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INFLATION

INFLATION: CAUSES AND EFFECTS

(By Barbara B. Reagan, Professor of Economics, Southern Methodist University)

Public discussion of inflation is often almost hopelessly confused, and much is hysterically pitched. As economic leaders, I hope you will seek clarity in understanding, hope in approaching solutions, and sanity in the face of unwarranted worry. The real issues are bad enough without exaggeration.

I have been asked to summarize the causes of inflation and the effects of inflation.

I am going to stress the points on which many economists agree,[1] and not take time to explore controversies. You may want to stop me right here, because according to many journalists, everyone knows that there are as many views as there are economists. Clearly we economists know less than we wish we knew, but we agree on much. A recent survey of economists in academia, business, and government showed widespread agreement on microeconomic issues involving the price mechanism and less agreement on macro issues, especially normative prescriptions on what ought to be done currently. The survey found that the questions of greatest interest today for those outside the profession are also those on which there is less agreement among economists (J. R. Kearl, et al.). They are also questions on which much current work is being done.

DEFINITION OF INFLATION

Pure inflation would be a substantial, sustained rise in the general price level with all prices staying in the same relationship to each other. This, of course, does not occur in the real world.

More realistically, inflation is a substantial rate of sustained increase in the general price level. The general price level can be measured by the Consumer's Price Index (CPI) or better by the implicit price deflator for GNP, which allows for shifts in the mix of products produced.[2]

Some price increases are not inflationary, but along with price decreases are merely a normal part of the workings of a market system. For example, prices go up so as to allocate reduced supplies following a crop failure. Or if aggregate demand is increasing as the economy moves upward from underutilized resources, then prices would go up

[1] Because of the vastness of recent literature, this is necessarily a selective approach; the books and articles on which the summary is based are listed at the end. I am concentrating on domestic causes and effects of inflation.

[2] The choice of a particular price index may involve overstatement of inflation rates depending on whether prices measured include taxes, whether the price of government services is included, and how new products and technical improvement of quality are handled. Such problems are not discussed here.

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in the sectors of increased demand for labor and goods. Neither of these cases constitute inflation. These price changes are self-limiting as the economy moves to a new equilibrium, and they signal changes in uses which are needed for economic efficiency. Thus, not all price increases equal inflation, only the sustained rise in the overall index used, which describes the terms on which a representative bundle of goods and services exchange for money.

Consider the 18 months, for example, from the beginning of 1973 to mid-1974, when the CPI rose by 16 percent. At the same time, its food component rose 25 percent. The dollar declined about 10 percent against other major currencies. This made imported goods more expensive for us, relative to our domestically produced goods. The price of oil and oil products rose sharply in response to the monopolistic restrictions of OPEC. Prices of natural resources other than food and fuel also rose. These above average changes in food, fuel, and raw material prices coupled with the relative rise in the price of imports made the inflation rate of about 16 percent feel worse to the large working and middle class in the urban industrial centers. At that time, wage rates had not increased as much as prices. Profits, on the other hand, had been rising, but the stock market behavior was dismal. Robert Solow notes that even if these relative price changes had taken place around a stable price level (that is with no inflation at all), the large group of nonfarmers, nonoil millionaires, nonforeigners would have still been very unhappy (Solow, p. 52).

Subsequently, medical service costs outstripped the general rate of inflation. These increases have involved market responses to increased demand for services, prevailing methods of payment for medical services, and continued shortage of medical practitioners. Furthermore, building materials are in short supply related to demand, and demand seems to be escalating.

As will be seen subsequently, sharp changes in relative prices that are greater than the general inflation rate can themselves contribute to further increases in the overall rate of inflation.

Our definition of inflation is not complete without noting that economists need to differentiate between the longrun and the shortrun equilibrium rate of inflation. A somewhat imprecise way of looking at the longrun equilibrium rate of inflation, but still a useful way, is to think of the longrun inflation rate as the average rate over a long time period.

