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Adapting to Inflation in the United States Economy

Stanley Fischer

The costs and effects of inflation depend on the extent to which the institutional structure of the economy has adjusted to its existence. The United States economy has in the seventies made a variety of adjustments that make it easier for individuals to live with inflation, but which also produce complicated side effects.

In this paper I review in detail the major institutional changes in the economy that have made it easier to live with inflation, and briefly describe the most important of the remaining nonadaptations. The economy is now at a stage where most individuals have some protection against inflation, but where inflation still has major economic effects. The economic implications of the increasing indexation of the economy are also analyzed.

Section 8.1 sets the background by examining the historical inflation record, showing that the inflation rate is now high by peacetime historical standards but not especially variable. However, the variability of the inflation rate has been increasing since the early sixties. Variability of inflation matters because uncertainty about the inflation rate creates economic difficulties at least as serious as those caused by high inflation itself. Interest rates have correspondingly been both high and, particularly in the case of long-term rates, variable.

Section 8.2 discusses major innovations in the capital markets in the seventies that have made it easier to live with inflation, while section 8.3

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examines labor market adjustments. The response of government, as well as its failure to adjust the tax laws for inflation, is examined in section 8.4. The effects on the household sector of the innovations described in sections 8.2–8.4 are summarized in section 8.5. Section 8.6 discusses the economic implications of the spreading and uneven indexation of the economy described in sections 8.2–8.4.

8.1 The Current Inflation in Historical Perspective

In this section, I set the inflation of the seventies into the historical perspectives of long-term United States price level behavior and that of the post-Korean War period. The annual inflation rate in the United States since 1880 is shown in figure 8.1. It is clear that the current inflation is the most rapid in peacetime during that period; indeed, it is the most rapid peacetime inflation in United States history.

Figure 8.1 also shows a measure of the variability of the inflation rate from year to year.¹ The current inflation is not the most variable peacetime inflation; inflation rates fluctuated more from year to year at the turn of the century and in the Great Depression than they have recently. However, the inflation rate was more variable during the seventies than in the period since the mid-fifties.

From the viewpoint of an individual entering a nominal contract, the payoff of which is specified in dollars, it is the price *level* that determines the real value of the outcome. Uncertainty about the average inflation rate over the period of the contract translates into uncertainty about the price level at the time of payment on the contract. The fact that year to year variability of the inflation rate in figure 8.1 is now relatively low by historical standards suggests that there is more predictability about the behavior of the price level over periods of a year or two than there was in the past. Individuals therefore should not show any greater reluctance to enter contracts of reasonably short duration than they did in earlier periods. However, the increasing variability of the inflation rate in the last decade suggests we should see either shorter contracts or devices to offset price uncertainty—such as indexation—becoming more widespread since the sixties, even for relatively short-term contracts.

There is an important distinction between the predictability of the price level over short and long periods, first emphasized by Benjamin Klein (1975). While there is not now great uncertainty about the price level that will prevail a year from now, uncertainty about the price level in the distant future is probably greater than in the past. Up to World War II it was reasonable to believe that the price level would be more or less stable over very long periods. Rapid inflation was a wartime phenomenon, typically followed by deflation, as at the end of the War of 1812, the Civil War, and World War I. In other words, it used to be reasonable to believe

