in consumption. Within each country innovative firms would gain from harmonization, while users of products would suffer higher costs. Overall, highly innovative countries would gain, while poorer countries would experience net losses (Maskus 1990b).

Even recognizing this tradeoff, however, the

possibility remains that global income and growth could rise after partial harmonization. As discussed above, the existence of different IPRs across countries may impose damages on the international trading system. Reducing these differences could lower these costs. Moreover, to the extent that the world currently allocates too few resources to innovation, a global expansion of investment in research and development could raise world income.<sup>27</sup>

Nevertheless, countries that mainly import their technologies and new products would experience losses from such a change, at least for some period of time. These losses would result from higher monopoly prices, the loss of profits shifted from domestic firms to foreign firms, the absence of local innovation, and perhaps less access to foreign technologies.

It follows that for any prospective agreement on IPRs to gain widespread participation, it must represent a compromise between the current ineffective and discriminatory regime on the one hand, and full harmonization with rigorous levels of protection on the other hand. Furthermore, if there are overall global gains from strengthening and reducing differences in policies, a case can be made for winners to compensate losers to secure their participation. An ideal forum for this framework to emerge is through the multilateral negotiations underway in the Uruguay Round of the GATT.

### *ACHIEVING A MULTILATERAL AGREEMENT ON IPRS*

Negotiations on intellectual property rights in the Uruguay Round suggest that a compromise may be reached that is fair to different national interests and provides a more effective framework for enforcement. Moreover, there are substantial risks to the world trading system if the Uruguay Round fails to reach an agreement, leaving the existing policy regime in place.

Existing institutional arrangements do not provide an effective forum for settling IPR disputes, nor do they provide means of enforcement.

Prior to the Uruguay Round, the international body responsible for handling IPRs was the World Intellectual Property Organization (WIPO), an arm of the United Nations. A number of international conventions and treaties exist covering industrial property, artistic creations, and special issues, such as biotechnology and semiconductors.<sup>28</sup>

While these conventions provide some basic requirements and allow some international cooperation, the WIPO structure suffers three fundamental shortcomings. First, not all countries are members of the conventions. Second, the prevailing policy principle in WIPO is national treatment, which requires countries not to discriminate between domestic and foreign firms in its IPRs. However, this principle does not prevent the level of protection from being weak if a particular country so desires. Third, even if a country violates this nondiscrimination principle, WIPO has no effective means of resolving resulting disputes among countries. Thus, WIPO exercises little control over the practices of different nations, which encourages varying IPRs and discriminatory enforcement.

The Uruguay Round negotiations on intellectual property have resulted in a prospective agreement that overcomes many of these problems. It would abandon the existing international structure by placing IPRs within the purview of GATT obligations. This implies that countries would be expected to enforce their policies without discrimination and that disputes could be settled in an accepted international forum.

The prospective agreement reflects a spirit of compromise between the interests of developed and developing countries. Nearly all countries would agree to eliminate counterfeiting over some period, consistent with the view that unauthorized use of a published trademark or copyright is illegitimate. At the same time, widespread agreement has been reached on the need to establish a stronger set of minimum standards in patents that provide some flexibility to countries at different levels of development. In addition, poorer countries would be allowed to bring their IPRs up to

international standards gradually, as their circumstances warrant. Technical and financial assistance would be provided by developed nations to help such countries expand and enforce their systems over time. Domestic competition policies would be upgraded to discipline any potential undesirable monopoly practices by firms owning IPRs. In return, countries would agree to minimize the use of compulsory licenses and agree to pay market-based compensation when they are used.

The likelihood of an agreement on IPRs in the Uruguay Round is enhanced by the comprehensive nature of the overall negotiations. The wide scope of the Uruguay Round promises greater market access in developed countries for the products of developing countries that are being asked to strengthen their IPRs. Such products would include textiles, apparel, and agricultural goods. Moreover, if agreement is reached in the Uruguay Round to set and enforce stronger mechanisms for settling trade disputes, developing countries would feel more confident their future grievances against the wealthier nations would receive a fair hearing.

The importance of developing an IPR agreement in the Gatt talks is reinforced by considering the risks to the world trading system if the Uruguay Round fails to reach an agreement, leaving the existing policy regime in place. For example, as firms take an increasingly global outlook to their strategic business decisions, the effects of national regulations covering competitive conditions around the world will become more significant. Governments may choose to use differential policies to engage in "regulatory competition" for business, risking the artificial fragmentation of world commerce. Multilateral disciplines to restrict this competition are important.

More important, many countries, such as the United States, view foreign infringement of their national IPRs as unfair trade actions. Accordingly, unilateral actions against countries with weak IPRs will continue to proliferate. Indeed, in the 1988 Omnibus Trade Act the United States elevated intellectual property laws to a special status

for attention in its efforts to discipline foreign practices. Under this "Special 301" provision, the U.S. trade representative is empowered to identify countries with policies that seem especially damaging to American business interests and to impose retaliatory trade restrictions if bilateral negotiations fail to remove them. There is some justification in this procedure if it succeeds in modifying unjustifiable foreign practices and results in greater and nondiscriminatory market access. However, such unilateral actions ultimately threaten the integrity of the international trading system by substituting bilateral deals for multilateral disciplines.<sup>29</sup>

### *SUMMARY*

The current Uruguay Round negotiations represent a watershed in international trade policy. While successful completion of the Uruguay Round will include progress in resolving traditional issues such as tariffs and quotas, newer trade issues such as intellectual property rights will be addressed for the first time.

With the growth in world trade in the 1980s, international differences in protection of IPRs have caused an increasing number of trade disputes. From a policy standpoint, IPRs are fundamentally different from traditional trade barriers, such as tariffs. Whereas reducing global levels of tariffs would provide welfare gains for all countries concerned, strengthening and harmonizing IPRs would generate benefits and costs that are likely to vary across countries. Thus, an appropriate agreement will involve a compromise between the current situation of markedly different protective regimes and a fully standardized set of international policies.

Successful completion of the Uruguay Round will go a long way toward settling IPR disputes. The prospective agreement on IPRs includes considerable compromise between the interests of developed and developing countries. In addition, by placing future negotiations in the multilateral framework provided by the GATT, potentially damaging bilateral disputes may be avoided.

## ENDNOTES

<sup>1</sup> The last criterion prevents the patenting of basic scientific discoveries deriving from fundamental laws of nature. Under most legal systems, there is an unclear demarcation between “fundamental” and “applied” discoveries that is becoming controversial in patent policy. For example, the United States has indicated its willingness to provide patents for discoveries emanating from the mapping of genes in the DNA molecule. This policy concerns observers who believe such information should be widely disseminated in order to spur development of practical applications.

<sup>2</sup> This trend has raised concerns about potential monopolization of key software, limiting the development of compatible applications programs.

<sup>3</sup> For additional details on intellectual property rights, see World Intellectual Property Organization (1988).

<sup>4</sup> A new technology, for example, is information about a better means of production. Information is a type of good for which consumption by one firm does not limit the ability of other firms to use it. In economic terms, once the technology has been introduced, it makes the most sense to provide it to all potential users at the cost of replicating another copy of a blueprint or computer program. This cost may be near zero. In this sense, an efficient market would allow innovations to be distributed and used competitively, without consideration of the initial R&D costs.

<sup>5</sup> Two exceptions exist to the provisions providing exclusive rights. First, a government may choose to develop and disseminate an invention itself on grounds of public interest. Second, a government may require that a patent owner allow use by another firm to expand domestic availability of the invented product or process. Such “compulsory licenses” usually provide a fixed payment to the patent owner.

<sup>6</sup> Among industrial countries the term of patent protection lasts from 15 to 20 years. This standard was established centuries ago in Europe, based on the length of time it required to train two apprentices. It should be noted that effective patent lengths can vary across industries because it may take patent authorities different periods of time to approve the applications. Thus, until recent legislative changes a U.S. pharmaceutical patent typically provided only ten years of protection due to the lengthy approval period.

<sup>7</sup> Most observers consider this basic framework to be the best choice for a technology-development policy. One alternative, for example, would be for the government to subsidize applied and commercial R&D directly. The difficulty here is that the government is ill-qualified to determine which projects are likely to succeed and advance the national technological base. Further, such policies risk problems of awarding contracts based on political favoritism and foreign retaliatory

subsidization. The patent system has the advantage of allowing market competition for protected future profits to allocate R&D resources among firms. A proper allocation of labor and capital into technologically dynamic uses is critical for promoting economic growth, as discussed by Grossman and Helpman (1991).

<sup>8</sup> Similar comments pertain to copyrights, which allow authors, musicians, and artists to earn (sometimes spectacular) returns on their creative efforts by controlling the duplication and sale of books, tapes, and the like. Without these potential returns there would be slower creation of cultural products and technical manuscripts. However, concerns arise that strict copyright protection may excessively restrict the diffusion of knowledge gained from literary and artistic work. An example would be the difficulty students might experience in affording expensive technical publications that carry significant research results. Copyrights are typically awarded for a time period extending 50 years beyond the author’s death, which again is a compromise among these conflicting interests.

<sup>9</sup> Maskus (1990b) provides evidence on the growth of foreign direct investment.

<sup>10</sup> Horstmann and Markusen (1987) analyze the strategic choices among these alternatives.

<sup>11</sup> Many goods and services that rely on IPRs are excluded from Table 1 due to data limitations. For example, there is substantial international trade in computer software and banking services.

<sup>12</sup> Indeed, some portion of agricultural trade is related to intellectual-property inputs. For example, U.S. export strength in farm goods depends in part on the use of advanced chemical and mechanical inputs, which are likely to be protected by patents. Further, food products carry trademarks and are often patented as well. These examples provide a flavor both for why IPRs are pervasive in trade and why it is virtually impossible to measure accurately their contribution to trade.

<sup>13</sup> It should be noted that trade in most IPR-sensitive goods has risen rapidly in recent years. For example, between 1985 and 1989 U.S. nominal exports of patent-intensive goods rose by 82 percent, and of imports by 75 percent, in comparison with growth in overall merchandise exports of 66 percent and in imports of 36 percent. Japan’s imports of all three types of IPRs-sensitive goods rose by more than 100 percent over that period, while that country’s total imports rose by 63 percent.

<sup>14</sup> Clearly, only some unknown portion of the income flows noted in Table 2 reflects returns to innovative activity. This portion would depend on numerous market and policy

variables, including the international strength of IPRs. Nonetheless, it is evident that foreign direct investment and licensing are significant forms of international business and that intellectual property plays a key role in global competition.

15 This varies among patents, trademarks, and copyrights. See Rapp and Rozek.

16 In fact, in developed countries semiconductors receive a hybrid protection combining patents and copyrights.

17 World Intellectual Property Organization provides a compilation of practices in most countries. Gadbow and Richards comprehensively review policies. However, because many countries have changed IPRs recently, their review is somewhat dated.

18 Maskus (1990b) provides some tentative estimates of these potential static costs.

19 There is a thriving market in some countries for counterfeit medicines (drugs sold falsely under trademark), some of which might be produced without proper quality controls.

20 Many products besides pharmaceuticals may not be patentable in various countries. Primary examples include biotechnological inventions and food products. See WIPO (1988) and Butler (1990) for more details.

21 Some observers claim that the Japanese patent system is discriminatory and acts to reward Japanese inventors to the exclusion of foreign inventors. Reasons for this include requirements for translation into Japanese and an understaffed patent office that delays processing of applications. At the same time, however, the United States has been accused of using its statutory authority to exclude IPR-infringing products from its market to discriminate against foreign firms.

22 Beyond the patent stage, countries differ in how they regulate business practices by patentees. The U.S. judicial system has been relatively rigorous in insisting that patent owners do not operate to restrain trade and technology diffusion, though this policy stance has softened recently. Such competition policy in the European Community and Japan has been more lenient toward firms owning IPRs.

23 While this statement is presumably true, it must be noted that a business could react in a variety of ways to differential IPRs, depending on market power and strategy.

In principle, the effect on total trade and investment would be unclear, though there would be distortions in the distribution of those flows.

24 Studies that attempt to account for the competitive structure of markets for IPR-sensitive products include Feinberg and Rousslang (1990), Maskus (1990b), and Maskus and Eby-Konan (1993).

25 It would be more accurate to suggest that the U.S. preference is for such standards to exist in all but the least-developed countries, where infringement is insignificant in economic terms.

26 Uniform international IPRs would allow their owners to charge different prices in various markets (to "price discriminate" in economic terms), depending on demand elasticities. This outcome would increase the returns to innovation and, presumably, induce more R&D and growth. In general, if harmonized standards were to represent a net strengthening of world IPRs, as envisioned by the United States, profits to creative activity would rise and more innovation would take place.

27 There is some evidence that in that in developed countries the social returns to innovation (counting consumer benefits from new products and technologies, including technological spillovers to other industries) exceed the private returns, Organization for Economic Cooperation and Development.

28 An example is the Patent Cooperation Treaty, which allows firms to apply to a centralized body, the decisions of which are recognized as valid in all signatory countries. Such protocols are limited, however, and, in any event, the protection provided in various nations may still differ.

29 That this process is likely is clear from a recent report that intellectual-property interests in the United States have tired of the lengthy delay in reaching a Uruguay Round accord. Petitions for investigation of, and eventual retaliation against, practices in several countries may be filed by the Pharmaceutical Manufacturers Association and the Motion Picture Association of America. It must be recognized that, in the long run, a full multilateral agreement would be a significantly better approach to meeting their concerns and improving world welfare and growth.

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# The Tenth District: Moving Ahead Slowly

By Tim R. Smith

**T**he Tenth District economy improved somewhat in 1992, but the pace of growth remained slow. The performance of major sectors of the region's economy was mixed. While the construction sector boomed, weak manufacturing continued to hamper economic growth across the district.

Economic performance differed greatly across the seven district states. The Kansas economy surged due to strong growth in construction and services, and Colorado and New Mexico recorded modest growth. Oklahoma, Wyoming, Missouri, and Nebraska did not fare as well due to problems in manufacturing and trade.

The district economy will probably gather some momentum in 1993 as the national economy picks up. District manufacturing may improve slightly, but the region's robust construction sector may lose strength. Moreover, two of the region's key industries—agriculture and energy—are

likely to provide little additional economic stimulus. Overall, the district economy is expected to grow modestly in 1993.

This article reviews the district's economic performance in 1992 and explores the outlook for 1993. The first section compares the overall performance of the district with the nation in 1992. The second section reviews the recent performance and outlook for the district's industries. The third section surveys the wide-ranging performance of district states in 1992 and discusses each state's outlook for the year ahead.