A relevant distinction between longrun and shortrun inflation is to differentiate between inflation that is foreseen and taken into account in economic transactions and thus in the long run is perfectly anticipated, and in the short run, unexpected or imperfectly anticipated inflation. An important reason for the present strong public aversion to inflation is that inflation has been of the latter type; the inflation rate has not been steady and has not been fully anticipated.

CAUSES OF INFLATION

Long run

In the long run, inflation is caused by increases in the money supply. Consider a longrun view of an economy with some growth in output. The growth increases the demand for real money.[3] The average rate

[3] Money in dollars of constant purchasing power.

of inflation over a long period of time, is related to the growth in the nominal[4] money supply that exceeds the growth in real money demand. The higher the growth rate of the nominal money supply, the higher the rate of inflation. On the other hand, the faster the growth rate of output and the more real money demand rises with the growth of output, the lower the inflation rate. In the longrun position, the rate of growth of output is equal to the potential rate of growth at full employment,[5] and the rate of inflation is approximately equal to the difference between the rate of growth of output and the rate of growth of money stock.

A variety of economic and noneconomic factors can affect monetary growth allowed by governments. Too much money tends to be created when increased marginal benefits of government expenditures call for a spending increase that is best financed by taxation and inflation, as during a war, or when pressure groups negotiate increases in wages or other costs which will raise substantially the unemployment rate if not accommodated by more rapid creation of money. The accommodating monetary policy of governments around the world—namely, the supply of inflation—depends on potential loss of votes in future elections (Gordon, p. 198).

The present time preference of politicians for intermediate or near-term effects instead of longrun solutions leads us into the shortrun causes of inflation.

Short run

In the short run, other factors causing inflation have to be added to changes in the money supply—fiscal policy, expectations of inflation, supply shocks, and the levels of output, income, and unemployment in the previous time period. Of course, last year's factors cannot be changed by policymakers today.

It is the persistent effects of the lagged output, income, and unemployment plus the slow changes in the expected rate of inflation which make it difficult to reduce inflation without affecting unemployment adversely.

In the short run, the rate of inflation and the level of output depend among other factors on aggregate demand and supply.

Demand side.—On the demand side, increases in inflation rates are caused by increases in growth rate of money, increases in the full-employment budget deficit, and increases in previous output, income, and employment. If policymakers want to reduce inflation by affecting the first two of these variables by tight monetary and fiscal policies, such policies will tend to reduce output and the level of income as well. It should be noted that the resulting shortrun change in inflation is less than the change in the growth of the money supply.[6] Thus, the correspondence between the money supply and the rate of inflation is weaker in the short run than in the long run.

Changes in the Federal budget are a major factor on the demand side. Such changes are affected, of course, by Government expenditures and tax policy. Escalation of the current inflation occurred in 1968 when the Federal deficit jumped from the previous year's $8

[4] In current dollars.

[5] Full employment output is the output produced when unemployment is at the natural rate.

[6] Aggregate demand rises because money in real purchasing power terms (i.e., real balance) has increased; it has increased because nominal money stocks have increased more rapidly than the price level.

billion to $25 billion at a time when unemployment was below 4 percent. This deficit was incurred over the protests of economists, when we tried to finance the Vietnam war without raising taxes.

Recent fiscal policy has been affected by the need to compensate for large income leakages in the U.S. economy through foreign trade and buildup of State-local government surpluses.

Tax cuts without changes in Government expenditures are generally thought to be inflation producing. In the recent tax debate, it has been noted that a modest tax cut of the appropriate type can fight inflation by easing pressures for wage increases and encouraging investment, thus lowering costs and increasing supply. Tax relief, for example, might be used to encourage more private research and development spending, and thus relieve some of the Federal spending for research. Inflation is intensified by a slowdown in productivity, such as the drag that accompanies the heavy capital investment now required to meet environmental, health, and safety goals. Tax relief in such cases might have more effect on the supply side than on the demand side.

Inflation can be caused by an excess of aggregate demand that is larger than our economic capacity to produce, but our current problem is the far more intractable one when inflation occurs with underutilized resources.

