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THE RELATION OF STOCK PRICES TO CORPORATE EARNINGS ADJUSTED FOR INFLATION

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ABSTRACT

The effects of inflation adjustments of corporate earnings on market prices were tested by cross section regressions of 485 manufacturing companies for the period 1966-76 and subperiods. The basic data were company reports and stock prices.

For the full period, market prices reflected the inventory valuation adjustment and the decline in real value of net financial liabilities fairly completely, but they relfected the adjustment for the understatement of depreciation to only a small extent. The surprisingly low effect of the depreciation adjustment could only be partly attributed to measurement error, but not entirely.

The estimated effect of capital gains on stock prices was either in the wrong direction or negligible.

The implication of the results is that market investors use a range of adjustments for the effects of inflation which differs from the estimates used in this study, though how and why they differ is not clear.

The adjustments were much lower in the later period 1972-76 than in the earlier period 1966-71. This seemed inconsistent with the higher inflation rates in the later period. The explanation for the difference is not clear, but it may reflect the difficulties of judging the size of the adjustments in a period of rapid inflation.

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Outline of the Study

The continuing and rising rates of inflation since the mid-1960s have created an increasing discrepancy between corporate earnings as they are reported and as they would be reported if adjusted for inflation. Numerous studies have pointed to such discrepancies, and various accounting changes to eliminate them have been discussed and proposed. Some changes have already occurred. Many firms have switched to lifo inventory accounting which avoids the misleading profits of the fifo method. To comply with new SEC regulations, many firms beginning with 1976 have reported the replacement cost of capital. Some are reporting the decline in real value of debt. In general, however, the published adjustments for the effects of inflation on corporate earnings are far from complete.

Rough adjustments for the effects of inflation on corporate earnings can be made from reported figures. Insofar as investors make use of available information to assess corporate earnings adjusted for inflation, stock prices would tend to reflect these "true" earnings as distinct from the reported earnings. This study tests the extent of such market adjustments. The test is made by regressing changes in the market value of a cross section of 485 manufacturing companies on their reported earnings and the various adjustments for inflation that investors could make from published reports. The period covered is 1966 to 1976. Company data were taken from the Compustat tapes and stock prices from the University of Chicago CRISP tapes. The adjustments were for changes in the general purchasing power of the dollar based on the implicit price index of gross domestic product from the national income and product accounts. A supplementary adjustment based on specific price in-

dexes for individual products was made only for inventories.

Inflation Adjustments

The adjustments for inflation were the following:

1) Depreciation adjustment. Conventional accounting practices based on historical costs understate the current value of capital and, as a consequence, current depreciation charges are too low and lead to an overstatement of net earnings. (Although accelerated depreciation for tax purposes, permitted partly as a consequence of inflation, may offset the overstatement or even lead to an understatement of net earnings at times, it is generally not used in reporting earnings to stockholders and the public.) The appropriate adjustment requires revaluation of the capital stock. The revaluation in this study, as noted, is made according to an index of general prices rather than the specific current value of capital goods. The revalued (net) stock is multiplied by an annual depreciation rate to give the depreciation cost. The rate used is the average ratio of depreciation to net plant and equipment reported by each company. (A depreciation rate of one-eighteenth, based on an average life of capital of 18 years used in the national income and product accounts of the BEA and on straight-line depreciation charges, was also tried and proved less successful.) The difference between our estimate of depreciation and the reported amount is the depreciation adjustment, representing an extra cost per year because the reported figure is understated by inflation. This cost is a deduction from reported earnings and implies a lower market value of the firm.

2) Inventory valuation adjustment. Production costs can be understated when materials used, which were purchased at an earlier time, are valued at original costs that are below replacement costs. The degree of understatement depends on the accounting method followed. By fifo and the average cost methods, inventory profits due to inflation can be substantial whereas by the lifo method they are zero as long as inventory stocks are rising. Under lifo special calculations have

to be made when inventories are declining. The inventory valuation adjustment is an estimate of the amount by which reported earnings are overstated by the inventory accounting method used. Such a deduction from reported earnings implies a lower market value of the firm.

3) Decline in real value of net financial liabilities. Inflation depreciates the real value of claims fixed in dollar terms. Corporations gain a real return insofar as they are net debtors, as most nonfinancial corporations are. Their liabilities fixed in dollar terms generally exceed the comparable assets in the form of cash and receivables. To the extent that interest payments are higher in recognition of the inflationary depreciation of debt, the deduction of interest payments from earnings gives rise to a misleading understatement of earnings if the corresponding gain is not recognized and allowed for in the calculation of earnings. Even if a company has not had to borrow at the higher interest rates brought about by inflation, and although the corporation receives no cash inflow year by year from the decline in real value of debt, the decline is an implicit addition year by year to its earnings.

When market interest rates rise as a result of higher inflation or any other reason, outstanding bonds decline in dollar market value. This change in market value of bonds is an additional adjustment of the current-dollar value of net worth, beyond the decline in real value of the face value of the bonds. It is not specifically an inflation adjustment, however, and has been omitted in this study. Changes in market value are ordinarily reversed in subsequent years as the bonds return to their par value at maturity.

4) Capital gain. Inflation increases the dollar value of capital equipment and inventories. The dollar capital gain is calculated as the change in market value of fixed capital and inventories over the period. The capital gain is not realized (unless the equipment is sold), but it adds to net worth, since usable capital and inventories are worth more in current market value than was paid for them.

For inventories the capital gain applies to the unused stock, while the

inventory valuation adjustment pertains to the stock used up in production. The two are correlated, but not highly. For fixed capital, however, there is a high correlation. Consider a simple example of capital purchased at the beginning of the year for $100 and 5 percent inflation (ignoring capital purchased during the year). If the depreciation rate is 10 percent, historical-cost depreciation for the year is $10. The revalued capital stock at the end of the year is $105 and current-value depreciation is $10.50. The depreciation adjustment is $0.50. The capital gain is the rise in value of the end-of-year capital, that is, 5 percent of $90 or $4.50. The two adjustments are proportional to the inflation rate and the capital stock. The proportions will not move similarly from year to year, of course, because the depreciation adjustment reflects the cumulative effect of past inflation, while the capital gain depends on the current inflation rate. But they tend to be highly correlated/ among companies. Statistical problems due to this multicollinearity are noted later.

Appendix A gives details of the derivation of these adjustments.

Framework of the Statistical Analysis

The main criterion for the form of the regression equations is that the inflation adjustments appear as independent variables and be arithmetically additive to reported earnings. The form chosen relates the change in market value of net worth to components of the change in net worth. The current-value of net worth is increased by issues of equity, capital gain, and retained earnings after adjusting for the understatement of depreciation and inventory costs and the omission of decline in real debt.

