

# the Southwest ECONOMY



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## Price Stability and Economic Growth

**I**nflation in the United States is running around 3 percent a year, the lowest annual rate since the mid-1980s. The rate is so low—especially when compared with those seen in the late 1970s and early 1980s—that many Americans believe inflation is no longer a problem. They believe that other economic problems, such as unemployment, should be the focus of policymakers' attention, at least in the near term. Many studies of the ultimate costs of inflation indirectly support this belief, suggesting we should not be too concerned about the inflation rates the United States has experienced in recent years.

Inflation, however, has adverse effects on economic activity that are difficult to quantify in traditional frameworks. There is a relationship between the rate of inflation and the rate at which the economy grows over time. If the main effect of infla-

tion were simply to lower the level of economic activity without affecting its growth rate, there would be a basis for believing that we can afford to live with inflation at the rates we have recently seen.

However, if inflation lowers the economy's long-term growth rate, we need to take the inflation threat more seriously, since lower long-term growth rates soon produce substantial declines in living standards. If inflation does retard economic growth, it is harder to be complacent about inflation at any rate.

### Production and Exchange

Consider a simple two-way classification of economic activity as either production or exchange. Production is the transformation of raw materials into the various goods and services available to consumers. Exchange, or transaction, activities are those in which firms seek out suppliers and customers seek out products. The business of exchanging goods and services is of little inherent value because it is an intermediate stage—getting goods from the firms that can best produce them to the consumers who most value them. Of course, the fewer resources that have to be devoted to exchange, the more there are available for producing the goods that consumers want.

In a modern industrial economy, exchange takes place through the medium of money at prices that reflect supply and demand. The ability of the price system to coordinate the activities of disparate individuals with conflicting objectives in such a way as to achieve the most efficient allocation of society's scarce resources has been appreciated by economists since the time of Adam Smith. The high standards of living enjoyed by consumers in contemporary free market industrial economies reflect the extensive specialization of labor and efficient allocation of productive resources that has resulted from the use of money to trade goods and services at prices set in free markets. Both the use of money and reliance on free markets are crucial. The experience of socialist economies with centrally planned markets shows that monetary exchange alone is not sufficient. And it is hard to imagine the amount of time that would be spent transacting in a free market economy that did not use money. The famous problem of requiring a "double coincidence of wants" before exchange could take place would prevent society from

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attaining anything more than the most basic standard of living.

A smoothly functioning price system, in conjunction with a stable monetary standard, minimizes the resources that a society has to devote to exchanging goods. Under such circumstances, an increase in the price of a good is an unambiguous signal to producers and consumers. To consumers, a higher price signals the need to economize on purchases of the good. To producers, a higher price signals the need to shift resources into production of the good. Prices are typically quoted in terms of some unit (the unit of account) that is also typically the same unit used to measure the medium of exchange. Thus, in the United States, prices in supermarkets and hourly wages are quoted in dollars, the same unit as that used to measure the money stock.

However, the efficiency of the price system in achieving an efficient allocation of resources comes from its ability to transmit information about relative price changes to those households and firms that most need this information. Relative prices tell us the price of some commodity in terms of some other commodity, and, as such, have units of commodities per commodity (not dollars). For example, if cars cost \$5,000 and pickup trucks cost \$10,000, the relative price of cars in terms of trucks is \$5,000/\$10,000, or one-half. That is, a car is worth half of a truck. If the price of a car increases to \$10,000, the relative price of cars in terms of trucks increases to 1.

### What Causes Inflation

Inflation is always the result of growth in the money stock outstripping growth in the demand for money. Growth in the money stock is primarily determined by the Federal Reserve. Growth in the demand for money is determined by the rate at which the volume of transactions between households, firms and the government grows,

**Table 1**  
Correlation of Inflation with Output Growth and with Productivity Growth:  
G-7 Countries, 1950–88

Country	Correlation with output growth	Correlation with productivity growth
United States	-.31	-.47
Japan	-.10	-.02
Germany	-.37	-.39
France	-.37	-.39
Italy	-.31	-.39
United Kingdom	-.44	-.52
Canada	-.08	-.24

