Earnings: Concepts vs. Reported

DOI:

[10.1561/108.00000018](https://doi.org/10.1561/108.00000018)

Document Version

Accepted author manuscript

[Link to publication record in Manchester Research Explorer](#)

Citation for published version (APA):

Grambovas, C., Garcia Lara, J. M., Ohlson, J., & Walker, M. (2017). Earnings: Concepts vs. Reported. *Journal of Law, Finance, and Accounting*, 2(2), 347-384. <https://doi.org/10.1561/108.00000018>

Published in:

Journal of Law, Finance, and Accounting

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Earnings: Concepts vs. Reported

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February 2017

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Acknowledgements We are grateful to Jing Liu, the Accounting staff at Bocconi University, and participants at the 2013 European Accounting Association, the 2012 Workshop on Empirical Research in Financial Accounting at the University of Las Palmas de Gran Canaria. The paper benefitted from presentation at the 2016 Journal of Law Finance and Accounting Conference, including the discussion of Partha Mohanram. All remaining errors are the responsibility of the authors.

Abstract

The paper examines three benchmark earnings concepts: (i) permanent earnings with the cost-of-equity determining the capitalization, (ii) permanent earnings with the risk-free rate determining the capitalization, and (iii) economic earnings (Hicks's concept). The concepts can be measured empirically using stock prices. The study explains how the three concepts differ in terms of reflecting risk and growth. Critically, (i) and (ii) highlight two cases along a continuum. Case (i) renders growth irrelevant so that risk alone, as reflected by the cost-of-equity, determines the E/P yield ratio. By contrast, for (ii) the risk-free rate determines the E/P ratio because growth cancels out risk. The case is referred to as full cancelling out, FCO for short. The empirical part of the paper compares the earnings concepts to reported earnings using US data, for the period 1976 to 2015. These evaluations split firms into two categories, industrial and financial. Main findings show that for industrial firms, as an overall average, reported earnings relate closer to (ii) – that is, FCO-- than to (i). Though the result is robust across methods, for distinct sub-periods (i) provides the better benchmark. As to reported earnings of financial firms, we hypothesize and find that reported earnings relate closer to (i) than (ii). This conclusion should be expected insofar financial firms rely on approximate fair value accounting, in which case earnings come close to economic earnings, (iii), and such earnings imply an average of (ii).

KEYWORDS: Permanent Earnings, Economic Earnings, Firm valuation, Earnings yields.

JEL Descriptors: M41, G32

Earnings: Concepts versus Reported

1. Introduction

For the past few decades accounting research has mostly viewed reported earnings as an outcome of applying a set of GAAP procedures, without any reference to what the earnings figure represents. Earnings take on a role within the financial reporting framework by providing some generic information that can be combined with other information to influence investors' forecasts of cash flows. With this perspective, earnings may not even be a key piece of information. A competing -- more old-fashioned -- perspective on earnings views such thinking as too expansive by not connecting earnings directly to value creation, that is, reported earnings should act as the key number to estimate firm value or change in value. This approach refers to income *measurement* and the concept-loaded terms permanent earnings (or sustainable income) and economic earnings (Hicks' concept of earnings, Hicks (1946)).

A measurement perspective accordingly differs from an information perspective because it directs attention to the idea that reported earnings ought to connect to firm value. It recognizes deviations of reported earnings from theory based earnings concepts by allowing for "measurement errors", which for obvious practical reasons are difficult to avoid (GAAP relies on rules after all). Moreover, as a matter of first-cut investment practice, a measurement perspective on earnings points toward the centrality of earnings multiples, as underscored long ago by Graham and Dodd (1934,1951).¹ It suggests a

¹ Some of the income measurement literature seeks to portray economic concepts of earnings as ideal measures of income to which reported earnings should seek to conform. We call this the (normative) ideal view of economic earnings concepts. This is not our view. Our view is that one can gain a better understanding of the nature of reported earnings by understanding what features of the accounting system cause reported earnings to deviate from economic concepts of earnings. We call this the (positive)

natural focus on E/P-ratios, which should, on average, allow for an economic assessment that goes beyond pure descriptive statistics.

This paper develops three earnings concepts and proceeds by comparing the concepts to reported earnings. Our research question, expressed broadly, thus focuses on: to what extent do the three concepts connect to empirical (US in our case) earnings data? This question in many respects condenses to the problem of finding the “best” benchmark for (reported) E/P ratios. To address the question requires measurements of the earnings concepts. We implement this aspect by using observed stock prices (which in effect assumes efficient markets). Though the earnings concepts developed potentially also depend on cost-of-capital, the risk-free rate, and, as a minor adjustment term, the current net distribution of wealth (or dividends), stocks prices are by far the most critical inputs.

Two of the earnings concepts fall into the category of permanent earnings which connect directly with value itself. Our third concept is usually referred to as economic earnings, which determine the change in value -- as opposed to value. Specifically, the three concepts can be summarized as follows.

(i) Permanent earnings using the cost-of-capital as the capitalization factor. If ‘ E^* ’ represents such permanent earnings, then the E^*/P ratio connects directly with cost-of-equity, that is, it picks up on risk. But it leaves out “growth”, which in turn suggests that real world E/Ps are less than the benchmark E^*/P , at least on average. This earnings concept involves subtle aspects, to be discussed later. Ryan (1988) is the modern originator of this concept.

benchmark view of economic earnings concepts. Beaver and Demski’s (1979) critique of the income measurement literature is directed at the (normative) ideal view.

- (ii) Permanent earnings using the risk-free rate as capitalization factor. Now the E^*/P ratio relies on the risk-free rate as the anchor – this rather than the cost of equity in (i). The underlying formal model effectively hypothesizes that earnings growth and earnings risk cancel each other. This model has a long history and it can be tied to the Gordon (1959) growth model (as an approximation). We refer to it as the permanent earnings model with a *full cancelling out of risk and growth* (FCO).
- (iii) Economic earnings: this concept is defined by the change in a firm's market value adjusted for dividends. Contrary to (i) and (ii), the concept refers to neither value itself, nor cost-of-equity or risk. But cost-of-equity (or risk) influences the expected economic earnings, a point which we discuss later.

Our empirical analysis centers on (ii) because it embeds the idea that growth and risk fully cancel each other (on average). This risk-growth cancellation feature is not present in (i) and (iii), as noted. But one can still organize these concepts relative to (ii) and more generally one can organize the empirics of E/P ratios around whether risk dominates growth or the other way around. Hence, (ii) acts as a natural reference point in the empirical analysis. While we do not suggest that GAAP represents such an accounting, the general idea is that balance sheet conservatism can pick up on the firm's intrinsic risk and, the other side of the coin, conservatism can tilt the income (and sales) numbers toward growth via low denominators (all as a matter of average, of course). The scenario thus deserves a close empirical examination insofar that, on average, GAAP may approximate such accounting.

Our basic empirics relies on non-parametric statistics, essential for robustness. This approach makes sense since the data uses a comprehensive sample of firms and

many data points are anomalous “outliers”. Also, the data will be statistically inter-dependent, across firms and over time. Our core analysis of concept (ii) accordingly starts out by identifying the sign of the reported earnings minus the permanent earnings – which can be thought of as a plus/minus signed “error” in reported earnings.

In broad terms, for industrial firms the data supports a fifty-fifty proposition for pluses and minuses; that is, FCO. But it should be noted that for certain sub-periods, spanning many years, the incidence of signs of the errors can differ materially from a fifty-fifty reference point. In other words, the error signs are serially correlated. So only the grand average of all the errors, across all firms and all years, can be viewed as approximating zero. The periods 1976-80 and 2004-15 tend to have positive errors (reported earnings exceed permanent earnings per (ii)), and the period in between tends to have negative errors. For the two specific sub- periods with positive errors, the results suggest that reported earnings are better approximated by permanent earning (i) rather than (ii).

Because (ii) rules out mark to market accounting, we hypothesize that for financial firms the hypothesis (ii) ought to be rejected. For these kind of firms, however imperfectly, the balance sheet approximates mark-to-market more so than for industrial firms, and such accounting increases E/P ratios. Financial firms’ earnings can accordingly be approximated by economic earnings, which in turn suggests that the theory of economic earnings can be applied. Specifically, financial firms’ earnings differ

from permanent earnings per the (ii) concept, and E/P ratios should be better benchmarked by the cost of equity, concept (i).².

Our results have implications for users of financial statements. First, contrary to much of the theoretical literature on valuation and earnings, our findings support the idea that it makes sense to consider the risk-free rate as a capitalization factor for (expected) earnings, at least as a first rough and ready starting point in valuation under “normal” circumstances³. Second, the common investment practice of using earnings as a core valuation attribute hinges on the idea that the reported E/P yield can be juxtaposed to some benchmark E/P yield as an initial step in attempts to identify cheap/expensive stocks (see Liu et al. 2002). That is, there is a need to assess whether any yield ratio is relatively high or low compared to some empirically meaningful benchmark. Furthermore, the choice of a benchmark cannot be viewed as foregone conclusion because it may or may not depend on a firm’s cost-of-equity or the risk-free rate.

2. Earnings Concepts

As a traditional starting point, accounting theory refers to two earnings benchmarks, a flow and stock concept of “ideal” earnings: “economic earnings” and “permanent earnings”. Economic earnings, often associated with Hicks’s concept,

² Under mark to market accounting for financial institutions, the accounting is still unconditionally conservative to some extent, because it uses exit values, especially when markets are illiquid. However, we argue that mark to market accounting is not as conservative as conventional accounting.

