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10 Inflation and the Stock Market

This paper discusses a crucial cause of the failure of share prices to rise during a decade of substantial inflation. Indeed, the share value per dollar of pretax earnings actually fell from 10.82 in 1967 to 6.65 in 1976.[1] The analysis here indicates that this inverse relation between higher inflation and lower share prices during the past decade was not due to chance or to other unrelated economic events.[2] On the contrary, an important adverse effect of increased inflation on share prices results from basic features of the current U.S. tax laws, particularly historic cost depreciation and the taxation of nominal capital gains.[3]

This analysis shows that in order to understand the structural relation between inflation and share prices, it is crucial to distinguish between the

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1. These price-earnings ratios are based on earnings net of real depreciation and with the inventory valuation adjustment. See my paper with Lawrence Summers (1979; chap. 8 above) for the description of the method by which these pretax price-earnings ratios are constructed. The traditional Standard and Poor's posttax price-earnings ratio, based on book profits (including inventory profits) fell from 17.45 to 9.02. An alternate measure of share-price performance, the ratio of the share price to the underlying real capital at replacement cost, fell from 1.214 in 1967 to 0.788 in 1977. For further evidence of the adverse effect of inflation on real share prices, see Charles Nelson (1976) and John Lintner (1973, 1975).
2. The analysis also shows that it is unnecessary to invoke a theory of systematic error of the type developed by Franco Modigliani and Richard Cohn (1979).
3. I emphasize that these are tax rules in the United States. Share prices in other countries that do not tax capital gains and that permit extremely rapid tax depreciation of investments may respond very differently to inflation. The relation between share prices and inflation in other countries is therefore of little relevance to the United States without a careful analysis of local tax rules.

effect of a *high* constant rate of inflation and the effect of an *increase* in the rate of inflation expected for the future. When the steady-state rate of inflation is higher, share prices increase at a faster rate. More specifically, when the inflation rate is steady, share prices rise in proportion to the price level to maintain a constant ratio of share prices to real earnings. In contrast, an *increase* in the expected future rate of inflation causes a concurrent fall in the ratio of share prices to current earnings. Although share prices then rise from this lower level at the higher rate of inflation, the ratio of share prices to real earnings is permanently lower. This permanent reduction in the price-earnings ratio occurs because, under prevailing tax rules, inflation raises the effective tax rate on corporate-source income.

This process is illustrated in figure 10.1. The top part of the figure shows the inflation rate. Until time t_0, the inflation rate is constant at π_0; it then rises to a higher steady-state level, π_1. This increase is immediately and correctly perceived. The middle part of the figure shows that until t_0 the price per share rises at a constant rate equal to the rate of growth of *nominal* earnings per share. At time t_0, the share price drops to a level consistent with the higher rate of inflation and then grows at the new

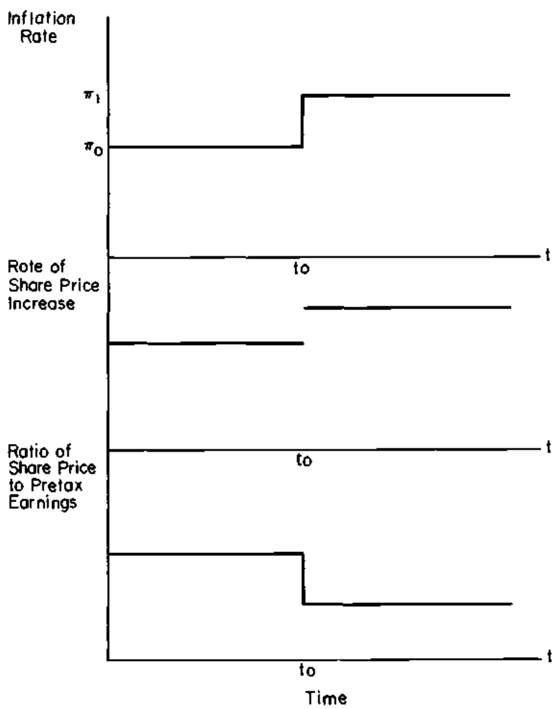

Figure 10.1

higher rate of growth of earnings per share. Finally, the lower part of the figure shows that the price-earnings ratio falls when the inflation rate increases but remains constant as long as the inflation rate is constant.

