INFLATION AND THE STOCK MARKET

Martin Feldstein

Summary

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        This paper explains why the nominal level of share
prices has failed to rise during a decade of substantial
inflation. The key to the explanation is the features of the
current U.S. tax laws, especially historic cost depreciation
and the taxation of nominal capital gains, that cause the
effective rate of tax or corporate source income to rise
when there is a higher rate of inflation.

        The current analysis shows that to understand the
structural relation between inflation and share prices it
is crucial to note that a high constant rate of inflation
leaves the price-earnings ratio unchanged while an increase
in the rate of inflation depresses the price-earnings ratio.

        The higher nominal interest rates that accompany
inflation actually represent lower real net-of-tax yields on
alternative assets for most investors. The current analysis
takes this into account in determining the share price.

        The main focus of the paper uses a stock valuation
model to derive the share demands of investors in different
tax situations and then calculates the share value that achieves
a market equilibrium. Numerical calculations illustrate the
analysis with a representative individual and a representative
tax-exempt institutional investor.

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Inflation and the Stock Market

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This paper explains why the level of share prices has failed to rise during a decade of substantial inflation. Instead, the share value per dollar of real pretax earnings fell from 10.82 in 1967 to 6.65 in 1976.[1] The analysis here shows that the inverse relation between higher inflation and lower share prices during the past decade was not due to chance or to other unrelated economic events. On the contrary, the 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.[2]

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

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[1]These price-earnings ratios are based on real earnings in each year, i.e., earnings based on real depreciation and with the inventory valuation adjustment. See Feldstein and Summers (1978b) for the description of the method by which these pretax real price-earnings ratios are constructed. The traditional Standard and Poors post-tax price-earnings ratio, based on book profits (including inventory profits) fall 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 Nelson (1978) and Lintner (1973,1975).

[2]I emphasize that these are tax rules in the United States. 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.

between the effect of a <u>high</u> constant rate of inflation and the effect of

an <u>increase</u> 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 <u>increase</u> 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 1. The top part of the figure

shows the inflation rate. Until time t_o, the inflation rate is constant at

π_o; 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_o the price per share rises at a constant rate equal to the

rate of growth of <u>nominal</u> earnings per share. At time t_o, the share price