³ Implementations of accounting-based valuation models like the residual earnings model in Ohlson (1995) or the abnormal earnings growth model in Ohlson and Juettner-Nauroth (2005), require estimates of firms’ equity risk premium along with estimates of growth rates. Thus, a growth risk connection can potentially be useful in empirical research such as Lee et al. (1999) and Francis et al. (2000).

represent the change in cum-dividend value⁴. Permanent earnings, by contrast, represent value, not its change. This concept (also sometimes referred to as “sustainable earnings”) puts the onus on the E/P 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). Scott (1986) also points out the importance of distinguishing between earnings concepts that focus on changes in wealth (‘gain’ in Scott, 1986) and permanent earnings (‘standard stream income’ in Scott, 1986).

Ryan (1988) identifies the concept of permanent earnings formally. He considers a full payout of earnings and a constant stream of expected earnings, discounted at cost of equity, in which case the cum dividend value equals

$$(P_t + d_t) \equiv x_t + x_t/r(e) \quad (1)$$

In the expression, P_t is stock price, d_t dividends, x_t earnings and $r(e)$ represents the cost of equity capital. The expression corresponds to

$$(P_t + d_t)/x_t \equiv c \quad (2)$$

where, c represents the earnings capitalization factor $(1 + r(e))/r(e)$. We use $PE_{r(e)}$ to denote permanent earnings defined using the cost of equity capital. The introduction referred to this concept as (i).

In (2), x_t alone suffices as information to infer the cum-dividend value. More subtly, (2) identifies the multiplier/scalar as a direct function of the cost of equity. Setting aside the minor role of dividends, and noting that $r(e)/(1+r(e))$ can be approximated by

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, below, 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.

$r(e)$, the formal model thus suggests that the E/P ratio should be closely approximated by the cost of equity, $r(e)$.

A more general approach to permanent earnings simply uses expression (2) as the starting point without prejudging the value of c : it does not necessarily derive from the cost of equity. Black (1980) underscores this aspect, and he suggests that $c=10$ would be perfectly fine. Ohlson (1995) recognizes that c can be specified as $(1+r(f))/r(f)$, where $r(f)$ is the current short term risk-free rate. In other words, one can simply replace $r(e)$ with $r(f)$ in (2). Now the formula relates directly to the valuation of a risk-free savings account, expressed as $P(t) = [(1+r(f))/r(f)] x(t) - d(t)$. The underlying economics makes no reference to the payout ratio; it derives from the present value of dividends discounted by the risk-free rate (regardless of the dividend policy). Permanent income, defined in this way, can be viewed as a “certainty equivalent” concept of income. In other words, it represents the risk-free level of income that has the same market value as the risky dividend stream underlying the equity value. In what follows, $PE_{r(f)}$ denotes the so defined permanent earnings.

More generally (2) allows for a continuum of alternative measures of permanent income depending on parameter c . The conventional (Ryan (1998)) version of P/E (based on the cost of equity capital) and certainty equivalent P/E (based on the risk-free rate; the introduction referred to this concept as (ii)) are just two special cases along this continuum.

The reader may object that the discount factor ought to depend on the equity risk. After all, should not P depend on the cost of equity, which in turn depends on risk? This

objection misses out on a key aspect. Just as P should depend on risk, it should depend no less on growth in expected earnings. Furthermore, under ideal circumstances, risk should be present only if there is some commensurate benefit, namely, growth. Thus, expression (2) with $c=(1+r(f))/r(f)$ can make sense due to the idea that growth and risk offset each other under ideal circumstances.⁵ Also, critically, though the formula with $c = (1+r(f))/r(f)$ can be derived from a savings account analysis, the formula can be derived no less in a more general setting in which risk is present, and thus $r(e)$ differs from $r(f)$ and where $r(e)$ specifies the discount factor in the calculation of the present value of expected dividends (PVED). The appendix develops this model formally.

To gain some intuitive understanding as to why an E/P benchmarked by the risk-free rate might approximate reported earnings consider the classic Gordon (1959) growth model

$$P_t = d_t(1+g) / (r(e) - g) \quad (3)$$

where g is growth, and all other variables are as previously defined. Assuming full dividend payout, set d equal to x , and rewrite (3) as

$$(P_t + d_t)/x_t = (1 + r(e))/(r(e) - g) \quad (4)$$

In contrast to (2), the Gordon model has $r(e) - g$ as the denominator of the capitalization factor as opposed to $r(e)$ by itself.

Now consider the possibility that the equity risk premium in the Gordon growth model roughly equals the growth rate. In such case the capitalization factor becomes $(1 +$

⁵ It is possible to have cases where the current risk is high and the prospects for future growth are low. However, such cases will typically be the result of periods of overinvestment in prior periods during which expected growth was high relative to the risk. In the long run these deviations from FCO will tend to offset each other in the full sample.

$r(e)/r(f)$, which approximates $(1+r(f))/r(f)$ for reasonable values of $r(f)$ and the risk premium. For example, suppose the risk-free rate is 4% and the risk premium is 4%. Then $(1+r(e))/r(f)$ equals 27 and $(1+r(f))/r(f)$ equals 26, which stands in sharp contrast to $(1+r(e))/r(e) = 13.5$. In other words, if one considers the choice of capitalization factor from the viewpoint of the Gordon growth model it follows that a capitalization factor based on the risk free-rate provides a better benchmark for earnings capitalization in the case when growth and the equity risk premium are two sides of the same coin.

Risk and growth cancellation is a familiar idea in financial economics. The so-called “Fed model” of equity valuation refers to neither risk nor growth: to estimate value, this model, too, capitalizes earnings using a risk-free rate.⁶

$$P_t = E(x_{t+1})/r(f). \quad (\text{Fed})$$

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 explained in the appendix, refers to the *short term* one-year risk-free rate.⁷

Whether the risk-free rate applied to share prices gives a reasonable benchmark for reported earnings depends on how accounting practices deal with growth and risk. In

⁶ 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).

⁷ Penman and Reggiani (2013) 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.

broad terms one can argue that the accounting works such that there are two effects that end up offsetting each other. On the one hand, risk, by itself, increases the E/P ratio. On the other hand, firms do not take on risk unless they can get some benefit, and the obvious benefit is growth in expected earnings as time passes. Due to conservative accounting, such benefits cannot be recognized in the current balance sheet. But the expectation of earnings growth affects the valuation and thus, *ceteris paribus*, the E/P ratio decreases. If the risk and growth move in tandem –resulting in FCO, on average -- then the E/P ratio should tend to oscillate around the risk-free rate. Hence the *empirical* question arises whether, *on average*, the canceling of these two effects can serve as a broad benchmark.⁸

An Appendix formalizes the growth/risk cancelation concept. The assumptions refer to the time-series dynamics of benchmark earnings, measured without any error. This dynamic will depend on both risk and growth in such a way that the implied valuation (the theoretical E/P ratio) reflects the risk-free rate, not the cost-of-equity. In this framework, the reported earnings can be thought of as the error-free earnings plus some noise.

3. Benchmarking the E/P ratio: Beyond stylized models.

To guide future discussions of empirical results, it helps to classify E/P ratios into its five outcomes. Using $r(f)$ and $r(e)$ (where $r(e) > r(f)$) as boundary points, Figure 1 summarize

⁸ Easton et al. (2002) provide evidence supporting that the average risk premium of industrial equities reflects the expected growth rate of earnings. Their table 1 results indicate that estimates of the expected (book) rate of return on equity capital for their sample of US equities were roughly equal to the expected long term growth rate. In fact, their table 1 results suggest more than full cancelling out for their 1981-1998 sample period, because $r-g$ is less than the 5-year risk free rate of interest used in their analysis in all their sample years.

these: A, RO, B, FCO, and C. RO stands for “risk only”, and identifies E/P as being benchmarked by $r(e)$, cost-of-equity; FCO refers of course to E/P as benchmarked by $r(f)$. These two boundary points divide the continuum of possibilities into the three broad regions: A, B, C. At the bottom, region C, the E/P ratio is less than $r(f)$, so that growth dominates risk; future earnings are likely to be much better than those currently observed. In the middle, region B, risk and growth partially cancel out though risk exceeds growth. Region A, at the top, provides the other extreme; these very high E/P occur when risk dominates growth. In this way, Figure 1 enumerates the full range of E/P ratios.

The above analysis can be tied to the standard textbook analysis, as exemplified by Brealey et al (2010) in the finance literature; in the FSA literature, Penman (2013) and, Easton et al (2013). The basic idea is that one can express value as capitalized earnings plus, in anticipation of the future, the present value of growth opportunities, PVGO:

$$P = \text{earnings}/r(e) + \text{PVGO}.$$

Cost-of-equity determines the capitalization rate for earnings due to assets in place as well as the superior value generated due to the expected outcome of future investments, PVGO.

Given competitive markets, *ex ante* it may seem reasonable to claim that PVGO equals zero and thus the benchmark per Ryan, RO, applies. However, the claim is incomplete; it misses out on a key aspect even if one stipulates competitive markets. As was underscored above, PVGO is effectively a discounting of future expected earnings and thus the PVGO calculation depends on the accounting rules in place, as does of course the first term. Accordingly, while the RO benchmark is certainly of conceptual

interest, it is not the end of the story because growth combined with conservative accounting reduces the first term, earnings capitalized by $r(e)$, and increase the second term, PVGO. With PVGO positive, the possibility of an earnings capitalization using $r(f)$ may come close to approximating P ; that is, FCO applies. Of course, it is exceedingly unlikely to be a good approximation for any given firm, but it could be a good approximation *on average*.

The textbook expression above makes it clear that one can think of “growth” in general terms as opposed to in the terms of the stylized models presented earlier. It has the advantage that it brings out the possibility of focusing the shift of reported earnings recognition to later periods (when the uncertainty gets resolved). In this spirit, the subsequent data analyses center on how reported earnings compare to various concepts of earnings; we do not try to measure the growth and compare it to measures of cost-of-equity. Such a procedure would be far too sensitive to implementation details. Instead our approach views both growth and cost-of-equity as implicit; the idea that FCO applies should be viewed as a conceptual construct that relates E/P to $r(f)$ rather than the outcome of two “measurements” that are (approximately) of the same magnitude.

