Earnings Concepts vs. Reported Earnings

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Abstract

This paper examines the long term average relations between reported earnings permanent earnings.

The calculation of permanent earnings requires the assumption of a discount rate. We focus our analysis on two natural choices i.e. the cost of equity and the risk free rate. Each of these choices provides a capitalization factor that can be used to infer value from current reported earnings. In this paper we investigate which of these capitalization factors best describes the long run relation between earnings and market values.

The answer in general will depend on the nature of the accounting system, and in particular on the extent to which the accounting system handles the trade-off between risk and growth. A capitalization factor based on the cost of equity corresponds to the case where risk and growth do not cancel out at all in the way the accounting system arrives at reported earnings. We refer to this as the no cancelling out (NCO) benchmark. The capitalization factor derived from the risk free rate corresponds to the case where growth and risk fully cancel out in the accounting system. We refer to this as the full cancelling out (FCO) benchmark.

FCO is not expected to hold if the accounting system closely approximates fair value accounting. Such accounting provides the underpinnings for Hick's concept of ex post economic earnings, which differs radically from the traditional GAAP accounting for industrial firms. We consider this angle to the FCO and NCO hypotheses by examining financial firms. Earnings for such firms should to some extent tilt towards Hick’s ex post economic earnings concept, so we expect the FCO to be rejected for such firms.

KEYWORDS: Permanent earnings, Firm valuation, P/E ratios, Ex post economic earnings
JEL Descriptors: M41, G32

Earnings Concepts vs. Reported Earnings: The Roles of Risk and Growth

1. Introduction and Summary

This paper evaluates whether a firm's reported earnings equal permanent earnings plus some "noise" that on average is zero. The concept of permanent earnings traditionally refers to those earnings that connect with a firm's intrinsic value (Graham and Dodd (1934), Black (1980), Beaver (1981)). As a practical matter, one identifies such permanent earnings from a stock's value (which equals price in an efficient market), and the inverse of a capitalization factor.

Our approach to permanent earnings specifies the capitalization factor as the risk-free rate, not the cost of equity capital. Hence, the basic hypothesis evaluates whether a risk-free rate capitalization of (contemporaneous) reported earnings, on average, equals the stock's price. The benchmark model appeals because it means that the capitalized reported earnings suffice as a valuation statistic after the elimination of a "zero mean" noise component. Empirical analysis of thirty seven years of US data supports this hypothesis: as a first cut, the difference approximates zero.

Our use of the risk free rate as a capitalization factor, rather than the cost of equity capital, will be central in both our model of permanent earnings and in the empirical analysis. The model stipulates a risk-aversion setting; a firm's cost of capital therefore differs from the risk-free rate. It is then shown that the use of risk free rate capitalization

to value the firm implies that earnings risk and earnings growth effectively end up being two sides of the same coin. They have cancelled each other in the valuation.[1]

Risk/growth cancellation is a familiar idea in financial economics. The well known "Fed model" of equity valuation refers to neither risk nor growth: to estimate value, this model, too, capitalizes earnings using a risk-free rate.[2] In two respects, however, the Fed model differs from our valuation framework. First, the Fed model connects the forthcoming *expected* (reported) earnings to current value; our framework, by contrast, connects *concurrent* earnings to current value. Second, the Fed model capitalizes the expected forthcoming earnings using the *10-year* risk free rate; our framework, as previously noted, refers to the *short term* risk-free rate.

The hypothesis posed is strictly empirical. To argue that GAAP accounting is intended to measure permanent earnings seems farfetched; we do not believe that such an objective has ever been articulated by standard setters, even implicitly. Having said that, one can still hypothesize that GAAP ends up measuring earnings such that they equal permanent earnings plus some zero mean "noise". The general idea seems reasonable enough simply

[1] Penman and Reggiani (2010) apply a similar risk/growth cancellation idea to model the relation between expected returns (as the dependent variable) and the current earnings yield, the current book to market ratio, and the growth rate of the firm, as the explanatory variables.

[2] Lander et al (1997) credit Graham and Dodd (1951) as providing the earliest recognition of the link between bond yields and earnings yields. The "Fed model" terminology was inspired by a 1997 report of the Board of Governors of the Federal Reserve System (BGFR (1997)). For further details see Lander et al. (1997) and Asness (2003). Thomas and Zhang (2009) focus on how the relation between earnings yields and interest rates is affected by inflation. Durrė and Giot (2007) present international evidence on the Fed model.

because practical valuation tends to elevate current earnings as the distinctive starting point.

The data for industrial firms supports the hypothesis. In the broad cross-section for 37 years, there is roughly a fifty-fifty chance that the permanent earnings exceed the reported earnings. It appears to be a robust finding. It holds up on a value-weighted basis no less than over equally weighted firm-years. Looking at individual years, the proportion can deviate significantly from the 50-50 proposition in either direction. These (material) deviations from 50-50 are also highly serially correlated, so one can visualize relatively long "cycles" when the proportion exceeds, or is less than, 50-50. Nonetheless, as an average across *all* "cycles" one ends up with the 50-50 proposition: earnings equal permanent earnings plus some mean zero, serially correlated, "noise".

The findings contribute to the literature on several dimensions. First, the paper brings out that, contrary to much of the theoretical literature on valuation and earnings, it makes sense to consider the risk free rate as a capitalization factor.[3] Thus we suggest that reported earnings can be thought of as a measure representing a certainty-equivalent value indicator. Certainty-equivalent here means that as rough and ready starting point investors can capitalize current earnings using a short rate to obtain an unbiased estimate

[3] The three standard fundamental equity valuation models are the dividend discount model, the residual earnings model (Ohlson (1995)), and the abnormal earnings growth model (Ohlson and Juettner-Nauroth (2005)). Easton et al. (2012) and Penman (2007) provide introduction to these models. For further insights see Ohlson (2005). All three models require an estimate of the firm's equity risk premium in order to implement them, along with an estimate of the long term growth rate of the firm. If growth and risk largely offset, then capitalizing current earnings using the risk free rate can potentially modify procedures to incorporate the risk premium and the growth rate.

of the (cum-dividend) intrinsic value. While the estimate may indeed be only a starting point, the non-obvious fact is that the procedure builds in no *systematic* bias, even though the pricing of stocks reflects risk-aversion and earnings typically are expected to grow. Although the underlying valuation idea can be traced to the Fed model, no prior research has shown the empirical validity of (on average) risk-growth cancellation using the short term risk free rate and concurrent earnings. It adds to our understanding of the data by suggesting a link between reported earnings growth and risk, at least as an (unconditional) average.

