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Chapter One

The Standard Theory up to the Mid-1960s

The rapid inflation since the mid-1960s has subjected financial markets to a series of unsettling disturbances. Interest rates rose to high levels and fluctuated widely with swings in monetary policy. The purchasing power of outstanding securities depreciated, there were major changes in financial practices, and investors struggled to protect portfolios against inflation. Before the mid-1960s the United States had little experience with high inflation rates except in wartime. The events of the past decade have tested the standard theory of the effects of inflation developed over the years in economic literature, conforming to parts of the theory but also exhibiting important departures. This book discusses, first, the main propositions of the standard theory and, second, the nonconforming events since the mid-1960s which have led to modifications and extensions of the theory and have raised additional theoretical and empirical questions not yet answered.

A large part of the literature on the effects of inflation is devoted to analyzing the response of the economy to a depreciation in the purchasing power of money and financial assets. Inflation is viewed as imposing a tax on money balances and other assets fixed in dollar value and is often likened to an excise tax on a commodity.[1] Although exceptions can be found, the uniform approach of most of this literature warrants designation as the standard theory of the effects of inflation on the economy.[2] When inflation escalated in the mid-1960s, this theory provided the only organized set of ideas on the subject applicable to the United States. Until its limitations became apparent in recent years, financial managers and analysts drew on it extensively for guidance in the inflationary environment

that was so new to them. We outline the main propositions of the standard theory for comparison with recent developments in the economy and in economic theory. Inflation for our purposes means a rise in a general index of all prices causing depreciation in the purchasing power of a dollar.

THE DISTINCTION BETWEEN UNANTICIPATED AND ANTICIPATED INFLATION

Depreciation in the real value of money and other financial assets redistributes wealth and income and affects economic behavior. In analyzing the effect on behavior, the standard theory stresses a distinction between unanticipated and anticipated inflation. If inflation is unanticipated, dollar prices fixed by contract do not compensate for the subsequent decline in real value of the dollar. If inflation is anticipated, contract prices are set at the time of negotiation in such a way as to allow for the anticipated depreciation in real value or are adjusted during the period of the contract according to some index of inflation. A "complete" adjustment, if accurate, succeeds in keeping the real value unchanged during inflation, and financial decisions based on real values are not affected. These basic propositions of the standard theory, with due allowance for prevailing institutional practices, can account for many of the observed effects of inflation.

To explain these effects, the literature focuses on the question, Who gains and who loses from inflation, and what do they do about it?

When inflation is unanticipated, the answer to the first part of the question is fairly clear. Holders of money and other fixed-dollar financial instruments lose purchasing power. The gains accrue to the issuers of those assets—the government, which issues money and securities, and business firms, which issue bonds and other market instruments—while there will also be indirect gains to owners or beneficiaries of these firms. Financial intermediaries are not supposed to be much affected, since their assets and liabilities are both largely fixed in dollar terms.[3] Households gain insofar as they are borrowers, but the household sector as a whole is a net creditor to other sectors.

When inflation proceeds with all prices rising proportionately, *relative* prices are unchanged, and the allocation of income and resources is not altered. But proportional increases in prices are not the rule, of course, and different sectors of the economy gain or lose depending upon the pattern of relative price changes. It was once

widely believed that wages lag behind output prices in inflation, redistributing national income from wages to profits[4] and thus providing a stimulus to business saving and investment. Wages do exhibit a slow response to accelerations and decelerations of inflation,[5] but studies that have reexamined this question do not find a systematic shift between labor and business income due to inflation.[6] Because no firm evidence exists of systematic lags in wages or any other group of prices, such lags have not played a part in the standard theory.

Although nonfinancial businesses are now thought *not* to gain from a wage lag, most of them are net debtors in their fixed-dollar contracts and in that respect gain from unanticipated inflation. Capital gains and wage lags aside, however, the standard theory supposes that inflation is largely neutral for the relation between output prices and costs. Such neutrality underlies the traditional view that business equity will remain intact during inflation and that common stocks will rise in dollar value more or less in proportion to the general price level. (The inadequacy of this presumption is discussed later.)