## *IMPROVEMENT FOR THE DISTRICT ECONOMY IN 1992*

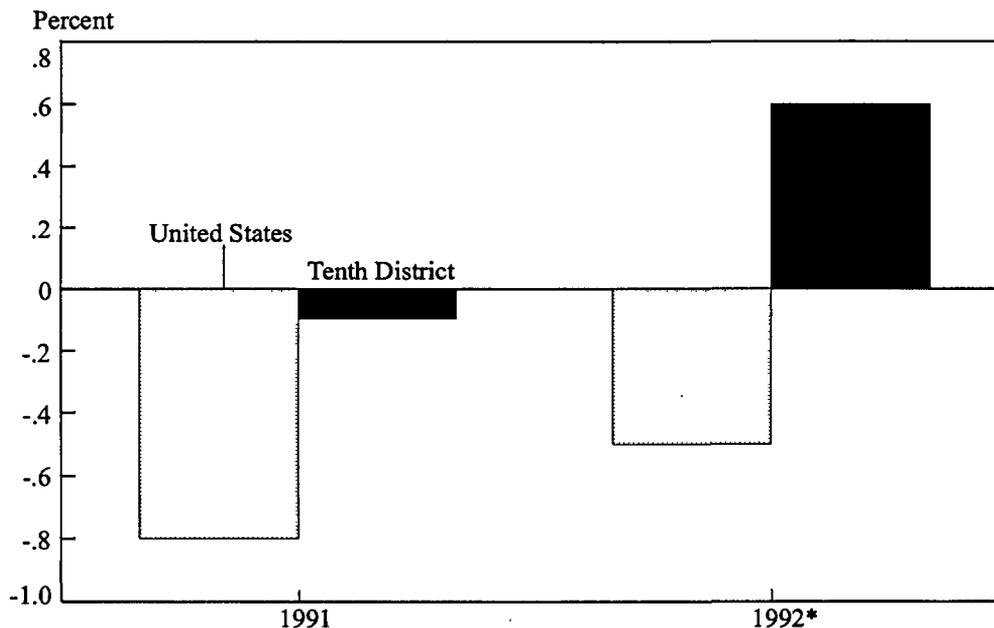
While the district continued to grow slowly in 1992, it grew more strongly than in 1991. As the nation struggled to recover from its recession of 1990-91, the district pulled ahead due to its generally favorable mix of industries. But weak manufacturing continued to hamper economic growth in 1992.

Two broad measures of economic performance, employment and income growth, both improved in the district last year and continued to outpace the nation.<sup>1</sup> Nonfarm employment in the district grew 0.6 percent, while nonfarm employment in the nation slipped 0.5 percent (Chart 1).<sup>2</sup> The average civilian unemployment rate for the first three quarters of 1992 stood at 5.6 percent in

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*Chart 1*  
**Growth in Nonagricultural Employment**  
*U.S. and Tenth District*



\* First three quarters, seasonally adjusted annual rates.  
 Source: Bureau of Labor Statistics.

the district, well below the nation's 7.4 percent rate. Real nonfarm personal income in the district grew 1.8 percent in 1992, compared with 1.6 percent nationwide (Chart 2).<sup>3</sup>

The increase in district employment in 1992 reversed a 0.1 percent decline in 1991. The improvement, however, was not spread evenly across individual district states. Employment in Kansas, New Mexico, and Oklahoma grew faster in 1992 than in 1991 (Chart 3). Jobs continued to grow in Colorado, but not quite as fast as in 1991. Missouri continued to lose jobs, but at a much more modest pace than the year before. And, after rising in 1991, employment in Wyoming and Nebraska ebbed slightly in 1992.

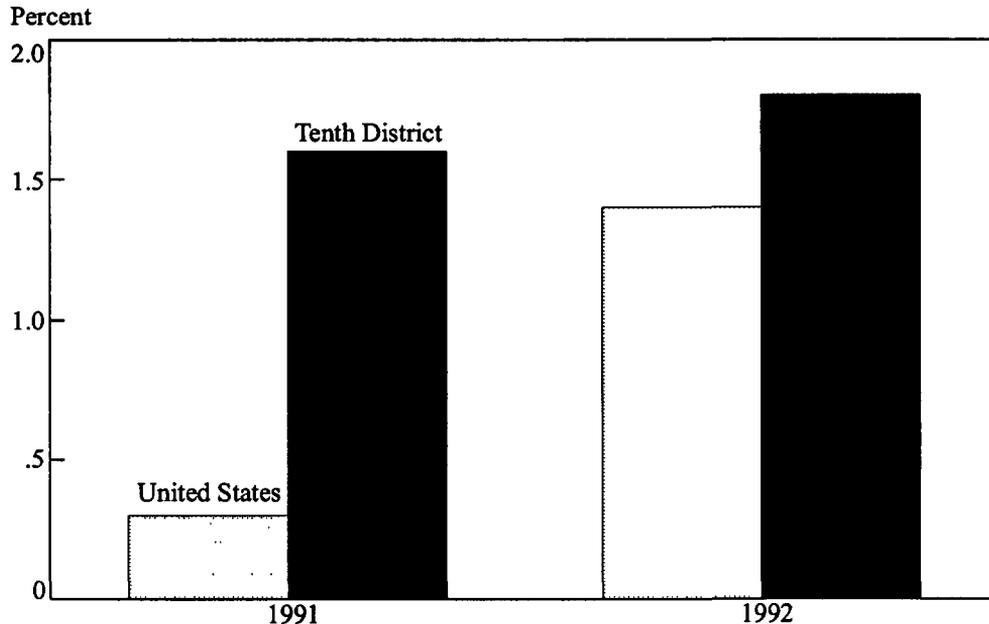
Real nonfarm personal income in the district grew 1.8 percent in 1992, somewhat faster than the

1.4 percent rise in 1991 (Chart 4). Income growth accelerated across most states in the region. New Mexico, Oklahoma, Wyoming, Kansas, and Nebraska all had stronger growth in 1992 than in 1991. Colorado and Missouri, on the other hand, saw income growth slip some from its 1991 pace.

#### *REVIEW AND OUTLOOK BY SECTOR*

The district's mix of industries helped soften the blow of the national recession of 1990-91 and also helped the district outperform the nation in 1992. Two keys to the better regional performance were a jump in construction jobs and a less severe decline in manufacturing jobs in 1992 (Table 1). The performance of other sectors of the district economy was mixed. Job losses continued to

Chart 2  
**Growth in Income**  
 U.S. and Tenth District



Notes: Income growth rates are based on real nonfarm personal income. For 1992, annualized growth rates reflect only seasonally adjusted data through the first two quarters.

Source: Data Resources, Inc.

plague many sectors, and performance worsened in the mining, service, wholesale trade, federal government, and transportation sectors. But retail trade, state and local government, and the financial sector all improved in 1992.

The national economy has been growing much more slowly during the current recovery than during most recoveries since World War II, but improvement is expected in 1993. Still, the national economy will probably achieve only moderate growth, constrained by weak growth in foreign economies and continued balance-sheet restructuring by businesses and consumers.<sup>4</sup> An improving national economy will benefit most sectors of the district economy, but few district industries are likely to rebound strongly.

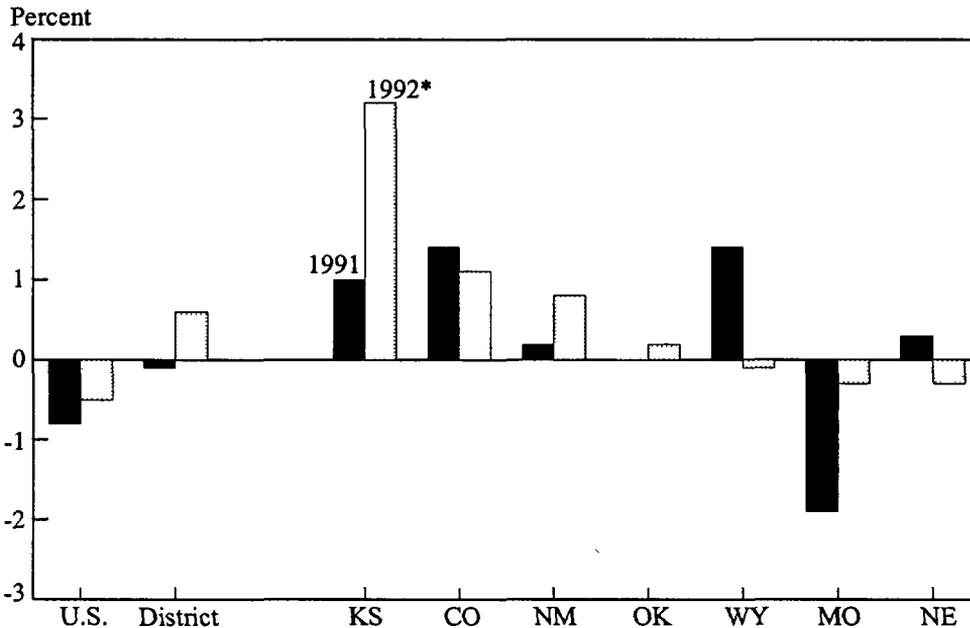
District *construction* activity improved con-

siderably in 1992, providing a strong boost across the region. District construction jobs grew 4.8 percent, following a modest decline the year before (Table 1). In contrast, the number of U.S. construction jobs fell in 1992. The value of district construction contracts awarded in the first three quarters of 1992 was nearly 13 percent above the same period a year earlier. The record now shows that the growth in construction contracts awarded in the district outpaced the growth in the nation throughout both the recession and recovery (Chart 5). Strong homebuilding activity and a surge in public building projects accounted for most of the recent strength in the region.

Residential construction in the district rose sharply in 1992, largely due to lower mortgage interest rates. Residential building contracts

Chart 3

**Growth in Nonagricultural Employment**  
Tenth District states



\* First three quarters, seasonally adjusted annual rates.  
Source: Bureau of Labor Statistics.

soared in the first three quarters, and total housing permits climbed at a 20 percent annual rate in the first three quarters of the year. Single-family dwellings remained the driving force behind the district's residential construction activity, while multifamily construction remained weak. All indicators of residential construction activity were significantly stronger in the district than in the nation.

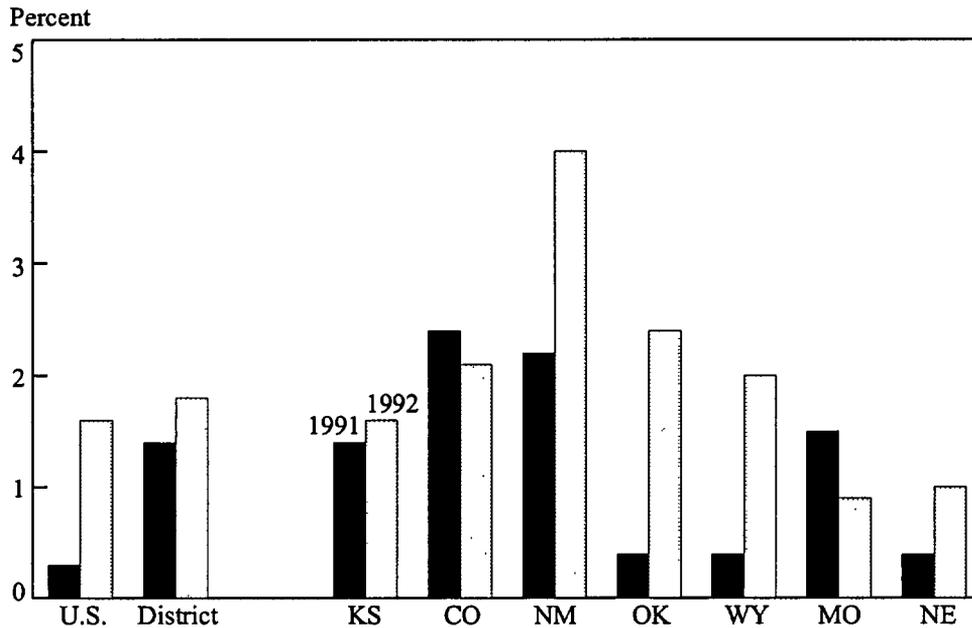
The region's nonresidential construction sector improved modestly in 1992. A strong rebound in nonresidential construction continues to be postponed by slow overall economic growth in the region and relatively high vacancy rates in some district cities. The value of nonresidential construction contracts awarded in the first three quar-

ters of 1992 was 8.2 percent higher than the same period a year earlier. In contrast, the value of nonresidential building contracts in the nation declined.

Construction growth will probably slow in the year ahead. Even if mortgage interest rates remain relatively low, large housing inventories across the region will take time to be absorbed, curbing additional homebuilding activity. The Denver International Airport has boosted district nonbuilding and nonresidential building contracts, but the effects of this massive public project will diminish as its 1993 opening date draws closer. Some cities may begin to see modest expansion in office and industrial construction, but vacancy rates across the district are generally still high enough to prevent

Chart 4

**Growth in Income**  
Tenth District states



Notes: (See notes, Chart 2.)

Source: Data Resources, Inc.

a significant rebound in commercial building.

*Manufacturing* activity improved somewhat in 1992, but continued to hinder district employment growth. The total number of manufacturing jobs fell 1.9 percent, after dropping 2.9 percent the year before (Table 1). In both years, the district lost manufacturing jobs at a steeper rate than the nation.

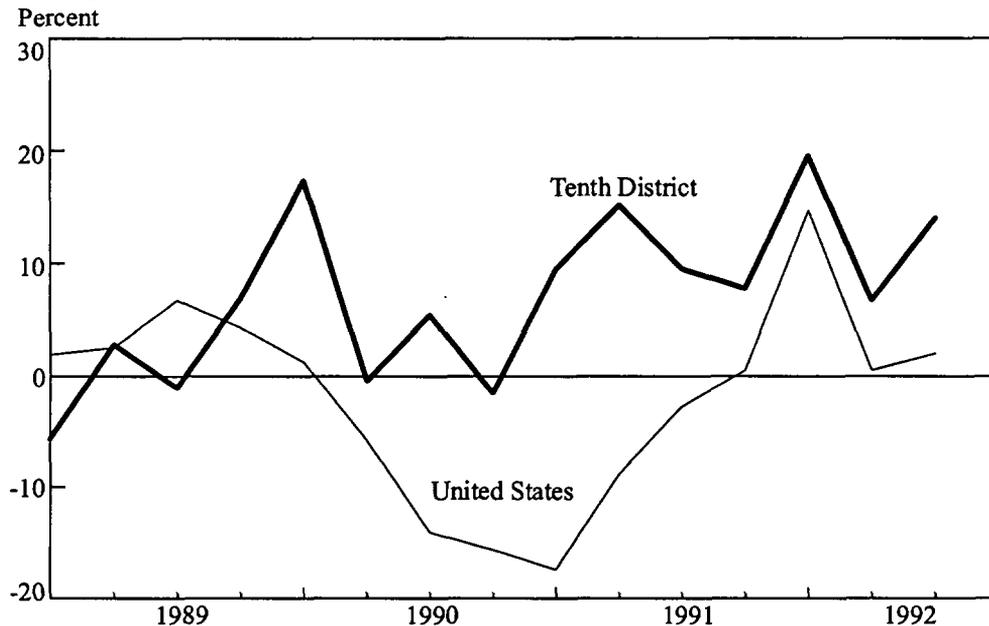
Durable goods production remained the weakest segment of the region's manufacturing sector. Jobs in the important transportation equipment industry again dropped considerably, but the drop was smaller than in 1991. Production at district automobile assembly plants in the 1992 model year jumped 15 percent from the year before. The surge in production helped raise the district's share of total U.S. production from 11.6

percent in 1991 to 13.8 percent in 1992. General aviation manufacturing, another important durable goods industry in the region, weakened somewhat in 1992 due to sluggish domestic and foreign sales of business aircraft. Dollar sales in the first three quarters of the year were down slightly from the same period a year earlier, following gains in each of the previous three years.