Second, the empirics provide some substance to the "folklore" idea that capitalized earnings take on a central role in valuation. The bottom line in the income statement can indeed act as an unbiased anchor. It complements the classical Ball and Brown (1968) study by changing the focus toward value (a stock) rather than change in value (a flow). Both aspects are empirically valid, a point which needs to be stressed.

Third, the paper develops and evaluates the difference between permanent earnings and Hick's idea of ex post economic earnings . Hick's ex post economic earnings centers on fair value accounting for assets/liabilities. As an accounting tilted in the direction of Hick's earnings concept we consider financial firms. The data shows that for such firms the 50-50 hypothesis can be rejected: the permanent earnings for financial firms are generally less than their reported earnings. Thus our research shows how practical valuation multipliers should depend on the underlying accounting.

2. The Permanent Earnings Concept

Accounting refers to two concepts of "ideal" earnings: "economic earnings" and "permanent earnings".[4] Economic earnings, often attributed to Hicks, explain the change in cum-dividend value (and where value is the "correct" value). Permanent earnings, by contrast, explain value -- not its change. This concept (also sometimes referred to as "sustainable earnings") puts the onus on the P/E ratio. It has a long history in the accounting literature, going back to at least Graham and Dodd (1934), Black (1980 and 1993), and the earliest version of Beaver's monograph (1981). Ryan (1988) provides the first formal treatment of permanent earnings. His approach, however, differs from ours because it does not consider issues related to the capitalization factor.

To relate reported earnings to permanent earnings requires a benchmark which relates price to the inverse of some capitalization factor. This approach thereby provides an "idealized" version of what earnings ought to measure: the number should result in the "correct" price if the price is multiplied by the inverse of the capitalization factor. The rest of this section develops a formal model of permanent earnings. It shows how risk and growth affect forecasting, and in what sense they cancel each other.

To keep matters simple, we initially assume that the short-term risk-free rate is a constant, as is the cost of equity. The notation is:

r_f = the risk-free rate

r_e = the cost of equity

[4] Hicks (1946 Chapter XIV) considers three concepts of *ex ante* income, and three corresponding concepts of *ex post* income. Our initial definition of permanent earnings is somewhat in the spirit of what Hicks defines as ex ante income No. 1. Our definition of economic earnings corresponds to what Hicks defines as *ex post* Income No. 1. A complete reconciliation of Hicks's and our concept of permanent earnings cannot be done because in his discussion Hicks leaves out any role for risk.

x_t = permanent earnings for period t

d_t = dividend at date t

p_t = value at date t.

The *definition* of permanent earnings is:

$$x_t \equiv c.(p_t + d_t) \qquad (1)$$

where $c \equiv r_f/(1+ r_f)$. The constant c defines a (cum-dividend) earnings rate, and its inverse represents a capitalization factor applied to (concurrent) earnings. Critically, the definition (1) ensures that reported earnings suffice to infer (cum-dividend) value.

Expression (1) derives from a savings account. One can think of savings account earnings as a special case when permanent earnings hold. But it is only a special case because a savings account value relates to the forthcoming earnings deterministically; the forthcoming earnings are *certain* and without risk. Our model allows for uncertain permanent earnings for the forthcoming period. To avoid risk-neutrality, this earnings uncertainty necessitates a cost of capital parameter. It serves the usual role as a discount factor when one values the future expected dividends.

Aside from relation (1), our model of permanent earnings depends on only two additional assumptions. Both are weak. First, the value of the equity equals the present value of expected dividends; PVED therefore applies at all points in time using the same discount factor. Second, the dividend policy satisfies a standard convergence condition which stipulates that the expected dividends grow (asymptotically) less than the discount

factor. (A policy that fixes the dividends to earnings ratio always satisfies the regularity condition, but it is by no means necessary).

Using the three assumptions, routine analysis results in the permanent earnings dynamic:

$$E[\tilde{x}_{t+1};t]=(1+r_e)x_t \; - \; r_f\{(1+r_e)/(1+r_f)\}d_t \qquad (2)$$

Conversely, from the dynamics (2) combined with the two standard assumption (PVED and the related regularity condition) one obtains the permanent earnings relation (1).

Note next that the expression inside { .} approximates one (for example, consider r_e = 0.09 and r_f = 0.045; the ratio then equals 1.043). Using this approximation, one readily sees that the model embeds that earnings growth and risk come together. Specifically, with a full dividend payout the percentage growth in expected earnings (to a close approximation) equals $r_e - r_f$, that is, the risk premium. A zero payout at some date implies the growth rate r_e. Both extremes illustrate the growth in earnings mirrors the risk.

The model can be applied to check whether growth and risk approximately cancels if one considers forthcoming earnings rather than concurrent earnings. That is, one can ask the question: “Do the assumptions suffice to derive the Fed model using r_f as the capitalization rate?” Manipulations of the dynamic (2) combined with the valuation function (1) imply

$$p_t = \left\{\frac{E[\tilde{x}_{t+1};t]}{r_f}\right\}\left\{\frac{1+r_f}{1+r_e}\right\} \cong \left\{\frac{E[\tilde{x}_{t+1};t]}{r_f}\right\} \quad (3)$$

Like (2), the expression inside the second {..} can be approximated by one. (For reasonable numbers the error should be about 10%).