The variables are measured as follows: The dependent variable of the regressions is the change in market value minus equity issues; it represents changes in the market's valuation of the equity owners' share in the company. Equity issues (EI) are the reported change in the book value of common equity excluding total retained earnings during the period. The change in market

value of the common stock is the price per share times the number of shares outstanding at the end of the period (M_t) minus the value at the beginning of the period (M_{t-1}). Retained earnings are reported earnings during the period minus dividends. (Extraordinary income items have been excluded; they are usually small, and the exclusion has little effect on the results.) The inflation adjustments to the reported changes in net worth from retained earnings are as described previously.

Note that the regression equation relates changes in the market's valuation of the company between years t-n and t to the cumulated flow of adjusted retained earnings during the intervening n years, rather than the level of the market value to earnings. If the variation in price-earnings ratios among companies reflects differences in expected future earnings, changes in prices will reflect (largely random) changes in expectations and increases in capital which generate future earnings. If the first of these effects on prices is more variable among companies than is the second, as seems plausible to me, the relation between changes in market value and in net worth will be more comparable among companies than price-earnings ratios are.

All the above variables are expressed as percentages of the initial market value of the firm to allow for size differences among companies. Various other variables were added to the regressions to test for particular influences, as discussed later.

The basic regression equation may be written as follows:

$$\frac{M_t - M_{t-n} - \sum_{t-n}^{t} EI}{M_{t-n}} = \text{const.} + a_1 \frac{\sum_{t-n}^{t} RE}{M_{t-n}} + a_2 \frac{\sum_{t-n}^{t} DA}{M_{t-n}} + a_3 \frac{\sum_{t-n}^{t} IVA}{M_{t-n}} + a_4 \frac{\sum_{t-n}^{t} DRD}{M_{t-n}} + a_5 \frac{\sum_{t-n}^{t} CG}{M_{t-n}},$$

where the dependent variable was defined above, RE is reported retained ordinary earnings, DA the depreciation adjustment, IVA inventory valuation adjustment, DRD decline in real debt, and CG capital gain (or loss). The a's are regression coefficients, assumed constant across companies. Eighteen dummy variables were added to the regressions to allow for differences in the constant term among industries.

They were generally not significant and did not materially alter the results. Dummy variables for industry differences in the regression coefficients, which would reflect differences in the expected rate of return on capital, were not used. (The distribution of the sample by industries is shown in Appendix Table A.)

The contribution of retained earnings to net worth is dollar for dollar; hence, if the change in market value were strictly based on the current change in net worth, a_1 would be unity. In most of the statistical results it is greater than unity. This can be explained by companies in which unexpected increases in earnings raise the market valuation of net worth. For these companies the earnings produce a more than proportional increase in market value. We can partially nullify this effect by dividing the variables by average market value during the period, as is done later, instead of by the initial market value.

The ratios of the other coefficients to a_1 show how completely the market value of the common stock reflects the various inflation adjustments of earnings. When a_1 is greater than unity, we may expect the other coefficients to be proportionately higher on the argument that a magnified market valuation of net worth reflects unexpected changes in "true" rather than reported earnings (though for capital gain the argument is less clear). On any other interpretation, many of the estimated adjustments, which turn out to be greater than unity though less than a_1, would be inconsistent with their hypothesized effects. A ratio to a_1 of plus or minus unity would be a theoretically complete adjustment, and zero no adjustment. As the variables are defined, a_2 and a_3 should be negative (IVA is measured as a positive quantity), and a_4 and a_5 positive.

Statistical Results

The full period 1966-76

Table 1 presents regression results for 1966-76, the full period for which the data were compiled. The dependent variable is the change in market value (excluding new equity issues) from the beginning to the end of the period,[1] and the independent variables are the cumulated sum of earnings and adjustments during the period. The period for each company is dated by the end of its fiscal year, so the beginning and ending dates of the period differ among companies.[2]

In equations 1 and 2 of Table 1, reported earnings are highly significant, and the three adjustments of reported earnings are significant in the expected direction. (The value of t at the .05 level of significance for a one-tail test is 1.67.) The addition of industry dummy variables reduces the size and signi-

Table 1

Regression of percentage change in company market value (exclusive of equity issues) on independent variables as percentage of initial market value, 1966-76

No.	Reported retained ordinary earnings	Depreciation Adjustment	Inventory valuation adjustment	Decline in real value of net fin. liab.	Capital gain	18 indus. dummies included?	Constant term	R^2
				485 manufacturing companies				
1	1.71	-0.29	-0.86	+0.61		no	-35	.47
	(19.0)	(3.1)	(3.6)	(2.9)			(3.3)	
2	1.68	-0.17	-0.95	+0.60		yes	-48	.51
	(18.6)	(1.9)	(3.7)	(2.9)			(2.3)	
3	1.86	-0.06	-1.20	+1.34	-0.53	no	-18	.48
	(18.4)	(0.5)	(4.6)	(4.4)	(3.2)		(1.6)	
4	1.79	-0.02	-1.16	+1.10	-0.37	yes	-35	.52
	(17.3)	(0.2)	(4.2)	(3.5)	(2.1)		(1.7)	
				246 manufacturing companies not using lifo				
5	1.79	-0.32	-1.77	+1.58		no	-11	.38
	(11.5)	(2.3)	(3.9)	(4.0)			(0.6)	
6	1.89	-0.20	-1.90	+2.01	-0.36	no	- 2	.38
	(10.4)	(1.1)	(4.0)	(3.7)	(1.1)		(0.1)	
7	1.84	-0.24	-1.85	+1.63	-0.001	yes	-28	.44
	(9.7)	(1.2)	(3.5)	(2.8)	(0.0)		(0.8)	

Note: t values of regression coefficients are in parentheses; signs have been omitted.

ficance of the depreciation adjustment and leaves the other coefficients essentially the same. The constant term gives the average percentage change in market value after allowing for the adjusted change in earnings. The regressions explain about half of the variation in the change in market value among the companies.

Reported retained earnings have a coefficient greater than unity, which overstates their contribution to current net worth. As suggested above, a coefficient above unity can be attributed to the effect of unexpected changes in earnings on the market value of net worth. Compared with the coefficient for reported earnings, the other coefficients are smaller, which implies that the adjustments of earnings for inflation are incomplete. In equations 1 and 2 the market's recognition of the depreciation adjustment is only about a tenth to a fifth of being complete,[3] that of IVA is about a half, and of the decline in real debt is about a third. The implication is that part of the market does not make these adjustments or discounts their importance. Certainly such adjustments are subject to considerable measurement error, and investors know it.