Nondurables manufacturing in the district also slowed in 1992, but remained stronger than durables manufacturing. Job growth in the region's two major nondurables industries—food processing and printing and publishing—moved in opposite directions. Employment at food processing plants fell slightly, after posting a moderate gain in 1991. Printing and publishing employment rose slightly, after dipping the previous year.

Chart 5

**Growth in the Value of Total Construction Contracts**  
(Percent change from four quarters ago)



Source: F.W. Dodge Division, McGraw-Hill Information Services Company.

Manufacturing in the region may begin to recover in 1993. Consumers who have been paying down debt could begin to satisfy pent-up demand for durable goods, prompting businesses to boost production schedules and begin to rehire workers. But factory production in the district will still be hampered by slower defense-related production and sluggish economic growth abroad.

The district *farm* economy improved in 1992, confounding earlier expectations. Farm income edged up due to strong livestock earnings, big district crops, and lower farm expenses. Still, land values were fairly flat in 1992, suggesting that farmers remain somewhat cautious about the future.

The district's farm economy may post additional gains in 1993. Farm income probably will

increase modestly due to wider livestock profits and bigger government payments. After declining for six years, government payments will increase in 1993 because market prices for major crops fell in the last half of 1992 in response to a large harvest of corn, wheat, and soybeans. Overall, district agriculture remains financially healthy and earnings are solid.

The district *mining* industry continued to shrink in 1992. Productivity improvements continued to put downward pressure on mining employment, despite stable or increasing output of many mineral resources across the district. Mining employment in the district fell nearly 8 percent, reflecting a drop in mining jobs nationwide (Table 1).

The region's mining activity is dominated by

Table 1

**Growth in Nonagricultural Employment by Sector, Tenth District States**

	Percent change	
	1991*	1992**
Manufacturing	-2.9	-1.9
Durable goods	-4.9	-3.2
Transportation equipment	-7.4	-5.7
Nondurable goods	-.0	-.2
Food processing	2.3	-.7
Printing and publishing	-1.8	.4
Mining	-6.6	-7.9
Construction	-1.3	4.8
Service	2.0	.3
Wholesale trade	-.6	-1.3
Retail trade	-.4	-.2
Federal government	.8	-.5
State and local government	1.1	6.1
Transportation	-.7	-1.2
Finance, insurance, real estate	-.6	.0

\* From fourth-quarter 1990 to fourth-quarter 1991.

\*\* First three quarters, seasonally adjusted annual rate.

Source: Bureau of Labor Statistics.

the energy sector, which turned in a mixed performance in 1992. Following several years of increases, coal production in the district leveled off in the first ten months of 1992. Preliminary data for the first half of the year suggest that crude oil production in the district continued to trend downward.

The bright spot in the district's mining sector during the year was natural gas. Soaring natural gas prices and tax credits for coal-seam methane gas, which were set to expire at yearend, boosted drilling activity in the region. The average number of gas and oil drilling rigs operating in the district slumped in the first part of 1992. But by October, the rig count had jumped 16.2 percent above its year-earlier level.

Employment in the district's energy sector is

unlikely to grow in 1993. Output of the district's low-sulphur coal may increase due to mounting environmental pressures, but productivity improvements made in recent years will limit job gains. Moreover, oil exploration and development activity probably will remain weak since oil prices are expected to remain relatively stable in 1993. While drilling for natural gas is expected to lose momentum as tax inducements expire, higher prices and environmental concerns will likely continue to bolster the region's gas industry.

The *service* sector slowed across the district in 1992. During the national recession, the district's service industries achieved moderate job growth. In 1992, however, service job growth in the region slowed to a snail's pace (Table 1). The weak service job growth in the district compares

favorably with the small decline in service jobs posted in the nation. One bright spot in the region's service sector was the important tourism industry. Established tourist areas in the Rocky Mountains fared well in 1992, and strong growth in southern Missouri established it as a major national tourist destination.

The lackluster regional economy did little to revive retail and wholesale *trade* in 1992. The number of retail jobs in the district shrank slightly after a small drop the year before. The number of wholesale jobs fell much faster in 1992 than 1991 (Table 1).

If the national economy improves, the district's service and wholesale trade sectors may grow somewhat faster this year. But retail growth will probably remain limited by sluggish growth in the region. Instead of a substantial net increase in retail activity, recent consumer spending patterns suggest that discount retail activity will continue to grow at the expense of full-price retail activity.

*Government*, one of the largest sectors of the district economy, continued to expand in 1992. In fact, government employment grew faster than any other category (Table 1). All of the growth was at the state and local levels, while the number of federal jobs fell slightly.

Government jobs grew in all district states, but the fiscal health of the individual states varied widely in 1992. The size of a state's general fund balance in relation to its general fund spending provides a simple measure of fiscal health. By this measure, fiscal conditions improved in 1992 for Colorado and Missouri. Conditions stayed about the same in Oklahoma, and deteriorated in Kansas, Nebraska, New Mexico, and Wyoming. Moreover, fund balances remained at or above 5 percent of fund spending in four states, a level of reserves generally considered desirable.<sup>5</sup>

Growth in government employment is likely to slow somewhat in 1993. Federal employment in the region will probably remain stable in the year ahead. Defense spending cuts will continue

to hurt states where military hardware is manufactured—such as Missouri—but favor states with research and development activities—such as New Mexico. State and local government employment may continue to increase in 1993, but at a slower pace than in 1992, as several district states continue to wrestle with tight budgets. Fund balances as a percent of general fund spending are projected to be smaller or unchanged in five district states in 1993. And only three states are projected to maintain balances greater than 5 percent of spending (National Governors' Association).

### *MIXED PERFORMANCE IN DISTRICT STATES*

While economic growth improved on average in the district in 1992, individual states did not share equally in this improvement. Employment grew faster in 1992 than in 1991 only in Kansas, New Mexico, and Oklahoma. Poor performance in key industries slowed job growth in Colorado and caused job losses in Wyoming, Missouri, and Nebraska.

#### *Kansas*

The Kansas economy improved markedly in 1992. Employment growth in the state exceeded growth in all other district states by a wide margin (Chart 3). Moreover, the state's unemployment rate fell from 4.2 percent in the fourth quarter of 1991 to just 4.0 percent in the third quarter of 1992, a level well below the nation's unemployment rate. Nonfarm real personal income grew at a rate slightly below the district average but improved from its 1991 pace.

One of the reasons for the strong performance in Kansas was the strength of the state's service sector. Employment in Kansas service industries was up in 1992 from its 1991 pace and, at 3.8 percent, grew much faster than in either the district or the nation. Business and personal services were quite strong, particularly in the Kansas City

metropolitan area.

Construction also continued to boost the Kansas economy in 1992. Total construction contract awards were pushed up by a pickup in public infrastructure construction and a swell in home building. As a result, construction employment surged 6.6 percent in 1992, following an increase of about 4 percent in 1991.

Kansas manufacturing weakened in 1992. An increase in nondurables jobs only partly offset a large decline in durables manufacturing employment. New car production at the Kansas City General Motors plant rose 18 percent from the 1991 to the 1992 model year, but other manufacturers of durable goods did not fare as well. For example, makers of general aviation aircraft in Wichita recorded a drop in shipments and a dip in net billings in the first three quarters of the year compared with the same period a year earlier.

Employment in the Kansas mining sector recovered somewhat in 1992 despite weak overall mining activity. After falling sharply in 1991, mining employment in the state increased 2.8 percent in 1992. While stable oil prices and sharply higher natural gas prices restored a small part of the jobs lost the previous year, drilling activity in the state languished until late in the third quarter. As a result, the average number of active drilling rigs fell to only 24 in the third quarter from 32 a year earlier. But in October, the rig count jumped well above its year-ago level.

In the year ahead, the Kansas economy will probably continue to outperform the district and the nation but slacken to a more moderate pace. The brisk pace of construction in the state is unlikely to continue, and a big turnaround in the state's manufacturing sector is unlikely. Food processing, however, could get a boost from an improving national economy. The state's natural gas fields may see some pickup in activity, but the mining sector will probably not repeat the job growth recorded in 1992. On the other hand, strong growth in business services likely will continue to

bolster the service sector. And agriculture should continue to lend strength to the Kansas economy.

### *Colorado*

Colorado's economy slowed somewhat in 1992. Both employment and income growth fell slightly (Charts 3 and 4). Meanwhile, the labor force expanded as people moved into the state from ailing regions such as California. As a result, the state's unemployment rate leaped from 5.3 percent at the end of 1991 to 6.2 percent in the third quarter of 1992, due mainly to growth in the labor force. Remarkably strong construction activity buoyed an otherwise lackluster state economy.

Construction stood out as the strongest sector of the Colorado economy during 1992. Construction jobs grew 17.3 percent in the first three quarters, more than three times faster than in 1991. The strength was spread across all parts of the sector. Strong population growth and low mortgage interest rates fueled a surge in residential construction. And public projects such as Denver International Airport and highway improvements continued to boost nonresidential building and nonbuilding construction.

Colorado's manufacturing sector continued to weaken in 1992. After falling 4.2 percent in 1991, employment in the state's factories fell another 2.0 percent in 1992. Job losses were shared among durables and nondurables industries.

Colorado shared in the national and regional declines in mining employment, but its natural gas and coal industries improved in 1992. The state's mining employment dropped 8.9 percent, following an even bigger drop the year before. Some of the drop can be explained by productivity improvements in the mining sector. The number of drilling rigs operating in the state in the third quarter was the same as a year earlier. Nevertheless, a clear upward trend in drilling activity began at midyear as producers of coal-seam methane gas accelerated drilling programs to take advantage of expiring tax credits. Coal production also expanded

somewhat in the first ten months of the year.

Trade and services provided little strength to the Colorado economy. A record 1991-92 ski season and strong summer tourism provided a moderate boost to retail employment. But the gains in retail jobs were partly offset by small job losses in wholesale trade and services. While the losses were small, they look particularly striking when compared to solid growth in 1991.

The Colorado economy is likely to grow moderately in 1993 but could slow somewhat from the 1992 pace. Construction will slacken as the Denver airport project winds down, but other public projects and continued strong population growth should maintain building activity at moderate levels. Moreover, office vacancy rates in Denver have fallen considerably over the past few years, providing some support to the commercial real estate market. Improvement in national consumer markets could help the state's manufacturing sector. Trade and services, however, may struggle if groups opposed to a controversial voter referendum are successful in encouraging boycotts of the state's tourist attractions and convention sites.

### *New Mexico*

The New Mexico economy improved in 1992, but employment growth remained sluggish. Employment in the state increased 0.8 percent, up from 0.2 percent in 1991 (Chart 3). The state's unemployment rate jumped to 7.4 percent in the first quarter, but drifted down to 6.9 percent by the third quarter. Despite anemic job growth, nonfarm personal income growth in 1992 was the best among district states due to soaring transfer payments and healthy growth in wages and salaries (Chart 4).

The construction sector contributed to the improvement in New Mexico's economy in 1992. Construction employment grew much more slowly than in Kansas or Colorado, but the small gain in construction jobs in 1992 reversed the decline recorded in 1991. The improvement was

driven by public infrastructure and single-family residential construction, particularly in the Albuquerque area.

New Mexico's mining sector continued to decline in 1992. Employment in this important sector dipped sharply, following an even bigger decline the year before. While the job losses stemmed from closings of copper and molybdenum mines, a lackluster energy industry in 1992 provided little offsetting support to the state's mining sector. The number of drilling rigs operating in the state tumbled in the first half of the year but then picked up as expiring tax credits encouraged natural gas drilling. Pipeline expansions have also improved markets for the coal-seam gas produced in the San Juan basin. Coal production in the first ten months of 1992 increased 15.2 percent from the same period a year earlier.

New Mexico's manufacturing sector turned around in 1992. After plunging in 1991, employment at the state's factories grew modestly in 1992. Most of the growth occurred in nondurables industries, while a turnaround in durable goods industries was postponed by a sluggish national economy and defense spending cuts.

The state's trade and service sectors remained sluggish. The number of jobs in wholesale and retail trade fell slightly, after remaining nearly constant in 1991. Service sector employment grew moderately, but at less than half the pace set the year before. Observers of the state economy cite strong tourism and a Medicaid-related expansion in health services as the main reasons for continued growth in the service sector.

In 1993, New Mexico's economy will probably improve again. Unlike some other states in the region, changes in defense-spending patterns could actually favor New Mexico's Air Force bases and research facilities. Manufacturing is likely to get a boost from a healthier national economy. And service employment should continue to benefit from tourism and health care spending in the state.

## Oklahoma

The Oklahoma economy was virtually flat in 1992, improving only slightly from the year before. Employment grew only 0.2 percent, but real nonfarm income growth improved considerably (Charts 3 and 4). The civilian unemployment rate slipped from 6.8 percent in the fourth quarter of 1991 to 6.4 percent in the third quarter of 1992. All sectors of the state economy were weak except government, which was bolstered by strong job growth at the state and local levels.

The Oklahoma manufacturing sector faltered again in 1992. Manufacturing employment fell more than 3 percent, compared with a 1 percent decline in 1991. The job losses were concentrated in the state's durable goods factories. While durables manufacturing was generally weak, auto production improved. The Oklahoma City General Motors plant boosted production by a third during the 1992 model year but still failed to restore production to the levels achieved in the late 1980s. Nondurables employment leveled off after rising modestly the year before.

Mining activity in Oklahoma also worsened in 1992. Dominated by jobs in the state's vast oil and natural gas fields, mining employment fell faster in Oklahoma than in both the nation and the district. The average number of drilling rigs operating in the state in the third quarter dipped to 91 from 98 a year earlier. And preliminary data for 1992 suggest production of both crude oil and natural gas declined, despite stable oil prices and much higher natural gas prices. The drop in oil production marks eight straight years of falling oil output.