What are the effects of gains and losses from unanticipated inflation? Gains and losses within the private economy as a whole largely cancel each other, since they differ only by the net amount of claims on the government and foreigners. Some groups will lose, however, and they may want to make up the reduction in their real net worth by saving more. Nevertheless, an increase in saving by one sector is no guarantee that aggregate saving will increase. A redistribution of real income due to inflation will not affect the aggregate rate of consumption and saving in the economy unless the gainers and losers save at different rates from marginal changes in income. There is usually little basis for concluding that any such differences work one way or the other. It is sometimes thought that, if the initial gainers were businesses, they might retain part of the gains for internal expansion, in which case aggregate saving and investment in the economy would rise. That is one of the main reasons behind the once popular view, now widely doubted, that inflation fosters capital investment and economic growth. The trouble with such an argument is that other outcomes are equally conceivable. Unless the owners (stockholders) desire the implicit increase in the saving done for them by their businesses through increases in retained earnings and capital investment, they would reduce their saving in other forms to offset it.

In the initial stages of an inflation, those who recognize it can try to escape the consequences of a depreciation in the real value of

money and other fixed-dollar assets. They can shift accumulated holdings and new acquisitions away from assets for which the real rates of return would be lowered by inflation. The shift would continue until real returns, pecuniary and nonpecuniary, of all holdings were equal on the margin. The standard theory envisages a transition period in which the adjustments are undertaken and then a final equilibrium position when the adjustments have been completed. The transition period could be rapid, or it could be drawn out if anticipations of inflation form slowly or if adjustments are delayed by institutional constraints such as long contracts and laws against usury.

Most of the attention devoted to these adjustments has focused on the demand for real money balances. In the theory, these adjustments to anticipated inflation reduce real money balances and thereby increase their marginal convenience yield until it equals the higher anticipated cost of holding money. The reduction in real balances is accomplished by a one-time increase in the price level resulting from an increase in aggregate expenditures and upward pressure on prices as the public offers unwanted balances in bidding for other goods and assets. A rise in prices to a new higher trend path can reduce real money balances by the desired amount. After the transition to the new trend path, prices continue rising at a rate that, given the growth rate of the money stock, keeps real money balances on their desired path. In all but severe inflations, however, the amount of the initial adjustment in real balances to a new trend path appears to be small.

The shift in demand away from money balances will initially be directed toward goods that are expected to maintain their real value during inflation and can also serve as partial substitutes for the store-of-value function of money. Such goods are real estate, physical capital including durable consumer goods, and basic commodities subject to minor physical depreciation. At first during the transition period, the demand for these goods will increase, and their relative prices will rise. The changes in relative prices elicit responses on the supply side. If supplies of these goods are elastic, production will expand, eventually pulling their relative prices back to their long-run relative costs of production.[7] The main exception is land, which is fixed in quantity (aside from the fact that it can be upgraded). The total value of the outstanding stocks of assets that substitute for money will remain higher in the final equilibrium through a combination of price and quantity increases, largely replacing the amount of real money balances eliminated from the public's holdings. The real quantity of money is largely determined by the public, given the

nominal amount supplied by the monetary authorities. In the standard theory, common stocks play the same role as physical assets, reflecting a presumption that real business profits will not be affected by inflation. If the public shifts from money to common stocks, the theoretical consequences for long-run equilibrium are the same as for other assets. The price of stocks in real terms will rise. To the extent that corporations find the higher price of stocks attractive compared with other forms of financing and therefore issue more shares, the price will fall back, and the increased total real value outstanding will reflect mainly a larger "quantity" of stocks (number of shares), with the real value per share largely unchanged. There are numerous qualifications to this theoretical outcome, particularly due to taxes, but we ignore them here. The main point for present purposes is that desired shifts in asset holdings by the public produce corresponding, though not necessarily equal, shifts in supply.