The coefficient of capital gain in equations 3 and 4 is statistically significant but has a negative sign, which makes no sense because capital gain should increase the dollar net worth of the companies. Its inclusion affects the other coefficients as well, reducing that of the depreciation adjustment practically to zero and doubling that of the decline in real debt. There is considerable multicollinearity between capital gain and these variables (see Appendix Table D).

It is not inconceivable that the market ignores capital gain in valuing company equity, but that does not explain a negative coefficient. Capital gain appears to be proxying for other extraneous influences. Other variables were added to the regressions to capture these influences and are reported later. None was successful in reducing the significance of the negative coefficient of capital gain for the full period. As shown below, however, capital gain is insignificant in regressions excluding lifo companies and for the earlier and

later subperiods (Table 2, below). This is consistent with a possible explanation suggested to me by William Brainard. The increase in the rate of inflation from the earlier to the later years produced a rising capital gain and also indicated a rising level of corporate taxes, not all of which yet affected current-period retained earnings. Hence capital gain may have correlated inversely with a depressing effect of the rising level of taxes (and perhaps other inflation effects) on market value. Since most of the effect of inflation on corporate taxes probably became fully evident by the beginning of the later subperiod, the negative effect of capital gain could have been significant between the subperiods, yet could have been cancelled by its positive effect on net worth and therefore insignificant within the subperiods.[4]

However capital gain should be interpreted, its questionable role in these regressions and its multicollinearity with the other variables suggest that the effects of the latter should be judged from the regressions omitting capital gain.

In equations 5-7 the companies that used the lifo accounting method for inventories in any year (for which the IVA is zero by definition except when inventories are declining) have been omitted. The coefficient of capital gain becomes insignificant and, with the industry dummies, practically zero. The coefficients of IVA and decline in real debt are larger for the non-lifo sample and are comparable in size to the coefficient for reported earnings, indicating a more or less complete adjustment in the market to these two effects of inflation. The enhanced effect of IVA in these regressions seems to suggest that the market viewed the lifo IVA of zero as too small (error in the IVA variable could have reduced the estimated coefficient). This is possible, because many companies using lifo as principal accounting method did not apply it to all inventories, though it was assumed here that they did. But the large number of companies excluded (almost half the full sample) may also affect the results, so that less confidence can be placed in the estimates for the non-lifo companies compared with those for the full sample.

In summary, so far as the results in Table 1 for the full period are concerned, the adjustments for IVA and decline in real debt are large and that for the depreciation adjustment is small. Capital gain does not show the hypothesized positive effect on market value, and it may be proxying for other influences.

Subperiods

The two subperiods in Table 2 present surprising differences.

The results for the earlier period 1966-71 are consistent with those for the full period in Table 1 and even closer to what might be expected. In particular, the coefficient of the depreciation adjustment is significant in all the equations and that of capital gain, though of the wrong sign, is uniformly insignificant. Relative to the size of the coefficient for reported earnings, the adjustment for depreciation is a quarter, and those for IVA and decline in real debt are a half, of being complete.

The results for the later period 1972-76, in which we might expect the effects of adjustments for inflation to be stronger, are practically the opposite; most of the coefficients have the wrong sign and are insignificant. The coefficient for the depreciation adjustment is practically zero, that for IVA is (incorrectly) positive though insignificant, and that for decline in real debt is (incorrectly) negative yet significant. The coefficient for capital gain, though (correctly) positive, is practically zero. Based on these results, the adjustments did not occur in the later period 1972-76.

Multicollinearity among the independent variables does not explain the different results for the two subperiods. As shown in Table 3, the intercorrelations for the two periods are very similar. In particular, the high positive correlation between capital gain and the depreciation and debt variables occurs in both subperiods.

It was noted above that unexpected changes in earnings could correlate positively with market revaluations of net worth to give a coefficient greater than

Table 2

Regression of percentage change in company market value (exclusive of equity issues) on independent variables as percentage of initial market value, 1966-71 and 1972-76

No.	Reported retained ordinary earnings	Depreciation adjustment	Inventory valuation adjustment	Decline in real value of net fin. liab.	Capital gain	18 indus. dummies included?	Constant term	R^2
				485 manufacturing companies 1966-71				
1	2.91	-0.83	-1.05	+1.13		no	+2	.42
	(18.0)	(3.9)	(1.8)	(2.1)			(0.3)	
2	2.94	-0.61	-1.50	+1.60		yes	+4	.45
	(18.0)	(2.8)	(2.3)	(2.9)			(0.2)	
3	2.94	-0.69	-1.24	+1.65	-0.36	no	+6	.42
	(17.8)	(2.6)	(2.0)	(2.2)	(0.9)		(0.7)	
4	2.95	-0.57	-1.53	+1.72	-0.09	yes	+5	.45
	(17.7)	(2.1)	(2.3)	(2.2)	(0.2)		(0.3)	
				485 manufacturing companies 1972-76				
5	1.23	+0.05	+0.31	-0.31		no	-37	.33
	(13.8)	(0.8)	(1.9)	(2.4)			(7.8)	
6	1.18	+0.06	+0.31	-0.37		yes	-44	.38
	(13.2)	(1.0)	(1.7)	(2.9)			(4.4)	
7	1.23	+0.05	+0.30	-0.30	-0.01	no	-36	.33
	(12.8)	(0.5)	(1.5)	(1.6)	(0.1)		(7.2)	
8	1.17	+0.05	+0.33	-0.40	+0.02	yes	-44	.38
	(12.0)	(0.5)	(1.6)	(2.1)	(0.2)		(4.3)	

Note: t values of regression coefficients are in parentheses; signs have been omitted.

Table 3

Correlation matrix of independent variables for subperiods

	Depreciation adjustment	Inventory valuation adjustment	Decline in real value of net fin. liab.	Capital gain
		1966-71		
Depreciation adjustment	1.00	.36	.56	.75
Inventory valuation adjustment		1.00	.50	.31
Decline in real value of net fin. liab.			1.00	.79
		1972-76		
Depreciation adjustment	1.00	.46	.69	.87
Inventory valuation adjustment		1.00	.61	.32
Decline in real value of net fin. liab.			1.00	.80

Note: Variables and sample same as Table 2.

unity for retained earnings. A related problem is that the market reportedly paid more attention to the dangers of large debt outstanding in the later period. If so, a negative correlation could be created between the decline in real debt and the change in market value, reversing the positive effect of the decline in real debt as an inflation adjustment. In this case, given the high intercorrelation between the adjustment for real debt decline and those for depreciation and IVA, the latters' coefficients could be affected by a major change in the coefficient for real debt decline.