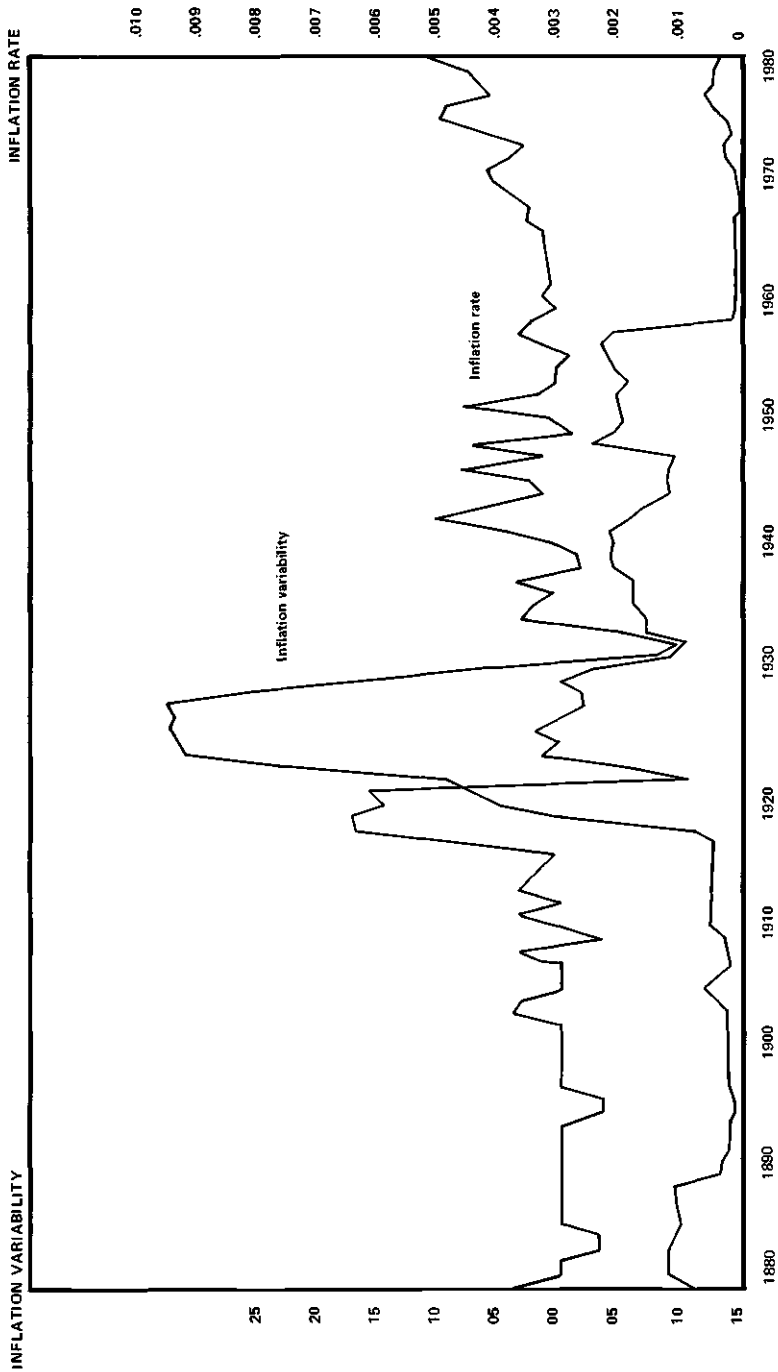


Fig. 8.1 United States inflation rate.

that the price level would come down after it had gone up. That is no longer a reasonable expectation, and uncertainty about the behavior of the price level over long periods, say thirty years, is therefore probably greater than it was in earlier periods.

Support for this view is provided by figure 8.2, which shows short-term interest rates over the period since 1880, as well as measures of the variability of short- and long-term interest rates. To a first approximation changes in interest rates reflect changes in expectations about inflation. It is clear from the figure that long-term interest rates are now substantially more variable than in earlier periods, suggesting that changes in expectations about long-term inflation are more frequent than they used to be. It should also be noted from figure 8.2 that short-term interest rate variability is now high by historical standards and has been increasing since the fifties. Recent announced changes in Federal Reserve operating procedure ensure that short-term interest rate variability will continue to be high by historical standards.

The features to emphasize from figure 8.2 are, first, the increasing variability of long-term interest rates, interpreted as reflecting increasing uncertainty about long-term inflation and, second, the rising level of short rates. Greater uncertainty about the price level over long periods is likely to lead to a reduction in the volume of very long-term contracts or to the use of other devices to reduce the vulnerability of participants in long-term arrangements to price level changes. The second feature, rising market interest rates, combined with controls on the rates payable by financial intermediaries, produces financial dislocations, particularly disintermediation, that may be attributed indirectly to increasing inflation. Thus much of the adaptation to inflation discussed in the following sections relates to changes in the regulations under which financial intermediaries operate.

8.2 Capital Market Adaptations

The decade of the seventies has seen a series of capital market innovations that either were a response to high inflation and interest rates, and/or make it easier to live with inflation. Taken together, they represent changes in the financial system on a scale comparable to the reforms of the thirties. I examine in turn innovations in the mortgage instrument and other nonbank financial intermediary assets and liabilities, the Depository Institutions Deregulation and Monetary Control Act (DIDMCA) of 1980, changes in the structure of corporate borrowing, and a selection of other developments.

8.2.1 The Mortgage Instrument and Related Innovations

Mortgages, life insurance, and pensions are the longest-term financial arrangements into which most households enter. Changes in the structure