Since the reduction in real money balances due to anticipated inflation is estimated to be slight for moderate rates of inflation, the resulting shift in demand to any given group of other assets will be quite small, perhaps undetectable in the data. The potential source of major shifts to other assets resides instead in the large amount of outstanding financial assets fixed in dollar terms. According to the standard theory, the effect of inflation on these holdings is different from that on money balances. Unlike money, on which the pecuniary rate of return is taken to be zero,[8] financial assets pay interest, and the interest rate can rise to compensate for the anticipated rate of inflation. An anticipated depreciation in the real value of outstanding fixed-dollar financial assets leads to an initial shift by buyers away from such assets. Consequently, their prices fall, and their nominal yields therefore rise. The result is a higher coupon rate than before on new issues. Any differences among various assets in real return to holders could be only a transitional phenomenon, except possibly for changes in risk or uncertainty, which are ignored in this analysis.

The effect of inflation on interest rates was studied at the turn of the century by Irving Fisher,[9] and his findings have come to be called the "Fisher effect." It is clearly a powerful force at work in inflationary economies. Nominal interest rates on new fixed-dollar instruments rise and compensate lenders for the anticipated depreciation in purchasing power of the principal and interest. If the return on real capital does not change, borrowers can offer a nominal interest rate higher by the amount of the anticipated rate of inflation. The rise in nominal interest rates continues until real rates of

return on all fixed-priced assets are the same as those on variable-priced assets. In the standard theory, equilibrium nominal interest rates and the anticipated rate of inflation change by equal amounts (apart from the effect of taxes and institutional impediments).[10]

After the adjustment in nominal interest rates is completed, anticipated inflation affects neither real rates of return nor the relative demands for fixed-dollar financial assets (except for money balances) and other real assets. The dollar prices of previously issued securities declined, of course, when market interest rates rose in anticipation of inflation. This reduced the value at current market prices of outstanding bonds held in portfolios. But no one is induced after this adjustment to sell or avoid fixed-dollar assets because of more attractive real yields elsewhere. The decline in current market price was an adjustment for the anticipated erosion of the purchasing power of bonds at maturity. Old securities, at the reduced prices, thus carry an increased market yield to maturity equal to the higher nominal coupon rate on new securities; and the yields on both compensate for the anticipated rate of inflation.

What then underlies the popular notion that inflation encourages investors to shift from fixed-dollar assets to equity and other variable-priced assets and to borrow more? In the standard theory, such behavior only occurs during the transition period, when money balances are being reduced in real terms and nominal interest rates do not yet fully reflect the higher rate of inflation anticipated by some groups. (Hedging, discussed later, is not part of the standard theory.) If one group is liquidating assets at prevailing prices, some other group must be willing to acquire them; after all, someone is on the other side of every transaction. The selling group wants to avoid holding securities in anticipation of a decline in security prices—rise in nominal yields—which buyers do not foresee or which they expect to be smaller than that expected by sellers.

When everyone anticipates inflation at a new higher rate, securities have no buyers at the old price. Their prices decline, and nominal yields rise sufficiently to induce someone to hold each outstanding interest-bearing asset. There is no actual shift by the market as a whole from one kind of outstanding asset to another (which is impossible), but only an initial desired shift resulting in a change in market values. The relative prices of real estate and common stocks and physical capital might be bid higher transitionally. Permanently, they will rise only by the amount of the (minor) reduction in real money balances and, even then, only to the extent that supplies are not perfectly elastic. Although outstanding fixed-dollar securities have fallen in price, new securities bear a sufficiently higher yield

to make them as attractive to savers as such securities were before inflation was anticipated.

What is true for individuals is also true for financial intermediaries which borrow on demand or short maturity to acquire a portfolio of long-term securities. These institutions might well face a rocky road during the transition period to a higher anticipated inflation rate. The rise in market interest rates imposes balance sheet losses on their portfolios, while their customers are attracted to market instruments paying higher yields than the institutions are able to meet at the time. When adjustments have been completed and portfolios turned over, however, the intermediaries can then pass on the higher coupon rates to customers, and their competitive position is the same as before.

