Performance Measurement: An Investor’s Perspective
(A Keynote Address)

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Introduction

Let me begin by thanking the ICAEW for inviting me to this conference and for offering me the opportunity to address this audience on the subject of performance reporting. My charge, as I understand it, is to provide some personal reflections on the issue of corporate performance measurement, from an investor’s perspective. I am delighted to do so, as this strikes me as an extremely important topic, not only for accounting professionals, but also for anyone with more than a passing interest in stock markets, and in how accounting numbers are actually used by investment professionals.

My remarks today will address two issues. In the first part of this talk, I would like to discuss the role of accounting in performance measurement. This first portion relates to the uses and limitations of GAAP accounting in the context of measuring firm performance. Despite their many limitations, I am a big fan of historical-based accounting systems. I will argue that GAAP-based accounting systems are vital to the investment community. For all its flaws, I believe historical-based accounting is, by and large, serving investors quite well, and that moves toward fair value accounting should proceed with great caution.

The second part of this talk covers the use of accounting numbers in fundamental investing. I will provide some examples of how accounting numbers can be used, and are indeed being used, by successful professional investors. I review some key insights gleaned from accounting-based valuation theory, and use these insights as an organizing framework to discuss the essence of value investing. In this second section, I hope to show that what we are learning about fundamental investing in recent academic studies in fact dovetails nicely with the strategies being used by such legendary investors as Ben Graham, Warren Buffett, and Joel Greenblatt.
1. The Role of Accounting in Performance Measurement

1.1 What do We Mean by Firm Performance?

On the subject of firm performance, I am reminded of the following conversation from Louis Carroll’s classic Alice’s Adventure in Wonderland. One day Alice came to a fork in the road and saw a Cheshire cat in a tree.

‘Cheshire Puss’, [Alice] began rather timidly, ‘would you tell me, please, which way I ought to go from here?’
‘That depends a good deal on where you want to get to,’ said the Cat.
‘I don’t much care where—’ said Alice.
‘Then it doesn’t matter which way you go,’ said the Cat.
‘--so long as I get SOMEWHERE,’ Alice added as an explanation.
‘Oh, you’re sure to do that,’ said the Cat, ‘if you only walk long enough.’

In performance measurement, as in life, if we don’t know or much care where we want to get to, then it doesn’t much matter which road we take. In fact, of course, there are many possible roads one could take when trying to measure firm performance and each one may have its merits, depending on the decision context. So we need to be clear about what we wish to measure, and whose perspective we are taking.

In this paper, I will take the perspective of an investor interested in the company’s value to its shareholders. This is not the only perspective one can take. We might, for example, wish to measure performance from the perspective of the IRS, interested in taxing current income. Or a debt holder, interested in the value of the assets being used to collateralize her loan. All these parties have a legitimate interest in how the firm has performed, but their interests are not the focus of this talk. We are instead focusing here on measuring firm value to shareholders. The issue is how accounting numbers might be used to help equity investors assess firm performance.
You might think that if we assume the perspective of a shareholder, measuring performance would be easy, particularly for publicly traded firms. If we want to know how a company did, we should simply check its stock returns. If a company’s stock price is an estimate of its fair value to shareholders, then the change in that price (i.e. its realized returns) should be an ideal measure of its performance. Taking “fair value accounting” to the limit, why not just report a company’s stock return in its annual reports. Why bother even measuring GAAP earnings? In my view, there are many reasons why this would not be a good outcome, either for accountants or for the investment community.

Let’s consider a case study. This chart depicts the 12-month price performance of one of the most valuable firms in the world: Apple Inc. (AAPL), as of the close of market on November 8, 2013. For comparison, I have also graphed the return to the aggregate NASDAQ market composite over the same time period.