Oklahoma's construction sector was mixed in 1992. Construction employment fell moderately in the first three quarters of 1992 after a similar decline in 1991. Employment data alone, however, do not reflect the growth that showed up in other indicators of construction activity, such as construction contracts and housing permits. These indicators suggest moderate construction activity

during the year with the strongest activity in single-family housing.

The trade and service sectors slumped in 1992. Employment in retail and wholesale trade establishments fell somewhat, due to a generally sluggish state economy. Services employment also slipped, after posting meager gains in 1991. But the service job losses were more than offset by job gains in state and local government, which added jobs five times faster in the first three quarters of 1992 than in 1991.

The Oklahoma economy is likely to grow slowly in the year ahead. A strong agricultural sector will balance other sectors that will remain weak. If natural gas prices remain high, the mining sector will benefit, but job gains will probably be limited. Without stronger export markets or much more rapid growth in the U.S. economy, a recovery in the state's manufacturing will remain elusive.

## Wyoming

The Wyoming economy stumbled in 1992 but held on to some of the gains from the previous year. Employment fell slightly in 1992, following modest growth in 1991 (Chart 3). Although the state's unemployment rate jumped during the first part of 1992, it settled at 5.4 percent in the third quarter, only slightly below the 5.5 percent rate at the end of 1991. Despite job losses in 1992, real growth in Wyoming's nonfarm personal income surpassed the district average, a marked improvement over 1991 (Chart 4).

The state's important mining sector followed the pattern of weakness set in the district and the nation. Job losses in the sector were smaller in Wyoming than in most other district states, however, due mostly to a significant pickup in natural gas drilling. The number of operating oil and gas drilling rigs averaged 43 in the third quarter, up from 36 a year earlier. Preliminary data suggest a substantial rise in natural gas production in the state. And the state's production of soda ash—used

in glassmaking—received a boost from the strong construction activity in the nation during the year. But crude oil production continued to slide, and coal production in the first ten months of the year was down 2.2 percent from the same period a year earlier.

Construction contributed only modestly to the Wyoming economy in 1992. Construction jobs increased only 2.3 percent, following a much stronger gain in 1991. The slowdown was due to declining activity in the nonresidential and non-building parts of the sector, which was only partly offset by a moderate increase in homebuilding.

The lackluster state economy produced flat trade and service sectors. Employment at retail and wholesale establishments changed little from 1991 levels, while service growth slowed to a snail's pace. Performance of these non-goods-producing sectors would have been even worse without strong summer and winter tourist seasons.

The Wyoming economy may curb its job losses in 1993 but will achieve slow growth at best. A strong livestock industry and more activity in the state's natural gas fields will be the key elements in turning the economy around. In addition, another year of strong tourism should help sustain the state's trade and service sectors.

### *Missouri*

Missouri's economy remained one of the weakest in the district last year. Still, a small drop in Missouri employment compared favorably to the 2 percent decline in 1991 (Chart 3), and the state's unemployment rate rose only slightly in 1992. Real nonfarm personal income grew slowly in 1992 after achieving moderate growth the year before (Chart 4).

The major culprit in Missouri's weak economy was again its manufacturing sector. Job losses at the state's factories were considerable in 1992, though smaller than the year before. The state's important durable goods industries bore the brunt of the job losses, but nondurables industries also felt some of the losses. Defense spending cuts and

weak foreign sales continued to buffet the states durables producers. Automobile production, on the other hand, stabilized after two years of double-digit declines.

Construction in Missouri turned around in 1992. Construction employment rose moderately, after dropping sharply the year before. As in other district states, residential construction led the improvement with single-family building permits increasing considerably in the first three quarters. The value of nonresidential construction contracts rose modestly on the heels of a sharp drop in 1991.

Missouri's trade and service sectors outperformed their national counterparts but reflected the overall weakness of the state economy nonetheless. Wholesale and retail employment stabilized after declining in 1991. Meanwhile, the state's business and personal service industries treaded water another year, posting virtually no change in employment. Tourism became an increasingly important dimension of trade and services, particularly in the booming Branson area.

The Missouri economy is poised for slow growth in 1993. Cuts in defense spending will remain a threat to the state's key manufacturing sector, but improved national economic conditions and a strong farm sector may provide some weak growth overall.

### *Nebraska*

The Nebraska economy was flat in 1992. Employment dipped slightly after a slight gain in 1991 (Chart 3). The civilian unemployment rate climbed to 3.2 percent in the third quarter from 2.9 percent at the end of 1991. Still, Nebraska's unemployment rate remained the lowest in the district and far below the national unemployment rate of 7.6 percent. Real nonfarm personal income grew more than twice as fast as the year before, but not fast enough to exceed the regional average (Chart 4).

The state's manufacturing sector remained stable in 1992. Manufacturing employment, dominated by nondurables such as food processing, fell only

slightly. Nondurables industries added jobs, offsetting continuing job losses in durable goods industries.

Construction indicators were strong in Nebraska in 1992. The value of construction contracts awarded in the first three quarters jumped considerably from the year before; all construction categories were strong. Permits for single-family homes soared, as did contract awards for nonresidential buildings and public structures, such as roads and bridges. While these indicators suggest a strong construction sector in Nebraska, they did not lead to new jobs. In fact, construction employment fell 1.4 percent after rising slightly in 1991.

Nebraska's non-goods-producing sectors slipped again. Employment in retail and wholesale trade fell 4.6 percent after falling slightly the year before. Service employment held up better, but there has been essentially no job growth in this sector in the past two years. The lackluster job growth possibly reflects the leveling off of growth in business services.

The Nebraska economy should remain stable in the year ahead. Agriculture will continue to serve as a solid foundation for the state economy, and farm incomes may rise somewhat further. Nondurables manufacturing likely will have another good year, benefiting from any accelera-

tion in the pace of the nation's recovery. Nebraska service companies that sell to other regions, such as telemarketing, may also pick up as the national recovery proceeds.

### *SUMMARY*

The Tenth District economy improved in 1992 but achieved only slow growth. Still, employment and income growth in the region outpaced growth in the nation. The performance gap between the district and the nation was largely the result of the district's booming construction sector and a better farm economy. The region's weak manufacturing sector limited district gains in 1992. And while the mining sector slipped, it had little overall impact on the regional economy because of the small total employment in this sector.

As the recovery builds steam in the nation, the district economy should continue to improve in 1993. Agriculture and energy should remain stable, contributing little new growth to the region. And some of the momentum in the construction sector may dissipate during the course of the year. But an improving national economy should bring some limited gains to the district's manufacturing and service sectors.

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### ENDNOTES

<sup>1</sup> This article assesses district economic performance using the most recent data available at the time of writing. Preliminary employment data are available for the first three quarters of 1992; income data for the first two quarters. Other data are available for various time periods.

<sup>2</sup> Discussions of employment growth in this article are based on growth for 1991, calculated from the fourth quarter of 1990 to the fourth quarter of 1991, and growth for 1992, calculated as the annual rate of growth from the fourth quarter of 1991 to the third quarter of 1992. The employment data are from the Bureau of Labor Statistics, seasonally adjusted at the Federal Reserve Bank of Kansas City. While agriculture is an important sector of the district economy, nonfarm employment is used to measure district economic performance because the number of direct farm jobs is small and difficult to measure. Nonfarm employment, however, does capture the indirect effects of agriculture on other sectors of the region's economy.

<sup>3</sup> Discussions of income growth in this article are based on growth for 1991, calculated from the fourth quarter of 1990 to the fourth quarter of 1991, and growth for 1992, calculated as the annual rate of growth from the fourth quarter of 1991 to the second quarter of 1992. The income data are seasonally adjusted real nonfarm personal income data from Data Resources, Inc.

<sup>4</sup> This view reflects the consensus estimate published in the December 10, 1992, *Blue Chip Economic Indicators*. The estimate is for real GDP growth of 2.0 percent in 1992 and 2.8 percent in 1993.

<sup>5</sup> These estimates of 1992 fund balances and general fund expenditures are from the National Governors' Association. The four states with fund balances of 5 percent of general fund expenditures or above were Kansas, Nebraska, Oklahoma, and Wyoming.

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# The Farm Recovery Back on Track

By Alan Barkema and Mark Drabenstott

The farm recovery regained its stride in 1992 after stumbling in 1991. Buoyed by huge crops and healthy livestock earnings, farm income made up some of the ground lost the year before. The year was hardly uneventful, though, as crop prices soared due to a weather scare and then plummeted when yields of most crops eclipsed previous records. While the farm balance sheet recorded almost no further gains, the industry ended the year in solid financial condition.

Agriculture should stay on track in 1993. Prospects for farm earnings appear relatively bright, aided by strong livestock earnings and a marked increase in government payments. The year may also prove pivotal in determining the industry's longer term prospects. The Uruguay Round of global trade negotiations is finally drawing to an end after more than six years of contentious negotiation, and the new North American Free Trade Agreement may be approved. The outcome of these negotiations will set the stage for agriculture's performance in world markets for years to come.

## *A SURPRISINGLY GOOD 1992*

The past year was full of surprises for U.S. agriculture. Shifting weather patterns and gyrating prices perplexed farmers and ranchers all year

long. In the end, farm income turned up, despite a widely anticipated decline. Livestock prices and earnings proved surprisingly strong, notwithstanding record supplies and forecasts of weak demand. And despite a late-spring frost and the threat of drought, farmers harvested the biggest crops ever.

## *Improved farm financial conditions*

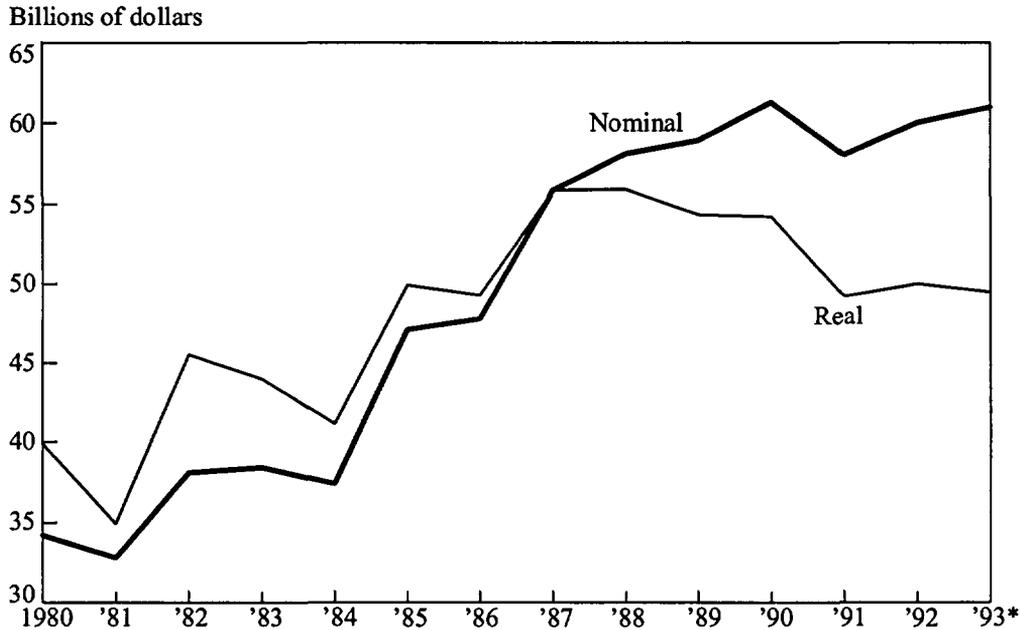
Farm financial conditions improved in 1992, confounding most observers. Farm finances had turned down in 1991, and the slide was generally expected to continue in 1992. But big crops, strong livestock earnings, and a drop in expenses led to higher farm income. Looking back, 1991 still marked a downturn in the farm economy, but the dip followed record income in 1990. With earnings recovering in 1992, it is now clear that farm incomes have stayed healthy for five straight years. In short, agriculture's recovery may have leveled out over the past two years, but it has stayed on a high plateau.

Farm income rebounded in 1992 due to record crops, solid livestock earnings, and lower expenses. At 346 million metric tons, the U.S. grain crop posted a new record. Although prices slumped in the second half of the year, farmers enjoyed good prices in the first half. Livestock profits were hardy as meat production also hit a new record. Meanwhile, farmers actually spent less on production inputs due to lower outlays for fuel, interest, and feeder livestock.

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Chart 1  
**Net Cash Farm Income**



\* Forecast.

Source: U.S. Department of Agriculture, Economic Research Service, Agricultural Outlook Conference.

Net cash income hit \$60 billion in 1992, up 3.5 percent from 1991 (Chart 1). In nominal terms, it was the second highest income on record, with the highest being \$61.3 billion in 1990. In real terms, it marked the eighth consecutive year when earnings were near or above \$50 billion (1987 dollars).

The rise in income, however, was only partly reflected in other farm financial measures. Land values in the Tenth District by the third quarter of the year had risen just 2.5 percent from the year before. In real terms, values stayed essentially flat (Chart 2). Land values in the district have climbed 37 percent from the market low at yearend 1986 but remain well below the peaks of the early 1980s.

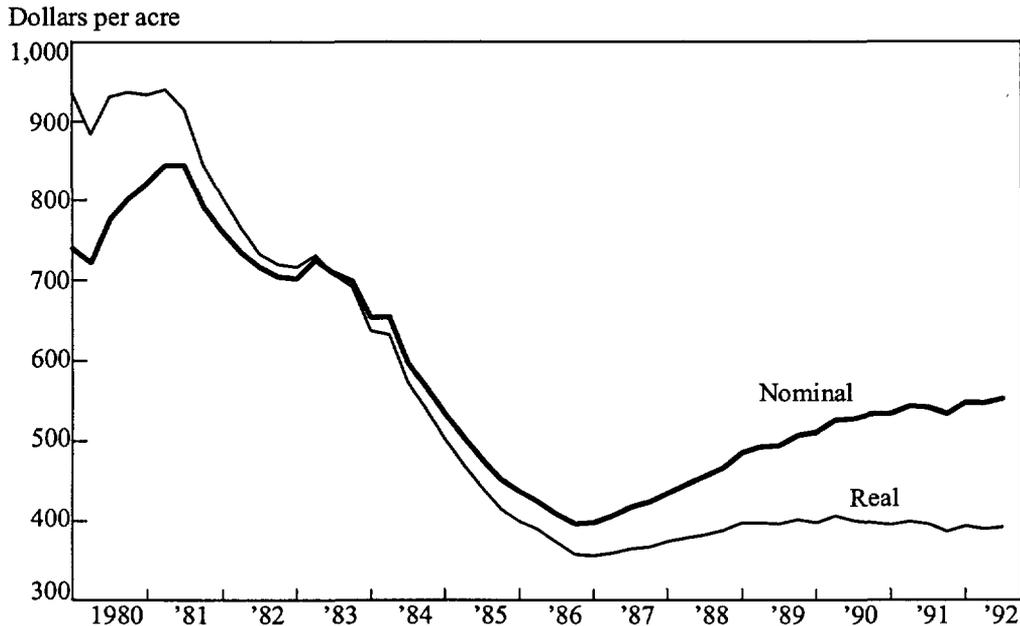
The farm sector balance sheet was flat in 1992, as both farm assets and farm debt grew slightly (Table 1). Nationwide, farm assets and farm debt

both inched up less than 1 percent. Farm debt remains low after a dramatic drop over the past several years. Farmers and ranchers are now using only 16 percent of their cash income to make principal and interest payments, compared with 27 percent in 1983 when farm debt peaked. Farm net worth edged up in 1992, but fell slightly after adjusting for inflation. The farm balance sheet is solid but has not made clear gains for two years.