drops to a level consistent with the higher rate of inflation and then

grows at the new 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
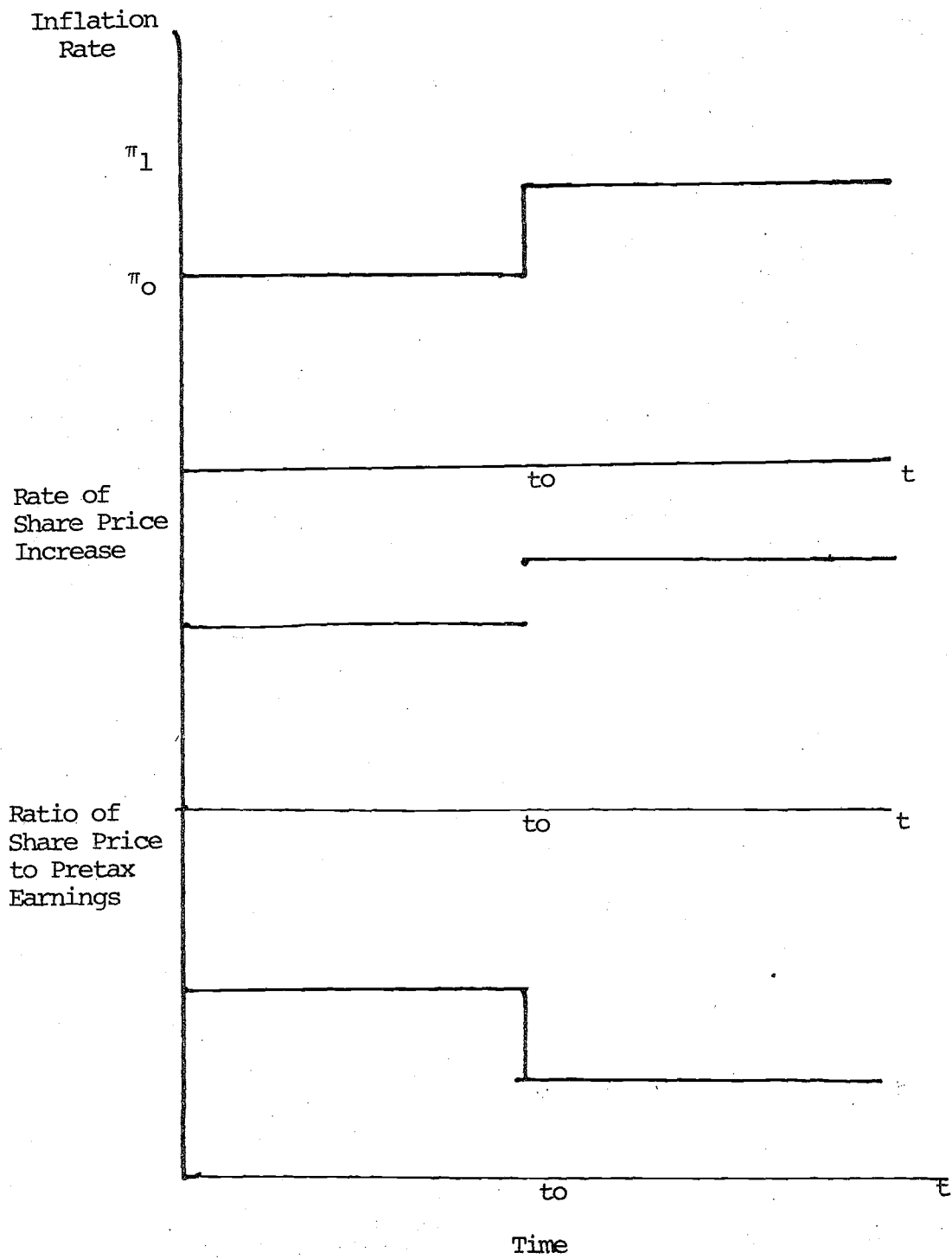
in bonds. It is clear that this argument should be rejected since the higher _nominal_ rate of interest generally corresponds to an unchanged _real_ rate of interest.[1] Indeed, since the entire nominal interest is subject to the personal income tax, the real rate of interest net of the personal income tax actually falls. The analysis of section 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 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 a different share value for individuals in each tax situation. It is therefore incon-sistent with the observation that the same stocks are held by individuals who face very different tax rates. The main focus of the current paper therefore uses a more general stock valuation model to derive the shares 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

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[1]The conclusion that inflation raises the nominal interest rate while leaving the real rate unchanged has been supported by evidence since Irving Fisher's (1930) classic study. For more recent evidence, see Feldstein and Eckstein (1970), Yohe and Karnovsky (1969), and Feldstein and Summers (1978a).

Figure 1

Inflation
Rate

π_1

π_0

to   t

Rate of
Share Price
Increase

Ratio of
Share Price   to   t
to Pretax
Earnings

to   t

Time

calculations. The final section of the paper discusses some of the important ways in which the current analysis could be extended.

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. 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 would make the net earnings per dollar of equity equal to the net interest that he would receive per dollar invested in government bonds, $(1-\theta)r$.[1] 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

$$(1.1) \qquad \frac{(1-\theta)(1-\tau)\rho}{q} = (1-\theta)r + \delta \quad .$$

The individual's demand price per share is thus

$$(1.2) \qquad q = \frac{(1-\theta)(1-\tau)\rho}{(1-\theta)r+\delta} \quad .$$

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[1] See, e.g., King (1977). He also treats the more general case in which retained earnings cause share prices to rise.

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.[1] As a result, real profits net of the corporate income tax vary inversely with inflation.[2] 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 $(1-\tau)\rho-\lambda\pi$.[3] After personal income tax at rate θ, the individual receives $(1-\theta)[(1-\tau)\rho-\lambda\pi]$.[4]

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[1] 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.

[2] For a more complete discussion of this see Feldstein and Summers (1978b) and Feldstein, Green and Sheshinski (1978), especially the appendix by Auerbach. Hong (1977), Motley (1969), and Van Horne and Glassmire (1971) discuss the effects of historic cost depreciation and the implication for the effects of historic cost depreciation and the implication for the effect of inflation and share values; they assume a single investor whose discount rate is unchanged by inflation.

[3] With an exponental depreciation rate of 15 percent and a growth rate of 3 percent, a seven percent inflation rate reduces net profits per unit of capital by 0.021; this implies $\lambda=0.35$.