The starting point for this analysis is the way in which inflation raises the effective tax rate on corporate-source income. This is in sharp contrast to the common popular argument that share prices are depressed because inflation raises the rate of interest that can be earned by investing in bonds. It is clear that this argument should be rejected since the higher *nominal* rate of interest generally corresponds to an unchanged *real* rate of interest.[4] Indeed, since the entire nominal interest is subject to the personal income tax, the real rate of interest net of the personal income tax actually falls. The analysis of section 10.1 shows that, with existing tax rules, inflation is likely to depress the real net rate of interest by less than it lowers the real net return to equity investment. The simple valuation model that calculates the share value by discounting at the real net rate of interest leads to the conclusion that, with current tax laws, an increase in inflation reduces the price that individuals are willing to pay for shares.

Although this discounted earnings model of share valuation is a useful heuristic device, it has the serious deficiency that it implies that individuals in different tax situations would place different reservation values on the same shares. It is therefore inconsistent with the observation that the same stocks are held by individuals who face very different tax rates. The main analysis of this paper therefore uses a more general stock valuation model to derive the assets demanded by investors in different tax situations—and then calculates the share value that achieves a market equilibrium.

Numerical calculations with the market equilibrium model show how inflation can substantially depress the equilibrium share value because of our current tax rules. The model is, however, very simple. It should be regarded as an aid to understanding and not as a device for making precise calculations.

A complete analysis of the effect of inflation on share prices requires considering a wider range of alternative investments and incorporating the possibility that perceived risk varies with inflation. Explaining the historical experience also requires a model of the process by which both expectations and the capital stock adjust through time. The goal of this paper is more modest: an examination of the way that taxes and inflation interact in affecting equilibrium share prices. The final section of the paper discusses some of the ways in which this analysis could be extended.

4. The conclusion that inflation raises the nominal interest rate while leaving the real rate unchanged has been supported by evidence since Irving Fisher's classic study. For more recent evidence, see my paper with Otto Eckstein (1970), William Yohe and Denis Karnosky (1969) and my paper with Summers (1978; chap. 9 above).

10.1 The Effect of Inflation on the Demand Price of Shares

Consider first an economy in which there is no inflation. Each share of stock represents the ownership claim to a single unit of capital and the net earnings that it produces. There is no corporate debt and all earnings are paid out as dividends. The marginal product of capital (net of depreciation), ρ, is subject to a corporate income tax at rate τ.[5] The earnings per share that are distributed to the individual investor are therefore $(1 - \tau)\rho$. Since there are no retained earnings, the earnings per share do not grow over time and there is no change in the value per share. The individual pays personal tax at rate θ on the earnings that he receives. The individual's net earnings per share are thus $(1 - \theta)(1 - \tau)\rho$.

A simple model of share valuation implies that the price that the individual would be willing to pay per share (q) would make the net earnings per dollar of equity equal to the net interest that he would receive per dollar invested in government bonds, $(1 - \theta)r$.[6] More realistically, individuals may require a higher yield on the riskier equity investment; if this risk differential is denoted by δ, the investor's indifference condition becomes

$$\frac{(1-\theta)(1-\tau)\rho}{q} = (1-\theta)r + \delta \tag{1}$$

The individual's demand price per share is thus

$$q = \frac{(1-\theta)(1-\tau)\rho}{(1-\theta)r + \delta} \tag{2}$$

What happens when the rate of inflation increases from zero to a positive rate π? For simplicity, the analysis will assume an instantaneous and unanticipated increase to π which is then expected to persist forever. To evaluate the new demand price per share, it is necessary to recalculate both the net earnings per share and the real net rate of interest.

Under U.S. tax law, taxable profits are calculated by subtracting a value for depreciation from other net operating income. This value of depreciation is based on the original or "historic" cost of the asset rather than on its current value. When prices rise, this historic cost method of depreciation causes the real value of depreciation to fall and real taxable profits to be increased.[7] As a result, real profits net of the corporate

5. Since each share of stock represents one unit of capital, the marginal product of capital is also the pretax earnings per share.