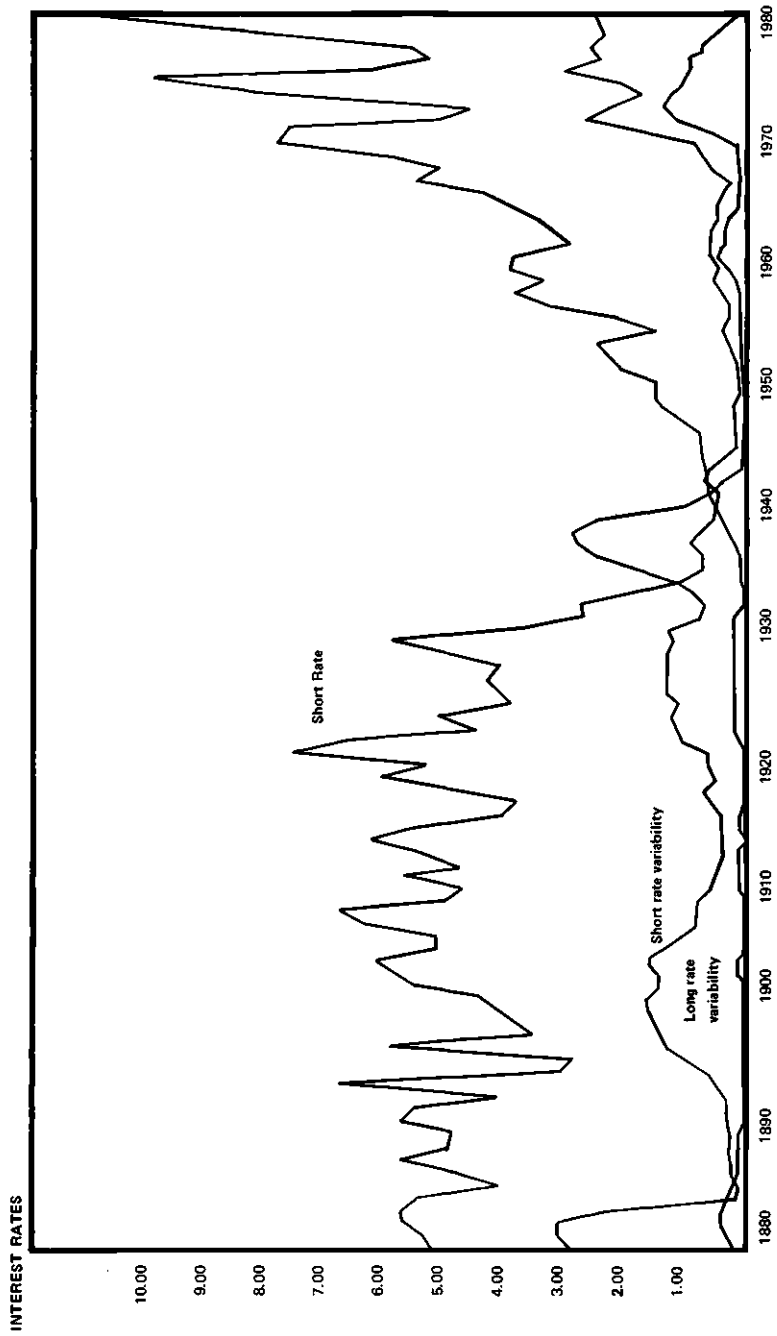


Figure 2: United States Interest Rates

Fig. 8.2 United States interest rates.

of these contracts should be expected to have occurred in the seventies in light of the increasing uncertainty about the price level over long periods described in section 8.1.

The level payment long-term mortgage that became standard for the United States economy after the Great Depression has major disadvantages for both lender and borrower as the inflation rate rises and interest rates become more variable. From the viewpoint of the borrower, the main disadvantage of the level payment mortgage is that inflation distorts the time profile of the stream of repayments on the mortgage. Figure 8.3 makes the point. The horizontal line shows the real value of payments made on the mortgage when the inflation rate is zero—in that case the constant nominal payments are also constant real payments. Now suppose the inflation rate rises and the nominal interest rate rises by the same amount, so that the real interest rate is unchanged. The negatively sloped line shows the real value of payments made in each period, given that the nominal monthly payment is constant over the life of the mortgage. The increase in the inflation rate increases the real value of the initial monthly payments, which are approximately proportional to the nominal interest rate. This means that the burden of monthly payments is likely to be highest immediately after the purchase of the house, hardly the time when most households would want to be making their maximum payments.

This particular difficulty can be overcome by the graduated payment mortgage (GPM), an instrument by which the nominal payments rise over time. Such mortgages were authorized for FHA mortgages (which account for 10% of mortgages) in some western states in 1978 and were immediately successful. By the beginning of 1979, over half the FHA mortgage applications received in California were for GPMS. GPMS may now be offered in all states, and the wider diffusion of the instrument should be expected.²

On the lender side, the level payment mortgage creates the difficulty that lenders are locked in for long periods to instruments whose nominal returns do not vary even as the rates they have to pay on deposits to remain competitive fluctuate with short-term market rates. Changes in the nature of the mortgage instrument are one way out of this problem. Two experiments have been tried. The first is the introduction, again primarily in California, of the variable rate mortgage (VRM), an instrument on which the interest rate can be changed periodically. VRMS were authorized in 1974, and by 1978 they accounted for over 20% of the mortgages held in California savings and loan associations.³ The second innovation that permits changes in the interest rate paid on mortgages is the rollover mortgage, commonly used in Canada. The interest rate on this mortgage is renegotiated every five years, with the borrower being guaranteed that refinancing will be available. Both the VRM and rollover

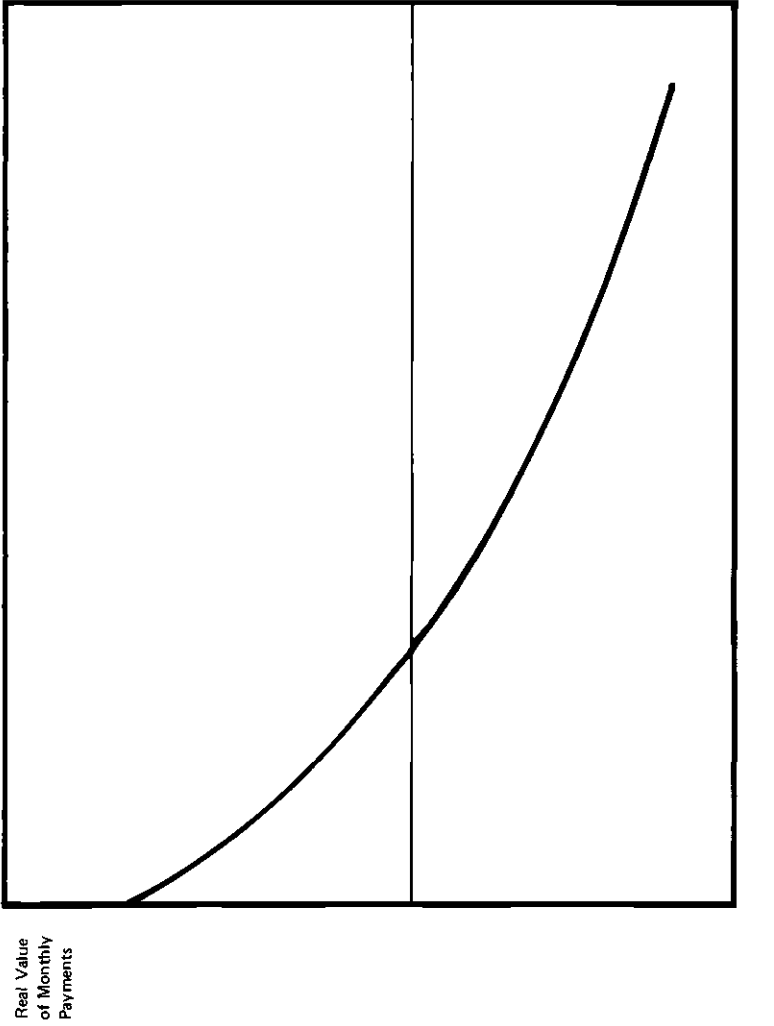


Fig. 8.3 Effects of inflation on real value of monthly mortgage payments.