In summary, anticipated inflation supposedly leaves the economy little affected in real terms aside from distortions due to taxes and ceilings. Nominal interest rates rise to compensate for the anticipated rate of inflation, and households have no reason to alter their holdings of financial and real assets. As a result, financial intermediaries maintain their position in the financial structure. The only exception is that inflation increases the cost of holding dollar assets on which no interest is paid—currency and, to some extent, demand balances. The real value of these assets will be reduced, but everything else, once adjustments are complete, is unchanged in real terms.

UNCERTAINTY AND HEDGING

The standard theory of the effects of inflation, with its narrow emphasis on the consequences of depreciation in the real value of fixed-dollar assets, is a generalized description of particular forces at work under inflationary conditions. It largely neglects institutional constraints, lags, and imperfect adjustments. It certainly does not incorporate all that was known about inflation even before the mid-1960s.

One major consideration that somehow never became an integral part of the standard theory is uncertainty, though writers were long aware of it. Inflation rarely proceeds at a steady rate for very long. Even in the recent moderate inflationary experience of the United States, the quarterly rate of inflation has often halved or doubled within a year's time. Such variations in the rate are extremely difficult to forecast. The experience of many countries indicates that as inflation becomes more severe, the magnitude of the variation increases.[11] As a result, the public does not focus on a single anticipated rate of inflation, but on a range of rates with varying chances

of occurring. Uncertainty over what the rate will be creates a desire to hedge against undesirable outcomes. A nominal interest rate that is high enough to cover the anticipated rate of inflation still provides no protection for security buyers against an actual inflation rate that exceeds the anticipated one and provides no protection for issuers against a rate below the anticipated one.

The uncertainty created by an inflationary environment is not readily avoided, and no prescribed way exists for financial markets to respond to it. Modern theories of investment behavior are based on the existence of a riskless asset. In an inflationary environment, where no asset, including government money, is without risk to its real value, the general results of that theory no longer hold.[12] There is no longer a uniformly prescribed market assessment of the risk attached to each asset. Consequently, investors will differ in their perceptions of the risk of particular assets and of the risk premiums they will pay. Nonetheless, inflation was thought to impart a special attraction as hedges[13] to those assets, such as common stocks, that are expected to keep up with inflation and maintain the same value in real terms. The great uncertainty over future rates of inflation, together with an apparently uncritical faith in the protection afforded against inflation by equity, probably accounts for the initial attraction to the public of certain securities, such as convertible bonds, which increased in supply and popularity during the 1960s. Although corporations had special reasons to issue convertible debt in the 1960s,[14] these bonds were attractive chiefly as hedges against uncertainty. The yields on straight bonds, which reflected the market's anticipated rate of inflation, were higher than those on convertibles and would have been more attractive if the anticipated rate had been certain. The hedging attraction is also found in bonds linked to a price index, which are issued in some foreign countries and have been proposed for the United States.

The implications of uncertainty for economic behavior, which now receive considerable attention in the economic literature, extend the standard theory described above in an important direction. Given uncertainty over the rate of inflation, investors, hoping to protect themselves against unexpectedly high rates, may prefer equity and real assets to financial assets fixed in dollar terms *even when* nominal interest rates on financial assets compensate buyers for the rate of inflation anticipated as most likely. Issuers may prefer equity *even when* the anticipated inflation compensates for the high nominal interest rate they must pay on straight debt. The market value of equity and real assets outstanding would as a result be comparatively larger under inflationary conditions, subject to the

qualification that increased risk could reduce the total demand to hold all assets. The extent of the increase in value of real assets would depend upon the degree of uncertainty over possible rates of inflation, rather than the point estimate of the anticipated rate. It is a rationale for the popular notion of a shift to equity during inflation. The "shift" would produce an increase in the market values in real terms of total holdings of equity securities and real assets and in the flow supply of new issues. This reason for a preference for equity seemed for a time to rest on firmer ground than the older common view that inflation stimulated economic activity and improved business profits in real terms.