Finally, consider economic earnings. It can be compared to both types of permanent earnings. From theory, it follows that expected economic earnings, period $t+1$, equals $r(e)$ times $P(t)$, which is equivalent to the case of permanent earnings with capitalization $r(e)$. By contrast, permanent earnings with capitalization $r(f)$ are less than economic earnings, and thus reported earnings are generally less than economic earnings if reported earnings on average approximate FCO. Thus, while reported earnings can fall

into any of the categories, to the extent they are generated by a process satisfying economic earnings, categories A and B should be much more common than C.

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 mark to market accounting. In this 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 mark to market accounting, then an expected earnings capitalization based on a risk-free rate would, on average, grossly overstate actual values.

4. Empirical Framework and Hypotheses

Referring to Figure 1, B and C will be the most common categories; after all, RO and FCO represent points of approximations rather than categories per se and A is far too extreme to be common. Given such an outcome one can nonetheless ask whether the average E/P is closer to FCO than RO. For industrial firms, we expect to find evidence of significant FCO. For financial firms, because their accounting better approximates marking to market, we expect results to be closer to RO than FCO. An issue requiring judgement is how B and C compare. The empirics will show that it depends on a few specific sub-periods, so the idea is that B and C, taken as a “grand” average, leads to FCO.

In more detail, the empirics assess the following hypotheses.

- (a) *A non-parametric evaluation of FCO: reported earnings minus $PE_{r(f)} \approx 0$.*

Our first approach to the FCO hypothesis accordingly evaluates the sign (plus or minus) of the difference between reported earnings and $PE_{r(f)}$, across all years, for industrials and financials separately. It provides a natural starting point because it is so straightforward. Additional analyses later elaborate on the sensitivity of the findings to firm size and more parametric-type tests.

Our initial approach does not model the time series dependence in the ratio of pluses to minuses. It would pose considerable problems and run counter to the need to generate statistics that are easy to internalize. Thus, we proceed descriptively by simply counting the number of pluses/minuses for each year. We further derive the “grand total” of pluses/minuses, and the percentage of years when the pluses exceed the minuses. Evidence in favour of FCO corresponds to 50% positives and 50% minuses.

We expect FCO to be more descriptive on average for industrial firms than financial firms. For the latter firms, the pluses should exceed the minuses by a distinct margin.

(b) *Reported earnings minus $PE_{r(f)}$ ≈ 0 after having adjusted the evaluation for firm size.*

One naturally must worry that the pooling of small/large firms in our first set of tests drives an acceptance of FCO. Thus, we also assess the hypothesis on a value weighted basis: the positive and negative signs weighted by relative market values. As before, results are shown separately for industrial and financial firms

(c) *A parametric evaluation of FCO which focuses on the earnings yield, $x/(P+d)$.*

FCO corresponds to expression (2) which implies that the (adjusted) earnings yield $x/(P+d)$ should on average equal $r(f)/(1+r(f))$. This alternative perspective serves to

highlight the materiality of the difference between the median earnings yield and its theoretical FCO benchmark, i.e. $r(f)/(1+r(f))$. That is, the outcome for each observation, $\{x/(P+d)\} - \{r(f)/(1+r(f))\}$, when averaged over firms for any given year, and across years, tell us the extent of deviations from the null and how these change over the years. The data can also be tabulated to bear on the cross-sectional variation in any year. Two basic questions can be addressed: by what percentage does the null hypothesis differ from zero, and to what extent do we observe years which “clearly” deviate from the null hypothesis.

(d) A parametric evaluation of the Ryan hypothesis, reported earnings minus $PE_r(e) \approx 0$.

As noted earlier, the outcome, $PE_r(e)$, that is scenario RO, competes with $PE_r(f)$ as a benchmark. Thus, it makes sense to compare the hypothesis $PE_r(e) = 0$ in a parametric setting with results obtained in (c). A test of the hypothesis requires an assumption on the average risk premium. We assume a market risk premium of 4%, and make no attempt to refine the analysis by estimating firm-specific betas. The “error” due to our assumption that all betas equal one should be minor and cancel out across observations. As to the 4% figure, it is in line with what the capital asset pricing empirical literature finds. An exhaustive study by Duff and Phelps (2013), for example, reports an average market risk premium for the S&P 500 over the period 1963 to 2012 of 4.5%. In any event, evaluations of $PE_r(e)$ as a benchmark follows the earlier approach when the focus was on $PE_r(f)$: the risk free rate plus 4% simply replaces the risk free rate. Results are reported separately for industrial and financial firms; the expectation is that for financial

firms $PE_r(e)$ serves as a better benchmark than $PE_r(f)$; the opposite is likely to hold for industrial firms.

(e) Comparisons of permanent earnings and reported earnings with economic earnings

Economic earnings, the change in market value plus dividends, can be compared to reported earnings and permanent earnings defined with $r(f)$. Do such earnings behave according to the previously discussed concepts? That is, economic earnings should on average exceed $PE_r(f)$ as well as reported earnings, at least for industrial firms.

To compare economic earnings with $PE_r(f)$, we first report the proportion of firms for which economic earnings exceed $PE_r(f)$ year by year. In addition, to allow for the possibility that the findings may be sensitive to firm size, we report the percentage of market capitalization for which economic earnings exceed $PE_r(f)$. Separate results are presented for industrial and financial firms. The procedures follow the same steps when we compare economic and reported earnings.

(f) A Test of the Fed Model

The Fed model, modified by using $r(f)$ as capitalization factor rather than the ten year rate, can be evaluated by using realized earnings instead of expected earnings. The basic test evaluates the null hypothesis that $x(t+1)/r(f) - P(t) = 0$. The test is similar to the basic ones in (a), (b), (c), except that the perspective has changed away from contemporaneous earnings to subsequent earnings. Results should be similar to the previous ones as long as $x(t+1) - ((1+r(f))x(t) - r(f)D(t))$ on average approximates zero.

(g) Evaluation of EBIT in lieu of reported earnings

Ryan's theoretical analysis can be extended to eliminate the effect of leverage/debt and the government's tax-claim to cash (the government being a third claimant, in addition to stockholders and debt-holders). The same can be said for the theory that leads to $PE_{r(f)}$. Accordingly, the market-value of equity plus debt (net of market securities held) replaces equity, EBIT replaces (reported) earnings, and, finally, the weighted average cost-of-capital replaces cost-of-equity ($r(e)$), that is, it specifies the parameter c in equation (2). This extended perspective raises the same questions as before, that is, basically, how reported EBIT compares to the three theoretical extended earnings constructs. It is far from clear whether one should expect any changes compared from the "pure" equity perspective, but we do look for robustness.

(h) Changes in the use of fair value accounting.

As suggested above, the use of fair value accounting shifts the relation between reported and permanent earnings away from $PE_{r(f)}$ and towards $PE_{r(e)}$. This should be no less true if the accounting changes due to changes in regulation of principles. To assess this possibility, we summarize results for the two sub-periods around the implementation of FAS 115 in 1994. SFAS 115 introduced the recognition of fair value accounting for certain investments in equity and debt instruments. SFAS 115, arguably, represented the first major shift to fair value accounting in the US. But the effect of this regulation is likely to be material only for financial firms. Given this, the hypothesis states that the earnings of financial firms will be closer to $PE_{r(e)}$ after 1994 than before.

5. Results

Compustat and CRSP provide accounting data (earnings in particular) and stock price data. The sample period runs from 1976 to 2015, a total of 40 years. The two subsamples, industrial and financial firms, consist of 234,010 and 45,536 firm-year observations, respectively.

To motivate the tabulation of separate results for industrial and financial firms, we start out by analyzing the unlevered market to book (MTB) ratio for the two sets of firms. A focus on unlevered ratios reflects an assumption that, as a reasonable approximation, total GAAP liabilities correspond roughly to their market values. Per hypothesis, financial firms, as compared to industrials, should come closer to mark-to-market accounting and accordingly the unlevered MTB should be much closer to one. Figure 2 tabulates the year by year median unlevered MTB for the two sets of firms. For financials, the median unlevered MTB is close to one in most years and with no discernable time trend. The mean of the yearly median values is also close to one, 1.03. Again, this is consistent with the idea that the total assets of financial firms as reported in the financial statements are, on median, close to market values. In contrast, the median unlevered MTB values for industrials are mostly materially greater than one; only the first four years of the sample period show the opposite. We further note that there is a tendency for the median unlevered MTB to increase over time, most likely reflecting the increase in conservative accounting and the secular increase of (non-capitalized) R&D expenditures. The mean of the yearly median values for industrial firms is 1.37 compared to 1.03 for financials. And in terms of individual years the median MTB of financial firms is always lower than that for industrials. Clearly, financial firms differ from industrials materially, and the overall patterns are those that one should expect because

financials use an accounting much closer to fair value accounting as compared to industrials.

We next report on the empirical issue (a), the sign-based non-parametric testing of reported earnings relative to $PE_r(f)$. Table 1 reports separate results for industrial and financial firms. In each case, we report two columns of results. The first column shows the percentage of firms for which reported earnings exceeds $PE_r(f)$, both by year and the sample period as a whole. We refer to these as the equally-weighted results. The second column reports results on a value-weighted basis, and shows the percentage of market capitalization for which reported earnings exceeded $PE_r(f)$. This refers to the empirical issue (b), noted in the prior section. Thus, for both (a) and (b) the $PE_r(f)$ hypothesis predicts that this percentage on average approximates 50%.