#### *Record meat output in 1992*

U.S. producers brought record meat supplies to market in 1992. Beef production inched up, poultry production continued its long expansion, and pork production surged to an all-time high. Meat demand was strong despite the weak U.S.

Chart 2  
**Farmland Values**  
 Tenth District



Note: Values include only nonirrigated cropland.

Source: Federal Reserve Bank of Kansas City, Agricultural Credit Survey.

economy, and per capita consumption hit a record high of 209 pounds. Overall, livestock prices held up better than many analysts had expected, while a drop in feed costs in the second half of the year boosted producer profits.

Beef production was up 1 percent, as the cattle industry continued its modest expansion. Marketings from feedlots increased, as did beef cow slaughter. The U.S. cattle inventory stood at 109.2 million head on July 1, 1992, unchanged from the previous year. But beef cow numbers were up, reflecting an effort by ranchers to rebuild the cattle herd.

Cattle prices were relatively strong in 1992, especially in light of more output and a sluggish economy. Finished cattle prices held steady throughout the year in the mid-\$70 a hundred-weight range. Prices for choice steers at Omaha

averaged \$75, up slightly from the year before (Table 2). Feedlots made profits in 1992, especially in the second half of the year when grain prices were weak.

Ranchers enjoyed another good year in 1992, despite a drop in feeder cattle prices. Prices for feeder steers at Oklahoma City averaged \$85 a hundredweight, down 8 percent from record prices the previous year. Ranchers still earned profits, though, marking five straight profitable years. Ranching is important in the Tenth District, and ranching profits are a key reason why farm financial conditions remain solid there.

Pork production hit a record high in 1992 as producers continued a strong expansion. Output surged to 17.3 billion pounds, topping last year's supply by 8 percent and breaking the record set in

Table 1

**Farm Balance Sheet Excluding Operator Households and CCC Loans on December 31**  
(Billions of dollars)

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
<b>Assets</b>										
Real estate	661.8	586.2	542.3	578.9	595.5	615.5	627.5	623.0	625.0	628.0
Nonreal estate	195.2	186.5	182.1	193.7	205.4	213.4	219.0	218.8	221.0	222.0
Total assets	857.0	772.7	724.4	772.6	800.9	828.9	846.5	841.8	846.0	850.0
Deflated	940.7	818.5	747.6	772.6	770.8	764.0	747.8	714.6	705.0	690.0
<b>Liabilities</b>										
Real estate	106.7	100.1	90.4	82.4	77.6	75.4	73.7	74.4	75.0	75.5
Nonreal estate	87.1	77.5	66.6	62.0	61.7	61.8	63.1	64.4	65.0	65.5
Total liabilities	193.8	177.6	157.0	144.4	139.4	137.2	136.8	138.8	140.0	141.0
Deflated	212.7	188.1	162.0	144.4	134.2	126.5	120.8	117.8	116.7	114.5
<b>Proprietor's equity</b>										
Deflated	663.2	595.1	567.4	628.2	661.5	691.7	709.7	703.0	707.0	710.0
Deflated	728.1	630.4	585.7	628.2	636.8	637.6	627	596.8	589.2	576.4
Debt-to-asset ratio	22.6	23.0	21.7	18.7	17.4	16.6	16.2	16.5	16.5	16.6

Note: Figures represent billions of dollars. Figures for 1992 and 1993 are forecasts.

Source: U.S. Department of Agriculture.

1980. Bigger production kept prices weak the whole year. Prices for barrows and gilts at the six major markets averaged \$43 a hundredweight, well under the 1991 average. Many small and mid-sized pork producers lost money in 1992, but a bigger share of pork output comes from large commercial enterprises whose unit costs are quite low. Those large enterprises probably still made money.

The poultry industry expanded further in 1992. Broiler production jumped 6 percent, turkey output climbed 4 percent, and poultry production was up 5.8 percent overall. Given the sluggish economy in 1992, those supply increases would normally have led to lower prices. But the poultry industry is adept at spurring growth in consumption, and consumption reached a record 87 pounds per capita. Broiler prices held steady at 52 cents a

pound, while turkey prices slipped 2 cents to 59 cents a pound. The drop in turkey prices meant losses for many producers in 1992.

#### *A roller coaster for crop producers*

Changing weather took crop prices and crop producers for a wild ride in 1992. The roller coaster began with a dry spring in the southern Wheat Belt and a late frost in the northern Corn Belt. Then a bone-dry May and June, which recalled vivid memories of the droughts of 1983 and 1988, threatened the corn and soybean crops across the Corn Belt. With crop inventories down and new crops imperiled, crop prices soared. But the roller coaster plunged when the weather turned favorable after the Fourth of July. In the end, most crops

Table 2

**U.S. Farm Product Price Projections***(December 10, 1992)*

Crops	Marketing years			Percent change
	1990-91	1991-92*	1992-93+	
Wheat	\$2.61/bu.	\$3.00/bu.	\$3.15-3.35/bu.	8.33
Corn	\$2.28/bu.	\$2.37/bu.	\$1.90-2.20/bu.	-13.50
Soybeans	\$5.74/bu.	\$5.60/bu.	\$5.20-5.60/bu.	-3.57
Cotton	\$.68/lb.	\$.58/lb.	N/A	N/A

Livestock	Calendar years			Percent change
	1991	1992*	1993+	
Choice steers	\$74.28/cwt.	\$75-76/cwt.	\$71-77/cwt.	-1.99
Barrows and gilts	\$49.69/cwt.	\$43-44/cwt.	\$39-45/cwt.	-3.45
Broilers	\$.52/lb.	\$.52-.53/lb.	\$.50-.56/lb.	.95
Turkeys	\$.61/lb.	\$.59-.60/lb.	\$.57-.63/lb.	.84
Lamb	\$53.21/cwt.	\$59-61/cwt.	\$57-63/cwt.	.00
Milk	\$12.24/cwt.	\$13.10-13.20/cwt.	\$12.00-13.00/cwt.	-4.94

\*Estimated.

+Projected.

Source: U.S. Department of Agriculture.

logged record or near-record yields.

Wheat prices climbed early in the year amid concerns about dry growing conditions in Kansas, dwindling wheat inventories, and strong export demand. High prices encouraged farmers in the northern Plains states to plant a fourth more spring wheat than the year before. Favorable spring and early summer rains quickly hiked wheat yield prospects across the nation, and spring wheat yields in the northern Plains hit record levels. Overall, the nation's average wheat yield of 39.4 bushels per acre fell just shy of the 1990 record. Near-record yields on the bigger acreage boosted total production to almost 2.5 billion bushels, a fourth larger than the year before (Table 3).

As the large wheat crop ripened, export demand tapered off and low-cost corn crowded wheat out

of livestock rations. The combination of a big crop and weaker demand pushed wheat prices down as harvest neared. In some areas, harvesttime prices fell as low as \$2.60 a bushel. Despite the sharp second-half slump, prices still averaged \$3.00 a bushel for the marketing year ended May 31, up from \$2.61 a bushel the year before.

The abnormally dry spring enabled farmers to plant the nation's corn crop well ahead of schedule. But farmers' delight with the early planting soon gave way to concern that drought would sear the crop, the nation's most important feed grain. As the drought scare spread, corn prices soared.

July's cooler temperatures and above normal rainfall, however, proved ideal for the growing crop. The good weather held, boosting the average yield to a record 129.3 bushels per acre. The 9.3

Table 3

**U.S. Agricultural Supply and Demand Estimates**

(December 10, 1992)

	Corn (bu.)			Feedgrains (mt.)		
	Sept. 1 - Aug. 31			June 1 - May 31		
	1990-91	1991-92	1992-93	1990-91	1992-92	1992-93
<b>Supply</b>						
Beginning stocks	1,344	1,521	1,100	45.5	47.7	33.9
Production and imports	7,938	7,494	9,332	231.8	220.3	274.5
Total supply	9,282	9,015	10,432	277.3	268.0	308.4
<b>Demand</b>						
Domestic	6,036	6,331	6,685	178.1	184.4	195.9
Exports	1,725	1,584	1,650	51.5	49.7	52.0
Total demand	7,761	7,915	8,335	229.6	234.1	247.9
Ending stocks	1,521	1,100	2,097	47.7	33.9	60.5
Stocks-to-use ratio (percent)	19.60	13.90	25.16	20.78	14.48	24.41
	Soybeans (bu.)			Wheat (bu.)		
	Sept. 1 - Aug. 31			June 1 - May 31		
	1990-91	1991-92	1992-93	1990-91	1991-92	1992-93
<b>Supply</b>						
Beginning stocks	239	329	278	536	866	472
Production and imports	1,929	1,990	2,169	2,773	2,022	2,509
Total supply	2,168	2,319	2,447	3,309	2,888	2,981
<b>Demand</b>						
Domestic	1,282	1,356	1,367	1,375	1,135	1,183
Exports	557	685	740	1,068	1,281	1,300
Total demand	1,839	2,041	2,107	2,443	2,416	2,483
Ending stocks	329	278	340	866	472	498
Stocks-to-use ratio (percent)	17.89	13.62	16.14	35.45	19.54	20.06

Note: Data represent millions of bushels or metric tons.

Source: U.S. Department of Agriculture.

billion bushel corn crop eclipsed the 1985 record by more than half a billion bushels. As the crop's potential became apparent, prices plunged in mid-summer and sank further through harvest. The strong early summer prices boosted the average farm-level price for the 1991-92 marketing year ending August 31 to \$2.37 a bushel, about a dime more than the year before.

The nation's soybean crop netted almost 2.2 billion bushels, the biggest since 1982, due to almost perfect midsummer weather and a shift of soybean acreage from the South to higher yielding midwestern fields. The drought scare pushed prices up in early summer, but prices tumbled a dollar a bushel when crop prospects brightened after the Fourth of July. Farm prices averaged \$5.60 a bushel for the 1991-92 marketing year ending August 31, down slightly from the previous year and the lowest in four years.

### *ON COURSE IN 1993*

The farm economy should hold its course in 1993. A healthier national economy should boost consumer incomes, which will strengthen the demand for meat as record supplies of red meat and poultry reach the market. Although most crop prices are likely to average less than the year before, most farmers will have more bushels to market from the big 1992 crop. Moreover, bigger government payments should help cushion the decline in crop prices. While farm income may edge up, little improvement appears in store for the industry's already strong balance sheet.

### *Farm income and financial conditions*

U.S. farmers seem likely to stay on a high plateau of healthy finances in 1993. Another good year for livestock, only a small increase in expenses, and a substantial jump in government payments should work together to nudge farm income higher. But continuing the pattern of the last few years, strong income will be matched by little

adjustment in balance sheets, largely because farmers and ranchers remain cautious about the future.

Farm income in 1993 may nearly match the record set in 1990. Crop receipts should stay strong, as farmers continue to market the large 1992 crop they carried over into the new year. In addition, low crop prices will probably spark a big rise in direct government payments, probably from \$8 billion in 1992 to \$11 or \$12 billion in 1993. The rise in payments, the first in six years, will come mainly in bigger deficiency payments to feed grain and wheat producers. Livestock receipts may slip slightly in 1993, but should remain at a high level due to record forecast meat production. Expenses, meanwhile, should increase only modestly, as low inflation continues to benefit farmers and ranchers. Overall, net cash income may hit \$61 billion in 1993, up 1.7 percent from 1992.

The strong earnings may have little impact on farm balance sheets. Farmland values, the lion's share of total farm assets, will probably stay relatively flat, especially in real terms. Farm debt gives little sign of resuming rapid growth anytime soon. Farmers recognize that U.S. agriculture still has excess capacity, and they and their bankers are still smarting from the painful financial lessons of the past decade. Overall, the farm balance sheet should remain solid in the year ahead, with few gains in assets, debt, or net worth.

Farm credit conditions will be shaped in 1993 by plentiful funds, relatively low interest rates, and few problem loans. Agricultural banks continue to report low loan-deposit ratios. At the end of the third quarter, banks responding to the Tenth District survey of agricultural credit conditions reported an average loan-deposit ratio of 54.5 percent. During the 1993 spring borrowing season, interest rates on farm loans should be favorable. Money-market interest rates rose during the fourth quarter of 1992, but interest rates on farm loans could remain low during the first quarter of 1993. Most farm lenders will carry few, if any, problem loans into 1993, due to strong farm earnings in 1992.

### *Food prices outlook*

Food prices are expected to creep up slowly in 1993, although not as slowly as they did last year. In 1992, food prices—measured by the food component of the Consumer Price Index—rose slightly more than 1 percent, the smallest rise since the mid-1960s. In 1993, food prices may rise between 2 and 4 percent. Prices of food items prepared at home, which account for more than 60 percent of food purchases, are likely to edge up 1 to 3 percent. Prices of food prepared in restaurants and other away-from-home establishments may rise slightly more.

Three factors appear responsible for dampening food price gains. First, slow growth in consumer incomes in the sluggish economy has encouraged consumers to “buy down,” or switch to lower priced food products that may require more at-home preparation. In the year ahead, stronger growth in the national economy should help consumers gradually step back to higher priced food products. Second, low inflation is holding down the costs of food processing and distribution, which account for about 70 percent of retail food costs. Third, ample supplies of most farm products, especially red meat and poultry, are holding down farm-level prices, which account for the other 30 percent of the consumer’s food bill.

### *Farm policy outlook*

The coming year may be quiet in the area of domestic farm policy, but it could be pivotal internationally. Farm policy in the United States is constructed in five-year pieces, and because 1993 marks the midpoint of the 1990 farm bill, little action is expected. But agriculture has much at stake in two trade deals that may be signed in 1993. The prospective North American Free Trade Agreement (NAFTA) awaits congressional approval, and decisive action may occur in the Uruguay Round of international trade negotiations.