SOURCE: Data are from Robert Summers and Alan Heston (1991), "The Penn World Table (Mark 5): An Expanded Set of International Comparisons, 1950–1988," *Quarterly Journal of Economics*, vol. 106, May, 327–68, and from *International Financial Statistics* (various issues). Data for Germany refer to the former West Germany.

and the opportunity cost of holding money. As such, over the long term, the rate of inflation is under the direct control of policymakers—it is the outcome of decisions on the part of policymakers and not something determined by the vagaries of food or energy prices or the rate at which wages increase.<sup>1</sup>

Inflation is generally defined as a steady and sustained increase in all prices. Increased inflation typically means increased uncertainty. This is because high inflation rates are typically more variable than low inflation rates. High inflation is also typically associated with a greater divergence among people's expectations about the future price level. And inflation raises uncertainty about relative prices.<sup>2</sup>

### How Inflation Disrupts the Price System

Inflation detracts from output in the short run by leading firms and households to spend more time transacting. It does this by disrupting the signals about relative prices that are conveyed through the price system. There are a number of ways in which this happens.

Changing prices is costly since information about new prices needs to be disseminated by sellers, and buyers need to acquire information about the altered prices. Price increases generally come in discrete jumps, because this is less costly

than continuously changing prices as demand and supply conditions change.<sup>3</sup> However, there tends to be a certain degree of asynchronization in when prices are actually changed. As a result, relative prices fluctuate solely on the basis of increased inflation, undermining the information content of price signals. A family visits the supermarket and observes that the price of some item they regularly purchase has increased. In a noninflationary environment, they can unambiguously interpret this price increase as an increase in the relative price of the product and adjust their spending accordingly. However, in an inflationary environment, shoppers can no longer be so sure and need to devote time and energy to figuring out whether it is a temporary increase in relative prices that is simply the result of adjustment to a new higher general price level.

The effect of inflation on the allocation of effort within firms is neatly summarized in the following quote:<sup>4</sup>

Being efficient and competitive at the production and distribution of "real" goods and services becomes less important to the real outcome of socioeconomic activity. Forecasting inflation and coping with its consequences becomes more important. People will reallocate their effort and ingenuity accordingly.

The relative significance of two types of capacity for adaptation to



changing conditions [has] changed. The product designer who can come up with a marginally improved or more attractive product, the production manager who in a good year is capable of increasing the product per man hour by a percent or two, the vice president of sales who might reduce the real cost of distribution by some similar amount, etc., have all become less important to the stable functioning and/or survival of the organizations to which they belong. Other functions requiring different talents have increased in importance: the vice president of finance with a talent for so adjusting the balance sheet as to minimize the real incidence of an unpredictable inflation rate is an example.

### Inflation and Growth

Before discussing the direct effects of inflation on the long-term growth rate, we should note the existence of mechanisms whereby a reduction in productive activity at a point in time can translate into slower growth. Much recent thinking on economic growth suggests that the rate of return to capital accumulation depends on the scale of economic activity. The basic idea is that there may be externalities associated with the investment decisions of firms and individuals; that is, the return to my investment may depend on the investment decisions of all other firms and individuals. Since the rate of return to capital accumulation is a key determinant of how fast an economy grows, factors that lower the level of economic activity at a point in time may also indirectly lower the growth rate.

Output grows over time as more workers are added to the labor force and as each worker becomes more productive. Of these two components of output growth, productivity growth is by far the more important. Productivity growth comes about as a result of improvements in technology and organizations, and in the quality of workers and machines. As already noted, in an inflationary

environment workers and firms devote more time to transacting, which reduces the amount available for acquiring new skills. Inflation also creates an incentive for society as a whole to invest in improvements in the transactions technology to minimize the burden of the inflation tax. Just as we can have too little investment in technological improvements, so too can we have too much. Finally, inflation also disrupts the functioning of capital markets that allocate capital to its most productive uses.

### The Evidence

Table 1 shows the correlation between inflation and real growth for the major industrialized countries, the G-7 group, over the period 1950–88. The countries in this group are the most similar to the United States in terms of their inflation experiences and political and economic institutions. Table 1 shows the correlation between inflation (defined as the annual percentage change in the consumer price index for the country in

question) and two different measures of real growth: growth in output per person and growth in output per worker. The latter is a crude measure of productivity growth. Table 1 shows that inflation is negatively correlated with both output growth and productivity growth for all of these countries.