To the uncertainty over future rates of inflation one must add the related uncertainty over future rates of interest. While nominal rates of interest are clearly affected by anticipations of inflation, changes in rates may not be completely synchronized with changes in anticipations and therefore may be an independent source of uncertainty. One reason for such changes in rates is government action against inflation, which has had some very violent short-run effects on interest rates, as in 1966, 1969, and 1974. The market faces the problem of anticipating not only the rate of inflation but also the type and extent of government reaction to inflation. An apparent example of such anticipation of government reaction is the seemingly perverse response of stock prices to news of rapid growth in the money supply, in which the market bypasses any direct effect of the increase in monetary growth and responds instead to an expectation of subsequent credit tightening to slow the increase.

It is not inconsistent with the standard theory to take account of inflation uncertainty by supposing that investors hedge against risks. Uncertainty means that the actual outcome of inflation will produce surprises, and unanticipated capital gains or losses will occur. In this view, inflation has effects in real terms by producing a preference for assets that mitigate the uncertainty of inflation. In theory, real assets and equity securities are inflation hedges and would be held and issued in larger volume relative to fixed-dollar assets. This would reduce the role of financial intermediaries which deal primarily in fixed-dollar instruments. The problem remains, however, that this extension of the standard theory does not account for the contrary developments since the mid-1960s.

NOTES

1. "Just as a toll can be levied on the use of roads or a turnover tax on business transactions, so also on the use of money. The higher the toll and the

tax, the less traffic on the roads and the less business transacted, so also the less money carried." Keynes [1923], ch. II, pt. I, "Inflation as a Method of Taxation," p. 49.

2. See the discussion in Kessel and Alchian [1962], Conard [1964], pt. II; and the first part of Lintner [1973].

3. Commercial banks receive special attention in the theory of inflation, because the tax on money balances due to anticipated inflation produces a revenue for the issuers of money—commercial banks and the government. See Cagan [1972], ch. 2.

4. In many of the business cycle theories reviewed by Haberler [1943], an initial lag of wages behind prices helps propel cyclical expansions; later, a catching-up rise in labor costs contributes to the onset of contraction. Also see the discussion of the literature in Kessel and Alchian [1960].

5. On the post-World War II period, see Wachter [1976], and Moore [1973].

6. See Kessel and Alchian [1960], Cargill [1969], and Lintner [1973].

7. According to modern growth theory, such changes in quantities of capital goods can have an effect, though presumably small for mild inflations, on the long-run real rate of return on capital.

8. To the extent that bank services on demand deposits are expanded and contracted similarly to changes in interest rates, demand deposits also pay a variable (nonpecuniary) return and are not a special case. For evidence on the effect of changing services on demand deposits, see Klein [1974].

9. The most complete statement of this work was published later in Fisher [1930].

10. Qualifications to the Fisher effect pertain first to taxes and second to statutory constraints. (1) Income taxes on interest income interfere with the adjustment. Lenders can be fully compensated for anticipated inflation after taxes only if the nominal interest rate, *after* deducting the applicable marginal tax rate, increases sufficiently to cover the inflation rate. Corporate borrowers can afford to pay an interest rate that compensates lenders after taxes for inflation, because such payments are deductible from the (generally higher) corporate income tax. See Gandolfi [1976], and Feldstein [1976]. (2) Some government regulations impose ceilings on nominal interest rates. State usury laws limit mortgage and installment loan rates, and federal regulations limit rates payable on time and savings deposits and prohibit interest on demand deposits.

It is not clear how serious the qualifications are in practice. Tax rates, though in many cases fairly high, are mitigated by less than universal coverage; municipal bonds are free of federal taxes and financial institutions pay low income tax rates. Interest ceilings are not unchangeable but are eventually raised. In general, however, the effects of taxes cannot be ignored.

11. See Okun [1971], and Logue and Willett [1976].

12. Lintner [1969], esp. section II.

13. In his classic book on investing, John Burr Williams viewed common stocks as an inflation hedge but was also aware of many qualifications. See Williams [1938], pp. 109-11.

14. Piper and Arnold [1977], pp. 280-82.