Negotiations to form the new NAFTA among

Canada, Mexico, and the United States concluded in August of last year. If approved, the NAFTA would offer significant benefits to U.S. agriculture by prying open the door to a booming Mexican food market. Food demand in Mexico is on the rise, as growing incomes encourage Mexican consumers to upgrade their low-quality diets.

The NAFTA will create both winners and losers. U.S. feed grains producers may reap the largest benefits from freer access to the Mexican market. Solid gains in sales also await U.S. livestock producers, but some U.S. horticultural producers may face stiffer competition from Mexican producers. Overall, the industry’s prospective gains under the NAFTA appear to outweigh the losses.

The Uruguay Round of global trade negotiations was stalled all year by a long-running dispute between the EC and the United States over farm subsidies. The dispute reached its zenith in November, when the United States threatened restrictive tariffs on certain farm imports from the EC, mainly white wine. The U.S. threat came in response to EC oilseed subsidies, which have raised the ire of U.S. soybean growers. A last-minute compromise before Thanksgiving averted the tariff crisis and broke the stalemate in the broader negotiations.

The compromise spanned the oilseeds dispute and other key farm trade issues that had bedeviled the Uruguay Round since its beginning. Anchoring the new compromise is a 21 percent reduction in the quantity of subsidized farm exports by the end of the decade. Previously, the United States had held out for at least a 24 percent reduction, the EC for no more than 18 percent.<sup>1</sup> The EC also agreed to reduce its oilseeds acreage 15 percent in the first year of the agreement and at least 10 percent every year after that. The United States had hoped to limit the tonnage of oilseeds grown in the EC but ultimately settled for the less stringent acreage limit.

The compromise between the EC and the United States reduced, but did not eliminate, the

risk that farm trade issues could sink the Uruguay Round. France, the EC's largest farm producer and exporter, objects strongly to the compromise, fearing it may force the EC to make further changes in its Common Agricultural Policy (CAP).<sup>2</sup>

The farm-trade deal between the EC and the United States has enabled negotiators to turn to other thorny trade issues in such widely diverse industries as pharmaceuticals, telecommunications, and banking. Even if overall agreement is achieved among the 108 participating countries—no small undertaking—the French, still smarting from the farm trade compromise, could torpedo the entire agreement.

If successful, the Uruguay Round will fall far short of the United States' initial goal of eliminating all trade-distorting farm policies by the end of the decade. But the Round still promises to nudge global farm policy in the right direction.

### *Export outlook*

The outlook for U.S. farm exports hinges on the shape of the world economy in the year ahead. Although the International Monetary Fund projects stronger world economic growth, the outlook is clouded by slowing economies in Germany and Japan. A pickup in economic growth from the sluggish pace of a year ago would brighten prospects for farm exports, especially high-value foods like meat and horticultural products. But further decline appears likely in low-value bulk exports, partly due to low prices of grains and soybeans. Overall, U.S. farm exports are expected to total \$41.5 billion in fiscal 1993, down slightly from the year before. Farm imports are also expected to edge down to \$24 billion, leaving a net farm trade surplus of \$17.5 billion, \$0.5 billion less than a year ago (Chart 3).

Global markets for U.S. farm products are shifting geographically. Japan, the EC, and Canada again are expected to rank first, second, and third as U.S. agriculture's biggest markets. But the fastest growing markets in recent years have been

the newly industrialized countries of the Pacific Rim—the NICs—where rapid income growth has pushed up food demand. Mexico and other Latin American nations may soon emerge as the next growth market for U.S. farm products. Mexico, already U.S. agriculture's fourth-largest market, is expected to buy about \$4.1 billion of U.S. farm products in 1993, up a third from two years ago. Stronger growth in the Mexican economy and freer trade under the prospective NAFTA should boost exports even more in coming years.

The former Soviet Union remains an important market for U.S. farm exports, but prospects have dimmed in recent months. The region harvested a large crop in 1992. Meanwhile, soaring inflation has riddled incomes and savings, reined in meat demand, and triggered a cutback in livestock production. In combination, the larger crop and smaller feed requirements point to less demand for U.S. grain in the year ahead.

The availability of credit dominates the near term outlook for farm exports to the former Soviet Union, however. Since December 1990, nearly \$6 billion of government-backed loans have financed the sale of U.S. farm products to the former Soviet Union. But the U.S. Department of Agriculture recently announced that Russia, the largest of the 15 former Soviet republics, was suspended from the credit program because loan repayments fell behind schedule. How Russia's suspension from the credit program will affect future food sales is uncertain. If Russia meets its current loan obligations, additional credit may be forthcoming. Otherwise, other forms of assistance may be required to maintain the flow of U.S. food to the former Soviet Union.

### *Livestock outlook*

Livestock producers look forward to a profitable 1993. Meat supplies are expected to climb 2 percent to another record, but improving consumer incomes should help bolster prices. Feed costs, meanwhile, will likely stay low due to weak

prices for corn, soybeans, and other feed crops. Profits probably will be weakest for pork producers due to another jump in pork supplies that is expected to drive down prices.

Beef production could edge higher in 1993 as the cattle industry continues its modest expansion. The nation's cattle herd is expected to be 102 million head on January 1, 1993, up 2 percent from the year before. The herd expansion is likely to continue for at least another couple of years. As ranchers hold back calves to increase future output, demand for calf imports from Canada and Mexico should remain strong. Feedlot operators can be expected to keep their lots quite full in 1993 due to low feed costs and steady final prices. Overall, beef production may increase 1.5 percent in 1993.

Cattle prices in 1993 may follow 1992's steady pattern. The rise in beef output is likely to be matched by some improvement in consumer demand as the economy continues to improve in 1993. Prices for finished steers may stay in the mid-\$70 range through most of the year, although prices will probably be weakest in the first quarter due to big competing supplies of meat. The year-average price for steers at Omaha may be \$74 a hundredweight, off \$1 from 1992. Oklahoma City feeder cattle prices may average \$84 in 1993, off \$1.50 from the 1992 level.

Pork producers give every indication of continuing their aggressive expansion in 1993. The December 1992 inventory of hogs and pigs was nearly the largest on record. The expansion in 1993 will be fueled by two factors. First, corn prices are very low, more than compensating for weak hog prices. Second, the pork industry continues to consolidate; large producers have substantially lower costs and can maintain profits when many farm-sized producers are losing money. Overall, pork production may jump 3.4 percent in 1993, marking the second straight year of record pork supplies.

Hog prices will likely sag from the bigger supplies. Pork producers, following the lead of the poultry industry, have been quite successful in

boosting demand for their product. The "other white meat" campaign, along with a drive to cut the amount of fat in retail cuts, has led to steadily rising pork consumption. Notwithstanding the positive demand factors, hog prices are still expected to slump due to the big pork supply. Prices for barrows and gilts at the six major markets may average \$39 to \$45 a hundredweight in 1993.

The poultry industry is expected to expand again in 1993, although the rate of expansion is expected to be slower than in recent years. Despite favorable feed costs, broiler profits were squeezed in 1992, which will moderate growth in 1993. Broiler production is expected to increase 3.9 percent, well below the 5 to 6 percent growth over the past decade. Turkey producers could cut back their expansion even more due to losses in 1992. Turkey production may increase less than 2 percent in 1993, half the increase in 1992.

Profits should be favorable for poultry growers in the coming year. Prices are expected to hold steady due to the slower rate of growth in poultry output. Broiler and turkey prices may average 52 cents and 59 cents, respectively, unchanged from the 1992 averages. Even though final prices may be steady, 1993 poultry profits should improve due to falling feed costs.

### *Crop outlook*

Crop inventories are expected to increase during the 1992-93 marketing year, despite soaring domestic demand and steady exports. With inventories up, most crop prices are expected to average lower than the year before. Still, inventories are far smaller than in the mid-1980s. Thus, crop prices may still be relatively sensitive to the development of crops this spring and summer.

World wheat production will be up slightly from a year ago, mainly due to the large U.S. crop. Meanwhile, weak incomes will constrain consumption in Eastern Europe and the former Soviet Union. The result will be a modest buildup in the world wheat inventory from the relatively low

level of a year ago.

With global wheat reserves up, competition will be keen in the world wheat market. The EC still holds the largest stores of exportable wheat supplies in the world, even though the worst drought in a century cut wheat yields in northern and Eastern Europe. Canada, Australia, and Argentina will also compete aggressively with the United States for wheat sales. Thus, government-guaranteed credit for the former Soviet Union and export subsidies for northern Africa under the Export Enhancement Program (EEP) will play a major role in U.S. wheat sales. In the end, U.S. wheat exports may climb slightly to 1.3 billion bushels.

Wheat use at home may also edge up. Increased grinding for flour and other food uses could bump up domestic wheat use to about 1.2 billion bushels, up 4 percent from the year before. But cheap corn, which is likely to remain a low-cost alternative to wheat in livestock rations, will constrain further gains in domestic use.

Despite the modest pickup in total wheat use, the nation's wheat stockpile is expected to grow slightly to 498 million bushels, still a relatively lean inventory by historical standards but probably large enough to cushion most unforeseen surges in demand. All of the expected increase in the wheat inventory is in hard red spring wheat. Stocks of all other kinds of wheat (hard red winter, soft red, white, and durum) are expected to shrink further. Thus, with inventories of most kinds of wheat still lean, farm-level wheat prices are expected to average \$3.15 to \$3.35 a bushel, a range higher than the average of \$3.00 a bushel a year ago.

In contrast to the slight buildup of wheat inventories, the nation's corn stockpile is expected to double in the year ahead. A small gain in exports and a surge in domestic use will fall well short of absorbing the huge 1992 harvest, pushing up the corn stockpile.

Corn exports in the 1993 marketing year may be up only slightly from the year before, despite a quick start. From September through November, corn exports were up more than a third compared

with the same period the year before. But the fast pace may be hard to maintain. The former Soviet Union, previously the world's largest corn buyer, has cut back imports due to a larger domestic crop, declining livestock production, and hard times financially. Large exportable supplies of feed wheat from Canada, where an early frost left much of the wheat crop suitable only for livestock, will also be stiff competition in the world feed grain market. Sluggish exports from other countries, however, might push up the U.S. share of the world corn market. In the end, U.S. export tonnage is expected to be up only slightly from a year ago, which was the smallest in five years.

Domestic corn use may be brisk. Lower corn prices will encourage further expansion by pork and poultry producers. The nation's larger herds and flocks are expected to devour about 5.2 billion bushels of corn, surpassing the record set a year ago. Record quantities of corn may also be used in food and industrial uses, including high-fructose corn syrup and fuel alcohol. In all, more than four bushels of corn will be used domestically for every bushel shipped abroad.

Despite further gains in domestic use, the huge crop and weak exports point to a bigger corn stockpile. Less than a year ago, grain analysts worried that the corn inventory had been drawn down dangerously low, especially with a drought threatening. But the record crop will easily meet the year's needs while rebuilding the corn inventory to nearly 2.1 billion bushels, roughly enough for about three months' use. With more corn on hand, farm-level corn prices during the 1992-93 marketing year are expected to average \$1.90 to \$2.20 a bushel, about 14 percent less than a year ago.

The soybean outlook also suggests the huge 1992 crop will more than meet strong demand at home and abroad. Of the two main products obtained from soybeans, the outlook is somewhat brighter for soybean oil than for soybean meal.

Smaller foreign production of competing oilseeds, such as rapeseed and cottonseed, ensures brisk exports of U.S. soybeans. Drought in the EC

and early frost in Canada riddled the rapeseed crop, while drought withered the Chinese cottonseed crop. With global oilseed stocks down, U.S. soybean exports got off to a fast start in the 1993 marketing year. But export sales are expected to slow following the harvest of the South American crop in the spring. Overall, exports of whole soybeans and soybean oil could rise about 8 percent from a year ago. But meal exports could slip about 12 percent, mainly because shrinking livestock herds in the former Soviet Union need less feed.

The feed requirements of growing domestic livestock herds and poultry flocks anchor strong demand for soybeans at home. Consumption of soybean meal in the United States is expected to rise to a record 24 million tons, with roughly three-fourths of the total fed to hogs and broilers. But domestic consumption of soybean oil, used in a wide range of foods from salad dressing to soy sauce, is also on the rise. As consumer incomes strengthen, soybean oil consumption could edge up about 1 percent in the year ahead.

The strong foreign and domestic demand for soybeans, however, will not be large enough to fully absorb the huge crop. Thus, the soybean inventory is expected to grow about a fourth to 340 million bushels, enough for about two months' use. With the bigger inventory, soybean prices may average \$5.20 to \$5.60 a bushel during the 1992-93 marketing year, down about 4 percent from year ago. Soybean oil prices may average 19 to 23 cents a pound, up slightly from a year ago. With soybean meal exports expected to weaken, meal prices may average \$165 to \$190 a ton, well below a year ago.

## CONCLUSIONS

The past year proved to be much better than expected for U.S. agriculture, despite extremes of weather and farm prices. Although a modest decline was widely anticipated, farm income edged up. Still, almost no gains were recorded in the farm balance sheet. Farmland values rose just enough to keep up with inflation, and farmers remained cautious borrowers. Thus, the industry held on to its strong financial gains from the late 1980s, a better outcome than most expected when the year began.

Agriculture anticipates another good year in 1993. Its balance sheet is strong and farm income will probably be up. While most crop prices are down—due to the huge 1992 crop—most producers have more bushels to sell. Meanwhile, continued improvement in the national economy points to stronger demand for the biggest red meat and poultry supplies on record.

Agriculture enters the new year on solid financial footing, but the industry's longer term prospects hinge on its performance in world markets. The year ahead could shape the global trading environment for years to come. If approved, the NAFTA will gradually open the door to the rapidly growing food market in Mexico. And a successful conclusion to the Uruguay Round could give the global economy a much needed shot in the arm while strengthening global markets for U.S. farm products. Agriculture's gains from either agreement will unwind slowly. But even these modest improvements in farm trade rules will be a turn in the right direction.

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*ENDNOTES*

<sup>1</sup> The agreement between the EC and the United States also included a 36 percent reduction in the amount of money spent to subsidize exports, a 20 percent reduction in domestic farm income supports, and a 36 percent reduction in farm import barriers. Each of these farm policy reforms was included in the compromise proposed in December 1991 by Arthur Dunkel, Director General of the GATT. The Dunkel proposal also included a 24 percent reduction in the quantity of export subsidies, which was the proposal's main stumbling block until the recent compromise between the EC and the

United States. Thus, the new compromise embraces most of the year-old Dunkel proposal.