In sum, the risk-growth cancellation applies in valuation except for the relatively small error term that shows up in (3). It applies to contemporaneous earnings, (1), without any error (because it is a definition), and it carries over to (3) except for the small error term. Thus neither risk nor growth plays any role in valuation. It is a sharp conclusion; it is intrinsically related to the idea that the growth in earnings depends directly on the risk-premium and the risk free rate.[5]

One can relax the assumption of a fixed interest rate to allow for a stochastically changing short term risk free rate. Expression (1) generalizes to define permanent earnings as

$$x_t \equiv c_{t-1}.(p_t + d_t) \quad (4)$$

where $c_{t-1} = r_{f,t-1}/(1+r_{f,t-1})$. Like the earnings on a savings account, the inverse of the capitalization factor at date t depends on the earnings rate during the most recent past

[5] One can ask: what happens if one changes the definition of c by replacing the risk-free rate with the cost of capital? This model is familiar from Ohlson (and others') work. The (pure) earnings dynamic now leads to zero growth in expected earnings when the pay-out is 100%. Thus one can say that this so re-defined model of "ideal" earnings implicitly builds in zero growth in expected earnings, after an adjustment for earnings retention. Also, to drive home the point, the forward E/P yield now equals cost of equity, which yet again stands in sharp contrast to the model in this paper with its yield essentially tied to the risk-free rate. (From an empirical perspective, it is obvious that, as long as the cost of equity differs from the risk-free rate, both of the "ideal" earnings models can not satisfy the 50-50 proposition).

period. Hence, the correct subscript related to the risk-free rate is t-1 when the valuation pertains to date t.[6] All empirical tests rely on this changing interest rate approach and they refer to x per (4) as IPE, implied permanent earnings.

As noted earlier, the concept of permanent earnings refers to one out of two distinct "ideal" earnings. The second refers to "economic earnings". In this case earnings, by definition, explain the cum-dividend change in market value ($(p_{t+1}+d_{t+1}) - p_t$). This earnings concept prescribes fair value accounting (FVA) for the entire set of assets/liabilities. Market and book values must perforce coincide if the pricing is rational. Given this definition of earnings it follows that, in a setting with *uncertain* earnings, *the expected economic earnings will be strictly larger than permanent earnings.*[7] If the forthcoming earnings are certain, then the two earnings concepts are equivalent. And this condition of certainty is also necessary.

The Fed model provides some intuition as to why one should expect economic earnings to exceed permanent earnings. Suppose that, in fact, earnings are calculated using perfect FVA. In such case it is obvious that expected earnings relate to value only if one uses cost of equity as opposed to the risk free rate; that is $E[\{(p_{t+1}+d_{t+1}-p_t\};t] = r_e\, p_t > r_f\, p_t$. Roughly, r_e is twice the magnitude of r_f so it makes a material difference. If we lived in a world with approximate FVA, then an expected earnings capitalization on the basis of a risk free rate would grossly overstate actual values.

[6] Gode and Ohlson (2004) discuss valuation in a stochastic rates setting. They underscore that it is the interest rate at the start of a period that capitalizes the subsequent earnings, whether expected or concurrent.

[7] It can readily be shown that the difference between expected economic earnings and expected permanent earnings given today's date t equals $[\{(1+r_e)/(1+r_f)-1\}p_t] > 0$, assuming $r_e > r_f$. Thus, economic earnings will generally exceed permanent earnings.

These observations suggest that one should expect economic earnings to exceed reported earnings, on average. We evaluate this relative magnitude hypothesis, the sign of the change in (cum-dividend) value minus expression (1): it should be greater than zero more than half of the time if reported earnings have a closer affinity to permanent earnings as compared to FVA.

3. Overview of Empirical Hypotheses.

In the light of the analysis above we report separate empirical results for industrial and financial firms. We expect the results to differ markedly between these two groups because the accounting systems of financial firms are much closer to pure fair value accounting than the accounting systems of industrial firms. In particular we expect the evidence in favour of the FCO hypothesis to be much stronger for industrial firms than financial firms. Conversely we expect the evidence in favour of the NCO hypothesis to be much stronger for financial firms than for industrial firms.

(a) Our first approach to the FCO hypothesis evaluates the sign –and only the sign– of the difference between reported and permanent earnings across all years and industrial firms. This non-parametric approach ignores firm size and issues related to scaling the difference in earnings and IPE. Because the test is straightforward without any distributional assumptions, it provides a natural starting point. Of course, given the very large number of observations (more than 200,000 (40,000) industrial (financial) firm years) the null will almost surely be rejected if one presumes that observations are independent. But the statistical interdependence of observations, which is bound to be present, is hard to model credibly. Thus we

rely on a description of the data over the years by looking at the ratio between pluses and minuses. In the final analysis, however, the reader has to make his/her own judgment whether the fifty-fifty hypothesis is a reasonable characterization.

(b) We hypothesize that the FCO proposition does *not* hold for firms belonging to the financial industry. The reasons were discussed in the previous section. We made three points related to financial firms. First, economic earnings should generally exceed permanent earnings as a matter of theory. Second, economic earnings are best approximated when the accounting relies on FVA precepts. Third, financial institutions seem to best reflect FVA because the great bulk of assets and liabilities are financial in nature.

(c) The next hypothesis evaluates whether the FCO proposition applies to large and small firms about the same. One naturally has to worry that the pooling of small/large firms could be a driving force behind an acceptance of the proposition. And if such is the case, then one would have to conclude that it does not hold for the economy as a whole. Thus we assess the FCO proposition on a value weighted basis: the total market value of positive sign firms is compared to the total market value of negative sign firms. Again we expect the evidence for FCO to be much stronger for industrial firms compared to financial firms.

(d) To test the NCO hypothesis it is necessary to make an assumption about the average risk premium of the stocks in our sample. We have assumed that for the average stock the market will require an expected return equal to 4% plus the risk free rate. We accept that this is a pure judgement call, but we do not think the

figure is out of line with what the capital asset pricing empirical literature finds. If anything we believe that 4% may be an overestimate of the correct average risk premium. This possibility needs to be taken into account when interpreting the results.

(e) In the previous section we explained the distinction between permanent earnings and Hicks Economic earnings. It is instructive to compare economic earnings to both permanent earnings and reported earnings. On average economic earnings should exceed both permanent and reported earnings, i.e. we expect the proportion of positives to exceed 50% in both cases.

(f) We can also apply the FCO proposition in the spirit of the Fed model. We use the short interest rate as a capitalization factor rather than the 10-year rate suggested by the "standard" Fed model. Our implementation also replaces the expected earnings with those realized; in a rational market the difference should be mean zero noise (though generally correlated across firms). In other words, we look at the sign of price times the risk free rate compared to subsequent year's reported earnings. Our permanent earnings model suggests that this extended version of the FCO proposition holds if the basic one holds. Of course, the small error in (3) must be neglected.