The equally-weighted results for industrial firms do indeed fluctuate around 50%. That said, a closer look shows that over the 40 years there are 10 years when the percentage exceeds 50%, a quarter of all years. The mean (median) percentage is 42% (41%). Overall these results indicate a high degree of risk/growth cancelling out. In fact, referring to Figure 1, category A is less frequent than category C, the latter being characterized by an environment with relatively high interest rates and favorable economic circumstances. Thus, growth dominates risk in that the EP ratio is less than the risk-free rate more often than not. To be sure, there is a high degree of serial correlation over time, and that suggests informally that it would be inappropriate to reject the null simply because the overall mean is 42% and N exceeds 100K.

Figure 3 presents the equally-weighted results in graphical form. As an overall statistic the percentage is very close to 50% (as was also indicated in the discussion of Table 1). The relevant percentage is much greater than 50% for the first four years of the sample period when inflation rates and interest rates were high whereas stock prices were “depressed”. By contrast, from 1980 through to 2003 the relevant percentage is less than 50% (growth exceeds risk) in all years except 1994 when it is just slightly above 50%. For this 23-year period the data is consistent with category C. In later years, after the financial crisis of 2007-2008, the relevant percentage settles very close to 50% (2009-2015 average of 49.6%) implying the full cancelling out of risk and growth. But this result, tilting findings in favor of category C, must be qualified insofar that the result is substantially driven by the incidence of loss firms. We discuss this issue in greater detail below. In any event, across the 40 years, $PE_r(f)$ seems like a reasonable characterization of the data, as long as one allows a focus on the signed difference, earnings minus $PE_r(f)$.

Consider next financial firms: Table 1 shows that for such firms the equally weighted results differ markedly from the industrials. For 31 years out of 40 the mean percentage is over 50%, that is, now category A applies overwhelmingly. The cross-year mean (median) is 63% (66%). So, for firms in the financial sector, risk exceeds growth and E/P ratios end up being quite high. Figure 3 also reports the results for financial firms in graphical form. The graph mostly plots above the 50% line with significant peak periods 1976 to 1980 (the inflation period), 1993 to 1995, 2002 to 2006, and 2009 to 2015.

Comparing the results for financials with industrials on a year by year basis, we find that the percentage of firms with reported earnings exceeding $PE_r(f)$ is greater for financial firms in all but the first two years of the sample period. This finding, combined with those previously reported, strongly supports the hypothesis that $PE_r(f)$ provides a better characterization of the reported earnings for industrial firms than it does for financial firms. To be sure, note that the percentages for the two sets of firms correlate over time, an outcome simply reflecting that in years when the E/P's are relatively high/low for financials the same tends to be true for industrials.

We now take a closer look at the (non-parametric, signed) value-weighted results in Table 1, which thus address hypothesis (b) per previous section. Out of the 40 years, the percentage for industrial firms exceeds 50% in 62.5% of all years. The mean (median) percentage is 60% (62%). Again, the results are highly cyclical over time with long swings below and above the 50% benchmark. But the results make it clear that as one moves from an equal weighted approach to a value weighted approach category A becomes more pervasive than C. Thus, for larger industrial firms, risk appears to dominate growth. One can argue that this outcome is expected insofar that small firms embed greater growth opportunities. Similarly, for financial firms on a value-weighted basis, results point to category A. There are only 5 years (out of 40) when the percentage is lower than 50%. The cross-year mean (median) percentage is 75% (78%).

Given that $r(f)$ often is close to zero, it follows that the incidence when earnings are positive yet less than $r(f)$ occurs relatively rarely. Expressed somewhat differently, the incidence when reported earnings are less than $PE_r(f)$ depends, to a large extent, on the occurrence of losses, and small firms are much more prone to post losses than large

firms. Accordingly we hypothesize that in the value weighted case the increase in the frequency of $\{\text{reported earnings} > \text{PE}_r(f)\}$ can be attributed to a decrease in the loss frequency. Such is indeed the case. For industrials, the mean incidence of losses decreases from 37% to 7%, as we move from an equal-weighted to a value-weighted basis. Results related to financial firms are in the same direction, albeit less dramatic, 20% vs 5%. Additional analysis also shows that percentage $\{\text{earnings} > \text{PE}_r(f)\}$ and percentage losses, across the years correlate negatively, significantly and materially so (for value-weighted industrials, -44% and for financials -27%). Thus, it is important to realize that our basic hypothesis, reported earnings minus $\text{PE}_r(f)$ approximates zero, requires inclusion of loss firms. This approach makes sense since losses are no less “real” than profits: the proper benchmarking of an earnings-to-price yield ratio cannot simply dismiss losses as irrelevant. And losses also capture the idea of growth: with high probability, future earnings will indeed improve. Notice further that any (modest) random reshuffling of the aggregate income over the years is unlikely to affect conclusions; in this regard the non-parametric statistics is effectively robust. To be sure, later we consider a parametric evaluation of the $\text{PE}_r(f)$ hypothesis.

We noted earlier that serial correlation in outcomes cause a problem when one evaluates the null-hypothesis (the fifty-fifty proposition). To deal with this aspect we model the time series results reported in Table 1 as first order autoregressive Ar (1) processes and test if the intercepts of the processes are equal to 0.5, i.e. 50%. Applying the Ar (1) model to the results for industrial firms (equally weighted), the 95% confidence interval for the intercept is 32.3% to 60.4%. So the null hypothesis of FCO cannot be rejected. For the equally weighted results for the financial firms the relevant

confidence interval is 50.1% to 79.2%. Thus, for financial firms this test rejects the null hypothesis of FCO in favor of less than full cancelling out. On a value weighted basis, the Ar (1) confidence interval is 30.9% to 96.3 % for industrial firms; again, the null of 50% cannot be rejected. For financial firms the 95% confidence interval is 60.2% to 92.5%, which, gracefully, now rejects the FCO hypothesis at the 5% level. Overall, these results reject the null hypothesis of FCO for financial firms, while the null hypothesis is not rejected for industrial companies. The results accordingly support one of the major takeaways of this paper.

The results across years in Table 1 show non-trivial volatility. To deal with this issue we also present a table designed to smooth out the annual noise. Thus, Table 2 represents the results in Table 1 for 31 rolling decades, for both equally and value-weighted bases. For industrial firms on an equally weighted basis, there is no rolling decade in which either the mean or the median percentage of firms with reported earnings greater than $PE_{r(f)}$ exceeds 50%. However, on a value weighted basis, the 50% benchmark is exceeded for industrial firms in the unusual (high inflation) periods of the late 70s and early 80s. This is then followed by 18 rolling decades when FCO seems to hold well. Then for the rolling decades starting with 1998 to 2007 onwards FCO seems to give way to the opposite for the larger industrial firms highlighted by value weighting. Overall, the evidence makes it very clear that for industrial firms the $PE_{r(e)}$ fares poorly compared to FCO and, as in earlier tests, FCO achieves considerable support.

For financial firms the mean (and median) percentage exceeds 50% in 26 rolling decades out of 31 on an equally weighted basis. On a value weighted basis, the mean (and median) percentage of market capitalization for which $\{earnings > PE_{r(f)}\}$ is greater

than 50% applies in *all* 31 rolling windows. Similar to the rolling decade results for industrial firms, the violation of FCO for financial firms is relatively high in the (relatively high inflation) first four decades in Table 2 compared with the next 17 decades. The violation of FCO, reported earnings tend to exceed $PE_r(f)$, also increases markedly in the last 10 decades.

So far, the statistics has relied solely on the non-parametric sign methodology. A potentially more powerful approach abandons this approach in favor of a direct comparison of the E/P ratio and the permanent earnings capitalization factor $r(f)/(1+r(f))$. Table 3 provides the results of this test, for industrial and financial firms separately. These results relate to hypothesis (c) in the previous section.

With respect to the industrials on an equal weighted basis, the Table 3 results show that the median value of the earnings yield minus the benchmark tends to be negative. That is, firms' (expected) growth rates exceed their risks, i.e. region C. Nonetheless, results are consistent with the null hypothesis of a zero difference insofar the difference is relatively small -- the median across all years is -2% --, which can be reasonably approximated by zero because the median interquartile range is no less than 16%. There is a reasonable degree of stability in this finding across the years in spite of the years spanning all sorts of different macroeconomic environments (GNP growth, inflation rates and interest rates). The great bulk of years, 70%, fall inside a (-3%,+3%) range. The only exception is the high inflation years in the 70's, which, as seen earlier, tilts heavily towards $PE_r(e)$; that is, the E/Ps are on average very large. Also, for all years but three, the first quartile is negative and quartile three is positive suggesting that firms' earnings yields are highly scattered in any given year, with zero acting as a

reasonable (unconditional) center across all years. The null hypothesis “mean of the medians = 0” across 40 years (presumed, unrealistically, to be independent) can be accepted at the 5% level.

As to the earnings yields of financial firms, the results in Table 3 could not be more different. Again, there is no surprise given the earlier results. The median value of the earnings yield minus the risk free rate benchmark has shifted from -2% to + 2%, a swing of 4%. Moreover, the number of years when the interquartile range violates the null has more than doubled to 12 observations (years), all for the same reason, the first quartile earnings yield minus the benchmark is positive. Also, note that the “mean of the medians = 0” hypothesis is now rejected at the 5% level. So, financials end up very different. Still, some caution is called for. One can argue that both sectors, industrials and financials, deviate non-trivially from the null; they just happen to do so from different sides of the null. When everything is said and done, this relativity conclusion, as opposed to the null by itself, would seem to be reliable.