Table 4 presents evidence that this indeed is the explanation for the sign reversals in the later period and part of the explanation for a_1 being greater than unity. In Table 4 the variables are all divided by the average market value during the period instead of the initial value, as in the other tables. The rationale for using average market value is that it will include changes that reflect unexpected developments after the period begins, which are then partly or fully cancelled out of the dependent variable. The dependent variable thus tends to reflect mainly continuing changes over the period (such as retained earnings produce) and less once-and-for-all changes (such as unexpected developments produce).

In Table 4 the coefficient of retained earnings is essentially unity for the full period and closer to unity though still above in the earlier period (significantly) and below in the later period (not significantly). Coefficient signs in the later period (as well as earlier) are correct as inflation adjustments except for capital gain.

Based on the regressions omitting capital gain, the market's recognition of IVA is complete in the earlier period and half complete in the later period, of decline in real debt is two-thirds complete in the earlier period and half in the later, and of depreciation adjustment is two-thirds complete in the earlier period but only one-seventh in the later. Table 4 gives the most sensible results obtained in this study, and they show (as do the other regressions) in-

Table 4

Regression of change in company market value (exclusive of equity issues) on independent variables, all expressed as percentage of average market value for the period,[a] 1966-76 and subperiods

No.	Reported retained ordinary earnings	Depreciation adjustment	Inventory valuation adjustment	Decline in real value of net fin. liab.	Capital gain	Constant term	R^2
			485 manufacturing companies 1966-76				
1	1.04	-0.33	-0.99	+0.55		-1	.31
	(12.0)	(6.4)	(6.3)	(4.3)		(0.2)	
2	1.14	-0.04	-1.34	+1.15	-0.46	+8	.35
	(13.2)	(0.5)	(8.0)	(6.7)	(5.1)	(1.2)	
			485 manufacturing companies 1966 -71				
3	1.49	-0.99	-1.41	+1.09		+24	.25
	(8.9)	(8.2)	(3.6)	(3.2)		(4.7)	
4	1.58	-0.33	-2.18	+2.69	-1.20	+32	.29
	(9.7)	(2.0)	(5.4)	(6.1)	(5.5)	(6.2)	
			485 manufacturing companies 1972-76				
5	0.88	-0.13	-0.51	+0.46		-35	.14
	(7.8)	(1.8)	(2.7)	(2.9)		(3.)	
6	0.94	+0.14	-0.83	+0.91	-0.39	-26	.16
	(8.3)	(1.2)	(3.9)	(4.2)	(3.1)	(3.7)	

Note: t values of regression coefficients are in parentheses; signs have been omitted.

[a]Average market value is average of three months preceding each end of fiscal year in the period.

complete and weaker effects for the inflation adjustments in the later period. An interpretation of these results is presented in the final section.

Reported replacement cost data for 1976

Further evidence on the depreciation adjustment is provided by the replacement cost data separately reported by many companies for the first time for 1976 in accordance with new SEC regulations. About half the companies in our sample reported such data for net plant and equipment and its depreciation. For these companies we can compare the reported depreciation on a replacement cost basis with our estimates of depreciation based on current-value net capital stock according to a general price index and multiplied by the reported depreciation rate (that is, the ratio of historical cost depreciation to net plant and equipment).

The correlations are shown in Table 5. The correlation is high, but the regression coefficients and constant terms indicate considerable difference in magnitudes. For depreciation the constant term is negligible so that market value in the denominator on both sides of the equation cancels, implying that our estimates are on average 21 percent greater than the company estimates. For capital stock, multiplying through the equation by market value, our estimates of capital are 119 percent of company estimates plus 70 percent of market value. This points to nonlinearity in the relationship. The differences are presumably attributable to the fact that the companies reported the current cost of the same capacity output, allowing for the benefit of quality improvements in equipment and technology. Such current-value costs of the same capacity are notoriously subject to inaccuracies. It is not clear which estimates of real depreciation the market relies on. Since estimates based on a general price index are not a bad proxy for the reported replacement cost depreciation as indicated by the correlation coefficient, but may be high as indicated by the regression coefficient, this would suggest that our estimates of the depreciation

Table 5

Correlation between our estimates and company estimates, capital stock and depreciation as percentage of initial market value 243 manufacturing companies 1976

Dependent variable	Regression coefficient of company estimates		Constant term (percent)	R^2
	Capital stock	Depreciation		
Our estimates of:				
Capital stock	1.19		71	.85
Depreciation		1.21	6	.78

adjustment are too low.

A comparison of the effect of the two estimates for 1976 is given in Table 6. Capital gain here is based on our estimate of the capital stock, since most companies did not report a replacement cost figure for 1975 on which we could derive the capital gain. Equations 1 and 2 show that both depreciation adjustments have an incorrect positive coefficient. With capital gain included in equations 3 and 4, however, the adjustment based on company estimates has the correct negative coefficient, though it is not significant, whereas the adjustment based on our estimates is essentially zero. Also, in equation 4 capital gain has a large positive and significant coefficient. Consequently, the company estimates of depreciation can be said to give slightly more reasonable results for 1976. (Although the coefficient of decline in real debt is about twice that for reported earnings, which is unreasonable, this is true for both sets of these regressions in 1976 and is unrelated to the depreciation adjustment.) Data for subsequent years will help to clarify the effect of company depreciation estimates. In particular, no account was taken here of the date on which company estimates became available to investors.

Table 6

Regression of percentage change in company market value (exclusive of equity issues) on independent variables as percentage of initial market value, our estimates versus company estimates of depreciation, 1976

No.	Reported retained ordinary earnings	Depreciation adjustment		Inventory valuation adjustment	Decline in real value of net fin. liab.	Capital gain	Constant term	R^2
		our estimates	company estimates					
			243 manufacturing companies reporting replacement cost					
1	0.72 (6.5)	+0.29 (2.5)		-1.31 (2.5)	+1.76 (4.1)		+14 (5.0)	.29
2	0.76 (6.9)		+0.24 (1.4)	-1.09 (2.0)	+1.94 (4.3)		+16 (6.1)	.28
3	0.71 (6.4)	+0.09 (0.5)		-0.96 (1.6)	+1.28 (2,3)	+0.40 (1.4)	+11 (3.6)	.30
4	0.69 (6.1)		-0.25 (1.0)	-0.83 (1.5)	+1.16 (2.2)	+0.70 (2.6)	+10 (3.1)	.30

Note: t values of regression coefficients are in parentheses; signs have been omitted.