4. Results

We use Compustat accounting and CRSP share price data. The sample period comprises 37 years, starting 1976 and ending 2012. The industrial and financial samples consist of 214,875 and 44,590 firm year observations respectively.

Table 1 contains the main findings on the FCO hypothesis on an equally weighted basis. This table shows the percentage of firms for which reported net income exceeds implied permanent earnings both by year and for the sample period as a whole. The FCO hypothesis predicts that this percentage should on average be around 50%. We expect the FCO hypothesis to hold for industrials, but not for financials.

The results for industrial firms do indeed fluctuate around 50%. Over the 37 years there are 10 (27) years when the percentage exceeds (is less than) 50%. The mean (median) percentage is 42% (39%). Overall these results indicate a high degree of risk/growth cancelling out. Indeed if anything there is more than 100% cancelling out. A feature of the results is there is a high degree of serial correlation in the percentage over time. This needs to be taken into account when testing if the cross-year mean percentage is significantly different from 50%.

The results for financial firms in Table 1 are very different. For these firms the evidence for the FCO hypothesis is not conclusive. There are 28 years when the mean is over 50%. The cross-year mean (median) is 62% (58%). So for these firms it looks like there is less than 100% cancelling out.

Table 2 tests the FCO hypothesis on a value weighted basis. This test places more weight on the larger firms that, arguably, on average are likely to have a lower risk premium. For industrial firms the evidence indicates that there are 21 years when the percentage exceeds 50%. The mean (median) percentage is 57% (58%). Again the results are highly correlated over time with long swings below and above the 50% benchmark. For financial firms the evidence in favour of the FCO is very weak. There are only six

years when the percentage is lower than 50%. The cross-year mean (median) percentage is 74% (78%).

We noted in the discussion of Tables 1 and 2 that the results are serially correlated. Thus, in order to test if the mean value of the time series is significantly different from 50% we need to take the serial correlation into account. This can be done by fitting an Ar (1) process to the data, and testing to see if the intercept of the Ar (1) is significantly different from 50%. Applying this approach to the industrial firm time series in Table 1, we find that the 95% confidence interval for the intercept is 31.3% to 62.7%. So we cannot reject the null hypothesis of FCO. For the financial firms the relevant confidence interval is 62.2% to 102%. Thus for financial firms this test rejects the null hypothesis of FCO in favour of less than full cancelling out.

The Ar(1) tests for Table 2 reveal a confidence interval for the industrial time series of 31.7% to 90.3%, so we cannot reject the null of 50%. For the financial time series the 95% confidence interval is 51.5% to 75.1% which rejects the FCO hypothesis at the 5% level.

Overall both tables do not reject the FCO hypothesis for industrial firms, but do reject the FCO hypothesis for financial firms. These results provide a clear demonstration of how very different the accounting is for financial firms compared with industrial firms with respect to the cancelling out of risk and growth in reported net income.

Our next table reports tests of a version of the NCO hypothesis, based on the assumption that the average market risk premium for both industrial and financial firms is 4%. We accept that this test is somewhat problematic as it requires a judgment to be

made about what is a reasonable estimate of the market risk premium. Our judgment is that 4% is about right, though we would not argue with views that that the market premium could be a bit above 4% perhaps even as high as 6%.

Table 3 Panel A reports the results for the NCO test on an equally weighted basis. The mean (median) percentage for industrial firms is 25% (20%). The percentage of firms for which net income exceeds IPE is above 50% in only 6 years out of 37. However the Ar(1) confidence interval is 13.3% to 57.6%. This indicates that the NCO hypothesis is not rejected at the 5% level, although the top end of the 95% interval is close to 50%. On balance we conclude that the evidence for NCO for industrial firms is very weak, but not conclusively negative.

For financial firms the evidence is more supportive of NCO. The relevant percentage exceeds 50% for 12 out of 37 years and the mean (median) percentage is 40%. The 95% confidence interval is 28.6% to 54.1%. So for these firms the NCO hypothesis seems much closer to the truth than the FCO.

The NCO results on a value weighted basis are reported in Table 3 Panel B. For industrial firm the mean (median) percentage is 25% (20%) and the 50% benchmarks is achieved in only 4 years out of 37. However the 95% confidence interval is 4.9% to 71%. Overall the evidence for NCO is weak for industrial firms. For financial firms the mean (median) percentage is 40% (37%) and the 50% benchmark is met in 10 years out of 37. The 95% confidence interval is 28.3% to 68.3%. So NCO seems reasonably descriptive for financial firms.

Table 4 re-presents the results in Tables 1 and 2 for ten year rolling windows.

For the equally weighted results the evidence indicates FCO for every ten year window for industrial firms. For financial firms the median percentage is less than 50% in only three of the thirty two ten-year windows. For the value weighted sample, the median percentage is always greater than 50% for financial firms and generally by a substantial margin supportive of the rejection of FCO. For industrials we can see some median values above 50% up to the 1979 to 1988 ten year window. The FCO seems to obtain for all the ten year windows from 1980-1989 to 1997-2006. From 2000 onwards the FCO hypothesis seems to be out of line with the data. It seems possible that these results may have been affected by the very low risk free interest rates that have been in place since 2008. The increasing use of fair value accounting may also explain some of the change.

Table 5 reports the results in terms of cum-div earnings to price ratios. If the FCO hypothesis holds we expect to see a median value of zero. If there is more (less) than FCO the median value will be negative (positive). For industrial firms we see FCO holding for all years except 1976 to 1979, and 2010 to 2012. For financial firms we only see a negative median in one year, 1989.

As discussed in (e), the next two tables report the differences between economic earnings (Hick's concept) vs. permanent earnings, and economic earnings vs. reported earnings. Table 6 compares economic earnings with. IPE. There are two panels. Panel A does not adjust for market capitalization whereas panel B does. In panel A the median percentage is greater than 50% for 24 years out of 37 for industrial firms, and the cross-year median is 57%. For financial firms the median percentage is greater than 50% in 30 years out of 37 and the cross-year median is 64%.

The predicted tendency for Hick's income to exceed IPE is even more apparent in panel B. In this panel the relevant percentage for industrial firms exceeds 50% in 30 years out of 37 and the cross-year median is 75%. For financial firms the relevant percentage exceeds 50% in 28 years out of 37 and the cross-year median is 76%.