6. See Mervyn King (1977). He also treats the more general case in which retained earnings cause share prices to rise.

7. When there is no inflation, the various methods of "accelerated depreciation" that are allowed for tax purposes may cause tax depreciation to exceed the economic depreciation for some assets. This is subsumed in the effective corporate tax rate τ. Accelerated depreciation does not change the conclusion that inflation reduces the real value of depreciation.

income tax vary inversely with inflation.[8] A linear approximation that each percentage point of inflation reduces net corporate profits per unit of capital by λ implies that net corporate earnings per share of capital are $(1-\tau)\rho - \lambda\pi$.[9] After personal income tax at rate θ, the individual receives $(1-\theta)[(1-\tau)\rho - \lambda\pi]$.[10]

Inflation reduces these net earnings even further by imposing an additional tax on nominal capital gains. More specifically, even though the real share price remains constant at the new equilibrium value q, inflation causes nominal capital gains at the rate of πq.[11] Capital gains are taxed at a lower rate than ordinary income and only when the stock is sold; the equivalent tax rate on accrued capital gains will be denoted c.[12] The extra burden caused by taxing nominal capital gains is thus $c\pi q$. The real net earnings per share are therefore $(1-\theta)[(1-\tau)\rho - \lambda\pi] - c\pi q$. Note that a small increase in the rate of inflation calculated at $\pi = 0$ reduces these real net earnings by $(1-\theta)\lambda + cq$.[13]

The effect of inflation on the real net rate of interest, $(1-\theta)r - \pi$, depends on the response of the nominal interest rate to the rate of inflation. As noted above, the U.S. experience has been that $dr/d\pi = 1$. Thus $d[(1-\theta)r - \pi]/d\pi = -\theta$.

For reasonable values of the tax parameters, the decrease in net earnings per dollar of equity $[((1-\theta)\lambda + cq)/q]$ exceeds the decrease in the real net interest yield on bonds $[\theta]$. For example, with a personal tax rate of $\theta = 0.3$, a depreciation effect of $\lambda = 0.30$, an effective capital gains tax rate of $c = 0.15$, and an initial share value per unit of capital of $q = 1$, each 1 percent of inflation reduces the real net yield on equity by 0.36 percent and reduces the real net yield on debt by 0.30. If the risk premium (δ) is unchanged, this implies that the share price calculated as the discounted value of earnings per share will fall.

8. For a more complete discussion of this, see my paper with Summers (1979; chap. 8 above) and my paper with Jerry Green and Eytan Sheshinski (1978; chap. 4 above), especially the appendix by Alan Auerbach. Hai Hong (1977), Brian Motley (1969), and Richard Van Horne and William Glassmire (1972) discuss the effects of historic cost depreciation and the implication for the effect of inflation on share values; they assume a single investor whose discount rate is unchanged by inflation.

9. It can be shown that with an exponential depreciation rate of 15 percent and a growth rate of 3 percent, a 7 percent inflation rate reduces net profits per unit of capital by 0.021; this implies $\lambda = 0.30$. Recall that each share of stock represents a claim to one unit of capital.

10. This assumes that inflation does not affect the pretax profitability of capital. The calculation also ignores the transitional effect of a lower present value of the future depreciation allowable on past investments.

11. These nominal capital gains are stated in constant dollars. If the price level at time t is $e^{\pi t}$, the nominal capital gains at that time is $\pi q e^{\pi t}$.

12. That is, c is the accrual rate of capital gains taxation equivalent to the present value of the tax that will be paid in the future when the stock is sold.

13. This is also true for $\pi > 0$ if the change in q is ignored.

More specifically, the simple valuation model that calculates the individual's demand price per share by equating the real net yield per dollar of equity to the sum of the real net interest rate and the risk premium implies

$$\frac{(1-\theta)[(1-\tau)\rho - \lambda\pi]}{q} - c\pi = (1-\theta)r - \pi + \delta \tag{3}$$

or

$$q = \frac{(1-\theta)[(1-\tau)\rho - \lambda\pi]}{(1-\theta)r - (1-c)\pi + \delta}. \tag{4}$$

Differentiating q with respect to π with the condition that $dr/d\pi = 1$ implies

$$\frac{dq}{d\pi} = \frac{-(1-\theta)\lambda + q(\theta - c)}{(1-\theta)r - (1-c)\pi + \delta} \tag{5}$$