Table 2 shows the correlations between inflation and output growth and inflation and productivity growth for the other members of the Organization for Economic Cooperation and Development (OECD). Again, in every case the correlations are negative. In other words, for the post–World War II period there is not a single case among the industrialized nations where higher inflation is correlated with higher long-term growth. The same negative relationships are found if we consider even broader groups of countries. For example, numerous studies have shown that high inflation rates retarded output growth in Latin America.<sup>5</sup>

We can obtain further insights into the relationship between inflation and growth by considering

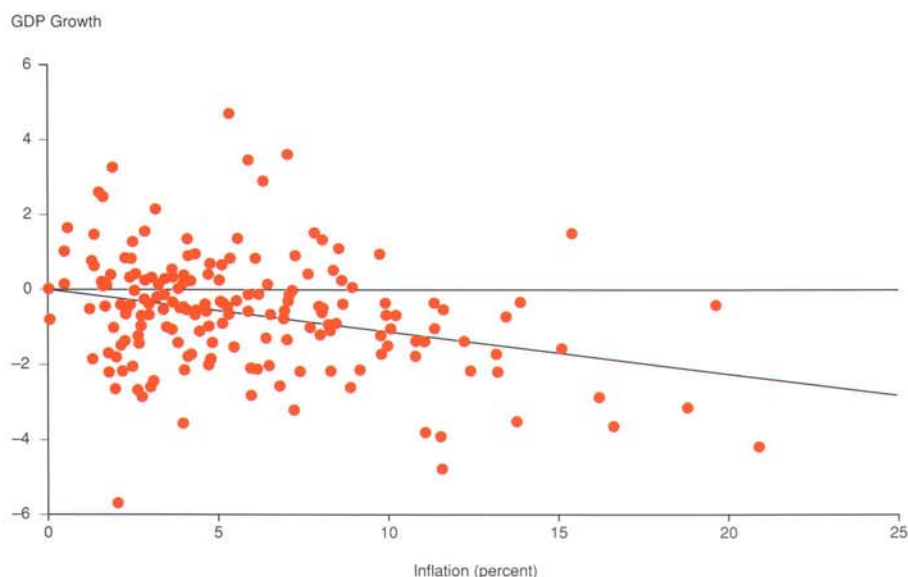
**Table 2**  
Correlation of Inflation with Output Growth and with Productivity Growth:  
Other OECD Countries, 1950–88

Country	Correlation with output growth	Correlation with productivity growth
Australia	-.57	-.59
Austria	-.10	-.14
Belgium	-.24	-.36
Denmark	-.45	-.57
Finland	-.27	-.31
Greece	-.59	-.60
Iceland	-.25	-.33
Ireland	-.30	-.31
Luxembourg	-.30	-.43
Netherlands	-.12	-.19
New Zealand	-.37	-.44
Norway	-.22	-.44
Portugal	-.41	-.62
Spain	-.34	-.34
Sweden	-.54	-.58
Switzerland	-.31	-.26
Turkey	-.21	-.27

SOURCE: Data are from Robert Summers and Alan Heston (1991), "The Penn World Table (Mark 5): An Expanded Set of International Comparisons, 1950–1988," *Quarterly Journal of Economics*, vol. 106, May, 327–68, and from *International Financial Statistics* (various issues). Data for Germany refer to the former West Germany.



**Chart 1**  
Relationship Between the Rate of Growth of GDP per Capita and Inflation:  
22 OECD Countries, 1950–88



average rates of output growth and inflation over successive five-year periods for each OECD country.<sup>6</sup>

Of course, inflation is not the only determinant of cross-country differences in growth rates. The well-known convergence effect suggests that a country's initial level of income is an important determinant of how rapidly it grows over a given time period. Poorer countries tend to grow faster than richer countries as they catch up to the income levels of the richer countries.

Also, the amount a nation as a whole invests (relative to its gross domestic product) will be important in determining its growth rate. For a given level of initial income, the more a country invests as a percentage of its GDP, the faster it will grow over a given time period.

Chart 1 shows the relationship between inflation and growth for the OECD countries after we control for the effects of investment and initial income. There is still a strong negative relationship between the two. Each extra percentage point increase in inflation is associated with a 0.12 percentage point decline in the rate of growth of GDP.