Table 7 compares Hick's economic earnings with reported earnings. The results are similar to those reported in Table 6. There is a clear tendency for Hick's economic earnings to exceed reported earnings. This effect is more apparent for financial firms. For both types of firms the effect is more pronounced on a value weighted basis.

Hypothesis (f) concerns the Fed model.[8] Specifically, the difference between capitalized next-period realized earnings minus the stock price is a mean zero variable. We expect the results in this case to closely follow the results of the basic hypothesis (realized earnings minus IPE is a mean zero variable). We present the results as they relate to value weighted proportions and we expect to find results similar to the ones reported in Table 2. This is indeed the case. The Fed model on average holds reasonably well for industrial firms although the overall median is above 50%. The Fed model seems to work much less well for financial firms, for which the median percentage is 83%.

VI. Concluding Remarks

This paper highlights two important issues in understanding fundamental earnings concepts. The first is that the definition of permanent earnings is defined relative to an assumed discount rate. In order to calculate permanent earnings you have to choose a

[8] The Fed model is normally implemented by comparing earnings yields calculated using consensus analyst earnings forecasts with a long term rate of interest calculated using yields on 10-year (or, sometimes, 30) government bonds. Since analyst forecasts are not available for all firm years in our sample, we used realized earnings. We use the one year rate of interest to facilitate comparison with the other tables in the paper.

discount rate. The second is that permanent earnings is very different in nature from Hick's ex post economic earnings. In particular Hick's economic earnings is based on the change in value whilst permanent earnings is based on value. Hicks economic earning does not require specification of a discount rate.

The relation between reported earnings and market values in general is a function of the type of accounting in place. An important dimension along which accounting differs is the extent to which its handles the tradeoff between growth and risk. For example in pure mark to market accounting where assets of all kinds are recognized, including the firm's growth opportunities, there is no cancelling out of growth and risk. In this "ideal" world reported earnings will exactly equal Hick's ex post economic and, on average, reported earnings will equal permanent earnings using the firm's equity cost of capital.

Other accounting systems embody some degree of cancelling out of risk and growth. One logical possibility that we identify is that growth and risk could in principle, fully cancel out. Our empirical findings address the extent to which FCO could be representative of the accounting systems of US industrial and financial firms over a 37 year period. Our results suggest that the FCO hypothesis yields a reasonable first approximation for industrial firms, but not for financial firms.

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TABLE 1: % of firms with (Net Income > Implied Permanent Earnings)
Implied Permanent Earnings calculated using the 1-year Treasury Bill Rate

	INDUSTRIAL FIRMS		FINANCIAL FIRMS	
	% Positives	N	% Positives	N
Total	40	214875	63	44590
1976	82	3442	79	407
1977	83	3396	83	409
1978	84	3564	86	437
1979	71	3787	77	550
1980	49	3952	68	580
1981	43	4461	57	639
1982	20	4664	37	663
1983	18	5055	41	706
1984	36	5136	53	727
1985	17	5139	32	749
1986	21	5363	47	820
1987	40	5589	55	891
1988	42	5394	58	895
1989	31	5219	49	891
1990	30	5198	47	875
1991	19	5258	43	904
1992	31	5497	52	926
1993	43	5923	73	1546
1994	56	6325	79	1719
1995	37	7061	68	1757
1996	30	7732	57	1767
1997	29	7868	46	1706
1998	31	7689	52	1635
1999	33	7830	69	1709
2000	33	7898	66	1754
2001	20	7509	51	1673
2002	35	7160	73	1699
2003	45	6844	80	1656
2004	53	6786	82	1649
2005	51	6647	81	1648
2006	42	6592	72	1626

[Cont…]

TABLE 1: [Cont…]

	INDUSTRIAL FIRMS		FINANCIAL FIRMS	
	% Positives	N	% Positives	N
2007	32	6567	58	1605
2008	39	6287	43	1555
2009	44	6027	58	1518
2010	56	5975	72	1500
2011	55	5913	74	1513
2012	59	4128	83	1286
Mean	42		62	
Median	39		58	
St. Error	2.91		2.48	
corr with median btm (pval)	0.55 (0.00)		0.12 (0.49)	

IPE (tb1) is implied permanent earnings, calculated as $c_{t-1}.(p_t + d_t)$, where p_t is market capitalization at the fiscal year end date, d_t is dividends, and c_{t-1} is $r_{f,t-1}/(1+r_{f,t-1})$, where r_f is the risk free rate, which is the 1 year treasury bill rate. We match the treasury bill rate with the firm-year observation based on the fiscal year end month. Net income is as reported in Compustat. N is the total number of observations (positives or negatives).

TABLE 2: % of market capitalization (over total market capitalization of all firms) held by firms with (Net Income > Implied Permanent Earnings) Implied Permanent Earnings calculated using the 1-year Treasury Bill Rate

	INDUSTRIAL FIRMS		FINANCIAL FIRMS	
	% Positives	N	% Positives	N
1976	77	3442	94	407
1977	96	3396	97	409
1978	97	3564	98	437
1979	87	3787	94	550
1980	58	3952	86	580
1981	57	4461	78	639
1982	23	4664	45	663
1983	26	5055	55	706
1984	53	5136	64	727
1985	26	5139	41	749
1986	33	5363	76	820
1987	63	5589	66	891
1988	68	5394	85	895
1989	37	5219	64	891
1990	34	5198	65	875
1991	16	5258	56	904
1992	35	5497	65	926
1993	57	5923	79	1546
1994	78	6325	87	1719
1995	48	7061	80	1757
1996	38	7732	72	1767
1997	28	7868	45	1706
1998	16	7689	36	1635
1999	16	7830	68	1709
2000	27	7898	58	1754
2001	13	7509	31	1673
2002	61	7160	87	1699
2003	81	6844	96	1656
2004	90	6786	97	1649
2005	90	6647	97	1648
2006	81	6592	92	1626

[Cont…]

TABLE 2: [Cont…]

	INDUSTRIAL FIRMS		FINANCIAL FIRMS	
	% Positives	N	% Positives	N
2007	65	6567	74	1605
2008	82	6287	59	1555
2009	86	6027	86	1518
2010	95	5975	90	1500
2011	95	5913	93	1513
2012	93	4128	91	1286
Mean	57		74	
Median	58		78	
St. Error	4.60		3.15	
corr with median btm (pval)	0.20 (0.23)		0.25 (0.13)	

IPE (tb1) is implied permanent earnings, calculated as $c_{t-1}.(p_t + d_t)$, where p_t is market capitalization at the fiscal year end date, d_t is dividends, and c_{t-1} is $r_{f,t-1}/(1+r_{f,t-1})$, where r_f is the risk free rate, which is the 1 year treasury bill rate. We match the treasury bill rate with the firm-year observation based on the fiscal year end month. Net income is as reported in Compustat. N is the total number of observations (positives or negatives).