We next turn our attention to the setting when $r(e)$ serves as the capitalization rate; to recall, Figure 1 identifies $PE_{r(e)}$ as our second benchmark case along the continuum of logical possibilities. Table 4 reports results of tests that treat $PE_{r(e)}$ as the null hypothesis. Our tests assume an average market risk premium for both industrial and financial firms of 4%. Panel A reports the results for industrial firms. On an equally weighted basis, results do not surprise the least since replacing $r(f)$ with $r(e)$ perforce decreases the incidence when reported earnings are less than the reference earnings. The mean (median) percentage of positives for industrial firms is 25% (21%) when reported earnings exceed the permanent earnings defined using $r(e)$. As to the financial firms

(Panel B), the evidence is much more supportive of the hypothesis; the mean (median) percentage is 41% (38%) of positives. On a value weighted basis, the results are similar. One arrives at the following conclusion: as one compares the two permanent earnings models as benchmarks it is clear that for industrial firms one must reject cost-of-equity capitalization in favor of risk-free rate capitalization (FCO); in other words, FCO is the better description for industrial firms. As to financial firms, the opposite is the better description, that is, the capitalization is closer to $r(e)$ than is $r(f)$. The conclusion does not surprise: as previously observed, it is a matter of accounting since financial firms come reasonably close to mark-to-market accounting, as indicated by Figure 2.

We now turn to tests of the properties of our third earnings concept, namely economic earnings. The first part of the hypothesis (first part of (e) per previous section) predicts that economic earnings will exceed $PE_{r(f)}$ on average. Table 5 presents the evidence bearing on the hypothesis. For industrial firms (Panel A), and in the case of equally weighted observations, the median percentage is greater than 50% for 25 years out of 40, and the cross-year median is 53%. For financial firms (Panel B) the median percentage is greater than 50% in no less than 30 years out of 40 and the cross-year median is 59%. The predicted tendency for economic earnings to exceed $PE_{r(f)}$ is even more apparent with value weighted data. The results are thus unambiguous: economic earnings on average exceed $PE_{r(f)}$.

A second part of the hypothesis related to economic earnings predicts that for industrial firms economic earnings should, on average, exceed *reported* earnings. The hypothesis follows directly to the extent that reported earnings on average can be approximated by $PE_{r(f)}$. Thus, we tabulate in the usual non-parametric fashion the

frequency of {reported earnings > economic earnings}. We do it for both industrial and financial firms, and hypothesize that the frequency is smaller for industrial firms. Table 6 presents the evidence. For industrial firms, Table 6, Panel A shows that the median percentage of firms for which economic earnings exceeds reported earnings is 57%, and the median percentage exceeds 50% in 29 years out of 40. For financial firms (Panel B) the all years' median percentage of firms for which economic earnings exceeds reported earnings is 58%, and the median percentage exceeds 50% in 27 years out of 40. Thus, while the expected results hold up reasonably well, the difference between industrial and financial firms is smaller than expected. Why this occurs is presently not clear to us.

Results are stronger in favor of economic earnings exceeding reported earnings when one adjusts for market capitalization using value weighted data. For industrial firms (Panel A), the median percentage of firms for which economic earnings exceeds reported earnings is 68%, and economic earnings is greater than reported earnings in 30 years out of 40. For financial firms (Panel B), the median is 65%, and the median percentage exceeds 50% in 29 years. Overall, Table 6 supports our prediction that economic earnings should be greater than reported earnings on average. This is true for both financial and industrial firms. However, again, we were expecting to see a bigger gap between economic and reported earnings for industrial firms than financial firms, but the results do not lend strong support to this idea. On an equally (value) weighted basis the gap is slightly greater for financial (industrial) firms.

A final earnings issue pertains to the so-called Fed model that relates closely to the $PE_{r(f)}$ hypotheses, as discussed earlier. Our standard sign test compares realised earnings capitalised by the one-year risk free rate to the market capitalization of equity

(the issue (f) in the previous section). The null hypothesis is that the proportion is 50%, of course. Table 7 presents the results relating to this model.⁹ On an equally weighted basis, for industrial firms (Panel A), the median percentage of positives is 43%. The median percentage increases to 62% when we use value weighted data. These results are congruent with the tests related to the PE_r(f) hypothesis, and entirely unsurprising. Similarly, as to financial firms (Panel B) the Fed model does not work at all; the median percentage when realized earnings exceed reference earnings is no less than 67% in the case of equally weighted data (number of firms), and 79% in the case of value weighted data (percentage of market capitalization). Overall, results confirm the close affinity, empirically no less than conceptually, between the Fed Model and the PE_r(f) model.

The results so far have focused on income earned for equity. However, it is also interesting to consider if similar results hold at the level of the entity as a whole, i.e. hypothesis (g). Thus, in Tables 8 and 9, we replicate our main findings using tax adjusted EBIT, instead of net income, as the main outcome of the income statement, and compare it with permanent earnings, calculated using firm value (instead of equity value) as a basis. We then check whether the empirical regularities that we previously reported still hold. In Table 8, we compare EBIT*(1-tax rate), with permanent earnings, calculated using, instead of market capitalization, firm value, defined as book value of debt, plus market value of equity, minus cash and cash equivalents, and using the 1-year treasury bill rate. Table 8 is the EBIT equivalent of Table 1. In Table 9, we compare EBIT*(1-tax

⁹ 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 –next period’s– realized earnings. We use the one-year rate of interest to facilitate comparison with the other tests in the paper.

rate) with permanent earnings calculated with firm value, and using the firm weighted average cost of capital as the discount rate. Table 9 is the EBIT equivalent of Table 4.

The results in Table 8 are similar to the results in Table 1, and these do not reject the FCO hypothesis for industrial firms. For financial firms the equally weighted results come closer to the FCO hypothesis than those reported in Table 1. In Table 9 one can observe that the results are similar to those of Table 4. In particular, the outcomes for industrial firms come closer to the PE_{r(e)} hypothesis, especially on a value weighted basis. Also, the results for financial firms are in line with PE_{r(e)} on a value weighted basis, although not as much on an equally weighted basis. These findings appear to confirm our earlier assertion (discussing Tables 1 and 4) that for industrial firms one may employ risk-free rate benchmarking, while for financial firms cost-of-equity benchmarking is a better choice.

Hypothesis (h), explains why one might expect the results to change following the more widespread adoption of fair value accounting. We explore this possibility informally in Tables 1, 4, 8, and 9, where we examine whether results differ before and after the passage of SFAS 115, in 1994. Changes in the median percentages between the two sub-periods provides an easy to appreciate focus. In all four tables the median percentage increases for both financial and industrial firms, and on both a value weighted and an equally weighted basis. The increases in the median percentage is generally large across all four tables. Nonetheless, the rise in medians for the value weighted results for industrial firms in Table 1 stands out, since the median value increases from 55% before 1994 to 81% from 1994 onwards. We have already pointed out earlier the apparent importance of risk for the larger industrial firms. This result appears to provide us with

further insight, since it appears that risk dominated growth for this set of firms after 1994 (on average). In addition, this result may be driven by the increased involvement in financial activities (issuing their own debt, use of financial instruments, etc.) of the large corporations from the 1990s onward. Finally, the only exception in large median increases is the value weighted results for financial firms in Table 9, where the median percentage increases from 49% to only 51%.

6. Concluding Remarks

The paper's key contribution centers on the idea that firms' reported earnings can be compared to a number of benchmark concepts of earnings. These concepts of earnings differ as to whether they indicate a stock of value, with two versions of permanent earnings depending on the capitalization rate, or a flow, which leads to economic earnings. As a practical matter these ideas translate into the benchmarking of E/P ratios. With these ideas in place and developed in terms of implications, the empirical analysis provides some reasonably robust conclusions.

First, as expected, the findings differ in terms of firm size (market capitalization) and there is a difference between industrial and financial firms. In particular, for industrial firms, reported E/P ratios connect, on average, with the risk-free rate (the case of $PE_{(r(f))}$) more so than the cost-of-equity (the case of $PE_{(r(e))}$). This is an interesting result insofar it suggests that GAAP accounting has (in the past) worked such that income measurement cancels risk and growth, on average. In sharp contrast, the findings reverse in the case of financial firms, where the cost-of-equity appears to serve as a better

benchmark than the risk-free rate. We attribute this finding to the accounting principles used by financial firms, which come closer to mark to market accounting.

Second, results have to be modified if one shifts the focus to larger firms and to compare these to smaller firms. Firm's E/P ratios tend to be larger for larger firms – industrial and financials alike – and on a value-weighted basis for industrial firms the overall results are now closer to a draw between $PE_{r(f)}$ and $PE_{r(e)}$.

Third, the difference between reported earnings and $PE_{r(f)}$ changes over time, and the analysis of different sub-periods yields different conclusions. The data shows that reported earnings are far more likely to exceed permanent earnings (defined by $PE_{r(f)}$) in two distinct sub-periods, one in the late seventies and one more recently following the Fed's Quantitative Easing policy.

Fourth, economic earnings tend to exceed reported earnings more often than not, something close to 60% of the times. This result makes eminent sense insofar that theory predicts that economic earnings exceed permanent earnings when capitalized by $r(f)$. However, whilst we had predicted the tendency for economic earnings to exceed reported earnings to be much stronger for industrial firms than financial firms, this prediction is not convincingly supported by the results.

Finally, we note that the current paper focuses on very broad comparisons of financial and industrial firms. It is possible that the degree of risk/growth cancellation may vary across subsectors/industries of these two very broad sectors. We leave the exploration of the possibility as scope for further research.

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Appendix

The appendix formalizes a model of permanent earnings for any strictly positive discount rate.

The notation is:

r = a discount rate used to define permanent earnings

$r(f)$ = the one year risk-free rate

$r(e)$ = the cost of equity

x_t = permanent earnings for period t

d_t = dividend at date t

p_t = value at date t .

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

The *definition* of permanent earnings calculated using the discount rate r is as in the body of the paper:

$$x_t \equiv (p_t + d_t)/c \quad (A1)$$

where $c \equiv (1+r)/r$.