If we accept the company estimates as correct, they imply a downward bias in the regression coefficients of the depreciation adjustment. The company estimates for the 243 companies averaged 9 percent of initial market value for 1976, compared with 20 percent for our estimates/ (not shown in table). If this comparison applied to all years, the depreciation coefficient should be over twice as large. For the full period in Table 4, for example, it would be two-thirds of a_1, falling between the values for IVA and decline in real debt.

IVA based on specific price indexes

To check whether the IVA would be more accurate if calculated with specific commodity prices rather than a general price index, a second IVA was calculated by the same method but with a set of price indexes specific to each industry that had been compiled for another purpose. In an earlier study[5] I constructed input and output price indexes for 54 manufacturing industries from seven-digit BLS wholesale product prices, weighting each index according to industry data on the commodity composition of inputs and outputs. These series covered 1967-74. They were used for the present study by assigning each company to one of the 54 industries.

It was assumed that raw materials were best approximated by the input price index, and finished products by the output price index. The Compustat tape pro-

vides data on inventories classified into raw materials, goods in process, and finished products. The dollar amount of goods in process was apportioned between the other two inventories according to their reported dollar magnitudes. When the Compustat inventory data were missing for earlier years, the proportions of the latest year available were used.

Regressions comparing the two estimates of IVA are presented in Table 7. In general, the IVA coefficient for the specific price indexes is smaller and less significant. This seems to confirm that such specific adjustments are fraught with inaccuracy and to suggest that they are generally not used by the market to adjust for inflation. An alternative interpretation is that, while the market uses such specific price indexes, the adjustment of market values is in fact incomplete (the regression coefficient is low only in part because of bias due to errors in these IVA figures) and the statistical significance of the variable is lower only because our estimate of the specific-price IVA is an inaccurate reflection of the one used by the market. No doubt the truth is somewhere inbetween.

Other variables added to the regressions

Several other variables were tried to see whether the results would be materially affected. By and large they were not, either for the full period (see Appendix Table C) or for the two subperiods (not shown).

Equity ratio is the ratio of common equity to total invested capital. It is a measure of leverage and allows for risk to the common stock. It has a positive effect on the increase in market value, but is not significant except in combination with capital gain. It increases the coefficient of the decline in real debt, when accompanied by capital gain, and increases the magnitude of the negative constant term. In the later subperiod, when equity ratio might be expected to have been more important, it had virtually no effect (not shown).

Age of the capital stock is the average age of the current-value capital stock in years multiplied by the capital stock as a percentage of initial market value. It is a measure of capital obsolescence to supplement the adjusted depre-

Table 7

Regression of percentage change in company market value exclusive of equity issues on independent variables as percentage of initial market value, general purchasing power versus specific-price IVA, 1967-74

No.	Reported retained ordinary earnings	Depreciation adjustment	Inventory valuation adjustment: general purchasing power	Inventory valuation adjustment: specific price indexes	Decline in real value of net fin. liab.	Capital gain	Constant term	R^2
			510 manufacturing companies					
1	0.92	-0.25	-0.90		+0.45		-13	.19
	(10.7)	(3.0)	(4.0)		(2.5)		(1.7)	
2	0.90	-0.23		-0.54	+0.36		-17	.18
	(10.4)	(2.7)		(3.2)	(2.0)		(2.4)	
3	1.01	-0.07	-1.08		+0.88	-0.34	- 7	.20
	(10.7)	(0.6)	(4.6)		(3.4)	(2.3)	(0.8)	
4	0.94	-0.15		-0.61	+0.56	-0.14	-15	.18
	(10.0)	(1.4)		(3.4)	(2.3)	(1.2)	(2.0)	
			281 manufacturing companies not using lifo					
5	1.02	-0.35	-1.28		+0.80		+ 5	.17
	(7.5)	(2.8)	(3.5)		(2.5)		(0.4)	
6	0.99	-0.33		-0.84	+0.67		+ 1	.16
	(7.2)	(2.7)		(2.9)	(2.1)		(0.1)	

Note: t values of regression coefficients are in parentheses; signs have been omitted. Number of companies exceeds that of other tables because of inclusion of companies with data missing for years other than 1967-74.

ciation. The derivation of the latter assumed that capital lost no value until retired. Age of capital has the expected negative coefficient, is significant when included in regressions without capital gain, and raises the coefficient of the decline in real debt. It is highly correlated with capital gain (R = .93), however, and is insignificant when the latter is included.

Dividend payout ratio is the ratio of dividends to total ordinary earnings. It tests the hypothesis that paid-out earnings may be of more value to stockholders than retained earnings are. It is insignificant and has virtually no effect on the inflation adjustments.

Change in earnings is the change in reported retained ordinary earnings, as in the first column, from the earlier subperiod 1966-71 to the later subperiod 1972-76, expressed as a percentage of initial market value. It is intended as a proxy for prospective changes during the period in future net worth to account for a coefficient of earnings a_1 greater than unity. (Ideally for this purpose, the change in earnings should take the difference between periods before and after 1966 rather than 1971, but the pre-1966 data were not compiled.) It is positive and significant, and the estimate of a_1 is reduced part of the way toward unity. The estimate of a_1 nevertheless remains significantly above unity; its tendency to incorporate prospective increases in future net worth is not fully reflected in the change in earnings. Another proxy that was tried in an attempt to capture this tendency was the change in sales (not shown), which gave similar though less significant results.

Interpretation and Concluding Remarks

Taking the statistical results as a whole, we find that market prices reflect a major adjustment of reported earnings for IVA and decline in real debt. The regressions in Table 4 using average market value as a divisor and excluding capital gain seem the most reliable. For the full period in Table 4, the adjustment for IVA is 100 percent complete and for decline in real debt is half complete. The

adjustment for the understatement of depreciation, on the other hand, is weaker -- a third of being complete. This is certainly surprising, because the recent discussions of reforming accounting practices focus on the understatement of depreciation and view the decline in real debt as somewhat hypothetical and as less important, perhaps to be disregarded. Our results suggest that the decline in real debt cannot be viewed as unimportant in affecting the market value of manufacturing companies.

The partial effect of the depreciation adjustment is puzzling and may be due to mismeasurement. Although it is highly correlated with capital gain, the effect of the depreciation adjustment is still small when capital gain is omitted from the regressions. Our adjustment of depreciation may be too high. Comparison with the replacement cost depreciation reported by 243 companies for 1976 suggests a 21 percent overestimate. In terms of the depreciation adjustment, our estimate would be over twice as high. This implies a doubling of the regression coefficient of the adjustment, which is more plausible but still far from complete. The uneasy implication here of disequilibrium and market inefficiency may elicit the contrary conjecture that investors did make complete adjustments but used different estimates. It is not clear whether this conjecture is justified.