TABLE 3: Implied Permanent Earnings calculated using the 1-year Treasury Bill Rate + 4%
Panel A: % of firms with (Net Income > Implied Permanent Earnings)

	INDUSTRIAL FIRMS			FINANCIAL FIRMS	
	% Positives	N		% Positives	N
Total	23	214875	38	44590	23
1976	67	3442		64	407
1977	72	3396		74	409
1978	72	3564		77	437
1979	58	3787		69	550
1980	34	3952		55	580
1981	31	4461		41	639
1982	12	4664		25	663
1983	10	5055		20	706
1984	20	5136		36	727
1985	8	5139		16	749
1986	9	5363		24	820
1987	22	5589		39	891
1988	22	5394		42	895
1989	15	5219		28	891
1990	15	5198		34	875
1991	8	5258		22	904
1992	12	5497		27	926
1993	16	5923		53	1546
1994	29	6325		59	1719
1995	15	7061		32	1757
1996	12	7732		20	1767
1997	10	7868		11	1706
1998	15	7689		16	1635
1999	19	7830		36	1709
2000	21	7898		37	1754
2001	11	7509		18	1673
2002	19	7160		43	1699
2003	21	6844		48	1656
2004	28	6786		54	1649
2005	24	6647		52	1648
2006	16	6592		29	1626
2007	13	6567		25	1605
2008	24	6287		24	1555
2009	27	6027		38	1518
2010	39	5975		53	1500
2011	42	5913		57	1513
2012	44	4128		66	1286
Mean	25			40	
Median	20			37	
St. Error	2.88			2.94	

All variables as previously defined (see Table 1)

TABLE 3: Implied Permanent Earnings calculated using the 1-year Treasury Bill Rate + 4%
Panel B: % of market capitalization (over total market capitalization of all firms) held by firms with (Net Income > Implied Permanent Earnings)

	INDUSTRIAL FIRMS		FINANCIAL FIRMS	
	% Positives	N	% Positives	N
1976	48	3442	56	407
1977	72	3396	90	409
1978	74	3564	94	437
1979	65	3787	89	550
1980	34	3952	71	580
1981	35	4461	53	639
1982	10	4664	24	663
1983	12	5055	27	706
1984	27	5136	41	727
1985	9	5139	19	749
1986	7	5363	44	820
1987	24	5589	48	891
1988	27	5394	67	895
1989	14	5219	28	891
1990	8	5198	39	875
1991	3	5258	19	904
1992	5	5497	22	926
1993	11	5923	59	1546
1994	26	6325	67	1719
1995	11	7061	38	1757
1996	6	7732	15	1767
1997	6	7868	5	1706
1998	4	7689	5	1635
1999	5	7830	22	1709
2000	9	7898	14	1754
2001	4	7509	5	1673
2002	15	7160	46	1699
2003	26	6844	64	1656
2004	48	6786	78	1649
2005	46	6647	74	1648
2006	28	6592	60	1626
2007	18	6567	39	1605
2008	39	6287	28	1555
2009	51	6027	48	1518
2010	78	5975	79	1500
2011	83	5913	78	1513
2012	78	4128	71	1286
Mean	29		47	
Median	24		46	
St. Error	4.08		4.27	

All variables as previously defined (see Table 1)

TABLE 4: Summary of main results of Tables 1 and 2 over rolling windows of 10 years

Period		% Firms with NI>IPE				% Market Cap with NI>IPE			
		Industrials		Financials		Industrials		Financials	
Start	End	mean	median	mean	median	mean	median	mean	median
1976	1985	50	46	61	62	60	57	75	82
1977	1986	44	39	58	55	55	55	73	77
1978	1987	40	38	55	54	52	55	70	71
1979	1988	36	38	53	54	49	55	69	71
1980	1989	32	33	50	51	44	45	66	65
1981	1990	30	30	48	48	42	35	64	65
1982	1991	27	25	46	47	38	33	62	64
1983	1992	28	30	48	48	39	34	64	65
1984	1993	31	31	51	51	42	36	66	65
1985	1994	33	31	54	51	45	36	68	65
1986	1995	35	34	57	54	47	43	72	71
1987	1996	36	34	58	56	47	43	72	69
1988	1997	35	31	57	55	44	37	70	68
1989	1998	34	31	56	52	39	36	65	65
1990	1999	34	31	59	55	37	34	65	66
1991	2000	34	32	60	62	36	32	65	66
1992	2001	34	32	61	62	36	32	62	66
1993	2002	35	33	63	67	38	33	64	70
1994	2003	35	33	64	67	41	33	66	70
1995	2004	35	33	65	67	42	33	67	70
1996	2005	36	33	66	68	46	33	69	70
1997	2006	37	34	67	71	50	45	71	77
1998	2007	38	34	69	71	54	63	73	80
1999	2008	38	37	68	71	61	73	76	80
2000	2009	39	40	67	69	68	81	78	87
2001	2010	42	43	67	72	74	82	81	88
2002	2011	45	45	69	73	83	84	87	91
2003	2012	48	48	70	73	86	88	87	92

All variables are as in Tables 1 and 2.