Since the denominator is positive,[14] $dq/d\pi$ is negative if

$$q(\theta - c) < (1-\theta)\lambda \tag{6}$$

Several things about this condition should be noted. First, realistic values of the tax parameters satisfy the inequality and imply $dq/d\pi < 0$. The example of $\theta = 0.3$, $c = 0.15$, and $\lambda = 0.30$ implies $dq/d\pi < 0$ even at $q = 1$. Second, the inequality is satisfied more easily for investors with low individual tax rates. In the important extreme case of a tax-exempt institution, $\theta = c = 0$ and the inequality is satisfied for any value of $\lambda > 0$. Finally, for some individuals with high tax rates, the inequality will not be satisfied and $dq/d\pi > 0$.[15]

This diversity of responses of q to the rate of inflation reinforces the implication of equation (4) that the demand price per share differs among investors according to their tax situation. An analysis of the effect of inflation on the market price of stock requires a portfolio model of investor equilibrium. In such a model, the risk premium (δ) is both implicit and endogenous. The risk differential changes as the investor reallocates his portfolio until a market equilibrium is achieved in which the same market value of stock is consistent with each investor's own portfolio equilibrium. The specification of such a model is the subject of section 10.2. Section 10.3 then analyzes how the equilibrium responds to a change in the rate of inflation.

14. This is a necessary condition for a finite value of q.

15. Recall that these calculations all assume a firm with no debt finance and no retained earnings.

10.2 A Market Equilibrium Model of Share Valuation

The market equilibrium model builds directly on the analysis of the previous section. The economy is assumed to have two assets (risky equity shares and riskless government bonds) and two types of portfolio investors (tax-exempt institutions and taxable individuals). The analysis begins by specifying the investors' portfolio equilibrium equations. When these are combined with the asset supply constraint, they implicitly define the market value per share of equity. This equilibrium model is then used in section 10.3 to calculate the effect of changing from an equilibrium with a zero rate of inflation to a new equilibrium with a positive constant rate of inflation.

The household's investment problem is to divide its initial wealth between bonds and stocks. Equation (1) showed that, in the absence of inflation, the portfolio equilibrium of the households can be written

$$\frac{(1-\theta)(1-\tau)\rho}{q_0} = (1-\theta)r_0 + \delta_{h0} \tag{7}$$

where the share price and interest rate carry a subscript zero to distinguish these initial preinflation values from the values of these variables when there is inflation. The risk premium δ_{h0} has subscripts to indicate that it refers to the household in the initial equilibrium.

The risk premium that a household requires to hold a marginal share of equity should be an increasing function of the amount of risk that the household is already bearing. More explicitly, I shall assume that δ_{h0} is proportional to the standard deviation of the return on the household's portfolio. The source of this uncertainty is the variability of the pretax equity return; the variance of ρ will be written σ_ρ^2. The after-tax variance per dollar of equity investment is thus $(1-\theta)^2(1-\tau)^2\sigma_\rho^2/q_0^2$. If the household has s_{h0} shares in the initial equilibrium, the dollar value of its equity investment is $s_{h0}q_0$. Since bonds are riskless, the variance of the return on the household portfolio is $s_{h0}^2(1-\theta)^2(1-\tau)^2\sigma_\rho^2$. If the risk premium is proportional to the standard deviation of the portfolio return,

$$\delta_{h0} = \delta_h s_{h0}(1-\theta)(1-\tau)\sigma_\rho \tag{8}$$

where δ_h is a constant.[16]

Substituting (8) into (7) and rearranging terms yields the share price that is consistent with the household's chosen share ownership in the absence of inflation:

$$q_0 = \frac{(1-\theta)(1-\tau)\rho}{(1-\theta)r_0 + \delta_h s_{h0}(1-\theta)(1-\tau)\sigma_\rho} \tag{9}$$

16. Note that σ_ρ is a standard deviation of a rate of return and is therefore in the same units as the rate of return, i.e., percent per year. The coefficient δ_h is therefore a unit-free number.

Note that this household demand price for shares varies inversely with the quantity of shares that it holds.