Supply side.—On the supply side, the actual rate of inflation depends on the expected rate of inflation, the state of the labor market, and supply shocks, an important phenomenon in the 1970's.

The role of expectations of future inflation on the supply side needs to be emphasized. Nominal wages adjust downward slowly as unemployment increases, but they rise with expectations of inflation. Both workers and firms think in terms of real wages. Firms are willing to pay the higher wages that workers feel they need to stay up with inflation because firms expect to be able to pass the increases on to consumers in the price inflation they expect. The higher the rate of inflation expected, the higher the actual rate of inflation tends to be.

The state of the labor market, which includes inflationary expectations,[7] also affects the current inflation rate because increase in unemployment and decrease in level of output occur together.[8]

A level of output below what could be produced at full employment (GNP gap) can involve an actual inflation rate lower than the expected rate of inflation. How much lower depends on the sensitivity of money wages to unemployment and how much unemployment reacts to changes in output. It is the slope of the aggregate supply curve that expresses how much decrease in inflation follows from a decrease in output and employment in the short run, or conversely, how much more inflation comes from an increase in output and decrease in unemployment.

Supply shocks (such as the largely external increase in materials' prices in 1973–74 due to the oil embargo, or increases in wage disturbances, excise taxes, and payroll taxes) shift the aggregate supply

[7] The relation between inflation, expected inflation, and the difference between the unemployment rate and the natural rate of unemployment is incorporated into the expectations-augmented Phillips curve. Decreases in unemployment are accompanied by increases in labor force participation, and changes in overtime and productivity of labor.

[8] The well-known Okun law is that the short run, for every 1 percent decrease in unemployment above the natural rate of unemployment (which was taken in the 1960's to be 4 percent), there is a 3-percent GNP gap (output is below what could be produced at full employment).

curve in the short run. A sudden increase in Government regulations ordering desired action rather than using economic incentives to obtain it is also a supply shock. The result is decreased production and more inflation.

In the 1970's, one of the factors causing substantial increases in unemployment in response to the largely ineffective attempts to reduce inflation through restrictive monetary policy has been the slowness with which inflation expectations were reduced. The expectation of inflation caused wages and prices to rise, and unemployment did not dampen wage agreements enough to restore full employment (Dornbusch and Fischer, pp. 408–410).

Equilibrium solution.—The shortrun rate of inflation and level of output are determined by the interaction of aggregate demand and supply curves. If the expected rate of inflation increases, the aggregate supply curve shifts upward, producing higher inflation and reduced output. Increases in money supply, changes in the full-employment budget surplus, and increases in the previous year's level of output shift the aggregate demand curve upward, thus increasing both inflation and output in the short run.

The shortrun equilibrium is linked with the long run in a dynamic adjustment process. The details of the adjustment process depend on the way expectations are formed. Expectations of future inflation can be based simply on recent experience, or they can be based on the anticipated growth in the money stock. Consider, for example, the adjustment path to a new longrun equilibrium after a disturbance in the rate of monetary growth [9] under the simple assumption that expectations of future inflation are based on the rate experienced the past year. The path can be visualized as a curling movement so that the rate of inflation is sometimes higher and sometimes lower than the longrun equilibrium rate it is approaching. There are times that output decreases when the inflation rate increases; namely, stagflation.

If expectations of inflation are based on the growth of the money supply, then adjustment to growth in money would move in one period to the longrun equilibrium. In such cases the expectations turn out to be correct (rational expectations), growth in money supply was translated into inflation, and neither the growth rate of the output nor the unemployment rate is affected. If, however, wage and price adjustments are recognized as sluggish, then the adjustment process differs, and output is affected even with rational expectations.