mortgage tend to help the lender (given that borrowers are typically allowed to renegotiate terms when interest rates fall) and are therefore offered at a lower interest rate than the level payment mortgage.

There have been other innovations on both sides of mortgage lending institutions' balance sheets that have made those institutions less vulnerable to interest rate fluctuations. Most important has been the development of secondary markets for mortgages. In the seventies, the financial intermediary system acquired the ability to tap the bond markets for funds, both through the issue of bonds backed by mortgage collateral and through passthrough securities that sell the claims on the income streams financial intermediaries acquire through mortgage lending. The volume of borrowing in these markets now accounts for about a quarter of mortgage lending.⁴

On the liability side of their balance sheets, nonbank financial intermediaries have innovated by issuing new obligations, notably the money market certificate, a six-month instrument with interest rate tied to the Treasury Bill rate, and therefore precisely designed to fight disintermediation. Of course, this innovation required regulatory approval, which was forthcoming in 1978 in time to prevent major disintermediation in the high-interest-rate period at the end of 1979 and in early 1980. By the end of 1979 nearly a quarter of the liabilities of federally insured savings and loan associations were money market certificates.⁵ The term and interest rates permissible on other liabilities issued by savings and loan associations have also been rising during the seventies.

In brief, there has been a virtual revolution in the nature of the asset and liability structure of the balance sheets of the major mortgage lending institutions.

8.2.2 DIDMCA

The Depository Institutions Deregulation and Monetary Control Act of 1980 embodies some of the changes discussed in the previous section and makes other changes in the financial intermediary system that will remove most of the Depression-related features of the system except for deposit insurance.

The most significant feature of the act is the removal of interest rate controls, to be phased out over a six-year period. By 1986 the interest rates paid to depositors in financial institutions will be regulated by competition among the institutions. Rates on deposits can be expected to adjust more rapidly and fully to changes in market interest rates—and thus to inflation—than they have in the postwar period. For instance, interest-bearing checking accounts will be permissible nationwide and depositors can then expect to be compensated for rising inflation by receiving interest on their deposits that rises along with the inflation rate. The act also overrides state usury laws.

The act subjects all institutions accepting deposits to the same reserve requirements, dependent only on the types and volume of deposits. The variety of assets that different institutions can hold is being expanded; for instance, savings and loan associations will be able to increase their holdings of consumer installment credit to 20% of their portfolios.⁶

By the mid-eighties, the financial intermediary system will be essentially freed of the regulations that have made it and its depositors vulnerable to changing interest and inflation rates in the postwar period.

8.2.3 The Structure of Corporate Debt

The major change in the structure of corporate debt in the post-World War II period has been a move from equity to debt finance.⁷ From 1946 to 1960, equity issues accounted for over 4% of total firm financing (including internally generated funds) of nonfinancial corporate business, and credit market debt for about 19%. From 1966 to 1978, equity accounted for about 3% of financing, and debt for about 27.5%.⁸

The above data are potentially misleading in that, as the inflation rate rises, increased debt financing is needed each year merely to maintain constant the real value of outstanding debt. Data on the values of outstanding stocks of debt and equity are thus more relevant to the question of whether there has been a shift to debt finance. Gordon and Malkiel (1980) present data showing that the ratio of the market value of debt to the market value of debt plus equity for a large sample of listed firms rose from an average of 18% for the period 1957-60 to 31% for 1975-78. The ratio reached a peak in their sample period of 1957-78 in 1974, because the market value of equity was then so low. These data confirm the shift to debt finance in the postwar period.

This shift to debt finance is hardly an innovation, but is nonetheless in part a result of increasing inflation. As the nominal interest rate has risen over the postwar period, the value of the tax deductibility of interest payments has risen and made debt finance more attractive.

The second innovation in the structure of corporate finance has been a shift to shorter debt. This shift is a reflection of the increasing uncertainty over long-term inflation that was shown in section 8.1. Long-term debt has fallen from 80% of total credit market debt in 1946-60 to 72.5% in 1979, with short-term debt rising correspondingly.⁹ These data treat bank borrowing as partly short- and partly long-term debt. However, since bank borrowing is increasingly on a floating rate basis, part of debt that is counted as long-term bank borrowing has interest rates that are adjusted weekly.¹⁰ This is yet another response to the increasing volatility of interest rates.

Along similar lines, there has been a shortening of the maturity of outstanding debt within the structure of long-term corporate debt. This shortening for the period through 1972 is documented by Klein (1975),

who shows a small effect of increasing inflation uncertainty on the maturity of debt issues. Since 1972, when Klein calculated the average maturity of outstanding corporate debt at 19.1 years, the average maturity has fallen by about another 1.5 years.¹¹ Thus there has been a continuing decline in the maturity of outstanding corporate bonds, which complements the shift from long-term to short-term debt described in the preceding paragraph.