[4] 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; as reality this may be approximately offset by the shareholders' gain at the expense of bondholders.

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.[1] 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. 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 $(1-\theta)\lambda+cq$.[2]

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 $\lambda=0.35$ an effective capital gains tax rate of $c=0.15$ and an initial share value per unit of capital of $q=1$, each one percent of inflation reduces the real net yield on equity by 0.40 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.

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

[2] 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

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

or

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

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

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

Since the denominator is positive,[1] $dq/d\pi$ is negative if

(1.6) $$q(\theta-c) < (1-\theta)\lambda \quad .$$

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 $\lambda=0.35$ 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 $dq/d\pi>0$.

This diversity of responses of q to the rate of inflation reinforces the implication of equation 1.4 that the demand price per share differs among investors according to their tax situation. An analysis of the

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[1]This is a necessary condition for a finite value of q.

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 the next section; section 3 then analyzes how the equilibrium responds to a change in the rate of inflation.

3. 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 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 1.1 showed that, in the absence of inflation, the portfolio equilibrium of the households can be written

$$(2.1) \qquad \frac{(1-\theta)(1-\tau)\rho}{q_o} = (1-\theta)r_o + \delta_{ho} \quad ,$$

where the share price and interest rate carry a subscript zero to distinguish these initial pre-inflation values from the values of these variables when there is inflation. The risk premium, δ_{ho}, 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_{ho} is really 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 $(1-\theta)^2(1-\tau)^2\sigma_\rho^2/q_o^2$. If the

household has s_{ho} shares in the initial equilibrium, the dollar value of

its equity investment is $s_{ho}q_o$. Since bonds are riskless, the variance of

the return on the household portfolio is $s_{ho}^2(1-\theta)^2(1-\tau)^2\sigma_\rho^2$. If the risk

premium is proportional to the standard deviation of the portfolio return,

$$(2.2) \qquad \delta_{ho} = \delta_h s_{ho}(1-\theta)(1-\tau)\sigma_\rho$$

where δ is a constant.

Substituting 2.2 into 2.1 and rearranging terms yields the share price

that is consistent with the household's chosen share ownership in the

absence of inflation:

$$(2.3) \qquad q_o = \frac{(1-\theta)(1-\tau)\rho}{(1-\theta)r_o + \delta_h s_{ho}(1-\theta)(1-\tau)\sigma_\rho} \ .$$

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

$$(2.4) \qquad \frac{(1-\tau)\rho}{q_o} = r_o + \delta_{io}$$

where the institution's risk premium satisfies

$$(2.5) \qquad \delta_{io} = \delta_i s_{io}(1-\tau)\sigma_\rho \ .$$

Combining these two equations yields the institution's demand price per

share:[1]

$$(2.6) \qquad q_o = \frac{(1-\tau)\rho}{r_o + \delta_i s_{io}(1-\tau)\sigma_\rho} \ .$$

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[1] Note that, since $(1-\theta)$ can be eliminated from equation 2.3, the household and institution demand price equation differ in the absence of inflation only because of differences in δ_i.