For tax-exempt institutions, the relevant value of θ is zero. The portfolio equilibrium of the institution can therefore be written

$$\frac{(1-\tau)\rho}{q_0} = r_0 + \delta_{i0} \tag{10}$$

where the institution's risk premium (indicated by subscript i) satisfies

$$\delta_{i0} = \delta_i s_{i0}(1-\tau)\sigma_\rho \tag{11}$$

Combining these two equations yields the institution's demand price per share:[17]

$$q_0 = \frac{(1-\tau)\rho}{r_0 + \delta_i s_{i0}(1-\tau)\sigma_\rho} \tag{12}$$

The total number of shares outstanding, $\bar{s}$, constrains the combined holdings of the institution and the household investors:

$$\bar{s} = s_{i0} + s_{h0} \tag{13}$$

This supply constraint and the two demand equations (9) and (12) are sufficient to determine the equilibrium share price and the allocation of the shares between the two types of investors. The nature of this solution is illustrated in figure 10.2. The equilibrium relation of equation (9) is drawn as the household's demand curve for shares, $s_{h0}(q_0)$. Similarly (12) is drawn as the institution's demand curve $s_{i0}(q_0)$. These are added horizontally to get total share demand as a function of share price $s_0(q_0)$. The intersection of this market demand curve with the supply constraint line $\bar{s}$ determines the equilibrium price q_0^* and the corresponding share holdings (s_{h0}^* and s_{i0}^*).

To use this model to study the impact of inflation on share prices, it is necessary to evaluate the parameters $\delta_h\sigma_\rho$ and $\delta_i\sigma_\rho$. Although these parameters cannot be observed, their values can be inferred from the equilibrium conditions in the absence of inflation. Thus equation (9) implies

$$\delta_h\sigma_\rho = \frac{(1-\tau)\rho - q_0 r_0}{q_0(1-\tau)s_{h0}} \tag{14}$$

and (12) implies

$$\delta_i\sigma_\rho = \frac{(1-\tau)\rho - q_0 r_0}{q_0(1-\tau)s_{i0}} \tag{15}$$

17. Note that, since $(1-\theta)$ can be eliminated from equation (9), the household and institution demand price equations differ in the absence of inflation only because of differences in δ_i.

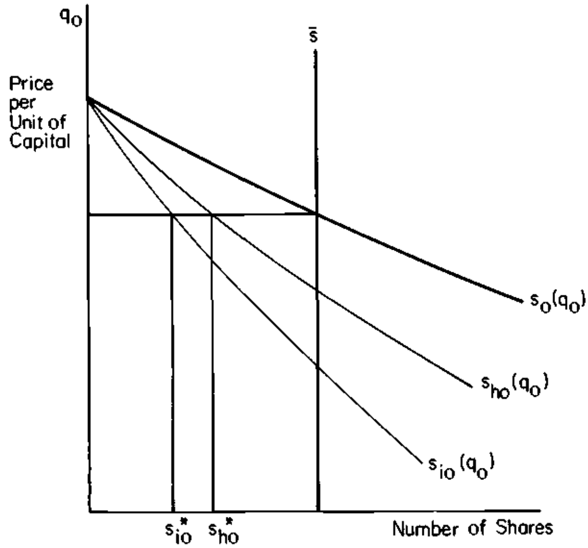

Figure 10.2

For these illustrative calculations, the pretax return to capital will be taken to be $\rho = 0.11$, the effective corporate tax rate $\tau = 0.4$, and the interest rate in the absence of inflation $r_0 = 0.03$. In 1970, households held \$700 billion of equities while institutions (including private pension plans, foundations, educational endowments, and insurance companies) held \$135 billion; I will therefore set $q_0 s_{h0} = 700$ and $q_0 s_{i0} = 135$. Together these assumptions imply

(16) $$\delta_h \sigma_\rho = (0.157 - .071 q_0)10^{-3}$$

(17) $$\delta_i \sigma_\rho = (0.815 - .370 q_0)10^{-3}$$

It is common to assume that the corporate capital stock (and therefore ρ and $\bar{s}$) will adjust until in equilibrium q equals one. An alternative view is that, with the corporate financial behavior that is optimal under existing tax laws, this arbitrage will not be fully achieved and the equilibrium value of q_0 will be less than one.[18] Section 10.3 shows how, under either assumption, the introduction of a moderate rate of inflation can cause a substantial fall in the share value.