Finally, it should be emphasized that the effective maturity of a coupon bond changes when the inflation rate rises. For the reasons described in discussing the level payment mortgage, the real value of coupon payments on a standard bond falls over time if the inflation rate is positive. Thus, even if the real interest rate on a bond stays unchanged, the time shape of the stream of payments the corporation promises shifts toward the present as the inflation rate rises. Effectively, the maturity of the bond becomes shorter.

The conclusion is that the shortening of the structure of outstanding corporate debt in response to high and uncertain inflation is more pronounced than the above listed data on the division between long and short debt and the stated maturity of the debt appear to indicate. The introduction of the floating rate bank loan, as well as floating rate borrowing by some corporations, represents another response in corporate finance to uncertain inflation.

8.2.4 Other Changes

Other changes in the capital markets will affect the ability of the economy to deal with inflation. First, there have been changes in regulations which now require listed corporations to publish inflation-adjusted accounts alongside their regular accounts. As is well known, profits calculated under the two accounting schemes may differ widely. Inflation adjustments to 1979 profits for three large corporations are shown in table 8.1. The column Profits₁ shows profits as adjusted for the effects of inflation on the costs of goods sold and for depreciation. In each case

Table 8.1 Effect of Inflation on Corporate Profits, 1979

Company	Reported Profits	(1) Profits ₁ (adjusted for general inflation)	(2) Capital Gain on Outstanding Debt	Profits ₂ (sum of (1) + (2))
AT&T	5,674	1,837	6,841	8,678
Exxon	4,295	3,052	998	4,050
General Motors	2,893	1,776	182	1,958

Source: Company annual reports. Data are in millions of dollars.

profits are reduced, for the three companies together by 48%. Profits₂ adds to Profits₁, the capital gains the company obtains because the real value of its outstanding nominal obligations falls with inflation. Profits₂ is a measure of the income accruing to the equity holders of the firms; the inflation adjustment in this case raises total revenue by 14%. The change is obviously greatest for utility companies which use debt extensively. Profits₂ remains lower than reported profits, calculated using historical cost data, for Exxon and GM. The publication of the new accounts should give the investing public a firmer basis for portfolio decisions.

Second, I turn to the other major long-term contracts which households typically enter: life insurance and pensions. In both cases there have been inflation-related changes, but no major innovations. Life and other insurance policies now frequently contain cost-of-living adjustment clauses that permit automatic changes in the nominal amount of coverage (along with changes in premiums) without any need to enter a new contract. In the case of long-term term life insurance, this simple innovation does remove a major inflation distortion. For whole life policies, however, there remains a distortion resulting from the fact that the annuities payable do not adjust with inflation once payouts begin.¹²

Turning to private pensions, there is effectively indexation that will correct against any major changes in the price level to the extent that the pension benefit is based on wages at the time of retirement; if the benefits of existing beneficiaries are linked to those of new beneficiaries, the indexation extends also to those currently receiving benefits. But it is not known how many individuals fall into the categories that are effectively indexed. Recently some private pension plans have made voluntary adjustments to individual pensions in response to changes in the price level (e.g. Dupont). But there has been no systematic move to indexation of private pensions, and it is indeed difficult to see how such a change could be made in the absence of an indexed asset for pension funds to hold as a means of guaranteeing their ability to meet indexed liabilities.¹³

Indexation of social security and governmental and railroad pension benefits will be discussed in section 8.4 below.

8.3 Factor Markets

Formal indexation arrangements in the form of COLA (cost-of-living adjustment) clauses are prominent in the labor market. The extent of the inclusion of indexation clauses in formal labor contracts has mirrored the behavior of the Consumer Price Index in the postwar period, as can be seen in figure 8.4. The basic pattern is that indexation was predominant in the late fifties, that COLA clauses began to disappear in the early part of the sixties as the inflation rate stabilized at a low level and then tended to reappear as the inflation rate rose in the late sixties and early seventies.