Figure 2

q_O

Price
per
Unit
of
Capital

$\overline{s}$

$s_O(q_O)$

$s_{ho}(q_O)$

$s_{io}(q_O)$

s^*_{io} s^*_{ho}
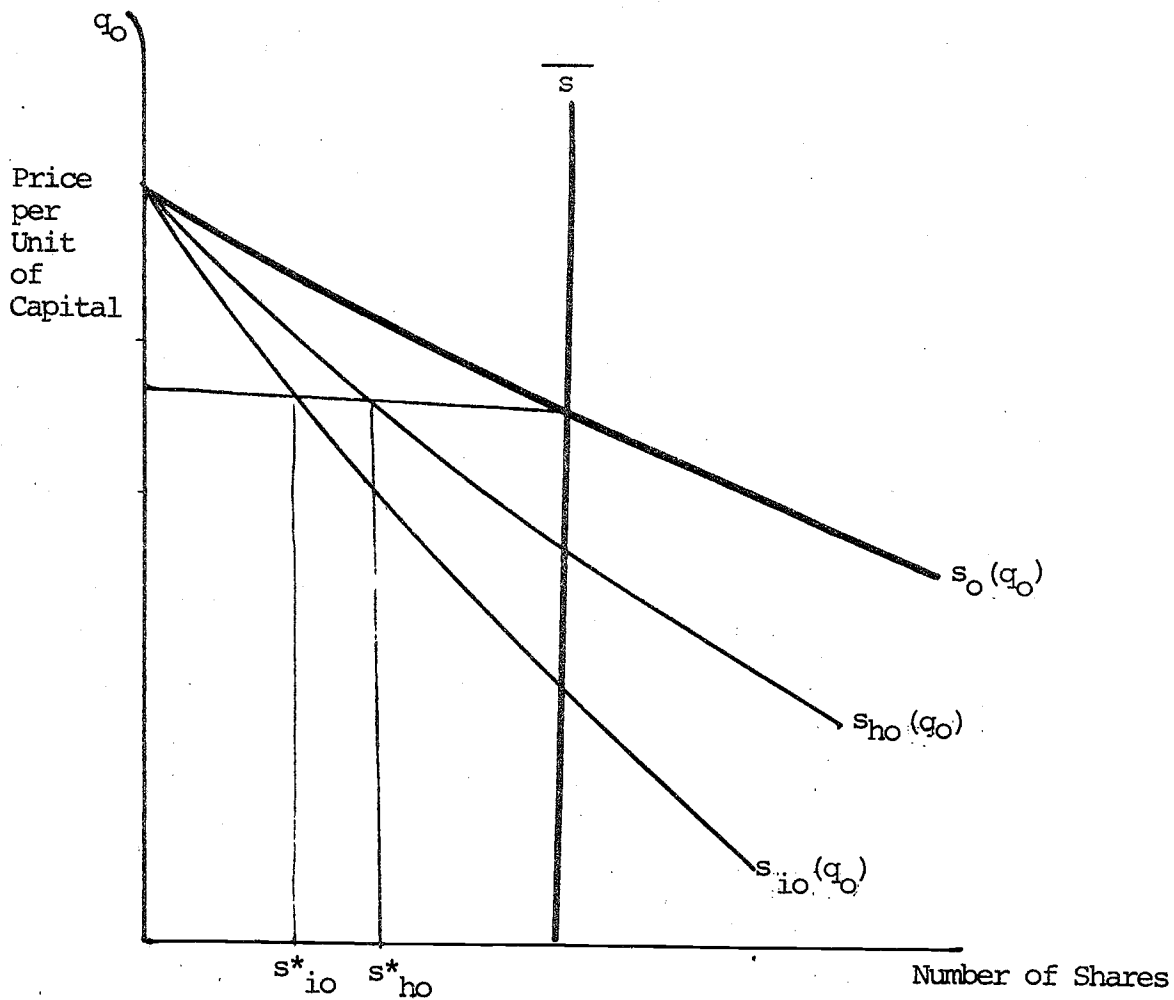
Number of Shares

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

$$(2.7) \qquad \bar{s} = s_{io} + s_{ho} \quad .$$

This supply constraint and the two demand equations (2.3 and 2.6) 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 2. The equilibrium relation of equation 2.3 is drawn as the household's demand curve for shares, $s_{ho}(q_o)$. Similarly 2.6 is drawn as the institution's demand curve $s_{io}(q_o)$. These are added horizontally to get total share demand as a function of share price $s_o(q_o)$. The intersection of this market demand curve with the supply constraint line $\bar{s}$ determines the equilibrium price q_o^* and the corresponding share holdings $(s_{ho}^*$ and $s_{io}^*)$.

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 $\delta_h \sigma_\rho$. Although these parameters cannot be observed, their values can be inferred from the equilibrium conditions in the absence of inflation. Thus equation 2.3 implies

$$(2.8) \qquad \delta_h \sigma_\rho = \frac{(1-\tau)\rho - q_o r_o}{q_o(1-\tau)s_{ho}}$$

and 2.6 implies

$$(2.9) \qquad \delta_i \sigma_\rho = \frac{(1-\tau)\delta - q_o r_o}{q_o(1-\tau)s_{io}} \quad .$$

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 $r_o=0.03$. 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 $q_o s_{ho} = 700$ and $q_o s_{io} = 135$. Together these assumptions imply:

$$(2.10) \qquad \delta_h \sigma_\rho = (0.157 - .071 q_o) 10^{-3}$$

and

$$(2.11) \qquad \delta_i \sigma_\rho = (0.815 - .370 q_o) 10^{-3}$$

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_o will be less than one.[1] The next section shows how, under either assumption, the introduction of a moderate rate of inflation can cause a substantial fall in the share value.