The constant $1/c$ defines a (cum-dividend) earnings rate, and its inverse represents a capitalization factor applied to (concurrent) earnings. Critically, the definition (A1) ensures that reported earnings suffice to infer (cum-dividend) value: given cum dividend value one knows permanent earnings and conversely. In its essence, A1 is simply a re-scaling representation.

Expression (A1) with r equal to $r(f)$ derives from a savings account. 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. The ensuing analysis allows for *uncertain* (permanent) earnings for the forthcoming period. To avoid risk-neutrality, this earnings uncertainty necessitates a cost of capital parameter different from $r(f)$. It serves the usual role as a discount factor when one values the future expected dividends. In other words, a second assumption A2 stipulates that $p(t) = PVED(r(e))$. Thus, it should be underscored that PVED with a discount-factor $r(e)$ co-exists with A1 which is wholly independent of the discount factor, except that the price depends implicitly on $r(e)$, because the dynamics and realizations of $x(t)$ depend on $r(e)$.

Though assumptions A1 and A2 effectively suffice to develop the earnings dynamics, we also need a standard regularity condition on the dividend policy. It stipulates that the expected dividends grow (asymptotically) less than the discount factor. A policy that fixes the dividends to earnings ratio, $d(t)=x(t)*K$, $K>0$, always satisfies the regularity condition. To be sure, such an assumption is easily combined with something like $d(t)=0$ when t is even. The set of admissible dividend policies is truly general.

Given these assumptions, A1 and A2 plus the regularity condition on the dividend policy, routine analysis derives the permanent earnings dynamic:

$$E[\tilde{x}_{t+1};t]=[1+r(e)]x_t - r\{[1+r(e)]/[1+r]\}d_t \quad (ED)$$

In fact, the more general result runs as follows: *Given the three statements A1, A2, ED, any two of the statements imply the third.*

One can consider interesting special cases of (ED). First consider the case of zero dividend payout. In this case, we can see that the growth rate of permanent earnings will be the cost of equity capital whatever the discount rate used to define permanent earnings.

Next consider the case of 100% dividend payout of the level of permanent earnings defined using the rate r . In this case if r is set equal to $r(e)$ then the expected rate of growth of permanent earnings will be exactly zero. In contrast if r is set equal to $r(f)$ then the expected rate of growth of permanent earnings will be approximately equal to the risk premium (using the approximation that $[1+r(e)]/(1+r(f))$ roughly equals one). In general, for any value of r between $r(f)$ and $r(e)$ the expected rate of growth of permanent earnings will range between zero and the risk premium (again making use of the approximation that $[1+r(e)]/(1+r)$ equals one). For a given cost of equity, the rate of growth of permanent earnings increases with r and decreases with the dividend payout ratio.

In our main analysis, we focus particular attention on permanent earnings defined using the risk free rate. One can relax the assumption of a fixed interest rate to allow for a stochastically changing short term risk free rate. Expression (A1) generalizes to define permanent earnings as

$$x_t \equiv (p_t + d_t) / c_{t-1} \quad (A1'')$$

where $c_{t-1} = (1+r(f)_{t-1}) / r(f)_{t-1}$. 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 period. Hence, the correct subscript related to the risk-free rate is $t-1$ when the valuation

pertains to date t .¹⁰ All empirical tests rely on this changing interest rate approach and they refer to x .

¹⁰ 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.

Figure 1

E/P, Risk and Growth: Five Scenarios

A	$E(x)/P \gg r(e)$	RISK WITH A NEGATIVE GROWTH BENEFIT
RO	$E(x)/P \approx r(e)$	EARNINGS YIELD EXPLAINED SOLELY BY RISK
B	$r(e) \gg E(x)/P \gg r(f)$	SOME GROWTH BENEFIT, BUT LESS THAN RISK
FCO	$E(x)/P \approx r(f)$	GROWTH CANCELS OUT RISK EXACTLY (FCO)
C	$E(x)/P \ll r(f)$	GROWTH DOMINATES RISK

TABLE 1: Test for FCO (Full Cancelling Out) using the 1-year Treasury Bill Rate.
% of firms with Reported Earnings > PE_r(f) and % of Market Capitalization (over total market capitalization of all firms) with Reported Earnings > PE_r(f).
Permanent earnings [PE_r(f)] calculated using the 1-year Treasury Bill Rate

	INDUSTRIALS			FINANCIALS		
	N	%Firms	%MkCap	N	%Firms	%MkCap
Total	234010	40	-	45536	64	-
1976	3444	82	77	372	79	94
1977	3398	83	96	378	82	97
1978	3565	84	97	408	86	98
1979	3787	71	87	509	75	94
1980	3952	49	58	535	66	85
1981	4459	43	57	605	56	78
1982	4661	20	23	605	35	43
1983	5052	18	26	651	39	56
1984	5139	36	54	657	51	67
1985	5139	17	26	701	30	39
1986	5363	21	33	758	46	75
1987	5587	40	63	830	54	63
1988	5390	42	68	832	57	84
1989	5215	31	37	837	48	65
1990	5192	30	34	815	46	65
1991	5251	19	16	851	41	57
1992	5491	31	35	865	51	62
1993	5920	43	57	1443	72	78
1994	6325	56	78	1633	78	85
1995	7063	37	48	1660	67	78
1996	7730	30	38	1668	56	72
1997	7867	29	28	1607	46	44
1998	7682	31	17	1531	52	40
1999	7822	33	16	1608	68	66
2000	7890	33	27	1651	65	58
2001	7497	20	13	1556	50	29
2002	7148	35	61	1581	73	88
2003	6830	45	81	1503	79	94
2004	6771	53	90	1523	81	96
2005	6624	51	90	1510	80	96
2006	6562	42	82	1478	70	91

[Cont...]

TABLE 1: [Cont...]

	INDUSTRIALS			FINANCIALS		
	N	%Firms	%MkCap	N	%Firms	%MkCap
2007	6553	32	66	1459	55	70
2008	6271	39	82	1429	42	58
2009	6016	44	86	1351	58	84
2010	5955	56	95	1350	70	88
2011	5976	55	95	1351	73	93
2012	6240	50	93	1371	79	92
2013	6348	47	92	1411	82	94
2014	6283	47	92	1433	83	97
2015	4552	48	88	1220	80	95
Mean		42	60		63	75
Median		41	62		66	78
St. Error		2.67	4.48		2.46	3.03
Corr with median btm (p-val)		0.51 (0.00)	0.10 (0.54)		0.13 (0.41)	0.25 (0.11)
median pre 94		38	55		52	71
median 94 onwards		43	81		70	86

PE_{r(f)} is implied permanent earnings, calculated as $(p_t + d_t)/c_{t-1}$, where p_t is market capitalization at the fiscal year end date, d_t is dividends, and c_{t-1} is $(1+r(f)_{t-1})/r(f)_{t-1}$, 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. Reported earnings is Net income, as reported in Compustat. N is the total number of observations (positives or negatives). btm is the book to market ratio.

TABLE 2: Results of Table 1 over 31 rolling decades

Period		% Firms with NI>PE_r(f)				% Market Cap with NI>PE_r(f)			
		Industrials		Financials		Industrials		Financials	
		mean	median	mean	median	mean	median	mean	median
1976	1985	50	46	60	61	60	57	75	81
1977	1986	44	39	57	53	56	55	73	76
1978	1987	40	38	54	52	52	55	70	71
1979	1988	36	38	51	52	49	55	68	71
1980	1989	32	33	48	50	44	45	66	66
1981	1990	30	30	46	47	42	35	64	65
1982	1991	27	25	45	46	38	33	61	64
1983	1992	28	30	46	47	39	34	63	64
1984	1993	31	31	49	49	42	36	65	65
1985	1994	33	31	52	49	45	36	67	65
1986	1995	35	34	56	52	47	43	71	70
1987	1996	36	34	57	55	47	43	71	69
1988	1997	35	31	56	53	44	37	69	69
1989	1998	34	31	56	51	39	36	65	65
1990	1999	34	31	58	54	37	34	65	66
1991	2000	34	32	60	61	36	32	64	64
1992	2001	34	32	60	61	36	32	61	64
1993	2002	35	33	63	66	38	33	64	69
1994	2003	35	33	63	66	41	33	66	69
1995	2004	35	33	64	66	42	33	67	69
1996	2005	36	33	65	67	46	33	68	69
1997	2006	37	34	66	69	50	45	70	77
1998	2007	38	34	67	69	54	63	73	79
1999	2008	38	37	66	69	61	73	75	79
2000	2009	39	40	65	68	68	81	76	86
2001	2010	42	43	66	70	74	82	79	88
2002	2011	45	45	68	71	83	84	86	89
2003	2012	47	48	69	72	86	88	86	91
2004	2013	47	49	69	72	87	90	86	91
2005	2014	46	47	69	72	87	91	86	91
2006	2015	46	47	69	72	87	90	86	91