[Insert Figure 1]

As you can see, Apple’s shareholders have not had a great year – they earned -4.83% on their investment over the past 12 months, while the NASDAQ composite logged a +34.92% gain. On a market-adjusted basis, Apple shareholders lost a whopping -39.75%! This is despite the fact that the company just reported its highest sales revenue ever ($171 billion USD) and the second highest earnings ever ($37 billion USD), for fiscal year ended Sept 28, 2013. In fact, in its latest completed quarter (Q4 of 2013) Apple sold 33.8 million iPhones, 14.1 million iPads, and 4.6 million Mac computers. Both the iPhone and the iPad sales are new records. What’s more, on November 6th, 2013, Forbes magazine named Apple the Most Valuable Brand in the world (over Microsoft, Coca-Cola, IBM, Google, and McDonald’s). It’s the third straight year in a row that Apple has won this honor.

In the October 28, 2013 press release that accompanied its latest Q4 results, Apple’s CEO, Tim Cook began with: “We are pleased to report a strong finish to an amazing year with record fourth quarter revenue…” (emphasis mine). He goes on to list Apple’s record sales numbers and its line-up of new products for the holidays. Later in the press release, Apple’s
CFO, Peter Oppenheimer, added: “(In Q4,)… we generated $9.9 billion in cash flow from operation and returned an additional $7.8 billion in cash to shareholders.” Listening to these guys, Apple had a great year.

So how should we measure the performance of Apple? Was 2013 a good year or a bad year? Do we go with Tim Cook or the verdict of Wall Street? Whose view better captures what happened to Apple in 2013? And whose view should be reflected in Apple’s GAAP financials? On reflection, why isn’t the verdict of Wall Street the only one that really matters? These are some of the issues I would like to address in this article.

1.2 The Role of Accounting in Valuation
What is the intrinsic value of a firm? Here is a simple and relatively non-controversial definition.

“The intrinsic (equity) value of a firm is the present value of expected future payoffs to shareholders.”

Unlike rare art, stocks are presumed to have an intrinsic value. The intrinsic value of a Van Gogh painting is ill defined; basically, its value is what people are willing to pay for it. But when investors think about equity valuation, we have in mind a monetary sum that corresponds to the present value (PV) of expected future payoffs to shareholders. Each share, after all, is simply a fractional ownership claim on an on-going business enterprise.

Alternative equity valuation methods differ in terms of technique, but they all have the same objective – to estimate the present value of the eventual payoffs to shareholders.

Given this definition, several key concepts about firm value become immediately obvious. First, valuation involves forecasting – we need to predict future cash flows, dividends, and discount rates. In fact, the essential task in valuation is forecasting. The technical differences in alternative valuation models are trivial when compared to the importance of making a better forecast of future payoffs; Second, value is at best an educated guess – given most companies are going-concerns with indefinite lifespans, the process of estimating their
future payoffs will be highly subjective and imprecise; Third, *historical accounting numbers are not enough* -- reported accounting numbers should be useful, in conjunction with other information, in valuing firms. But accountants should not expect summary numbers taken from GAAP financial statements to measure firm value directly. They were not designed to do so.

This is because GAAP numbers are not intended to anticipate and reflect the value of future economic exchanges that have not yet taken place. Although some GAAP measurements do require us to make limited forecasts of future events (e.g. estimation of warranty reserves, or even cost allocations estimates such as depreciation or amortization), these forecasts are by and large associated with past exchange transactions – such as the warranty needed for a sale that has already taken place, or the periodic usage of a building that has already been purchased. We are not, in general, at liberty to anticipate or incorporate the benefits of future revenue streams, even if they seem to be close at hand. GAAP revenue recognition rules are quite clear on this point: company accounts will reflect the value of an economic exchange only when there has been *substantial performance* in terms of the goods delivered or services rendered to customers. We do not book what we have not earned.

In contrast, market-based equity valuation is all about current expectation of future cash flows. In the case of Apple Inc., all the GAAP numbers show 2013 has been a profitable year. No one questions the fact that the company sold a lot of iPhones, that its assets have grown tremendously, and that the book value of its equity has attained record levels. That is not why its share value has cratered. What Apple’s abysmal market performance is telling us is that its future revenue stream does not look as bright today as it did 12 months ago. The market shares enjoyed by its iPhones and iPads are showing signs of erosion. The present value of its expected future payoffs to shareholders now seems much lower than before. Apple’s shares are being punished, not for what has happened this year, but for what might have been, but will no longer be.