The capital gain variable has a negative coefficient inconsistent with its hypothesized effect, and appears to be proxying for extraneous influences of high inflation rates. Because of high multicollinearity it also interferes with estimates of the other adjustments.

All the inflation adjustments of earnings are considerably weaker for the later period 1972-76 than the earlier period 1966-71. Based on Table 4 with capital gain omitted, the adjustment for IVA is 100 percent complete in the earlier period and less than 60 percent in the later period, that for decline in real debt two-thirds in the earlier and half in the later, and that for depreciation two-thirds in the earlier and only 15 percent in the later. The latter would be 30 percent if we applied the correction noted above to the later period. We might have

expected the adjustments to be stronger, however, in the period of higher inflation.

Possibly the later period did experience stronger effects which were obscured in our statistical results because of greater inaccuracies of measurement under high inflation rates. But if, as our results suggest, the adjustments are in fact weaker for periods of high inflation, the implication is that adjustments become more difficult to make or that more noise is introduced into the data. In response to less accurate information, the market tends either to pay less attention to the adjustments or, more likely, to produce a wider range of estimates of the adjustments. It remains to be seen whether the publication of replacement cost data will alter this effect of high inflation rates.

Appendix A

Notes on the Data and Derivation of the Inflation Adjustments

1. Companies excluded

The Compustat tape for fiscal year 1976 covers the history of about 2500 companies for up to 20 years. In the present study this sample was reduced to 485 manufacturing companies because of certain incomparabilities or, primarily, because of incomplete data. Nonmanufacturing companies were too disparate to deal with on a common basis and were not covered.

Manufacturing companies were excluded for the following reasons:

(i) Foreign charters. (U.S. corporations with foreign subsidiaries, however, were not for that reason excluded.)

(ii) Substantial holdings of natural resources which present special problems of valuation. The exclusions were mining companies (SIC classes below 20), paper companies owning timberlands, and integrated oil companies owning petroleum reserves (nonintegrated companies producing oil and gas from wells are classified as mining companies and hence were excluded already). Other companies with subsidiaries owning natural resources were not excluded.

(iii) Major mergers or changes in accounting practices, as indicated by the Compustat "special treatment" list (its Appendix E of published material in several cases for the tape file), or other peculiarities which resulted in a negative value for the capital stock after adjustment.

(iv) Unavailability of data for fiscal year 1964 or any later year. (Data for earlier years back to 1957 were used to the extent available in deriving the real capital stock.)

(v) Substantial acquisitions of capital other than through capital expenditures. The cutoff was based on mergers or advances to, or purchases of, other companies, less sales of capital, that averaged (without regard to sign)

10 percent or more of gross property, plant, and equipment for the period 1965-76. This removed companies not excluded by item (iii) above.

2. General purchasing power of the dollar

The price index used for all/the inflation adjustments was the implicit deflator for gross domestic product: annual index 1940 to 1946, quarterly index 1947 to 1957, and fixed-weight quarterly index from 1958 to 1976. The quarterly index was interpolated to a monthly series.

Industry-specific price indexes/ were used for a supplementary calculation of IVA as described in the text.

3. Derivation of current-dollar value of tangible capital, depreciation, and capital gain

The current value of the capital stock was derived by revaluing the existing stock each year by the increase in a general price index and adding annual capital expenditures and acquisitions net of retirements and sales. The starting point was the earliest year between 1957 and 1964 for which net plant and equipment was reported on the tape. (The stock includes land used in operations, which cannot be treated separately.) No attempt was made to link up with earlier years from other sources, which would be a very difficult task. Consequently, the initial capital stock was assumed to have been accumulated evenly over an 18-year period and was revalued by the increase in prices over the preceding 9 years.

Retirement of capital at historical cost is reported on the tape for most companies beginning in the early 1970s and was used when available. (Retirements include sales. Sales are reported separately but at current-dollar receipts; this item was revalued to historical cost before being deducted from retirements including sales.) For earlier years, all retirements were assumed to occur at the end of 18 years, the average life of capital used in the national income estimates of the Bureau of Economic Analysis. This was accomplished by keeping

track of the age of each year's addition to capital. The initial capital stock for the first reported year of data was assigned an age distribution based on annual net investment of the private nonfarm sector. For each year net acquisitions as derived below were assumed to occur at the beginning of the year and retirements at the end of the year.

Net acquisitions of capital through purchases of companies or mergers were derived from the identity (all items valued at historical cost):

net acquisitions (purchases net of sales) = change in gross capital
- capital expenditures + retirements.

To incorporate these acquisitions into the age distribution of the existing capital stock, purchases and sales of capital were assumed to have the same age distribution as the existing stock in the company.[6] (As noted in Section 1, companies for which the average absolute value of the annual ratio of derived net acquisitions and advances to other companies to beginning-of-year reported gross property, plant, and equipment for the period 1965-76 was 10 percent or more were excluded from the sample.)

When gross property, plant, and equipment was not reported on the tape, the figure was taken from Moody's Industrial Manual or, if not available there, was interpolated from adjacent years (straight-line between log values). When capital expenditures for any year were missing, they were estimated by the change in gross capital (thus including net acquisitions which cannot be treated separately in this case and were assumed to be all new capital).

The annual rate of depreciation of capital was the reported annual ratio of depreciation to net plant and equipment for each company. The depreciation adjustment is therefore the product of this ratio and the difference between our estimate of the current value of capital and the reported figure for net plant and equipment. The use of the reported depreciation ratio here could produce some error. For example, if companies followed straight-line depreciation and net capital declined, the ratio would rise, whereas the "true" rate of depreciation might be constant. No attempt was made to refine these estimates.

Capital gain was the rise over the year in the current-dollar value of the capital stock at the beginning of the year net of retirements during the year

and of capital expenditures (assumed to be acquired as of midyear) over the second half of the year. If any reporting period did not cover 12 months, the capital gain was adjusted to a 12-month year. The adjustment was based on the assumption that capital gain in the 12-month period bore the same proportion to the gain in the observed period as the comparable proportion for the price index.

4. Derivation of inventory adjustment and capital gain on inventory

The standard inventory valuation adjustment (IVA) for a given period is based on the accounting identity:

cost of goods sold = inputs purchased + goods removed from inventory (or, - goods added).