Chart 2 presents evidence on the relationship between inflation and a more precise measure of productiv-

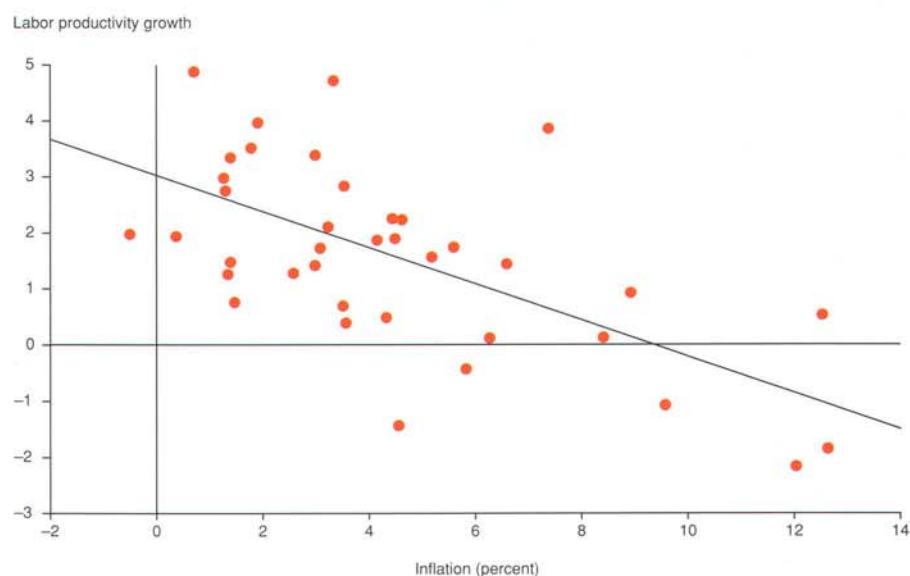
ity for the United States since World War II. Here productivity is measured as output per hour worked, as opposed to output per worker, and so it controls for changes in the length of the average workweek. Furthermore, we only look at productivity in the manufacturing sector, which is somewhat easier to measure than productivity in services. Again, there is a striking negative relationship between inflation and productivity growth. A simple regression of

productivity growth on inflation indicates that each extra percentage point of inflation is associated with a 0.31 percentage point reduction in productivity growth in manufacturing.

There certainly seems to be evidence of a significant negative relationship between inflation and output growth. Can we say anything about the mechanisms that produce this relationship? Specifically, is there any evidence to suggest that the mechanisms discussed earlier are responsible for the negative relationship between inflation and growth?

Unfortunately, it is difficult to measure the size of the transactions sector. Statistics on employment do not typically tell us whether workers are engaged primarily in production of goods for final consumption or in the exchange of those goods. Work that has been done on quantifying the size of the transactions sector has typically made the heroic assumption that all the workers in particular sectors (such as certain branches of government and transportation and communications) ought to be classified as being employed in transaction activities. Nonetheless, it is interesting that this work has also shown that growth in the size of the trans-

**Chart 2**  
Productivity Growth in U.S. Manufacturing and Inflation, 1954–91





actions sector is typically associated with slower productivity growth.<sup>7</sup>

There are two pieces of evidence that higher inflation rates require that more resources be devoted to transaction activities. The first is the scatter of points in Chart 3, which shows the relationship between inflation and output of the banking sector in the United States. A regression line is included for reference. The scatter of points in this chart is consistent with the notion that more resources are devoted to transactions activities as the inflation rate increases. Obviously, a myriad of other factors is also important in determining how fast the banking sector grows. The purpose here is simply to suggest a mechanism whereby inflation may retard growth.