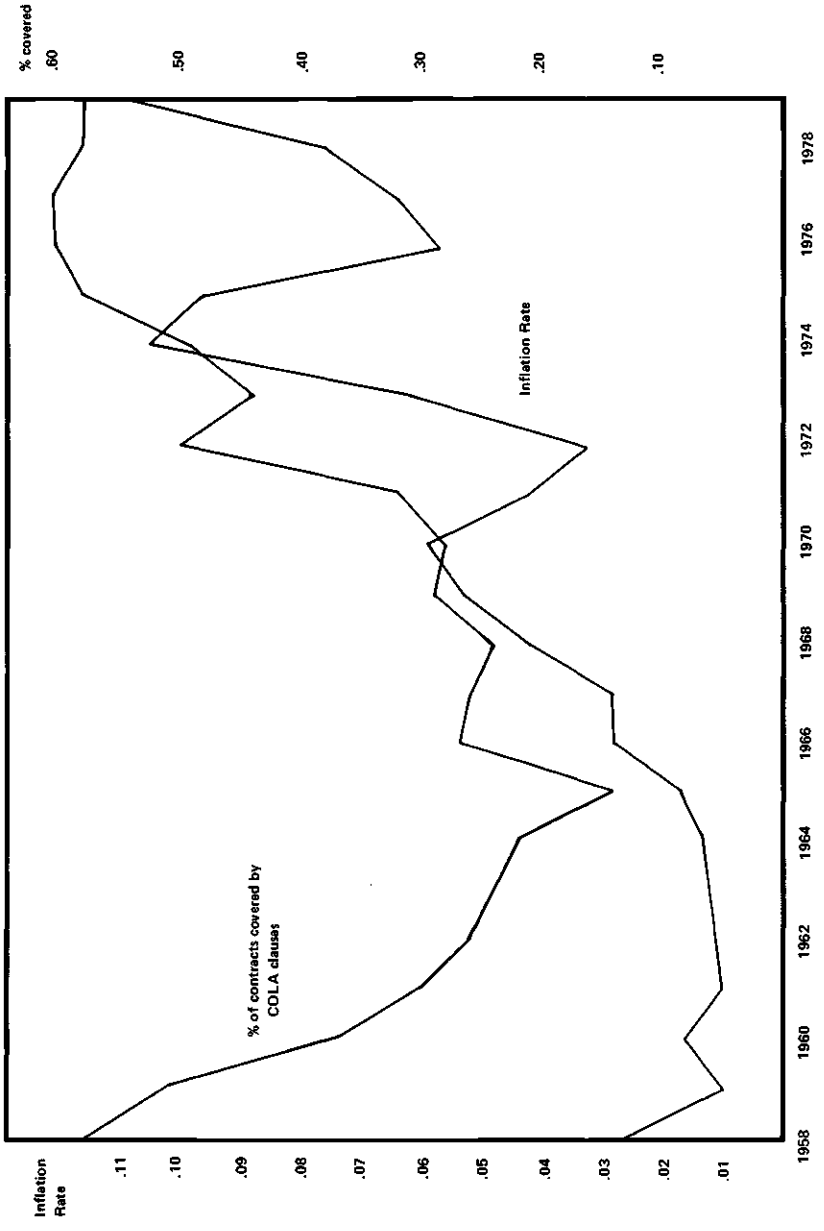


Fig. 8.4 Percentage of contracts covered by COLA clauses.

Since 1975, the proportion of workers in major union contracts (covering 5,000 or more employees) who have been protected by a cost-of-living clause has been stable at around 60%. However, there should be no illusion that the mass of the working force is formally covered by COLA clauses. First, only about 10% of the labor force is covered by collective bargaining agreements involving more than 5,000 employees, so that the 60% shown for 1979 in figure 8.3 in fact refers to a group of workers amounting to only 6% of the total labor force.

Second, existing COLA clauses do not provide 100% compensation against inflation. A typical indexed labor contract will include some nominal increase in wages that is independent of the inflation rate and then provides partial coverage against price increases. For example, wages might be scheduled to rise by 5% plus 0.5% for every 1% increase in the price level. In this way the firm and the workers share the risks of unanticipated inflation.

Third, existing COLA clauses do not provide full protection against inflation because there are inevitably lags in the application of the adjustments. Most COLA adjustments take place every three months, but in some contracts the adjustment is only annual.

The questions that naturally arise after discussion of union contracts are: first, whether the formal indexation that exists for 60% of the workers covered by major contracts is special, applying to 6% of the labor force; and second, whether the increasing indexation of labor contracts in the past decade has had important effects on the behavior of the economy. The answer to the first question is that indexation of labor contracts is not widespread. Federal government employees are not formally covered by COLA clauses, but about 25% of state and local employees are (or were in a 1978 survey). There is little need for employees on contracts of a year or shorter to be covered by indexation clauses since price level behavior is reasonably predictable in the short run. And most contracts, whether formal or informal, last for a year or less. Given the conclusion that indexation clauses are not yet widespread in labor contracts, their existence cannot have had important effects on the overall behavior of the economy. But it should be stressed that the nature of the current inflation—in which short-term price developments can be forecast quite well—does not suggest a great demand for indexation in short-term labor contracts.

There is little documentation of the extent of indexation in long-term contracts other than those for labor, though there is much informal evidence of considerable use of indexation. It is common in long-term industrial contracts for prices to be escalated by an index that relates to the cost of production or the market price of the commodity being exchanged. Similarly, long-term rent contracts that include revenue participation implicitly involve a form of indexing.

8.4 Government

The indexation of social security benefits was introduced in 1972. Estimates of the value of the existing obligations incurred by the social security system are currently in the range of \$3 trillion ($\3×10^{12}), far in excess of the marketable national debt. Given the indexation of benefits, it thus appears that most workers own a substantial indexed retirement benefit.

However, social security cannot be directly compared to an indexed obligation of the government. The indexation of social security benefits can always be overridden by Congress, and applies only for those years in which Congress does not make any explicit adjustments to the benefits. But the establishment of formal indexation reduces the likelihood that Congress will permit the value of real benefits to existing beneficiaries to fall, and thus increases the inflation protection afforded by social security. It is in this sense that most individuals are protected from the worst effects of inflation.

Aside from the question of whether there is any legal obligation to maintain the real value of social security benefits, there is an economic question of how individuals value their social security assets. Since the system is on a pay-as-you-go basis, the benefits receivable in the future by existing workers will be paid for by future workers, who are the children of the beneficiaries. To the extent that recipients of the benefits are concerned about the welfare of their children, any increase in benefits carries with it an implied offset in the form of the reduction of the welfare of the then contributors to the system. Of course, precisely the same issue exists with regard to the question of whether the national debt should be regarded as a debt or an asset or, on balance, neither, by current economic agents. This is still a matter of controversy.