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1 Statement of Financial Accounting Concept No. 1 states explicitly that "(f)inancial accounting is not designed to measure directly the value of a business enterprise, but the information it provides may be helpful to those who wish to estimate its value." [FASB (1978)]

2 Or, from a Balance Sheet perspective, we cannot book something as an asset if the firm does not have clear control over it.
My point is that market returns and accounting earnings measure fundamentally different economic constructs. Financial reporting is concerned with presenting the *economic history* of an enterprise. This economic history consists of contractually determined amounts arising from *past exchanges*.

Reported earnings cannot, and in my view should not, anticipate profits from future exchanges that have not yet taken place. Market returns, on the other hand, are driven primarily by revisions in the market expectation of *future profits*. Until accounting regulators decide that reported earnings should include anticipated profits from future exchanges (that is, until we abandon the "revenue recognition" principle), it is difficult to see how a firm’s stock market performance can be a substitute for GAAP earnings.

And *should* GAAP earnings start anticipating future exchange transactions? In my view, that would be a terrible idea. The market has come to rely on accountants as the keepers of economic history. As an investor, when I turn to the financial statements, I want a trustworthy and interpretable account of what took place. A corporate chronology might not be as exciting as science fiction, but at least we know what we are reading relates to economic events and transactions that really took place. As soon as we start to anticipate future exchanges, we are into a world of speculation, and unfortunately (given dysfunctional managerial incentives and other moral hazard problems), it is often also a world of fiction.

Part of the problem is simply information uncertainty. The *level of uncertainty* associated with future revenue streams is many orders of magnitude larger than the uncertainty associated with the numbers we currently report. The amount of prognosticating we currently do in relation to companies’ warranty expenses, for example, (or most other liability reserves), is absolutely *miniscule* when placed beside to what we would need to do to forecast the future sales of a company like Apple. And as the pace of change quickens in our world the level of uncertainty about a firm’s future also increases. In such a world, a trustworthy historian is much needed.

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3 More precisely, I believe the Standard Setting language of today uses “past exchanges, transactions, and other changes in circumstances.”
In relative terms, Apple is not even a particularly difficult company to value. This company has reasonably well-defined product lines and markets, modestly stable margins, and positive operating cash flows. Consider a high-growth early-stage firm like Tesla Motors (TSLA), the electric car maker based in Palo Alto, California (my neighborhood). Even for Silicon Valley, this is one of the most exciting companies to come along in many years. Its CEO, Elon Musk, is a proven winner – a la Zip2, PayPal, SpaceX, and SolarCity. Its Model S just received the highest rating ever assigned to any automobile by Consumer Report. Over the past 12 months, we have seen its stock price increase 6-fold (going from $30 to a high of $193 per share). Now, I love the cars they make, but I think at this point I would much rather buy the car than the shares. One can envision a scenario in which Tesla sells enough new cars to justify its current price, but at its current pace of 5,000 to 6,000 Model S units per quarter, they have a lot of growing to do before we can rationalize its share price. When I read Tesla’s financials, I want to know how many cars were sold and for how much; I want to know how they have funded their operations; I do not need to know how many cars some excited investor thinks Elon Musk can sell from today to Kingdom come. For that, I can consult the newspapers.

Here is my point: equity valuations are opinions. We can all have opinions about what a firm’s value should be, but let’s let these opinions be seen as what they are… subjective, speculative, quasi-educated guesses about the future. Tim Cook is allowed to give his opinion about Apple’s future, but we should put them some place appropriate, like perhaps in the MD&A section. Sell-side analysts, many with their own agendas and incentives, should also be allowed to supply their opinions – maybe we can read about them in Yahoo Finance.

Let me here make an observation about “fair value accounting.” As I understand it, the guiding philosophy behind this movement is that if we can find an external market for something that the company owns or owes (or a market for near-enough substitutes), we should book that “something” as an asset or a liability. This is a balance sheet focus. The idea is to get the balance sheet to reflect the appropriate value of each asset and liability, or as close as possible. This would presumably apply not only to fairly concrete and tangible
assets (such as PP&E) or liabilities (such as Warranty Reserves), but also such intangibles as Brand Names, Patents, and Goodwill.