Implication of model.—The model sketched here suggests that modern advanced societies operating at near full employment have entrenched expectations of inflation and thus an inflationary bias. In contrast to the good old days when wars heated up economies but recessions actually reduced prices, now economies begin to inflate before there are signs of excess pressure. The revision of prices downward requires longer and deeper recessions than seem bearable. In prior periods, the ordinary citizen had a deeper fear of recession and unemployment than today. Now we have numerous built-in, countercyclical programs to ameliorate the downside of the cycle. We have a national policy of full employment. Politicians, of course, fear reces-

[9] Other changes such as fiscal policy are not covered here.

sion. No democratic government could survive if it permitted a major recession of the kind that used to occur. The typical citizen does not feel that a prolonged depression is likely. If it is expected that any recession will be brief, there is less tendency of business to reduce prices when markets soften because it is thought the markets will improve soon. When mass unemployment is unlikely, workers keep up the pressure for higher wages with more confidence. Furthermore, there is less temptation for business to resist the high wage pressure (organized or unorganized) if prices are being maintained or even raised, and if production will soon need to be increased (Solow, pp. 57–61).

As a result, prices are sticky on the downside.[10] We have earlier noted that relative prices must change to reflect changes in supply, demand, or technology. If prices seldom fall, then normal market forces will set up a tendency for the price level to float upward. Such an inflationary episode might well be self-limiting, but another change in supply, technology, or demand would set off another upward drift.

A closely related reason for the resistance of prices on the downside is the pricing practices of oligopolistic industries. Economic concentration, particularly oligopolies, helps create inflation. Profit goals are set and tend to be maintained even as wage and energy costs increase. Special interest groups that want protection from the competition of the marketplace also contribute to sticky prices, and thus to inflation. The central core of industry is not very competitive, and response is not sensitive to changes in aggregate demand. Sometimes business even says it has to increase prices when aggregate demand decreases because overhead per unit is up.

Another related cause of inflation is the strong tendency for the pattern of wage differentials by skill level, by occupation, by industry to be maintained. Whenever one segment of the labor force gets ahead and disrupts the usual pattern, other workers try to restore the traditional differentials. This obviously occurs only at higher and higher wage levels, and subsequently higher price levels.

These explanations merge into the mainspring of inflation, that is the price-wage spiral by which each private group attempts to protect its own interests by passing on higher costs.

EFFECTS OF INFLATION

Unanticipated inflation increases uncertainty and makes planning by business, families, and government difficult. It may inhibit long-run risk taking. Inflation redistributes income so that some people win and some lose, but there is less agreement on how much.

Understanding of who is getting hurt is important before considering remedies. We must also understand how much of the hurt is a real cost of inflation. Economic leaders such as you must recognize the smokescreen of inflation complaints behind which the real goal is to flagellate favorite whipping boys, be they the opposite political party, the envied rich, the hated unions, the feared monopoly or oligopoly, greedy processors, the ever-threatening and burgeoning bureaucracy, or ———— (you fill in the name of your favorite demon).

[10] Product diversity and costs of getting information contribute to sluggish product prices; job and worker diversity, costs of getting information, and long-term contracts contribute to sluggish wage adjustments.

This is too important an issue to us all to permit diversionary games.

Before selecting remedies, the marginal benefits to be gained from reducing the impacts of inflation must be weighed against the cost of successive increments of the inflation-curing medicine. Only if the marginal benefit from another spoonful of the medicine outweighs the bad taste and adverse side effects, should the additional medicine be prescribed. For example, in my opinion, the cure sometimes proposed of "biting the bullet" and inflicting recession, low production, and high unemployment long enough to change people's expectations and to make prices and wages more flexible downward is too costly. Similarly, the cost in economic efficiency lost, if rigid price controls were to be established, is too great at this time.

There may well be effective ways to decrease the losses due to uncertainty about inflation,[11] and make a moderate upward drift of the overall price level at a constant rate easier to live with. As a basis for such thinking, we must be clear as to what the effects of inflation are and which societal groups are most impacted. To do this, we must differentiate between the long run and the short run, between the effects of perfectly anticipated inflation and unexpected or imperfectly anticipated inflation.