TABLE 3: Earnings Yield Tests. $NI_t/(P_t + d_t) - r(f)/(1+r(f))$

	Industrials				Financials			
	Median	p25	p75	N	Median	p25	p75	N
1976	0.08	0.03	0.12	3444	0.06	0.02	0.10	372
1977	0.07	0.03	0.12	3398	0.08	0.03	0.12	378
1978	0.06	0.01	0.11	3565	0.08	0.03	0.13	408
1979	0.03	-0.03	0.09	3787	0.07	-0.02	0.11	509
1980	-0.01	-0.07	0.05	3952	0.03	-0.04	0.09	535
1981	-0.04	-0.11	0.03	4459	0.00	-0.09	0.05	605
1982	-0.05	-0.13	0.01	4661	-0.01	-0.09	0.05	605
1983	-0.04	-0.11	0.01	5052	0.00	-0.06	0.05	651
1984	-0.04	-0.13	0.01	5139	0.00	-0.08	0.04	657
1985	-0.03	-0.14	0.00	5139	-0.01	-0.07	0.03	701
1986	-0.02	-0.13	0.01	5363	0.01	-0.05	0.05	758
1987	-0.02	-0.14	0.03	5587	0.01	-0.07	0.06	830
1988	-0.02	-0.15	0.02	5390	0.01	-0.07	0.06	832
1989	-0.04	-0.16	0.01	5215	-0.01	-0.10	0.03	837
1990	-0.03	-0.20	0.02	5192	0.00	-0.18	0.06	815
1991	-0.03	-0.15	0.01	5251	0.00	-0.10	0.05	851
1992	-0.01	-0.11	0.03	5491	0.02	-0.06	0.06	865
1993	0.00	-0.09	0.03	5920	0.04	0.00	0.08	1443
1994	-0.01	-0.10	0.03	6325	0.03	-0.01	0.06	1633
1995	-0.03	-0.11	0.01	7063	0.01	-0.02	0.04	1660
1996	-0.02	-0.12	0.01	7730	0.01	-0.02	0.03	1668
1997	-0.03	-0.14	0.00	7867	0.00	-0.02	0.01	1607
1998	-0.03	-0.20	0.02	7682	0.01	-0.02	0.03	1531
1999	-0.04	-0.14	0.02	7822	0.02	-0.02	0.05	1608
2000	-0.06	-0.29	0.01	7890	0.01	-0.03	0.05	1651
2001	-0.07	-0.38	0.01	7497	0.03	-0.02	0.05	1556
2002	-0.05	-0.42	0.04	7148	0.05	0.01	0.07	1581
2003	0.00	-0.13	0.04	6830	0.04	0.02	0.06	1503
2004	0.00	-0.12	0.04	6771	0.03	0.01	0.05	1523
2005	-0.01	-0.13	0.02	6624	0.02	-0.01	0.04	1510
2006	-0.02	-0.13	0.01	6562	0.01	-0.02	0.03	1478
2007	-0.03	-0.15	0.02	6553	0.01	-0.03	0.04	1459
2008	-0.03	-0.48	0.06	6271	0.01	-0.24	0.06	1429
2009	-0.01	-0.16	0.05	6016	0.03	-0.09	0.08	1351
2010	0.02	-0.09	0.06	5955	0.04	-0.02	0.09	1350
2011	0.02	-0.12	0.07	5976	0.06	0.00	0.10	1351
2012	0.00	-0.18	0.06	6240	0.06	0.02	0.10	1371
2013	-0.01	-0.16	0.05	6348	0.06	0.02	0.09	1411
2014	-0.01	-0.18	0.05	6283	0.06	0.02	0.09	1433
2015	-0.01	-0.20	0.05	4552	0.05	0.01	0.08	1220
Median	-0.02	-0.13	0.03		0.02	-0.02	0.06	

All variables are as in Table 1. NI is Net Income, that is, reported earnings, as reported in Compustat. d is dividends.

TABLE 4: Test for NCO (Non-Cancelling Out) using a risk premium of a 4%
% of firms with Reported Earnings > PE_r(e) and % of Market Capitalization (over total market
capitalization of all firms) with Reported Earnings > PE_r(e)
Permanent earnings [PE_r(e)] calculated using the 1-year Treasury Bill Rate + 4%

	INDUSTRIALS			FINANCIALS		
	N	%Firms	%MkCap	N	%Firms	%MkCap
Total	234010	23	-	45536	39	-
1976	3444	67	48	372	64	54
1977	3398	72	72	378	73	89
1978	3565	72	74	408	77	94
1979	3787	58	65	509	67	88
1980	3952	34	34	535	53	70
1981	4459	31	35	605	40	52
1982	4661	12	10	605	23	22
1983	5052	10	12	651	19	29
1984	5139	20	26	657	35	43
1985	5139	8	9	701	15	20
1986	5363	9	7	758	23	42
1987	5587	22	24	830	37	46
1988	5390	22	27	832	41	66
1989	5215	15	14	837	27	25
1990	5192	15	8	815	33	35
1991	5251	8	3	851	21	18
1992	5491	12	5	865	26	23
1993	5920	16	11	1443	52	56
1994	6325	29	26	1633	58	65
1995	7063	15	11	1660	31	39
1996	7730	12	6	1668	20	15
1997	7867	10	6	1607	12	6
1998	7682	15	4	1531	17	7
1999	7822	19	5	1608	35	21
2000	7890	21	9	1651	37	13
2001	7497	11	4	1556	18	5
2002	7148	19	15	1581	43	44
2003	6830	21	26	1503	48	67
2004	6771	28	48	1523	53	78
2005	6624	25	46	1510	50	73
2006	6562	16	28	1478	28	60

[Cont...]

TABLE 4: [Cont...]

	INDUSTRIALS			FINANCIALS		
	N	%Firms	%MkCap	N	%Firms	%MkCap
2007	6553	13	18	1459	25	40
2008	6271	24	39	1429	23	25
2009	6016	27	51	1351	39	49
2010	5955	39	77	1350	52	76
2011	5976	42	83	1351	56	76
2012	6240	37	77	1371	64	71
2013	6348	30	70	1411	64	81
2014	6283	30	66	1433	64	79
2015	4552	31	55	1220	59	72
Mean		25	31		41	48
Median		21	26		38	48
St. Error		2.65	4.05		2.83	4.14
Corr with median btm (p-val)		0.67 (0.00)	0.23 (0.15)		0.51 (0.00)	0.39 (0.01)
median pre 94		18	19		36	45
median 94 onwards		23	27		41	55

All variables as previously defined (see Table 1).

TABLE 5: Economic earnings (Hicks) – PE_r(f)
Permanent earnings [PE_r(f)] calculated using the 1-year Treasury Bill Rate
% of firms and % of market cap where Hicks > PE_r(f)

	INDUSTRIALS			FINANCIALS		
	N	%Firms	%MkCap	N	%Firms	%MkCap
Total	216930	51	-	40235	59	-
1976	3370	74	81	354	81	94
1977	3306	61	41	348	62	37
1978	3226	63	65	353	68	70
1979	3393	61	68	396	69	77
1980	3656	64	83	480	63	67
1981	3818	40	40	504	49	66
1982	4328	49	65	554	51	72
1983	4542	68	82	564	75	77
1984	4765	32	43	582	49	65
1985	4798	55	83	600	66	93
1986	4813	51	76	626	58	70
1987	4996	38	59	717	27	32
1988	5073	49	65	752	56	77
1989	4909	50	78	760	53	83
1990	4865	26	40	747	18	31
1991	4853	60	74	738	67	79
1992	4966	53	57	774	65	80
1993	5169	63	77	1194	78	84
1994	5647	42	55	1380	50	40
1995	6044	60	83	1444	79	90
1996	6725	55	75	1506	73	92
1997	7219	56	83	1466	83	95
1998	7173	36	76	1402	38	68
1999	7114	50	76	1434	32	55
2000	7260	37	50	1532	46	81
2001	7227	42	38	1441	65	35
2002	6939	34	27	1449	63	39
2003	6681	80	89	1371	89	97
2004	6483	64	78	1324	77	89
2005	6352	55	66	1346	57	73
2006	6215	59	82	1311	69	88

[Cont...]

TABLE 5: [Cont...]

	INDUSTRIALS			FINANCIALS		
	N	%Firms	%MkCap	N	%Firms	%MkCap
2007	6165	45	70	1292	26	37
2008	6073	11	10	1286	12	6
2009	5842	72	81	1232	61	92
2010	5638	70	79	1186	71	75
2011	5619	41	61	1190	45	38
2012	5566	54	79	1163	76	94
2013	5891	66	86	1198	81	91
2014	5864	50	68	1201	70	78
2015	4347	38	54	1038	55	56
Mean		52	66		59	69
Median		53	72		63	76
St. Error		2.25	2.87		2.89	3.60

Hicks Economic Earnings is the change in market capitalization from t-1 to t, plus dividends in t. All other variables as previously defined in Table 1.

TABLE 6: Hicks Economics Earnings – Reported Earnings
(Economic earnings > Reported earnings)

	INDUSTRIALS			FINANCIALS		
	N	%Firms	%MkCap	N	%Firms	%MkCap
Total	216930	56	-	40235	58	-
1976	3370	69	79	354	84	93
1977	3306	51	26	348	49	20
1978	3226	51	42	353	41	24
1979	3393	52	54	396	52	51
1980	3656	63	79	480	56	50
1981	3818	42	39	504	47	53
1982	4328	57	69	554	57	74
1983	4542	75	85	564	79	78
1984	4765	36	39	582	51	57
1985	4798	67	86	600	73	93
1986	4813	61	80	626	62	64
1987	4996	42	57	717	30	34
1988	5073	54	60	752	58	70
1989	4909	57	77	760	58	80
1990	4865	35	43	747	25	29
1991	4853	70	78	738	77	81
1992	4966	61	62	774	71	81
1993	5169	67	77	1194	77	73
1994	5647	44	49	1380	40	27
1995	6044	64	84	1444	80	88
1996	6725	60	75	1506	74	91
1997	7219	62	85	1466	84	95
1998	7173	42	76	1402	40	67
1999	7114	56	76	1434	32	53
2000	7260	42	52	1532	46	77
2001	7227	55	44	1441	69	36
2002	6939	44	29	1449	61	34
2003	6681	84	87	1371	88	97
2004	6483	67	72	1324	71	75
2005	6352	57	58	1346	52	54
2006	6215	63	76	1311	66	84

[Cont...]

TABLE 6: [Cont...]