As an investor, I have some serious conceptual concerns with this approach. The key to more accurate valuation for most firms (particularly growth firms) is not the value of its “assets-in-place”, but the “expected future growth opportunities” associated with those assets. As I hope will be clearer after I present a bit more valuation theory (in Section II), the value of a firm’s “assets-in-place” is not what serious fundamental investors are really focused on. The key to successful investing is being able to better forecast the “expected-abnormal-growth-opportunities” associated with these assets. In other words, fundamental investors are interested in the value of the firm’s capacity for “wealth creation” in the future.

What fundamental investors need from accountants is information that helps them to make their own forecast of what these growth opportunities are likely to be. We need performance measures that help us evaluate the likely future performance of the company’s core operations (the wealth creating engine) of the firm. We want to compute a measure of firm value that could be used to challenge and perhaps discipline the current market price. We do not need to have that market valuation parroted back to us in the form of GAAP numbers.

One might argue that if accountants somehow managed to capture the fair value of all the assets and liabilities of the firm, there would be no need to forecast future wealth creation – i.e., it is already folded into our valuation of the existing assets. In my view, this is a misguided objective. As the Apple and Tesla examples show, the only way accounting systems would be able to do that is by anticipating future sales and recording what the company has not yet earned. Once we start down this road, it is difficult to know when to stop.  

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4 For example, what prevents us from recognizing an asset called “Value of Corporate Brand”, computed as the difference between a firm’s book equity and its stock price? Such an asset appears to meet our market test for objective pricing. One could argue that it is really no different from acquired Goodwill, in terms of its economic worth to the company and in terms of the level of control a firm has over it going forward. And if we book such an asset, shouldn’t we also book changes in the value of this asset as part of corporate earnings? In that case, are we not back to reporting stock returns as our performance measure?
1.3 What about the Market?

The stock market also has an opinion about firm value, but it is a volatile and extremely noisy opinion (Black (1986)). The fact of the matter is that academics have not been particularly successful at explaining what actually moves stock prices.5 Even with the most powerful econometric models, under the most generous definitions of what constitutes fundamental news, our studies have only been able to explain a fraction (much less than half) of the observed volatility in market prices.6

Increasingly, what we are learning today is that stock returns are driven by many forces unrelated to fundamentals—investor sentiment, moods, or emotions, as well as market-wide fund flows, and other things that bear no relation to the present value of future cash flows.7 Market prices are constantly buffeted by waves of noise trader sentiment, and the effect of these noise traders can only be partially mitigated by rational arbitrageurs, because the smart money is operating under various limitations, including cost and risk constraints.8 So even if our ultimate goal is to measure firm performance on the basis of changes in the PV of a company’s future cash flows (which I have argued should not be the goal of GAAP statements), accounting-based performance measures still cannot be replaced by something as capricious as stock returns.

5 Many studies document the fact that stock returns move for reasons other than fundamental news. For example, see Richard Roll (1984)’s classic analysis of orange juice futures.
6 See for example Cutler et al. (1989), Shiller (1981, 1984), Campbell and Shiller (1988), Lee, Shleifer, and Thaler (1991), and Summers (1986). In Cutler et al (1989), annual aggregate market returns are regressed against a large array of fundamental metrics in a VAR system of equations. Even though the authors included measures of fundamental news from past, current, and future periods, they were able to explain less than half of the observed variance in market returns. These results are based on market aggregates; efforts at explaining firm-level returns are met with even less success.
7 See Hirshleifer (2001) for an earlier summary of how psychology can affect prices. Many more recent studies have appeared since that article. Some representative studies include Baker and Wurgler (2007), Coval and Stafford (2007), Richardson, Sloan, and You (2012), Kumar and Lee (2006), and Arif and Lee (2013). In most of these studies, measures of investor sentiment are first “orthogonalized” (pre-whitened) relative to a host of fundamental news variables. Nevertheless, these studies show investor sentiment explains, and in some cases even predicts, stock returns.
8 There is now a large literature on the limits of arbitrage. Some representative studies include Shleifer and Vishny (1997), Mitchell et al. (2002), Brunnermeier and Nagel (2004), and Hirshleifer et al. (2009).
The winners of the 2013 Nobel Memorial Prize in Economics were just announced a few weeks ago. This year the prize was shared by three Americans – Eugene Fama, Lars Peter Hansen, and Robert Shiller. For many of us who have followed the market efficiency debate over the years, the decision to honor Fama and Shiller together is not without irony, given the radical differences in their views on the subject. Fama is being honored for his work in the 1960s showing that market prices are accurate reflections of available information. Shiller is honored largely for circumscribing that theory in the 1980s by showing that prices can deviate from rationality. In awarding them the prize, the Royal Swedish Academy of Sciences notes that collectively the three professors’ work “laid the foundation for the current understanding of asset prices.” In characterizing this contribution, the committee said their findings “showed that markets were moved by a mix of rational calculus and human behavior.”