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[1] See Auerbach (1978), Bradford (1977), and King (1977) for statements of this view.

3. Inflation and the Market Equilibrium Share Value

This section examines the effect of our unanticipated increase in the steady state rate of inflation. The analysis assumes that the corporate capital stock remains constant; this implies that the total number of shares $(\bar{s})$ and the average pretax profitability (ρ) remain constant.[1]

Inflation changes the net yields on stocks and bonds in the way described in section 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,[2] $r_1=r_0+\pi$ and the real net return on bonds is $(1-\theta)r_0-\theta\pi$. The new portfolio equilibrium therefore satisfies:

$$(3.1) \qquad \frac{(1-\theta)[(1-\tau)\rho-\lambda\pi]}{q_1} - c\pi = (1-\theta)r_0 - \theta\pi + \delta_{1h}$$

where

$$(3.2) \qquad \delta_{1h} = \delta_h(1-\theta)(1-\tau)\sigma_\rho \quad .$$

The household's demand price for shares therefore satisfies

$$(3.3) \qquad q_1 = \frac{(1-\theta)[(1-\tau)\rho-\lambda\pi]}{(1-\theta)r_0-(\theta-c)\pi+\delta_h s_{hl}(1-\theta)(1-\tau)\sigma_\rho} \quad .$$

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

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[1]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 ρ 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.

[2]See footnote 1 page 3 above for evidence that this has been the historical experience in the United States.

written as

$$(3.4) \qquad q_1 = \frac{(1-\tau)\rho - \lambda\pi}{r_o + \delta_i s_{i1}(1-\tau)\sigma_\rho} \quad .$$

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

$$(3.5) \qquad \bar{s} = s_{h1} + s_{i1} \quad .$$

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 3 combines the no-inflation demand equations originally shown in figure 2 with the corresponding demand equations of 3.3 and 3.4 in the presence of inflation. The dashed lines ($s_{ho}(q_o)$ and $s_{io}(q_o)$) show the no-inflation share demands and s_o, the horizontal sum of these demand curves, gives the market demand. Comparing equation 3.4 and 2.6 shows that the institutions' demand price is lower at every value of s_{i1} but also tends to zero as s_{i1} tends to infinity; the curve $s_{i1}(q_1)$ is drawn in this way. Comparing equations 3.3 and 2.3 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 the price 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.