	INDUSTRIALS			FINANCIALS		
	N	%Firms	%MkCap	N	%Firms	%MkCap
2007	6165	52	68	1292	27	34
2008	6073	18	10	1286	18	6
2009	5842	78	77	1232	63	89
2010	5638	71	67	1186	68	52
2011	5619	43	48	1190	39	28
2012	5566	58	68	1163	71	90
2013	5891	71	78	1198	75	87
2014	5864	55	59	1201	58	52
2015	4347	43	43	1038	46	38
Mean		56	63		58	61
Median		57	68		58	65
St. Error		2.11	2.99		2.84	3.95

All variables as previously defined in Tables 1 and 5.

TABLE 7: Fed Model
% of market capitalization (over total market capitalization of all firms) held by firms with
(Reported earnings t+1 > market cap * tbrate) -- tbrate is the 1 year treasury bill rate

	INDUSTRIALS			FINANCIALS		
	N	%Firms	%MkCap	N	%Firms	%MkCap
Total	216231	42	-	40171	65	-
1976	3326	83	90	349	84	97
1977	3243	86	97	354	88	98
1978	3417	78	85	399	82	97
1979	3675	60	71	483	69	88
1980	3838	43	43	507	56	73
1981	4359	25	28	559	36	44
1982	4596	32	37	575	49	65
1983	4843	32	44	595	52	66
1984	4886	26	37	610	45	61
1985	4918	29	42	641	49	76
1986	5125	40	68	728	48	60
1987	5246	44	66	770	55	81
1988	5042	36	55	806	51	69
1989	4975	25	27	793	39	46
1990	4961	29	25	798	53	63
1991	5066	36	39	832	57	60
1992	5314	49	62	847	71	82
1993	5728	55	78	1384	77	84
1994	6067	45	60	1451	74	77
1995	6756	39	50	1522	66	77
1996	7306	37	43	1490	71	80
1997	7274	29	25	1427	51	58
1998	7185	37	27	1451	64	70
1999	7318	34	22	1552	67	68
2000	7289	23	10	1463	56	25
2001	7008	34	41	1458	72	79
2002	6734	49	88	1391	81	95
2003	6538	54	90	1335	82	95
2004	6409	52	90	1366	80	96
2005	6261	45	83	1326	73	89
2006	6220	34	75	1309	50	69

[Cont...]

TABLE 7: [Cont...]

	INDUSTRIALS			FINANCIALS		
	N	%Firms	%MkCap	N	%Firms	%MkCap
2007	6132	30	62	1294	33	26
2008	5875	46	89	1248	59	86
2009	5687	57	95	1199	71	89
2010	5659	56	94	1200	73	93
2011	5599	53	93	1159	79	94
2012	5918	49	93	1216	82	95
2013	5903	49	92	1214	83	96
2014	4535	49	87	1070	79	95
Mean		44	62		64	76
Median		43	62		67	79
St. Error		2.43	4.22		2.41	3.03

All variables as previously defined in Table 1.

**TABLE 8: EBIT vs Permanent Earnings, calculated using the 1 year treasury bill rate
% of firms with EBIT > PE_EBIT_r(f) and % of Market Capitalization (over total market
capitalization of all firms) with EBIT > PE_EBIT_r(f)**

	INDUSTRIALS			FINANCIALS		
	N	%Firms	%MkCap	N	%Firms	%MkCap
Total	231803	43	-	40298	62	-
1976	3366	81	86	261	59	77
1977	3321	84	96	262	65	90
1978	3476	83	97	289	69	92
1979	3697	69	86	389	52	80
1980	3722	46	59	379	36	72
1981	4229	40	60	439	32	57
1982	4431	18	22	450	17	23
1983	4810	18	29	480	21	29
1984	4894	35	62	481	28	45
1985	5043	18	32	548	23	31
1986	5267	26	43	606	33	49
1987	5500	42	70	680	48	72
1988	5305	42	76	674	49	79
1989	5137	33	43	662	43	62
1990	5120	30	35	664	39	65
1991	5179	22	18	695	39	57
1992	5416	38	48	720	48	66
1993	5849	52	72	999	70	90
1994	6246	60	83	1152	78	92
1995	6983	42	57	1245	60	79
1996	7648	34	42	1290	54	65
1997	7802	34	38	1299	49	51
1998	7642	35	20	1307	50	60
1999	7800	36	17	1510	61	65
2000	7886	35	25	1524	60	54
2001	7506	23	14	1454	45	45
2002	7164	44	81	1494	73	89
2003	6852	49	87	1460	80	94
2004	6795	57	94	1524	86	98
2005	6650	54	93	1521	82	96
2006	6585	45	83	1456	65	82

[Cont...]

TABLE 8: [Cont...]

	INDUSTRIALS			FINANCIALS		
	N	%Firms	%MkCap	N	%Firms	%MkCap
2007	6577	33	64	1431	48	65
2008	6299	46	86	1407	43	53
2009	6019	50	90	1359	66	89
2010	5973	60	97	1355	80	98
2011	5986	59	98	1351	82	96
2012	6248	55	97	1377	85	98
2013	6360	52	96	1418	85	96
2014	6296	52	96	1442	87	99
2015	4724	56	92	1244	89	99
Mean		45	65		57	73
Median		43	71		57	75
St. Error		2.63	4.49		3.21	3.40
median pre 94		39	60		41	66
median 94 onwards		48	85		69	89

EBIT is as reported in Compustat, and tax adjusted, that is, EBIT (as in Compustat) * (1-0.29). We use a fixed marginal tax rate of 29% for all observations. 29% is the average marginal tax rate calculated using the marginal tax rate provided by John Graham (<https://faculty.fuqua.duke.edu/~jgraham/taxform.html>) and used in Graham and Mills (2008), whenever available for our sample. We use the before marginal tax rates.

Permanent earnings [PE_EBIT_r(f)] is calculated as V_t/c_{t-1} , where $V = [\text{Book value of Debt} + \text{Market Value of Equity} - [\text{Cash} + \text{cash equivalents}]]$ and c_{t-1} is $(1+r(f)_{t-1})/r(f)_{t-1}$, with $r(f)$ being the 1-year treasury bill rate.

Book value of debt is Compustat items DLC + DLTT. DLC is debt in current liabilities and DLTT is long term debt. Market value of equity is market capitalization at the balance sheet date.

**TABLE 9: EBIT vs Permanent earnings, calculated using the weighted average cost of capital
% of firms with EBIT > PE_EBIT_r(wacc) and % of Market Capitalization (over total market
capitalization of all firms) with EBIT > PE_EBIT_r(wacc)**

	INDUSTRIALS			FINANCIALS		
	N	%Firms	%MkCap	N	%Firms	%MkCap
Total	161377	30	-	17735	34	-
1976	2950	73	59	188	46	67
1977	2871	75	78	188	51	73
1978	2833	75	79	190	55	68
1979	2979	63	67	212	41	59
1980	3006	41	47	285	32	58
1981	3098	35	43	296	24	46
1982	3500	18	32	311	18	27
1983	3529	16	36	307	15	28
1984	3719	25	46	324	21	43
1985	3787	12	41	324	16	34
1986	3923	14	50	343	19	43
1987	4030	27	47	381	30	49
1988	4063	24	49	403	29	49
1989	4072	17	50	419	23	50
1990	4044	18	45	422	27	46
1991	4061	12	50	430	25	46
1992	4143	17	56	422	28	48
1993	4204	23	55	436	39	51
1994	4458	36	49	517	43	53
1995	4742	20	54	590	32	48
1996	5162	16	57	593	26	46
1997	5338	13	64	597	24	47
1998	5301	18	53	609	23	50
1999	5088	24	45	597	31	50
2000	5053	27	41	595	32	48
2001	5128	15	46	569	22	43
2002	5019	29	46	559	36	51
2003	4904	29	50	550	39	51
2004	4686	36	52	552	42	52
2005	4560	31	50	571	35	49
2006	4399	18	56	567	31	50

[Cont...]

TABLE 9: [Cont...]

	INDUSTRIALS			FINANCIALS		
	N	%Firms	%MkCap	N	%Firms	%MkCap
2007	4339	15	58	569	29	50
2008	4361	37	50	593	36	51
2009	4263	37	54	563	43	52
2010	4055	48	64	538	46	53
2011	4005	53	70	535	49	56
2012	4079	49	66	520	54	57
2013	4230	41	58	540	51	56
2014	3395	46	58	530	51	53
Mean		31	53		34	50
Median		27	50		32	50
St. Error		2.85	1.62		1.79	1.40
median pre 94		24	49		28	49
median 94 onwards		29	54		36	51

PE_EBIT_r(wacc) is permanent earnings, calculated as V/c_{t-1} ,
where $V = [\text{Book value of Debt} + \text{Market Value of Equity} - [\text{Cash} + \text{cash equivalents}]]$
and c_{t-1} is $(1+r(wacc)_{t-1})/r(wacc)_{t-1}$,
 $r(wacc)$ is the weighted average cost of capital, with the weighting implemented as follows:
 $[[\text{cost_equity} * \text{MkCap}] + [\text{costdebt_taxadj} * [\text{dlc} + \text{dltt}]] / [\text{MkCap} + \text{dlc} + \text{dltt}]$

cost_equity is the 1-year treasury bill rate + 4%.

MkCap is Market Capitalization at the balance sheet date.

dlc is debt in current liabilities and dltt is long term debt.

costdebt_taxadj is (cost of debt * 1-0.29). We use a fixed marginal tax rate of 29% for all observations. 29% is the average marginal tax rate calculated using the marginal tax rate provided by John Graham (<https://faculty.fuqua.duke.edu/~jgraham/taxform.html>) and used in Graham and Mills (2008), whenever available for our sample. We use the before marginal tax rates.

cost of debt is calculated as in Francis et al. (2005): interest expense (compustat data item xint) in t+1, divided by the average interest bearing debt in t and in t+1 (compustat items dlc and dltt)

EBIT is as described in Table 8.