The markets are moved by a mix of rational calculus and human behavior. We have certainly come a long way since the heydays of the efficient market hypothesis! As Michael Jensen (1978) predicted, financial economists have not abandoned rational calculus or the concept of ‘efficiency.’ We understand and still appreciate the power of equilibrium thinking. At the same time, however, 35 years later, we have also come to better appreciate the importance of human behavior and arbitrage costs in asset pricing. As a profession, many more of financial economists are now willing to entertain, and wrestle with, the limitations and problems of an imperfect market. It would be most unfortunate if, at this juncture in the evolution of finance as a science, accountants decided it is better to simply rely on markets to tell us how to measure performance.

When we apply for mortgages in the United States, the government requires financial institutions to prepare a “Truth in Lending Statement.” In this statement, interest rate calculations are prepared according to a pre-specified formula. All the upfront “points” and “discounts” are converted into an annualized interest rate equivalent calculated over the term of the loan (even what constitutes the “term” of a loan is pre-defined). The goal is to cut through the marketing clutter and offer one place where customers shopping for loans know what they are looking at. This formula is unlikely to be an ideal measure in any theoretical
sense; it will invariably miss certain dimensions of the loan deal (such as customer service, the convenience of local banking, etc.). If we look hard enough we can criticize it on many grounds. But at least it is computed using a common and reasonably objective set of rules, and is broadly comparable across loans. In my view, GAAP-based financials based on a firm’s past exchange transactions serve a similar purpose for investors.

In many ways, GAAP financial reports are a “truth in lending statement” for equity markets. With all of their attendant problems and limitations (and we know there are many), investors at least generally know what they are looking at in these statements. My fear is that even this sometimes tenuous link to historical reality may be lost if we dive head-long into certain types of “fair value accounting”.

1.4 The Usefulness of Accounting to Valuation

I have talked a lot about the limitations of historical financial numbers in valuation. Let’s now consider the positive side. Why do we need historical-based accounting, even if our main interest is in deriving an estimate of the present value of future cash flows? There are at least three important reasons why historical accounting numbers (and the accounting systems that generate them) are crucial to the task of valuing companies.

First, **accounting provides a language for forecasting**. Thanks largely to the "revenue recognition" and "expense matching" principles, GAAP earning is a reasonably objective measure of performance in terms of economic exchanges that took place during a given time period. As a measure of *period-specific* performance, accrual-based GAAP earnings are better than dividends or cash flow measures. This is why financial analysts typically express their predictions in terms of earnings, not cash flows or dividends.

Different valuation models can be viewed as simply alternative “pro forma accounting systems.” As such, these models are a means by which we can articulate our assessment of future events, typically in terms of accounting constructs. A valuation model is helpful

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9 See Penman (1999) or Lee (1999) for an expanded discussion of the relation between historical accounting numbers and firm value. This applies to various derivatives of the discounted cash flow (DCF) model, as well as permutations of the residual income model (RIM), however we specify the starting capital base.
because it specifies what is to be forecasted, directs you to the information needed to make
the forecast, and shows you how to convert a stream of expected payoffs into a value
estimate. However, the essential task in valuation is not algebraic manipulation of valuation
equations. The essential task in valuation is forecasting, and accrual-based accounting
systems help us to make forecasts.