Federal government pension benefits, including those of the military, are formally indexed to the Consumer Price Index. Federal, including military, employees make up about 5% of the labor force. About a third of state and local government employees are covered by indexed pensions, adding another 4% of the labor force that has such benefits. But the indexation for state and local government employees is typically only partial as compared to the full federal indexing. The pensions of railroad employees are also price-indexed.

Some estimates indicate that over 50% of federal expenditures are indexed.¹⁴ However, given Congress's ability to override indexation, as it sometimes does, any such number should be regarded as suggestive rather than definitive. For instance, the 50% estimate above includes federal wages for civilian and military employees, which in 1979 were increased less than the inflation rate.

There is no formal indexation of taxes. Purely proportional taxes would in effect be indexed, but the tax system is far from neutral to

inflation. The best-known failure of the tax system to index relates to "bracket-creep," whereby rising prices without adjustment of tax brackets increase real taxes even if real income does not rise. But the most serious failure to index the tax system lies in the treatment of returns to capital.¹⁵

8.5 The Household Balance Sheet and Income Statement

Sections 8.2–8.4 have described a variety of innovations and adaptations that influence the way in which inflation affects the economy. But do these changes add up to a major shift, or do they rather represent piecemeal adjustments to the new era of high and uncertain inflation and fluctuating interest rates? To set the changes in perspective, we present in this section the household sector's balance sheet at the end of 1979 and its income statement, to show which household sector transactions have been affected by the innovations and where the remaining nonadaptations to inflation are to be found.

Table 8.2 shows the household sector balance sheet for the end of 1979. The housing stock is the main tangible asset of the household sector. Correspondingly, the major financial liability is mortgages. As noted above, there have been innovations in the form of the mortgage instrument. But it should be noted that these innovations have occurred mainly

Table 8.2 Balance Sheet of the Household Sector, 1979

	\$ trillion
Tangible assets	
Residential structures	2.76
Consumer durables	.89
Financial assets	3.83
Deposits*	1.45
Credit market instruments	0.55
Equities	0.91
Life insurance reserves	0.21
Pension fund reserves	0.62
Other	0.08
Financial liabilities	1.33
Mortgages*	0.88
Consumer installment credit	0.31
Other	0.14
Memo: Personal disposable income, 1979	1.62

Source: Financial assets and liabilities, Federal Reserve Board, *Flow of Funds Accounts, Assets and Liabilities Outstanding, 1969–79*, February 1980. Household sector is "Households, Personal Trusts, and Nonprofit Organizations." Tangible assets: Federal Reserve System, *Balance Sheets for U.S. Economy*, June 1980.

*Affected by institutional changes in the last decade.

in California and a few other western states, and that most home financing is still done through the level payment mortgage. The advantages of home ownership are of course heavily affected by taxation, but there have been no major changes in the tax rules relating to home ownership in the postwar period, despite the potent effects of inflation in reducing the after-tax real cost of home purchases. Consumer durables represent the second major household asset category. There have been few innovations in the financing of consumer durable purchases, but since these are financed through relatively short-term consumer installment credit, the need for change is less. The tax benefit of borrowing rises with the nominal interest rate (assuming the pretax real rate is unchanged), but there have been no tax changes here either.

The major financial assets are deposits. The changes that have occurred here will substantially reduce the effect of inflation on the costs of holding funds in the traditional financial institutions. Innovations covering the remaining 62% of financial assets have been minimal—though in the case of equities little innovation should be expected.

Table 8.3 shows that the major source of personal income is wages and salaries. The effects of inflation on this source of income have been

Table 8.3 Sources and Disposition of Personal Income, 1979

Personal Income	\$ billion 1923	% of Personal Income 100
Sources		
Wages and salaries*		63.8
Other labor income (largely fringe benefits)		6.4
Proprietors' income		6.8
Rental income of persons		1.4
Personal interest income*		10.0
Dividends		2.7
Transfer payments* of which (as % of transfer payments)		13.1
oASDI and health insurance benefits	52.5	
Govt. employee retirement benefits	14.8	
Veteran benefits	5.7	
Other	27.0	
Less: Personal contributions for social insurance		4.2
Disposition		
Personal tax and nontax payments		15.6
Personal consumption expenditures		78.5
Interest paid to business		2.1
Personal saving		3.8

Source: *Economic Report of the President, 1980*, tables B-20 and B-21.

*Affected by recent innovations.

changed to a small extent by the increasing indexation of labor contracts. The innovations discussed earlier also change the relation between inflation and personal interest income, and of course between inflation and transfer payments. Thus the innovations have strongly affected the relation between inflation and at least 25% of personal income, and also have had some impact on the relation between inflation and wage and salary income.

Little innovation should have been expected on the disposition side of the income statement, except in the case of taxes. As previously noted, such innovation has not been forthcoming, and its absence is likely to have significant effects on the economy's rates of capital accumulation and growth.¹⁶

The data presented in this section confirm the impression that the most important of the innovations discussed in sections 8.2–8.4 are those relating to the structure of the financial intermediary system. The other changes described are distinctly sporadic and incomplete.

8.6 Economic Implications

Despite their unevenness, the changes that have taken place in the institutional structure of the economy in the last decade can be described as having reduced the use of long-term nominal contracts in the economy and as having increased the extent of indexation. Formal indexation has increased chiefly in labor contracts, though even here it will be recalled that the indexation is less than 100%.