10.3 Inflation and the Market Equilibrium Share Value

This section examines the effect of an unanticipated increase in the steady-state rate of inflation. The analysis assumes that the corporate

18. See Auerbach (1978), David Bradford (1979), and King (1977) for statements of this view.

capital stock remains constant; this implies that the total number of shares ($\bar{s}$) and the average pretax profitability (ρ) remain constant.[19]

Inflation changes the net yields on stocks and bonds in the way described in section 10.1. For households, the real net yield on equity becomes $(1-\theta)[(1-\tau)\rho - \lambda\pi]/q_1 - c\pi$ and the real net return on bonds becomes $(1-\theta)r_1 - \pi$. Since the nominal interest rises by the rate of inflation,[20] $r_1 = r_0 + \pi$ and the real net return on bonds is $(1-\theta)r_0 - \theta\pi$. The new portfolio equilibrium therefore satisfies

$$(18)\qquad \frac{(1-\theta)[(1-\tau)\rho - \lambda\pi]}{q_1} - c\pi = (1-\theta)r_0 - \theta\pi + \delta_{1h}$$

where

$$(19)\qquad \delta_{1h} = \delta_h s_{h1}(1-\theta)(1-\tau)\sigma_\rho$$

The household's demand price for shares therefore satisfies

$$(20)\qquad q_1 = \frac{(1-\theta)[(1-\tau)\rho - \lambda\pi]}{(1-\theta)r_0 - (\theta - c)\pi + \delta_h s_{h1}(1-\theta)(1-\tau)\sigma_\rho}$$

Similarly, the institution's demand price for shares (with $\theta = c = 0$) can be written as

$$(21)\qquad q_1 = \frac{(1-\tau)\rho - \lambda\pi}{r_0 + \delta_i s_{i1}(1-\tau)\sigma_\rho}$$

Since the number of shares has not changed, it is still true that

$$(22)\qquad \bar{s} = s_{h1} + s_{i1}$$

These three equations determine the new equilibrium share price and the corresponding allocation of shares.

Before calculating the new equilibrium explicitly, it is useful to discuss the change with the help of a diagram. Figure 10.3 combines the no-inflation demand equations originally shown in figure 10.2 with the corresponding demand equations of (20) and (21) in the presence of inflation. The dashed lines ($s_{h0}(q_0)$ and $s_{i0}(q_0)$) show the no-inflation share demands and s_0, the horizontal sum of these demand curves, gives the market demand. Comparing equations (21) and (12) shows that the institutions' demand price is lower at every value of s_{i1} but also tends to

19. The assumption of a fixed corporate capital stock causes the calculation to overstate the change in the share price. If q falls, capital will leave the corporate sector, raising p and thereby q. Since this would be anticipated by investors, the immediate fall would be less than that calculated here. A satisfactory solution to this problem requires a dynamic model with endogenous corporate investment decisions.

20. See note 4 for evidence that this has been the historical experience in the United States.

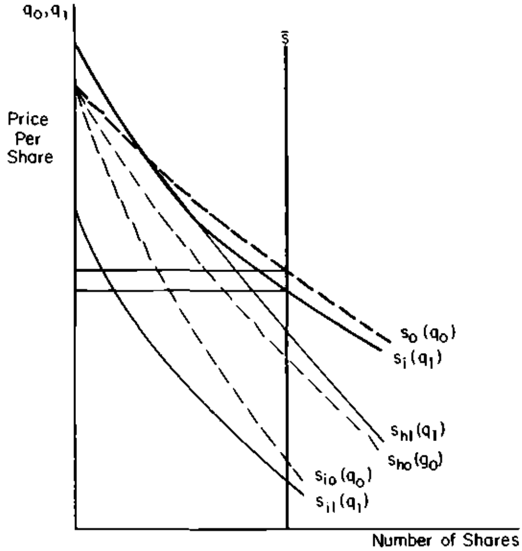

Figure 10.3

zero as s_{i1} tends to infinity; the curve $s_{i1}(q_1)$ is drawn in this way. Comparing equations (20) and (9) shows that the shift of the household demand curve is ambiguous since the numerator is reduced by $-(1-\theta)\lambda\pi$ while the denominator is reduced by $-(\theta - c)\pi$. To emphasize the possibility of a lower equilibrium price even when the household demand price rises, the household demand curve is drawn with the demand price at the initial value of $s_{h1} = 0$ greater than its previous level.

The new market demand curve $s_1(q_1)$ coincides with the household demand curve until a price is reached at which institutions are willing to hold some stock. Thereafter, the market demand curve is the sum of the two demands. The new equilibrium price occurs at a value of q_1 that is below the old equilibrium. Institutions reduce their shareholdings and individuals increase their shareholdings.