Figure 3
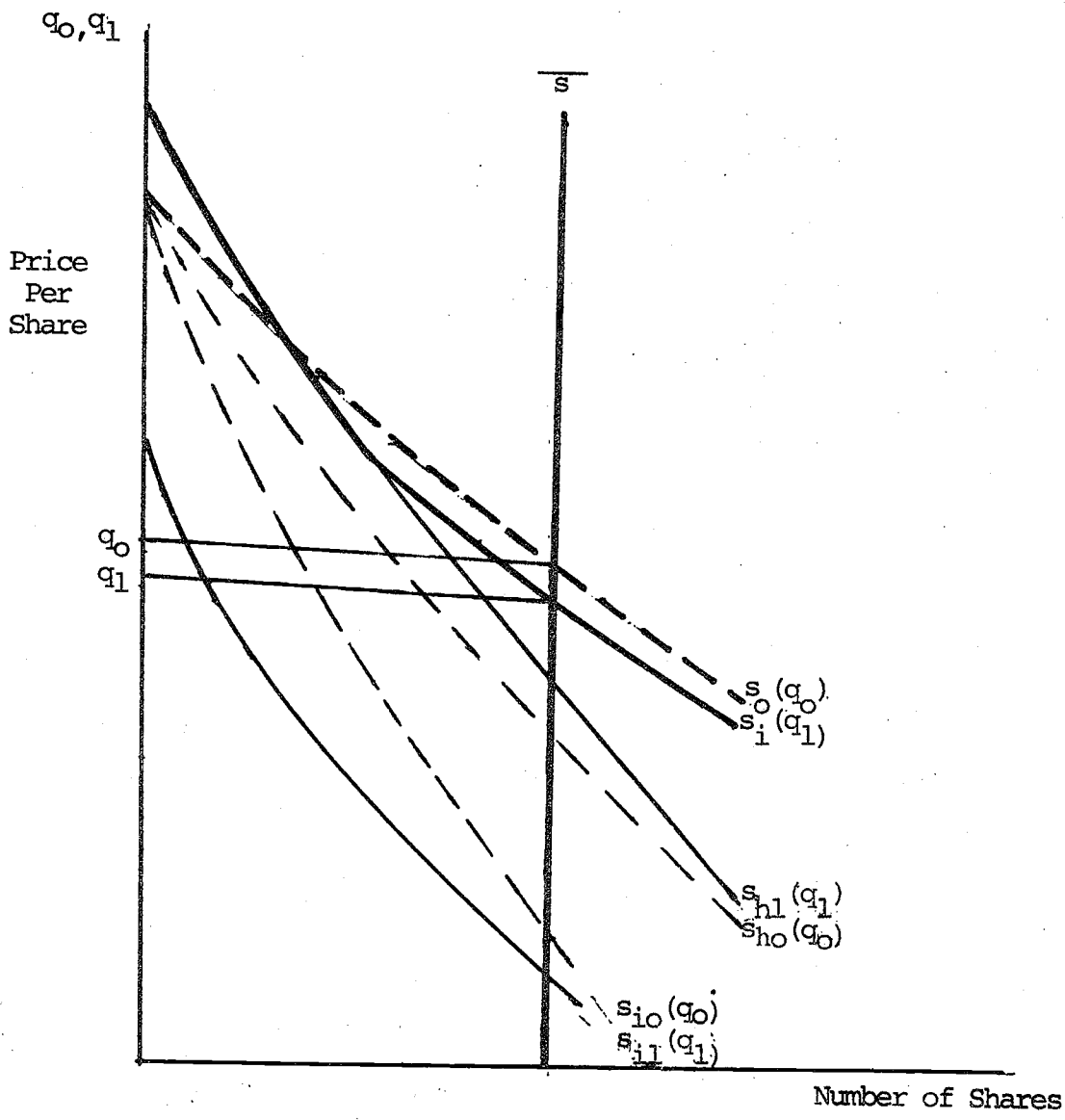
Institutions reduce their shareholdings and individuals increase their
shareholdings.

Equations 3.3 to 3.5 can be used to calculate explicitly the values of
q_1 and of the separate shareholdings. Combining 3.3 and 3.4 and using
$\bar{s}-s_{h1}$ for s_{i1} yields an equation for the new shareholding by households:

$$(3.6) \qquad s_{h1} = \frac{\delta_i \sigma_\rho (1-\tau)\bar{s}+(\theta-c)\pi}{\delta_h \sigma_\rho (1-\theta)(1-\tau)+\delta_i \sigma_\rho (1-\tau)} .$$

Consider first the new equilibrium when q_0 was equal to 1. Using the values
of $\delta_h \sigma_\rho$ and $\delta_i \sigma_\rho$ implies by equations 2.10 and 2.11 and with the effective
capital gain tax of c=0.15, equation 3.6 implies that s_{h1}=770, i.e., infla-
tion causes households to increase their sharehold from 700 shares to 770
shares. Substituting this value into equation 3.3 and setting the historic
cost depreciation penalty at λ=0.35[1] yields q_1=0.758. The share price per
unit of capital falls from one dollar to 75.8 cents. Note that the value
of household shares is reduced by the inflation from $700 billion to $584
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,[2] equations 2.10, 2.11 and 3.6 imply that s_{h1}=765.
Substituting into 3.3 yields q_1=0.681 or 85.2 percent of the initial price.

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[1]See footnote 3 page 6 above.

[2]Auerbach (1978) and King (1977) show that under certain conditions
the share price without inflation will be q_0=(1-θ)/(1-c) if the only share-
holders are individuals with these tax rates. With our current tax values,
this implies 0.82.

4. Conclusion

The simple model developed in this paper conveys the basic reason why a higher rate of inflation causes a substantial reduction in the ratio of share prices to real 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 most 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 real 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 (Feldstein and 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 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. The possibility of individual investment in other assets like real estate should be recognized. 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-induced accumulation.

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