Second, accounting provides an ex post settling-up mechanism. Because accounting
systems provide a structure for expressing what happened in a given time period, they
impose discipline on market participants engaged in making forecasts about these time
periods. Today’s earnings forecasts have credibility only because they can be compared to
the actual (and audited) numbers reported in the future. The existence of this ex post settling
up process is essential to ensure the integrity of these forecasts, whether they be from
company management (i.e., Tim Cook), or sell-side analysts.

Note that in order for this system to work, accounting systems need to be objective and
reliable. The settling-up mechanism calls for a sufficiently rigid set of rules and procedures
for measuring the impact of economic exchanges that actually take place during a given time
period. The more we allow companies to change the rules of the game after the forecast has
been issued, the more we risk the integrity of the settling-up mechanism.

Third, accounting information is useful in forecasting. This point should be self-evident.
In fact, it has been argued that providing useful information of this nature is the primary
objective of financial accounting. Although the GAAP accounting numbers are related to
exchange transactions that have already taken place, they provide a wealth of information for
making forecasts about the future. Fundamental analysis may be viewed as the art of using
existing information, such as historical financial statements, to make better forecasts.

Much of this task involves studying historical financial statements and their relation to future
outcomes. Analysts evaluate the quality of reported earnings, for example, with the hope of

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10 For example, FASB’s Statement of Financial Concepts No. 1 states that a primary objective of financial
accounting is to provide information useful in “assessing the amounts, timing, and uncertainty of prospective
cash receipts” to the company (FASB (1978), page ix).
making better forecasts of future earnings. Analysts also study a firm's footnote disclosure to
glean information about contingencies, off-balance-sheet assets and liabilities, line-of-
business information, and so on. They are motivated in this search by their interest in
understanding a firm's prospective cash flows. Fundamental analysis is driven by the need of
users to forecast the future.

In sum, equity valuation is the task of forecasting the present value of the stream of expected
payoffs to shareholders. In making this forecast, we specify a valuation model, and we
predict its parameters with the aid of fundamental analysis. Historical GAAP financial
statements are important for valuation, because they provide a language for forecasting and
an ex post settling up mechanism. Summary measures from historical financial statements,
such as reported earnings or book value, are not sufficient statistics for the stream of
expected payoffs. However, a company’s historical financial reports do provide a rich set of
information from which discerning investors can glean valuable information about the future.

In the next section of this paper, I will provide specific examples of how historical
accounting numbers have been used by professional investors to assess firm value and
predict returns. This is the essence of what we call fundamental analysis.

2. Fundamental Analysis using Accounting Numbers
In this section, I will discuss how historical-based accounting numbers can be used (and are
being used) to make investment decisions. We will get to the theory part shortly, but let me
once again begin with an illustration, this time taken from the writings of Benjamin Graham.
Professor Graham started life as a financial analyst and later was part of an investment
partnership on Wall Street. While he was successful at both endeavors, his true legacy was
made in the classroom. For more than three decades, he taught at Columbia University and
the New York Institute of Finance. Among his students were some of the most successful
investors of the last century, including Warren Buffett.
2.1 Benjamin Graham as a Quant

In one of the earliest edition of *Security Analysis*, which he co-authored with David Dodd in 1934, Graham proposed a simple stock screen. While the numbers in the screen have varied slightly from edition to edition, the original form of this screen is preserved. Here is the original screen.\(^{11}\) Any stock that possesses all 10 of the following characteristics, according to Graham, would be a worthwhile investment:

1. Earnings to price ratio that is double the AAA bond yield.
2. PE of the stock has less than 40% of the average PE for all stocks over the last 5 years.
3. Dividend Yield > Two-thirds of the AAA Corporate Bond Yield
4. Price < Two-thirds of Tangible Book Value
5. Price < Two-thirds of Net Current Asset Value (NCAV), where net current asset value is defined as liquid current assets including cash minus current liabilities
6. Debt-Equity Ratio (Book Value) has to be less than one.
7. Current Assets > Twice Current Liabilities
8. Debt < Twice Net Current Assets
9. Historical Growth in EPS (over last 10 years) > 7%
10. No more than two years of declining earnings over the previous ten years.