<sup>2</sup> Last spring, the EC reformed the CAP—over the objections of thousands of vocal French farmers—for the first time in the EC's 30-year history. The CAP reform cuts government-supported grain prices and requires EC farmers to idle 15 percent of their cropland. The French objections notwithstanding, the EC found no conflict between the CAP reform and the recent compromise struck with the United States.



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# The District's Long-Term Growth Prospects

By Mark Drabenstott

In recent years, at the bank's annual meetings of its boards of directors, I have presented an economic outlook for the Tenth District in the upcoming year. But this year, rather than returning to the recent annual theme of slow growth in the district economy, I will consider the district's long-term economic prospects. After giving a brief update on the region's recent economic performance, I will develop an outlook for the district for the turn of the century and beyond.

In approaching this task, I will not, indeed cannot, give a precise forecast of the actual rate at which the regional economy will grow over the long term. Such forecasts are simply beyond the capacity of economic science. Instead, I will analyze the recipe for long-term growth now being concocted across the district. Many of the growth ingredients in this recipe are basic—such as the work force, infrastructure, and available financial capital. But economic growth, like good cooking, is as much art as science. The magic comes from the way in which the ingredients are combined. In this case, the chefs of the region are its public and private leaders.

The district's long-term growth obviously

depends on the performance of the U.S. economy. Nevertheless, economists agree that a region's long-run growth path *relative to other regions* depends on the quantity and quality of its growth ingredients; or to put it in economic terms, its assets.<sup>1</sup> Five such district assets merit consideration: work force, education, infrastructure, fiscal climate, and financial capital.

An analysis of these five growth assets points to slower growth for the district economy than for the national economy. But the district is not necessarily doomed to that growth path. There is much that the region's leaders might do to improve growth prospects.

## *THE RECENT PERFORMANCE OF THE DISTRICT*

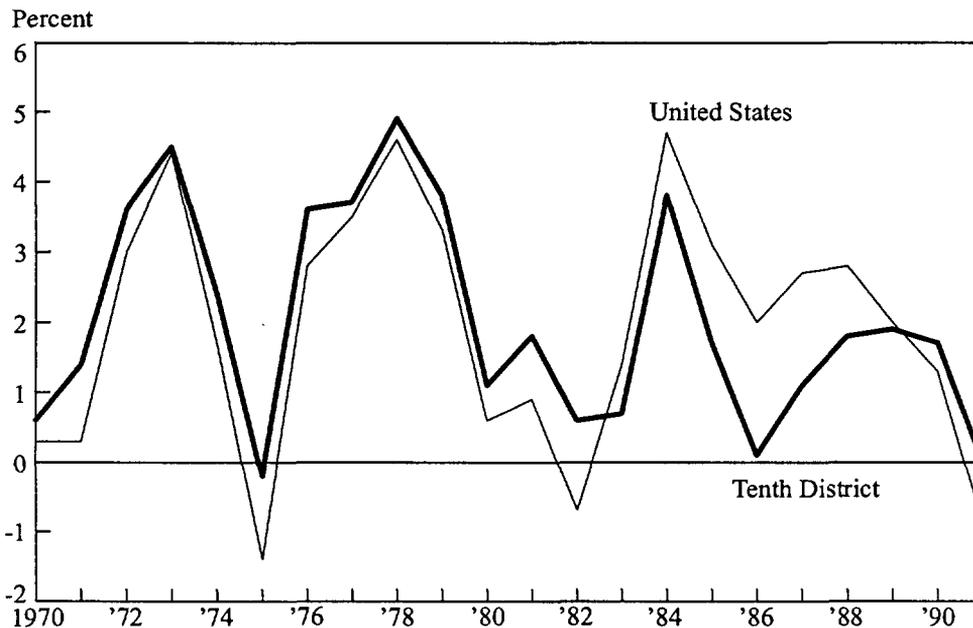
Recently, the district economy has grown slowly, although perhaps slightly faster than the national economy. Employment growth, one of the best broad gauges of the district economy, increased 0.6 percent over the year that ended in the third quarter of 1992, compared with a 0.4 percent drop in the nation. In terms of new jobs added over the past year, the district outperformed the nation by a full 1 percent. Growth in real income, another broad economic indicator, shows a similar pattern of slow growth across the region.

The district pattern of slow growth extends back much further than just the past year. Indeed,

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*Mark Drabenstott is a vice president and economist at the Federal Reserve Bank of Kansas City. This is an address made to a meeting of the bank's joint boards of directors and alumni directors on September 24, 1992, in Kansas City, Missouri. Corey Waldinger, a research associate at the bank, helped prepare the address.*

Chart 1  
**Total Employment Growth**



Source: Bureau of Economic Analysis.

slow growth has characterized the district economy for most of the past decade (Chart 1). The district economy fared quite well in the 1970s as agriculture and energy—pivotal industries in the region—both did well. But since 1980, the district averaged just 1.4 percent annual growth in employment, compared with 1.7 percent for the nation. The only two district states that had stronger job growth than the nation over the past decade were Colorado and New Mexico, states where population growth was the strongest in the district.

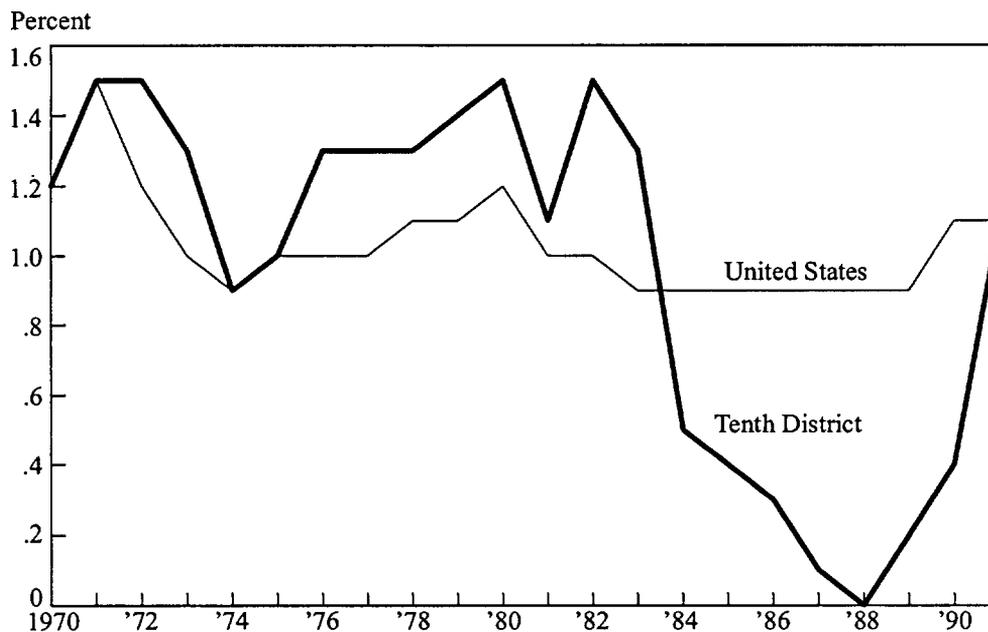
Milton Friedman once observed that despite the central place of elections in our society, the most important vote that people cast is with their feet. Population growth provides one of the most striking pictures of the district over the past two decades (Chart 2). A weak economy in the 1980s led

to a sharp slowdown in the growth of district population. Coming into the 1980s, the district's population was growing about 1.5 percent per year. But as the farm and energy recessions gripped the region's economy, more people started leaving the region. In just two years the region's population growth plummeted to a mere 0.5 percent. By 1988, it was down to zero—a demographic downswing of seismic proportions. Recently, however, population growth has picked up somewhat. Within the district, rural areas have lost population every year since 1983, while its cities have continued to grow, albeit slowly.

#### ***THE DISTRICT'S LONG-TERM GROWTH ASSETS***

The district's long-term growth prospects will

Chart 2  
**Population Growth**



Source: U.S. Bureau of the Census.

be framed by the quantity and quality of its economic assets. These basic ingredients will combine with the unique flavor of the region's leadership to yield tomorrow's growth. The question is, then, how do the region's economic assets look under close inspection? Five growth assets need to be considered: work force, education, infrastructure, fiscal climate, and financial capital. In each case, the asset can be assigned either a plus or a minus for long-term growth. A plus means that it will help the district grow faster than the nation, a minus means it will keep growth below the national rate.

### *Work force*

The district is blessed with an excellent work

force. It is well-educated, productive, and hard working. In its ethnic makeup, it is more homogeneous than the rest of the nation, a feature that is both a plus and a minus. The biggest question may be whether the region's work force will grow fast enough to fuel rapid economic growth.

By standard measures, the district work force is somewhat better educated than the nation as a whole. Seventy-nine percent of the district work force are high school graduates, compared with 77 percent for the nation (U.S. Bureau of the Census 1992). Nearly 22 percent of the district work force are college graduates, compared with about 21 percent for the nation. And district students scored about 1,000 on the SAT exam in 1990, compared with 900 for the nation as a whole (College Entrance Examination Board).

In addition to being well-educated, a relatively high percentage of the available work force is employed. In 1991, 57 percent of the district's population of 18-to-64 year-olds were working, compared with 54 percent for the nation as a whole (U.S. Department of Commerce). The district's participation rate has been higher than the nation's for more than two decades.

The district work force shares nearly the same age profile as the national work force. A bigger difference is found in the ethnic profile of the district's 17 million people. According to the 1990 census, the district has a disproportionate share of whites and native Americans, but is underrepresented by blacks, Hispanics, and Asians. Therefore, the district lacks the ethnic diversity that boosts entrepreneurial energy in regions like the West Coast. At the same time, the district may avoid some of the ethnic strife that is becoming more commonplace in other parts of the country.

Overall, the district's work force is a plus for long-term growth. The productive work force is recognized by business leaders elsewhere in the country. There is room for continued improvement, but compared with many other parts of the country, the quality of the work force is likely to help, not hinder, economic growth.

The quantity of workers, not their quality, may be the constraining factor over the coming years. The district seems destined to have a slowly growing population. The Commerce Department, for example, forecasts that district population will grow by about 0.5 percent a year through the year 2010, just under the national rate of growth. Based on the recent economic record of the region, district population growth could fall short of the nation by a wider margin. If true, such slow growth will act as a soft brake on growth.

It is worth remembering, however, that population growth in the region can change quickly. If the region's leaders can address some of the more pressing constraints to growth, the population problem may take care of itself. If a region builds a strong economy, the workers will usually come.

Despite a concern about population growth, therefore, the district's work force remains a plus for economic growth.

### *Education*

The district's educational system is critical to the region's long-term growth. The K-12 part of the system leaves an indelible imprint on the quality of the work force, and this part of the system appears to be working well in the district. The higher education part of the system shapes the quality of the work force, too. But it also affects the business environment as a fount of ideas and technology for new and existing businesses. In this higher tier, the district shows much less strength. Thus, the district's educational system has both strengths and weaknesses as an asset for long-term growth.

Dollars spent may not be the best yardstick to measure an educational system, but they do provide one reference point. The district spends less per capita on education than the United States as a whole. In 1990, district school boards spent an average of nearly \$4,000 per school-age pupil, compared with \$4,500 in the nation as a whole (U.S. Bureau of the Census 1991). Among district states, per pupil spending ranged from \$5,400 in sparsely settled Wyoming to \$3,400 in Oklahoma. While per capita spending is less in the district, governments in the region devote a bigger share of their budgets to education than elsewhere in the nation. Fully a third of total spending by state and local governments in the district goes to education, compared with only 29 percent for the nation as a whole (U.S. Bureau of the Census 1991).

Despite lower per pupil spending, the district apparently turns out smarter students, on average, and more of its students finish school. The lower spending on education in the district, therefore, may be as much a testament to the skills of the region's educators as it is a question about the miserliness of the district's taxpayers. Overall, elementary and secondary education cannot be

Table 1

**Research and Development Spending at District Universities**

<u>Institution</u>	<u>Rank among public universities</u>	<u>Rank among combined public &amp; private universities</u>	<u>Millions of dollars</u>		
			<u>R&amp;D spending</u>	<u>Federal support</u>	<u>State support</u>
Univ. of Colorado	19	29	155	116	2
Univ. of Missouri	44	65	84	24	13
Univ. of Nebraska	48	71	78	23	27
Colorado State Univ.	53	78	74	51	9
New Mexico State Univ.	54	81	71	55	8
Oklahoma State Univ.	58	85	66	18	3
Univ. of Kansas	64	92	61	27	2
Univ. of Oklahoma	67	95	59	17	4
Univ. of New Mexico	69	97	58	25	5
Kansas State Univ.	71	101	50	16	23
Univ. of Wyoming	100	143	23	12	2
<i>Addenda</i>					
Univ. of Wisconsin	2	4	310	179	52
Univ. of Minnesota	3	7	292	144	47

Note: All information based on 1990 R&D Budgets.

Sources: National Science Foundation 1991, 1992.

neglected in the future, but they are more strength than weakness for the district as a whole.

The region shows much less strength in higher education. District states tend to have a lot of universities, more than the nation on a per capita basis. The district has roughly 3.5 universities per million people, compared with just 2.4 for the nation. At first glance, that seems to be positive for the future.

But on closer inspection, it quickly becomes apparent that the district comes up short in one key aspect—university research and development. University research is critical to long-term economic growth on two grounds. First, it provides the innovation and technology that fuel new businesses. Second, research provides the magnet for

retaining the best and brightest college graduates. Some economists believe that the region's universities are net exporters of college-educated talent to the rest of the country.<sup>2</sup>

Universities in the region are mostly second tier in the scale of their research efforts. Using dollars spent on research and development as a guide, the district has only one of the top 25 public universities in the nation—the University of Colorado (19) (Table 1). Only two others are in the top 50—the University of Missouri (44) and the University of Nebraska (48). Combining public and private universities, the district has only the University of Colorado ranked among the top 50. The district is home to none of the top 50 private research universities.

Why do district institutions lag so far behind? At least part of the answer is that most state governments in the district provide paltry funding for research compared with many states elsewhere in the nation. The University of Colorado built their research program almost totally on federal and private grants; the state of Colorado put up only \$2 million for research in 1990—the smallest state contribution in the district. Only three district institutions receive more than \$10 million a year in state funds.

State funds are not the only way to boost research activity, but they often form a critical base for first-rate research institutions, especially for universities that lack strong ties to industry or endowment funding. The University of Wisconsin, for instance, is the nation's second ranking public university in R&D spending; its research budget is twice the size of Colorado's. The state of Wisconsin invested \$52 million in 1990. The University of Minnesota has the third biggest research program; the state of Minnesota invested \$47 million in 1990.