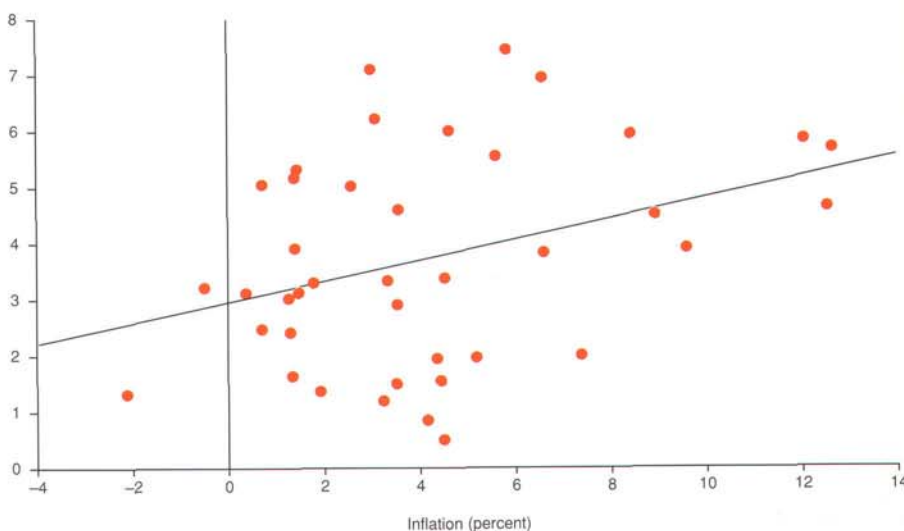
The second piece of evidence relates to the development of futures markets in the United States that accompanied the acceleration of inflation in the 1970s. In a study of how inflation affects the efficient functioning of markets, Dennis Carlton showed that the acceleration in inflation between the 1960s and 1970s was accompanied by an increase in the rate of introduction of new futures contracts on the major U.S. exchanges.<sup>8</sup> He also documented the increase in the volume of futures trading that accompanied the acceleration in inflation. Both of these developments are consistent with the notion that increased inflation leads to more resources being devoted to mitigating the effects of the added uncertainty about the future that accompanies higher inflation rates. In other words, resources are diverted into transactions activities at higher rates of inflation.

## Conclusion

Inflation can lower the long-term rate of output growth. Over the post-World War II period, for the industrial nations as a whole, there is a strong negative relationship between a country's inflation rate and its long-term growth rate. In-

**Chart 3**  
Rate of Growth of U.S. Banking-Sector Output and Inflation, 1952-91

Growth of banking output



flation can lower the long-term rate of output growth because it interferes with the efficient functioning of the price system. Since small differences in growth rates eventually translate into large differences in living standards, it is important to pay attention to factors that may retard a country's growth rate. And inflation, clearly, is among them.

—Mark A. Wynne

<sup>1</sup> As an aside, we might note that there is evidence that countries with independent central banks that are committed to price stability tend to grow faster than countries with central banks that are more subject to political influences and have multiple objectives. For further discussion, see J. Bradford De Long and Lawrence H. Summers (1992), "Macroeconomic Policy and Long-Run Growth," Federal Reserve Bank of Kansas City *Economic Review*, Fourth Quarter, 5-29.

<sup>2</sup> The positive association between inflation and the variability of relative prices has been noted by a number of authors (see, for example, Dwight M. Jaffee and Ephraim Kleiman [1977], "The Welfare Implications of Uneven Inflation," in *Inflation Theory and Anti-Inflation Policy*, Erik Lundberg (ed.) (Bolder, Col.: Westview).

<sup>3</sup> There are, of course, some prices that fluctuate on a day-by-day, hour-by-hour

or even minute-by-minute basis, such as stock prices and exchange rates, but these exceptions are notable by their rarity.

<sup>4</sup> From Axel Leijonhufvud (1977), "The Costs of Inflation," in *The Microeconomic Foundations of Macroeconomics*, Geoffrey C. Harcourt (ed.) (Boulder, Col.: Westview).

<sup>5</sup> See, for example José De Gregorio (1992), "The Effects of Inflation on Economic Growth: Lessons from Latin America," *European Economic Review*, 36 (April): 417-25.

<sup>6</sup> Thus, for each country we calculate the average inflation rate and growth rate from 1950 to 1955, 1955 to 1960, and so on. The last observation for each country is the average rate of growth and average inflation rate from 1985 to 1988.

<sup>7</sup> For example, see Scott M. Fuess and Hendrik van den Berg (1992), "The Impact of Transactions Activities on U.S. Productivity Growth," *Economics Letters*, vol. 38, 243-47.

<sup>8</sup> Dennis W. Carlton (1982), "The Disruptive Effect of Inflation on the Organization of Markets," in *Inflation: Causes and Effects*, Robert E. Hall (ed.) (Chicago: University of Chicago Press).