What are the consequences of increasing indexation? It is easiest to start by comparing an economy that is fully indexed with one that is not indexed. Suppose that in the fully indexed economy all contracts involving future payment tie the nominal payments to be made to an index such as the Consumer Price Index. Such an economy is well suited to handle the effects of an inflation that results purely from an increase in the quantity of money. In this case, the real economic situation can be restored by an equiproportionate rise in all prices, which is the type of price change that indexation will produce. An increase in the quantity of money should be expected, in a fully indexed economy, to lead to a rapid rise in all prices with minimal real effects on other variables.

A change in the quantity of money would have different effects in an economy in which prices were not indexed, however. In this case prices would probably take time to adjust, would adjust at different times and to different extents, and therefore would have effects on real economic activity.

A fully indexed economy affected by a shock requiring changes in relative prices as well as the aggregate price level—such as the oil price

shock—might have considerable difficulty in adjusting. This would be the case if contracts essentially attempted to fix real magnitudes, such as the real wage, over lengthy periods. A nonindexed economy could do a better job of adjusting to a change in its real circumstances.

It is in this latter sense that indexation is sometimes argued to be inflationary. The notion is that any increase in a price—such as that of oil—that is required to restore the economy to equilibrium is likely under indexation to produce automatic increases in wages and therefore in other prices. Such changes would be less likely to occur in a nonindexed economy. It is not, however, generally recognized that it should be easier to reduce the inflation rate through monetary policy in an indexed economy.

While indexation is theoretically attractive in isolating an economy from real effects caused by a “pure” money-supply-caused inflation, such inflations are unlikely to occur. There is no record of a pure inflation in which the money supply started growing essentially at the whim of the monetary authority. There is usually a real economic reason the government has turned to inflationary policy. In these circumstances, contracts indexed to the Consumer Price Index are likely to hamper adjustment rather than help. Further, no indexation scheme is free of lags and so perfect indexation is in any event unattainable.

So far we have been comparing a fully indexed economy with one that is not indexed. But the worst of all worlds is likely to be one in which the economy has made some adjustments to inflation by increasing indexation, but has not adjusted in other areas. Then inflation is likely to worsen the distortions of relative prices that occur in the absence of indexation. Some sectors would be sheltered from the inflation while others would have to bear the adjustments that the economy as a whole had to make.

To take an important example of the possible distortions from uneven adjustments to inflation, consider housing. As noted above, there have been extensive changes in the methods of financing home purchase, which are beginning to remove the difficulties caused by the interaction of the level payment mortgage with inflation. But under inflationary conditions, the tax laws strongly favor home ownership (assuming interest rates rise about one for one with inflation, as they have). With the financing distortion removed, the effects of inflation on the demand for housing will now be more distortionary than they were before.

Because the tax laws in the United States have made little accommodation to inflation, inflation has serious distorting effects on investment and financing decisions. If the tax system is not adjusted as continued inflation brings further private sector institutional adaptation to inflation, the costs of inflation may well increase rather than decrease, despite institutional changes induced by the inflation.

Notes

1. The measure of inflation variability for each year is the standard deviation of the inflation rate over the past decade.
2. See McFarlin and Vitek (1980).
3. See Thompson (1978) and Melton and Heidt (1979).
4. See Sivesind (1979) and Jaffee and Rosen (1980) for further details. GPMs have not been as well received in the secondary markets as by borrowers, and their spread may therefore be slowed, at least until further experience allows for improved evaluation of default risk.
5. Zabrenski (1980).
6. The contents of the act are summarized in the *Federal Reserve Bulletin*, June 1980, pp. 444-53.
7. Trends in corporate financing in the post-World War II period are comprehensively surveyed by Friedman (1980).
8. The data, based on Flow of Funds statistics, are taken from Friedman (1980, table 5).
9. Data for 1946-60 from Friedman (1980), for 1979 from *Flow of Funds Accounts* of the Federal Reserve System. Long-term debt is defined as bonds, mortgages, and 40% of bank loans. Short-term debt is remaining credit market borrowing.
10. Since the Federal Reserve's survey of terms of bank lending was first made in 1977 (see *Federal Reserve Bulletin*, May 1977), there has been an increase in the proportion of loans in all categories that carry floating rates. The increase was greatest for long-term commercial and industrial loans, 66% of which had a floating rate in February 1980, as opposed to 51% in 1977. However, the increase has been smallest for the largest category of loans, short-term commercial and industrial, which rose from 45% to 51% with floating rates.
11. Calculation based on data on outstanding securities contained in Salomon Brothers Memorandum, "The Anatomy of the Secondary Market in Corporate Bonds: Year-End, 1979 Update," 2 April 1980.
12. There is a general question of why graduated payment (as opposed to indexed) annuities are not available.
13. Equity participation mortgages may be an important real asset for funds to hold in this regard, though real estate is a far riskier real asset than government indexed bonds would be. The recent proposal to allow thrifts to issue equity participation mortgages could put them in the position of having real assets in their portfolios. But the tax aspects of such mortgages—which reduce tax deductible interest payments at the expense of reduced capital gains for the homeowner—make it unlikely that they will achieve much market penetration.
14. See the 1979 report by the Comptroller General to the Congress, "An Analysis of the Effects of Indexing for Inflation on Federal Expenditures."
15. See Fischer and Modigliani (1978) for a description of some of the effects of inflation on taxes on capital, and also Boskin and Shoven (1980). Feldstein's chapter in the present volume (chapter 7) provides a discussion of the interactions of taxes and inflation.
16. See, again, Feldstein's chapter in this book.

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