Perfectly anticipated inflation.—If an economy has been having a given rate of inflation, say 6 percent, for a long time and if it is correctly expected that the rate of inflation will continue to be 6 percent, inflation has few real costs. The primary cost of the perfectly anticipated inflation is the cost of holding currency,[12] and even this is minor. In an economy with rational expectations, nominal interest rates will have been adjusted upward by the expected rate of inflation. Interest will be paid on demand deposits. Long-term wage contracts and leases will have taken the rate of inflation into account. Tax laws will have been indexed.

If in such an economy, people attribute their gains in wages and salaries to their own endeavors instead of seeing wage increases as merely partial cost-of-living increase, they feel they are getting ahead because of merit. Then when prices go up, they feel they have been injured because their real income didn't increase. Illusion such as this undoubtedly contributes to the general aversion to inflation and to a crisis of spirit.

Imperfectly anticipated inflation.—In reality, only small adjustments have been made in this country for inflation. (Two of the more important are adjustment of social security payments and Federal retirement benefits to changes in the price level.) The rate of inflation has not been correctly anticipated. Sharp changes in prices due to supply shocks exacerbate the uncertainty from inadequately anticipated inflation. They make long-range planning extremely difficult and require major adjustments to new cost situations. When inflation is imperfectly anticipated, the distributional effects of inflation must be considered.

The major effect of inflation is that savings and investments are undermined. Substantial inflation largely wipes out or severely weakens family financial planning and saving for retirement undertaken for many years by families in middle age or nearing retirement.

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[11] Bonds that pay a stipulated *real* rate of interest, or indexing of the personal income tax so that inflation does not raise the effective rate have been suggested.

[12] The cost of holding currency is the income foregone by not holding an interest-bearing asset.

However, the low-income retired who live only on social security are not adversely affected when social security payments are indexed.

A major effect of inflation is to change the real value of assets fixed in money terms—money per se, bonds, savings accounts, insurance, and many pension plans. This shifts wealth from creditors (savers) to debtors. However, many people are both creditors and debtors. While they lose as creditors, they gain as debtors. If they own housing and are paying on mortgages, or if they have bought consumer durables—cars, household appliances, furniture—on credit, their real indebtedness is reduced by inflation as they pay with dollars of reduced purchasing power, and they have gained from inflation. To generalize, if a family has monetary assets exceeding debts, it loses. This is more apt to be true of established families on into retirement. If a family has more monetary liabilities than monetary assets, it gains. This is more apt to be true of younger families. The savings held in monetary form lose value only when inflation is not fully anticipated.

In general, wages tend to be bid up during an inflation. Real average hourly earnings adjusted for overtime in private nonagricultural industries were 5 percent higher in 1977 than in 1970 (Council, p. 298). In the postwar period evidence does not suggest that prices have gone up faster than wages allowing profits to expand. On the average, real wages are not greatly affected by inflation, although some workers may gain, and others lose.

Households in the economy are the major sector in a net creditor position and thus are the most vulnerable to inflation. The Government is the major monetary debtor with nonfinancial corporations the second largest monetary debtor group, and thus these could be major gainers. What actually occurs depends on whether any or all of the inflation was anticipated. Some of this may translate losses of families today to gains for future generations.

Inflation also pushes people into higher nominal Federal income tax brackets, and without indexing of tax rates, their real disposable income is reduced. This is the same result as if a tax rate increase had been voted.

Interest rates reflect partial adaptation to anticipated inflation. Lenders will seek higher nominal rates so as to receive real payments in the future as if prices had been stable. Although interest recipients at first look like gainers from inflation, the balance sheet effects, particularly taxes, result in a loss when inflation is greater than savers expected when they bought bonds or put money in the bank. Stockholders are also losers. There is evidence that unanticipated inflation has reduced the real return on common stocks, both in dividends and capital gains on equity.

As already noted, social security benefits and Government retirement benefits are indexed and thus follow prices with a lag. Supplemental security income (aid to blind, disabled, and aged) and food stamps are also indexed. State welfare payments vary as to how closely they are revised upward as prices inflate.

Property income such as rental income has lagged behind price increases. Private pension plan benefits nearly always are fixed in money terms and are not increased to adapt to inflation.