Is there a strong link between public research and economic development? Economists say yes (Leslie and Slaughter). The evidence seems to support that view, both in this region and elsewhere. For example, the region had 6.6 percent of the nation's new businesses in 1990 (Dun and Bradstreet); and a third of the new businesses in the district started up in Colorado, where the largest and fourth largest of the district's research universities reside. Colorado's scenic amenities are a plus, but even more important to new businesses are ideas.

On balance, education is a slight minus for the district. The district's high schools and institutions of higher learning turn out quality graduates, but its research universities are mostly second tier in size. In an economy where innovation is the fuel of progress, the district's supply of creative energy is scarce.

### *Infrastructure*

A third key asset for long-term growth is in-

frastructure. The district has an extensive array of infrastructure, ranging from roads and airports to fiber-optic networks. The quality of the region's physical infrastructure has slipped during the past decade but is probably not much worse than the rest of the country. A more pressing question may be whether the district has the right kinds of infrastructure to ensure access to the global economy of the 21st century.

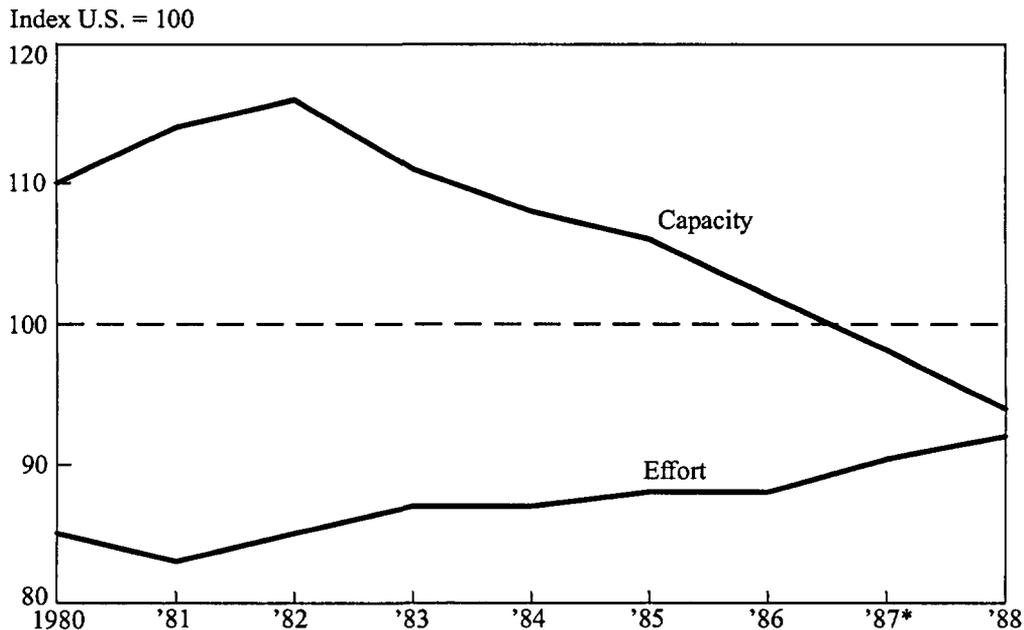
Throughout the past 30 years, the district has generally spent more on infrastructure than the nation, but the rate of investment now appears to be converging. In the district, annual spending on infrastructure has fallen from 2.6 percent of gross state product in 1960 to 1.8 percent in 1990 (U.S. Bureau of the Census 1990). In the nation, meanwhile, the decline has been from 2.2 percent to just under 1.8 percent.

The drop in spending on infrastructure may be causing some problems. For example, the district's roads and bridges are deteriorating. The district has a sixth of the nation's highway miles, but more than two-thirds of those miles are in poor or fair condition (Federal Highway Administration). And more than half the district's bridges are deficient (Walzer and McFadden).

Roads and bridges are vital to the district economy, but a scarcity of public funds is already sparking debate on the type of infrastructure in which to invest. The critical issue is whether the district has systems in place that enable it to access the national and international economies.

Landlocked in the center of the nation, the district has both advantages and disadvantages in terms of market access. The district lies at the nation's crossroads, but that is less and less important in an economy where transactions pass through fiber-optic lines and where growth markets lie beyond the nation's borders. The district lays claim to only one hub airport—Denver. The district is home to some major telecommunications companies, such as U.S. West and Sprint. But in comparison to some other parts of the nation, the district's access to distant markets is probably

Chart 3  
**Tenth District Tax Capacity and Effort**



\* Data not available for 1987.

Source: Advisory Council of Intergovernment Relations, 1990.

less developed.

Overall, infrastructure is a minus for the district's long-term prospects. The road system is extensive but needs improvements. On the more critical issue of market access, the district must run even harder to compete with regions that have more natural advantages in reaching foreign markets.

### *Fiscal climate*

A fourth ingredient for long-term growth is the district's fiscal climate. When businesses choose where to locate, they naturally look for states with low taxes; but they also look for high-quality government services, like education and transportation. Services are especially important for technology and information companies. In fact, some

economists argue that public services have become as important as low taxes in the location decisions of some firms.<sup>3</sup> But to provide more services, governments must raise taxes. The term "fiscal climate" describes the mix of taxes and services that a government chooses.

The economic downturn in the 1980s put a squeeze on the district's fiscal climate (Chart 3). Tax capacity went down in district states. Tax capacity is a broad measure of the resources states can tap to generate taxes, such as income, property, and sales. Tax effort, a corresponding measure of the extent to which a state taxes its available taxable resources, went up as states tried to maintain public services.<sup>4</sup> Historically, the region has been characterized by low taxes and low services. The district has had a lot of untapped taxable resources.

Today, the district remains a low-tax, low-service region. Most district states raised taxes in the 1980s, but that was mostly to maintain existing services. The difference today is that the district's untaxed reserve has evaporated significantly, the victim of a decade of sluggish growth. Every district state lost tax capacity in the 1980s, and the drop was striking in energy-producing states. So, even if state and local governments wanted to offer more services to attract some businesses, they lack the resources to do it. The district still has lower taxes than the nation as a whole, but taxes are higher than a decade ago, and services have improved little if any. State and local spending in the district is lagging well behind the nation, and while some might like to think government is more efficient in the Midwest, the reality is that the district probably offers fewer services than elsewhere.

On balance, the district's fiscal climate is neutral to long-term growth. The district is a low-tax region, a plus for economic growth, all other things equal. But in today's economy, businesses are much more concerned with all the other things. The district must admit to having fewer public services, on average, than other regions. This lack of services is a minus that, depending on the business and industry, may or may not be overcome by low taxes.

### *Financial capital*

The last ingredient for long-term growth is financial capital. Does the district have the capital and the institutions to sustain growth? Following a tough decade, the district has strong financial institutions. But the conservatism born of tough times, though reassuring in light of the nation's banking problems, poses questions about the region's future economic growth. Adding to those questions is the region's relative lack of venture capital.

Commercial banks in the district historically have had lower loan-asset ratios than banks

elsewhere in the nation. Such conservatism has served district bankers well over the past five years as the nation's banks have seen bad loans skyrocket. Nevertheless, two things are worth noting. First, the gap between district and national loan-asset ratios is the widest in more than two decades. Second, the district's loan-asset ratio has generally been on the decline since it peaked in 1984.

The question, of course, is whether the district has the financial resources to fund adequate economic growth. In addition to having more conservative bankers, the district's share of the nation's bank assets has declined. Over the past two decades, the district's share of U.S. bank assets has slipped from more than 6 percent to less than 5.5 percent. Although not large in percentage terms, the decline amounts to \$17 billion, an amount bigger than any commercial bank in the district. In other words, the deposit base from which loans are made appears to be shrinking relative to the rest of the nation.

Another financial asset important to long-term growth is venture capital. Economists agree that venture capital is crucial to many business start-ups (Smith and Fox). The district, as it turns out, commanded only 3 percent of the nation's venture capital placements in 1991. Three-fourths of those placements were in Colorado, a fact that might be filed alongside the discussion over research spending at district universities.

Overall, financial capital appears to be a minus for long-term growth in the district. The district's financial institutions are strong, but they are conservative. Their asset base is not growing as fast as the rest of the nation. And the district has limited venture capital. Other things equal, the region's capital base seems likely to fuel slow, not rapid growth.

### *PLANNING FOR THE DISTRICT'S FUTURE*

Taken together, these five key ingredients for

growth point to a district economy that will grow slower than the nation over the long term. The work force is a plus and the fiscal climate is neutral. But infrastructure, education, and financial capital are minuses. That mix of growth ingredients sums to a solid minus, meaning that the district is likely to grow more slowly than the nation.

The district's growth recipe, however, is not an unwitting concoction of basic ingredients. Also participating in the making of this stew are the chefs—in this case the region's collective set of public and private leaders. If they want to improve the district's growth prospects, a good starting point is to tackle the three principal growth impediments—university research, infrastructure, and capital.

#### *New investments in research*

How can the region bolster research programs at its universities? There are three possible approaches. First, more states in the region could adopt the "Colorado model." Following the University of Colorado example, states might select research niches, invest some additional seed money, and then aggressively leverage the research effort with federal dollars. The district is not without its areas of research expertise. This strategy suggests that such expertise has not been fully exploited for the region's benefit. Some universities, such as Kansas State, receive more research dollars from the state than from federal sources. But federal research dollars are becoming more scarce, so the Colorado approach may offer only limited potential in boosting research.

Second, leaders could combine research programs from across the region into a de facto major league research university. The creative energies of the region's universities have never been collectively harnessed, but under this approach they would be. Duplicate and competitive programs would be eliminated, and a new group of centers of research excellence could take their place. For

example, the University of Nebraska might become the site for a food research center, while deemphasizing its engineering research in favor of a new engineering research center at Kansas State.

To be successful, this approach demands that rival states cooperate. The problem is that neither mechanism nor incentive exists to channel the cooperation needed to create a regional research powerhouse. Can such a mechanism be created? It is worth noting that other regions are making gains in coordinating some development efforts through regional institutions such as the Great Lakes Commission and the Southern Growth Policies Board.

A third approach is consolidation. The region has more universities per capita than the rest of the nation. Some institutions might be eliminated and their teaching loads reassigned. The money left over could be spent to reinvigorate research programs. In a region like the Tenth District, which has a lot of space, new technologies might provide distance learning at lower cost. Notwithstanding the potential economic benefits, consolidation poses thorny political problems. In fact, most boards of regents in the district are debating whether to *add*, not subtract, institutions from their watch.

#### *New investments in infrastructure*

Next, what can be done to upgrade the district's infrastructure? With diminished tax capacity, the district must consider two things. First, it must target selected infrastructure for upgrading. District governments do not have the capacity to upgrade all their roads and bridges, nor to maintain courthouse public services in every county. Moreover, some parts of the district economy will not benefit from infrastructure investment simply because they lack the other assets that make for a viable economy. The Missouri legislature recently passed enabling legislation that proposes to build a four-lane highway to every community of 5,000 people in the state. A four-lane highway by itself will not rejuvenate rural towns whose economic

problems are much more fundamental. A public policy mechanism that disciplines infrastructure investments to those that have a clear payoff is badly needed in a region with public service demands that range from urban centers to the remotest rural areas.

Second, district leaders must consider creating new institutions that better link the region to potential trading partners. The first issue speaks to *where* the region invests, the second speaks to the *type* of investment. Currently, about half of state and local spending in the district goes to highways. Although highways are vital arteries of commerce, should not new types of infrastructure be considered that would tie the region more closely to global markets?

To grow more rapidly in the decades to come, the district must successfully tap the dynamic new markets in the global economy—Asia, Mexico, and Latin America, Eastern Europe, and the former Soviet Union. The region has goods and technology to sell in all of these countries. There may be a role for new institutions that would coordinate the flow of information and assist technology transfer between the region's industries and these developing markets. An example might be a regionwide trade center to coordinate trade and technology transfer in emerging markets.

### *Filling a capital gap*

Finally, how can the district enlarge its pool of capital, the fuel of economic growth? The region appears to have a capital gap. Financial institutions are strong but tend to be conservative, and the district's venture capital market is fragmented at best. Most economists agree that new businesses are the foundation of a growing economy, and new businesses often depend on venture capital for starting up. One solution, therefore, is to consider a way to bolster the district's venture capital insti-

tutions and thereby spur business start-ups.

If improving the region's economic growth is the goal, new institutions for providing public/private venture capital might be one answer. These institutions could be capitalized initially by public and private funds, then operated under independent management for long-run profitability. Kansas Venture Capital, Inc. (KVCII) is one example whose operation and results could be studied more closely. KVCII is a small business investment corporation that was capitalized through matching contributions from Kansas banks and the state of Kansas.

### *CONCLUSIONS*

The district is brewing a recipe for slow economic growth. Its productive work force is a major plus, while low taxes but limited tax capacity make fiscal climate neutral. The district's research universities are second tier in size, raising questions about the flow of innovations to fuel new businesses. The region will need to upgrade its existing infrastructure while also investing in new institutions that put the district in touch with growing foreign markets. Finally, the district has solid financial institutions, but they tend to be conservative and the district lacks a strong venture capital market.

The district is not doomed to this slow growth recipe—the region's public and private leaders can adjust it. It is encouraging that many leaders across the region are giving more thought to new initiatives to boost future growth. But in a region where economic growth trailed the nation for most of the past decade, individual efforts may not be enough. Instead, the best chances of success may come from pooling the efforts of the region's public and private leaders. In that respect, cooperation may prove to be the district's best growth asset of all.

## ENDNOTES

<sup>1</sup> Smith (1989) concludes that "environmental factors" are more important than "discretionary factors" in influencing business location. Environmental factors include such things as labor markets, access to markets, transportation, education, and tax structure. Discretionary factors include such things as tax incentives and direct financial incentives. For additional discussion of the factors that affect the location of economic activity, see Wasylenko (1985) and Wasylenko and McGuire (1985).

<sup>2</sup> At a recent Regional Economic Roundtable held at the Federal Reserve Bank of Kansas City, directors of business research centers in the seven states of the district universally decried the loss of college graduates to other parts of the nation. The loss of college graduates, they believe, will curtail the region's growth in the future.

<sup>3</sup> Helms (1985) concludes that higher state taxes retard economic growth when the tax revenue is used to fund transfer payments. But if the tax revenue is used to fund education or other public services like health or safety, improved economic performance may outweigh the negative influence of the higher tax.

<sup>4</sup> Tax capacity and tax effort are both measured relative to the national average for all 50 states (Advisory Council on Intergovernmental Relations). That is, a tax capacity of 110 means that a state has per capita taxable resources that are 10 percent greater than the average for all 50 states. Correspondingly, a tax capacity of 90 means per capita taxes are 10 percent less than for all 50 states. Tax effort numbers carry the same general meaning.

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