Since the value of goods in inventory can depart from current values, the change in inventory requires adjustment. The adjustment derives the change in inventory in constant dollars, revalues it in dollars of the middle of the accounting period, and subtracts the reported dollar change in inventory. This difference is IVA. When prices are rising, the reported change is never less than the revalued change, and the resulting IVA of zero or a negative amount serves as a reduction of reported profits to eliminate any "inventory profits" owing to inflation. If any reporting period differed from 12 months, the IVA was converted to a 12-month year, by the same procedure as used for the capital gain on capital.

In the regressions, IVA was treated as a positive number, so that the theoretically correct sign of its coefficient is negative.

The deflation of the reported inventory to constant dollars requires the identification of the valuation method by which goods in inventory are carried on a company's books. Three methods were allowed for here: fifo, lifo, and average cost. The Compustat tape indicates all the methods used by each company in each year. It was not feasible to identify the different inventories that were carried on the books by different methods; consequently, the entire inventory was assumed to be carried by the primary method indicated for each

company in each year. (Where the accounting method was not indicated, the method for the subsequent year was assumed to apply. Where not indicated for any years, the method was assumed to be fifo.) No distinction was made for raw, working, or finished inventories, except as indicated in the text for the supplementary calculation using industry price data.

The adjustments of the reported values of inventory were made as follows:

Fifo. In this accounting method goods are valued at purchase price when they enter the inventory stock and are removed in order of entry. That is, goods removed for use are always those with the earliest date of purchase. The reported value of the inventory at any time can be approximated by the purchase price of goods which have moved half way through the inventory. For example, if the inventory turns over completely in 3 months (the ratio of inventory to average monthly sales is 3), the average age of the inventory is 1½ months. The inventory is then deflated by the price index of 1½ months earlier. Turnover periods were assigned for each year according to the ratio of inventory to sales of each four-digit SIC manufacturing industry from the Annual Survey of Manufactures. The IVA for inventories valued by fifo is substantial in a period of rapidly rising prices.

Lifo. In this accounting method goods are valued at purchase price when they enter the inventory stock and are removed in reverse order of entry. That is, goods removed for use are the most recent additions. Consequently, the reported value of goods removed from inventory for use are current prices, and IVA is generally zero.

Complications arise under lifo when the inventory is depleted and goods are removed that were purchased in earlier periods. Since the goods are removed in the reverse order of entry, the inventory is built up in layers. Depletion of the inventory peels away the layers; goods are removed which were purchased in successively earlier periods. It is necessary to keep track of the successive layers and to revalue each one appropriately. The computer program written for IVA allowed up to four annual layers of inventory to be removed (that is, inventory reductions could reach goods purchased from one up to four years earlier); cases in which inventory depletions went beyond four layers were calculated by hand.

Average Cost. In this accounting method goods are valued at purchase price when they enter the inventory stock, and goods removed are priced at the average value of the goods in the inventory at the time of removal. The current value of the inventory can be derived by a continual update; each month the value of goods added, as based on the turnover rate, is averaged with the average value of the goods remaining. This method is a cross between fifo and lifo, since the value of the goods removed is in effect an average of the earliest and latest additions to the inventory.

The capital gain of the inventory is the change in current-dollar value of the beginning-of-period stock over the year and of the stock added or depleted (assumed evenly) during the year. It was adjusted to a 12-month year if any reporting period did not cover 12 months, by the same procedure as used for the capital gain on capital.

5. Derivation of decline in real value of net financial liabilities

The gain or loss in real terms from changes in the purchasing power of claims fixed in dollar terms is the product of monetary liabilities minus mone-

tary assets and the rate of change in prices. The rate of change of prices is based on monthly interpolations of the deflator for gross domestic product used above. Net monetary liabilities are

+ total long-term debt (over 1 year)

+ current liabilities (up to 1 year)

+ preferred stock at liquidating value

- cash and short-term investments

- receivables.

This figure was interpolated to the middle of the accounting period and multiplied by the price change for 12 months preceding the end of the accounting period.

5. Market value

Market value is the number of shares outstanding times the market price per share. The Compustat tapes provide market prices for end-of-calendar years only, and it was desirable to collect monthly market prices. These prices were derived largely from the University of Chicago CRISP tapes and in certain cases from newspaper files. For some companies the tapes available to me provided monthly rates of return including dividends, from which prices could be derived from a starting point after dividends were deducted. The dividend data used were for fiscal years on the Compustat tape, and it was assumed that the payments were made in equal quarterly installments. This assumption introduced some inaccuracy into the calculation of some of the prices.

Prices in the dependent variable of the regressions is an average of the three end-of-month prices preceding the end of the fiscal year. Price averages of the six months surrounding the end of the fiscal year, three months after, and the twelve months preceding were also derived and tried in the regressions (see footnote 1).

The number of shares outstanding from the Compustat tape is available only for the end of the calendar year, which differs in dating from the price data for non-December fiscal years. The error in measuring market value will not be major, however, unless a large change in shares outstanding occurred in the interim. No adjustment was made for such cases.

Appendix Table A

Distribution of Companies by Industry[a] in Full-Period Sample of Table 1

SIC Code	Industry	Number	Average Change in Mkt. Value[b] (percent)	Std. Dev. Mkt.Value[b] (percent)	Number with Change in Ending Month of Fiscal Year
20	Foods	45	49.9	180.3	4
21	Tobacco	7	193.4	351.2	0
22-23	Textiles & Apparel	27	-27.0	54.3	3
24	Forest products	4	254.1	151.1	0
25	Furnishings	6	-18.0	23.7	0
26	Paper and products	12	29.1	64.5	0
27	Publishing	13	-24.8	62.6	1
28	Chemicals	69	106.4	217.5	0
29	Petroleum	8	71.3	117.8	0
30	Rubber and products	19	41.9	134.6	0
31	Leather and products	9	59.5	259.3	3
32	Glass and products	29	29.8	73.9	0
33	Metals	31	37.8	145.8	0
34	Metal products	20	157.2	282.1	1
35	Machinery	63	101.1	237.3	5
36	Electrical equipment	52	67.1	175.0	4
37	Automobiles & Parts	48	59.2	97.6	4
38	Instruments	18	44.3	130.2	0
39	Miscellaneous	5	75.1	26.4	0
	All companies	485	66.2	180.6	25

[a]Companies classified by major activity.

[b]Excluding change in equity issues; same as dependent variable in regressions.