TABLE 5: $NI_t/(P_t + D_t) – r_f/(1+r_f)$

	Industrials				Financials			
	Mean	Median	Std Error	N	Mean	Median	Std Error	N
1976	2.25	0.08	1.59	3442	-0.08	0.06	0.03	407
1977	0.03	0.07	0.01	3396	-0.05	0.08	0.07	409
1978	0.01	0.06	0.01	3564	0.05	0.08	0.02	437
1979	-0.03	0.03	0.02	3787	0.94	0.07	0.90	550
1980	2.10	-0.01	1.42	3952	4.10	0.04	4.11	580
1981	0.20	-0.04	0.22	4461	-0.02	0.00	0.06	639
1982	-0.04	-0.05	0.14	4664	-0.21	0.00	0.10	663
1983	0.85	-0.04	0.60	5055	-0.09	0.01	0.04	706
1984	2.08	-0.04	1.63	5136	-0.14	0.00	0.03	727
1985	7.27	-0.03	5.53	5139	-0.13	0.00	0.03	749
1986	0.25	-0.02	0.58	5363	-0.09	0.02	0.03	820
1987	-0.77	-0.02	1.60	5589	-0.25	0.01	0.10	891
1988	-3.65	-0.02	3.90	5394	-0.68	0.02	0.31	895
1989	-0.64	-0.04	0.53	5219	-2.09	-0.01	1.14	891
1990	-4.25	-0.03	6.29	5198	-1.12	0.00	0.80	875
1991	-0.22	-0.03	0.12	5258	1.42	0.01	2.13	904
1992	0.62	-0.01	0.57	5497	-0.46	0.02	0.14	926
1993	-0.24	0.00	0.08	5923	-0.12	0.05	0.06	1546
1994	0.24	-0.01	0.33	6325	0.00	0.03	0.03	1719
1995	-2.73	-0.03	2.64	7061	-0.14	0.02	0.08	1757
1996	-467.80	-0.02	469.00	7732	-0.53	0.01	0.47	1767
1997	1.36	-0.03	1.14	7868	7.97	0.00	8.05	1706
1998	-0.61	-0.03	0.12	7689	21.02	0.01	21.54	1635
1999	47.99	-0.04	48.69	7830	5.84	0.02	4.69	1709
2000	-1.10	-0.06	0.49	7898	19.31	0.01	20.09	1754
2001	-5.98	-0.07	3.08	7509	-0.81	0.03	0.26	1673
2002	-17.09	-0.05	9.25	7160	-1.00	0.05	0.59	1699
2003	-6.22	0.00	4.63	6844	-2.95	0.04	2.74	1656
2004	-5.20	0.00	3.43	6786	-1.81	0.03	2.54	1649
2005	-3.24	-0.02	2.57	6647	-4.24	0.02	3.22	1648
2006	-0.07	-0.03	0.23	6592	-3.51	0.01	3.58	1626
2007	3.63	-0.03	6.27	6567	-3.97	0.02	4.41	1605
2008	-19.30	-0.03	14.37	6287	-7.92	0.01	7.34	1555
2009	23.17	-0.01	27.98	6027	-5.59	0.03	5.51	1518
2010	-0.42	0.02	0.47	5975	-5.78	0.05	6.20	1500
2011	-3.84	0.02	4.23	5913	0.13	0.06	0.55	1513
2012	-1.91	0.03	2.16	4128	0.34	0.07	0.64	1286

NI is Net income is as reported in Compustat. P is stock price at the balance sheet date. D is dividend payments. r_f is the risk free rate, which is the 1 year treasury bill rate.

TABLE 6: Economic Income (Hicks) – Implied Permanent Earnings (IPE)
Implied Permanent Earnings calculated using the 1-year Treasury Bill Rate
Panel A: % of firms with (Hicks > IPE)

	INDUSTRIAL FIRMS		FINANCIAL FIRMS	
	% Positives	N	% Positives	N
Total	55	214875	61	44590
1976	74	3442	82	407
1977	62	3396	61	409
1978	67	3564	70	437
1979	65	3787	75	550
1980	67	3952	64	580
1981	49	4461	56	639
1982	53	4664	56	663
1983	71	5055	78	706
1984	37	5136	53	727
1985	58	5139	72	749
1986	56	5363	65	820
1987	44	5589	33	891
1988	52	5394	60	895
1989	53	5219	57	891
1990	31	5198	20	875
1991	63	5258	70	904
1992	57	5497	69	926
1993	67	5923	81	1546
1994	48	6325	56	1719
1995	66	7061	82	1757
1996	61	7732	76	1767
1997	59	7868	85	1706
1998	40	7689	41	1635
1999	55	7830	35	1709
2000	42	7898	48	1754
2001	44	7509	66	1673
2002	36	7160	64	1699
2003	80	6844	91	1656
2004	65	6786	80	1649
2005	57	6647	59	1648
2006	61	6592	71	1626
2007	49	6567	29	1605
2008	14	6287	15	1555
2009	73	6027	60	1518
2010	71	5975	73	1500
2011	44	5913	46	1513
2012	60	4128	81	1286
Mean	55		62	
Median	57		64	
St. Error	2.25		3.03	

IPE (tb1) is implied permanent earnings, calculated as $c_{t-1}.(p_t + d_t)$, where p_t is market capitalization at the fiscal year end date, d_t is dividends, and c_{t-1} is $r_{f,t-1}/(1+r_{f,t-1})$, where r_f is the risk free rate, which is the 1 year treasury bill rate. We match the treasury bill rate with the firm-year observation based on the fiscal year end month. Economic Income

(Hicks) is the change in market capitalization from t-1 to t, plus dividends in t. N is the total number of observations (positives or negatives).