Equations (20) to (22) can be used to calculate explicitly the values of q_1 and of the separate shareholdings. Combining (20) and (21) and using $\bar{s} - s_{h1}$ for s_{i1} yields an equation for the new shareholding by households:

$$(23) \qquad s_{h1} = \frac{\delta_i\sigma_p(1-\theta)(1-\tau)\bar{s} + (\theta - c)\pi}{\sigma_p(1-\theta)(1-\tau)[\delta_i + \delta_h]}$$

Consider first the new equilibrium when q_0 was equal to 1. Using the values of $\delta_h\sigma_p$ and $\delta_i\sigma_p$ implied by equations (16) and (17), and an inflation rate of $\pi = 0.08$, equation (23) implies that $s_{h1} = 754$, i.e., inflation causes households to increase their shareholdings from 700 shares to 754 shares.[21] Substituting this value into equation (20) and setting the historic cost depreciation penalty at $\lambda = 0.30$[22] yields $q_1 = 0.812$. The share price per unit of capital falls from one dollar to 81.2 cents. Note that the value of household shares is reduced by the inflation from \$700 billion to \$612 billion even though they hold an increased number of shares.

A lower initial value per share does not change the conclusion that the share price falls but does reduce the relative magnitude of the fall. More specifically, if $q_0 = .8$,[23] equations (16), (17), and (23) imply that $s_{h1} = 746$. Substituting into (20) yields $q_1 = 0.729$ or 91 percent of the initial price.

10.4 Conclusion

The simple model developed in this paper conveys the idea of how a higher rate of inflation can cause a substantial reduction in the ratio of share prices to pretax earnings. The higher effective rate of tax on corporate income caused by historic cost depreciation and the tax on the artificial capital gains caused by inflation both reduce the real net yield that investors receive per unit of capital. Although the real net yield on bonds is also reduced, for many shareowners, this is outweighed by the fall in the equity yields.

The market equilibrium analysis examined the impact of inflation when both stocks and bonds are held by risk-averse investors in quite different tax situations. It also showed how the equilibrium ratio of share prices to earnings can fall even if the demand price per share for some individuals is actually increased by inflation.

Of course, the increase in the effective tax rate caused by inflation has not been the only adverse influence on the level of share prices during the last decade. The slowdown in productivity growth, the higher cost of energy, and the increased international competition have all reduced pretax profitability. Although there is no clear evidence of a permanent fall in profitability (see my paper with Summers, 1977), the transitory reduction may have caused some investors to project lower long-term pretax profitability. The higher tax rates on capital gains for high-income investors since 1969 further reduced after-tax profitability. An increase in uncertainty has also had an adverse effect on price-earnings ratios. One source of this greater uncertainty is the increasing ratio of debt to equity on corporate balance sheets. In addition, after a period of steady growth and low inflation, the events of the past decade have added uncertainty to

21. The other parameter values are $\tau = 0.4$, $\theta = 0.3$, $c = 0.15$, and $\bar{s} = 835$.

22. See note 9.

23. Auerbach and King show that under certain conditions the share price without inflation will be $q_0 = (1 - \theta)/(1 - c)$ if the only shareholders are individuals with these tax rates. With our current tax values, this implies 0.82.

any evaluation of the future. Finally, in considering the changes in the level of share prices over the past decade, it is important to recognize that the adverse effect of inflation has been perceived only slowly and imperfectly. Some investors have undoubtedly concluded incorrectly that even a steady rate of inflation would cause a continuing decline in the ratio of share prices to earnings. The share price level may therefore have overshot its equilibrium level.

A full understanding of the equilibrium relation between share prices and inflation requires extending the current analysis in a number of ways. The role of corporate debt and retained earnings should be included.[24] The possibility of individual investment in other assets like real estate should be recognized.[25] A more explicit portfolio model could derive asset demand equations from expected utility maximization and could recognize that some institutional holdings are really indirect ways for individuals to hold assets in a tax-favored way. Finally, the simplification that the capital stock remains constant should be replaced by a more dynamic model that recognizes the effect of inflation on capital accumulation.

24. An empirical analysis of corporate tax burdens with the existing corporate debt and retained earnings shows that inflation raises the tax burden on equity investors as well as on total corporate sector capital; see my paper with Summers (1979; chap. 8 above).

25. A model of the interaction of tax laws and inflation in determining the price of gold and land is presented in my 1980 paper (chap. 12 below).