The redistributive effects of unanticipated inflation appear to be large. A composite analysis is needed to get at the cross effects of

various components. One recent suggestive analysis from Brookings does this using a simulated inflation and using two income measures (Minarik). The shift in income measures alters the findings sharply for the upper income families. The income measures used are first, the current cash income of the household as defined by the Census Bureau, and second, a more comprehensive concept of income including income in kind, taxes, and balance sheet changes such as appreciation in value of home and depreciation in the cash value of bonds.

The inflation rate considered varies in several ways. For example, the effects of inflation are simulated when the 1970 data base is adjusted from an inflation rate of 5.9 percent to a 7.9 percent rate of inflation (i.e., a 1-year increment in the rate of inflation of 2 points). Another time, the inflation rate after the 2 point increment is assumed to have been sustained for 5 successive years.

The results for average low-income and middle-income families vary little with the income measure used or the types of inflation assumed. (Of course, around an average, some gain and some lose even though the average does not change.) The Minarik study finds that—

Families with incomes under $10,000 have their real income reduced less than 1 percent or on the sustained basis, less than 2 percent. The reduction is primarily caused by lags in adjusting transfer payments.

Middle-income families ($10,000–$25,000) are affected little or not at all by inflation. Most of their income is from wages and salaries, which tend to increase as prices inflate. Homeowners paying their fixed mortgage payments benefit from inflation, but this is offset by upward adjustment of income taxes.

The upper income groups (above $25,000) gain or lose from inflation according to the income measurement concept used and type of inflation assumed, as follows:

A. Cash income (Census definition):

1. The first year that the inflation rate increases by 2 points, interest rate income increases and upper income families gain by about 1 percent of real income.

2. By the sixth year of the sustained inflation at the higher level, the lag in dividends overcomes the gain in interest, and there is a net loss of real cash income up to about 2 percent.

B. Accrued comprehensive income:

When the more comprehensive concept of income which includes balance sheet effects is considered, the results are dramatically different, and upper income families suffer sizable losses. Income tax increases, lagging corporate retained earnings, and depreciation of the face value of interest-bearing securities are the major sources of loss.

The above findings are for the average effects of inflation for various income groups. When the income groups are subdivided into households whose heads are over age 65 and all others, the adverse effects of inflation on the elderly are shown. A 1-year inflation increment of 2 points lowers the comprehensive real income of the elderly up to about 10 percent at income levels under $100,000. This is because most of their income is from property. At high incomes above $100,000, elderly and nonelderly alike suffer from 10 to 18 percent loss up to $400,000 incomes. Age there makes no difference because most income is from property regardless of age (Minarik, p. 9).

In summary, low-income families as a group fare fairly well in inflation on the average except the elderly who have only private pensions or the elderly who have retirement income other than social security. Besides the elderly, those most hurt by inflation are the upper income recipients.

A social pessimist would end a summary of the effects of inflation by warning that unanticipated inflation results in intense conflict among economic groups. This can lead to a crisis in economic management, loss of faith in government, and catastrophic social disintegration. Some authoritarian form of government would result, not necessarily able to control inflation, but able to suppress objectors.

As a social optimist, I take a contrary path. I have faith in the flexibility of our institutions and our ability to invent new institutions if need be to agree upon national priorities, to follow a price-income policy, to stop intense inflation, and to accommodate to gentle inflation.

PARAMETERS FOR SOLUTIONS

This summary sets the stage for considering solutions and discussing issues. In my view, the general parameters of the solutions must be as follows:

1. The marginal benefit of the solutions must outweigh the marginal cost.
2. Solutions must impact steadily without stop-go shocks.
3. Enough time must be allowed so that the results of the policy can be seen. As economic leaders, you must counsel patience.
4. We must seek ways to achieve consensus planning. We must accept a pattern of action and then all work hard to make it succeed. I again call your attention to the role of expectations.
5. The solutions must be diverse and must be targeted to increase price stability or to ameliorate the adverse effects of inflation we can't avoid.

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