Appendix Table B

Effect of excluding 25 companies with reporting gaps or overlaps:
Regression of percentage change in company market value (exclusive of equity issues) on independent variables as percentage of initial market value, 1966-76

No.	Reported retained ordinary earnings	Depreciation adjustment	Inventory valuation adjustment	Decline in real value of net fin. liab.	Capital gain	Constant term	R^2
			485 manufacturing companies (Table 1)				
1	1.71	-0.29	-0.86	+0.61		-35	.47
	(19.0)	(3.1)	(3.6)	(2.9)		(3.3)	
2	1.86	-0.06	-1.20	+1.34	-0.53	-18	.48
	(18.4)	(0.5)	(4.6)	(4.4)	(3.2)	(1.6)	
			460 manufacturing companies with no change in ending month of fiscal year				
3	1.89	-0.30	-0.65	+0.45		-45	.51
	(20.4)	(3.4)	(2.7)	(2.2)		(4.3)	
4	2.02	-0.10	-0.96	+1.11	-0.47	-30	.52
	(19.7)	(0.9)	(3.6)	(3.6)	(2.8)	(2.6)	

Appendix Table C

Effect of including additional variables:
Regression of percentage change in company market value (exclusive of equity issues) on independent variables as percentage of initial market value, 1966-76

No.	Reported retained ordinary earnings	Depreciation adjustment	Inventory valuation adjustment	Decline in real value of net fin. liab.	Capital gain	Additional variables	Constant term	R^2
				485 manufacturing companies (eqs. 1 and 2 from Table 1)				
1	1.71 (19.0)	-0.29 (3.1)	-0.86 (3.6)	+0.61 (2.9)			-35 (3.3)	.47
2	1.86 (18.4)	-0.06 (0.5)	-1.20 (4.6)	+1.34 (4.4)	-0.53 (3.2)		-18 (1.6)	.48
3	1.70 (18.6)	-0.29 (3.2)	-0.88 (3.6)	+0.76 (3.0)		equity ratio[a] 0.49 (1.0)	-72 (1.9)	.47
4	1.74 (19.4)	-0.11 (1.0)	-1.12 (4.4)	+1.04 (4.2)		age capital[b] -0.004(3.0)	-24 (2.2)	.48
5	1.86 (18.3)	-0.07 (0.6)	-1.20 (4.6)	+1.33 (4.3)	-0.51 (3.1)	payout ratio[c]-0.07 (0.9)	-15 (1.3)	.48
6	1.47 (13.0)	-0.02 (0.2)	-0.83 (3.3)	+1.04 (3.5)	-0.48 (3.0)	change in earnings[d] 1.14 (6.9)	-22 (2.0)	.52
7	1.85 (16.1)	+0.01 (0.1)	-1.38 (5.1)	+1.95 (4.7)	-0.57 (1.9)	equity ratio 1.33 (2.5) age capital -0.001(0.6)	-113 (2.8)	.48
8	1.81 (15.4)	+0.05 (0.4)	-1.31 (4.6)	+1.75 (4.1)	-0.59 (1.9)	equity ratio 1.25 (2.3) age capital +0.0003(0.1) 18 industry dummies	-124 (2.8)	.52

Notes to Table C

[a]Equity ratio is an average for the years covered of the book value of common equity divided by total capital invested. A positive regression coefficient indicates that companies with a higher ratio (lower leverage) tended to increase more in market value.

[b]Age of capital is an average for years covered of the average age of the capital stock multiplied by the ratio of the capital stock to the initial market value. A negative regression coefficient indicates that companies with an older capital stock tended to increase less in market value.

[c]Payout ratio is an average for the years covered of dividends divided by total ordinary earnings. A negative regression coefficient indicates that companies which pay out a higher fraction of earnings tended to increase less in market value.

[d]Change in earnings is the change in retained earnings as in the first column from 1966-71 to 1972-76, as a percentage of initial 1965 market value.

Appendix Table D

Correlation matrix of independent variables
485 manufacturing companies 1966-76

	Reported retained ordinary earnings	Depreciation adjustment	Inventory valuation adjustment	Decline in real value of net fin. liab.	Capital gain	Equity ratio	Payout ratio	Age of capital	Change in earnings
Reported retained ordinary earnings	1.00	.46	.36	.23	.49	-.00	-.05	.31	.54
Depreciation adjustment		1.00	.32	.58	.80	-.33	-.04	.74	.22
Inventory valuation adjustment			1.00	.52	.32	-.26	-.03	.21	.08
Decline in real value of net fin. liab.				1.00	.78	-.67	-.00	.70	.16
Capital gain					1.00	-.37	.01	.93	.29
Equity ratio						1.00	-.02	-.33	-.06
Payout ratio							1.00	.04	-.05
Age of capital								1.00	.24
Change in earnings									1.00

*I am indebted to Robert E. Lipsey for advice at all stages of the study and to Susan Tebbetts for research assistance. Helpful comments were received during the presentation of preliminary results in seminars at Cambridge, Stanford, and New York divisions of NBER, the Federal Reserve Board, and Columbia University Business School. I particularly want to acknowledge the use of specific suggestions made by William Brainard and Peter Lloyd-Davies.

1/ Prices per share in the derivation of market value are an average of the three end-of-month market prices preceding the beginning and the end of the period. Other regressions were run using an average of the three end-of-month prices following these dates, an average of the twelve months preceding, and the single end-of-month price. The alternatives gave similar though slightly less significant fits.

2/ The earnings data and adjustment variables are for twelve month fiscal years. If the ending month of fiscal years changes during the period, the annual data have a gap or overlap in the year of change. No allowance was made for this in cumulating the earnings and the adjustments over the period. To check the importance of this source of error, the regressions were rerun for a sample excluding 25 companies with a change in the ending month of one or more fiscal years (see Appendix Table A for industry distribution). These reruns, presented in Appendix Table B, give similar results.

3/ Historical depreciation costs can be accelerated for tax purposes, but as noted the amounts reported to stockholders and used here are generally not. Therefore, acceleration for tax purposes is no reason for the depreciation coefficient to be biased downwards.

4/ To measure this effect, the change in the depreciation adjustment in the last two years of the periods covered was added to the regressions, as an indication of future increases. The result (not shown) did not affect the coefficient of capital gain. While this was not a conclusive test of the importance of this effect, no other test with the data available appeared feasible.

5/ Phillip Cagan, "Imported Inflation 1973-74 and the Accommodation Issue," Journal of Money, Credit, and Banking, February 1980.

6/ There is a problem if capital expenditures are reported net of retirements. See James B. Thies and Lawrence Revsine, "Capital Expenditures Data for Inflation Accounting Studies," The Accounting Review vol. LII, No. 1 (January 1977), 216-221. This problem is largely avoided by using Compustat item 128 which is gross capital expenditures rather than item 30 which is sometimes reported net. When item 128 was not reported, item 30 was used but,in that case in our sample of companies, was seldom reported net of retirements.