TABLE 6: (continued)
Panel B: % of market capitalization (over total market capitalization of all firms) held by firms with (Hicks Income > IPE)
Implied Permanent Earnings calculated using the 1-year Treasury Bill Rate

	INDUSTRIAL FIRMS		FINANCIAL FIRMS	
	% Positives	N	% Positives	N
1976	81	3442	94	407
1977	41	3396	39	409
1978	65	3564	70	437
1979	69	3787	77	550
1980	83	3952	68	580
1981	41	4461	67	639
1982	67	4664	69	663
1983	83	5055	78	706
1984	43	5136	63	727
1985	83	5139	93	749
1986	76	5363	76	820
1987	60	5589	30	891
1988	66	5394	79	895
1989	79	5219	87	891
1990	42	5198	27	875
1991	75	5258	81	904
1992	59	5497	82	926
1993	78	5923	84	1546
1994	57	6325	42	1719
1995	84	7061	92	1757
1996	76	7732	93	1767
1997	84	7868	95	1706
1998	77	7689	72	1635
1999	77	7830	54	1709
2000	52	7898	82	1754
2001	40	7509	34	1673
2002	28	7160	36	1699
2003	89	6844	96	1656
2004	78	6786	86	1649
2005	67	6647	73	1648
2006	82	6592	89	1626
2007	70	6567	39	1605
2008	12	6287	11	1555
2009	81	6027	92	1518
2010	80	5975	75	1500
2011	61	5913	38	1513
2012	81	4128	95	1286
Mean	67		69	
Median	75		76	
St. Error	2.99		3.85	

IPE (tb1) is implied permanent earnings, calculated as $c_{t-1}.(p_t + d_t)$, where p_t is market capitalization at the fiscal year end date, d_t is dividends, and c_{t-1} is $r_{f,t-1}/(1+r_{f,t-1})$, where r_f is the risk free rate, which is the 1 year treasury bill rate. We match the treasury bill rate with the firm-year observation based on the fiscal year end month. Economic Income (Hicks) is the change in market capitalization from t-1 to t, plus dividends in t. N is the total number of observations (positives or negatives).

TABLE 7: Hicks Income – Net Income
Panel A: % of firms with a positive difference between net income and Hicks income (Hicks income > Net Income)

	INDUSTRIAL FIRMS		FINANCIAL FIRMS	
	% Positives	N	% Positives	N
Total	52	214875	55	44590
1976	68	3442	83	407
1977	49	3396	45	409
1978	46	3564	38	437
1979	47	3787	40	550
1980	58	3952	51	580
1981	36	4461	44	639
1982	53	4664	56	663
1983	68	5055	74	706
1984	33	5136	50	727
1985	62	5139	71	749
1986	54	5363	55	820
1987	37	5589	27	891
1988	51	5394	56	895
1989	54	5219	57	891
1990	32	5198	23	875
1991	65	5258	71	904
1992	55	5497	68	926
1993	59	5923	67	1546
1994	39	6325	36	1719
1995	55	7061	73	1757
1996	52	7732	70	1767
1997	57	7868	81	1706
1998	39	7689	38	1635
1999	51	7830	29	1709
2000	39	7898	44	1754
2001	53	7509	66	1673
2002	42	7160	58	1699
2003	82	6844	86	1656
2004	64	6786	68	1649
2005	55	6647	48	1648
2006	60	6592	63	1626
2007	48	6567	25	1605
2008	17	6287	17	1555
2009	75	6027	61	1518
2010	67	5975	67	1500
2011	40	5913	37	1513
2012	57	4128	71	1286
Mean	52		55	
Median	53		56	
St. Error	2.13		2.98	

Economic Income (Hicks) is the change in market capitalization from t-1 to t, plus dividends in t. Net income is as reported in Compustat. N is the total number of observations (positives or negatives).

TABLE 7: (continued)
Panel B: % of market capitalization (over total market capitalization of all firms) held by firms with (Hicks income > Net Income)

	INDUSTRIAL FIRMS		FINANCIAL FIRMS	
	% Positives	N	% Positives	N
1976	78	3442	93	407
1977	25	3396	20	409
1978	42	3564	24	437
1979	54	3787	48	550
1980	78	3952	49	580
1981	38	4461	52	639
1982	66	4664	67	663
1983	83	5055	75	706
1984	38	5136	60	727
1985	85	5139	91	749
1986	79	5363	63	820
1987	56	5589	29	891
1988	58	5394	68	895
1989	76	5219	74	891
1990	42	5198	23	875
1991	75	5258	82	904
1992	60	5497	80	926
1993	74	5923	66	1546
1994	47	6325	23	1719
1995	79	7061	87	1757
1996	71	7732	89	1767
1997	81	7868	93	1706
1998	75	7689	70	1635
1999	71	7830	48	1709
2000	50	7898	75	1754
2001	43	7509	33	1673
2002	29	7160	30	1699
2003	87	6844	94	1656
2004	71	6786	72	1649
2005	57	6647	53	1648
2006	75	6592	79	1626
2007	67	6567	35	1605
2008	10	6287	09	1555
2009	76	6027	89	1518
2010	66	5975	54	1500
2011	47	5913	24	1513
2012	67	4128	87	1286
Mean	62		60	
Median	67		66	
St. Error	3.08		4.15	

Economic Income (Hicks) is the change in market capitalization from t-1 to t, plus dividends in t. Net income is as reported in Compustat. N is the total number of observations (positives or negatives).

TABLE 8: Fed Model

Panel A: % of market capitalization (over total market capitalization of all firms) held by firms with (Net Income t+1 > market cap * tbrate) -- tbrate is the 1 year treasury bill rate

	INDUSTRIAL FIRMS		FINANCIAL FIRMS	
	% Positives	N	% Positives	N
1976	92	3396	98	409
1977	97	3564	99	437
1978	87	3787	96	550
1979	74	3952	90	580
1980	49	4461	83	639
1981	34	4664	52	663
1982	41	5055	70	706
1983	50	5136	67	727
1984	40	5139	65	749
1985	49	5363	81	820
1986	70	5589	67	891
1987	70	5394	86	895
1988	60	5219	77	891
1989	33	5198	52	875
1990	31	5258	75	904
1991	43	5497	71	926
1992	65	5923	86	1546
1993	81	6325	88	1719
1994	63	7061	85	1757
1995	56	7732	82	1767
1996	48	7868	88	1706
1997	28	7689	65	1635
1998	31	7830	75	1709
1999	31	7898	76	1754
2000	14	7509	34	1673
2001	53	7160	80	1699
2002	87	6844	97	1656
2003	91	6786	97	1649
2004	92	6647	97	1648
2005	85	6592	94	1626
2006	78	6567	77	1605
2007	69	6287	38	1555
2008	89	6027	87	1518
2009	95	5975	90	1500
2010	95	5913	93	1513
2011	93	4128	92	1286
Mean	63		79	
Median	64		83	
St. Error	4.05		2.72	

Net income is as reported in Compustat, market cap is current market capitalization and tbrate is the 1 year treasury bill rate.

Figure 1: Percent of firms with Net Income greater than Implied Permanent Earnings - Industrials