When presenting this screen to my class, I ask students to try and group these 10 factors into two general categories (that is, find five factors that have more in common with each other than with the other five factors). If you stare at this screen for but a few moments, you will notice that there are in fact two natural groupings. The first five factors are more genetically linked to each other than they are to the next five factors that follow.

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\(^{11}\) I am indebted to Professor Aswath Damodaran for bringing my attention to this screen. See Damodaran (2012) for an excellent historical perspective on value investing. See Cottle et al. (1988) for a current version of the Graham and Dodd classic.
You will probably recognize that the first five factors are all measures of “cheapness”. The first two factors compare a company’s stock price to their reported earnings, and encourage us to buy stocks whose P/E ratio is below a certain threshold. The next three compare a stock’s price to its dividends, book value, and net current asset value (NCAV), respectively. Taken together, these first five factors are all instructing us to buy companies whose prices are “cheap” relative to reference measures extracted from historical financial statements.

The next five factors differ from the first five in that they do not involve the stock price. As a group, we might refer to these five factors as measures of a firm’s “quality”. Notice that these factors are pure accounting constructs: financial ratios or growth rates; accounting numbers over accounting numbers. Factors 6 through 8 measure debt (or leverage), as well as short-term liquidity (or solvency). Factors 9 and 10 are measures of a company’s historical earnings growth rate and the consistency of that growth. In short, Graham wants to buy firms with low leverage, high solvency, and a high and consistent rate of growth, sustained over a period of time. Quality firms, according to Ben Graham, are those with high and steady growth, low leverage, and good liquidity.

Does this strategy work? A few years ago, one of my MBA students, Becca Levin, designed a slightly updated version of this screen. Becca used the same basic formulation as Graham, but updated a couple of the constructs (substituting free-cash-flow yield, for example, in place of dividend yield; and requiring just 5-years of past earnings growth rather than 10-years). I recently conducted a test of this strategy using a dataset of U.S. companies over the most recent 14 years (1/2/1999 to 11/9/2013).

The Levin-Graham strategy is quite simple to implement, I assign a +1 score if a firm meets each condition; top firms can receive a maximum score of 10, bottom firms can score as low as 0. At the beginning of each quarter, all firms are sorted into 10 portfolios according to their Levin-Graham score. I then compute the equal-weighted return for each of these 10 portfolios over the next three months. The test is performed using “as reported” Compustat data, with no survivorship or restatement issues. All variables are computed using publicly
available data as of the date of portfolio formation (no “peek ahead”). To avoid illiquid stocks, I include only firms with a price of $3 or more. The results are reported in Figure 2.

[Insert Figure 2]

This figure reports the equal-weighted return to each of these 10 portfolios over the next three months (annualized, assuming quarterly rebalancing). The right-most column represents EW-returns to a portfolio of firms with the highest score, and so on. The eleventh (left-most) column is the return to the S&P500 (value-weighted) index over the same time period, included for comparison.

Remarkably, this 80-year-old screen continues to predict stock returns in the 21st century! In general, cheaper and higher quality stocks earn higher returns over the next 3-months. On an annualized basis, firms in the top two-deciles of the screen averaged around 14% per year, while firms in the bottom two-deciles averaged around 5%. The difference between these stocks is 9% per year (or equivalently, around 2.25% per quarterly rebalancing period). For comparison, the value-weighted S&P500 index (whose returns are dominated by the largest stocks) returned only 2.5% over this time period. The decile results are not monotonic, but by and large, we see that cheaper and higher-quality stocks do earn higher returns even in the most recent 14 year period, in what is arguably the most efficient stock market in the world.

2.2 A Bit of Theory Might Help

What might account for this performance? Was this an unusual time period in U.S. history? To proceed further, we need to introduce a bit of valuation theory.

The Residual Income Model (RIM)

In the early to mid-1990s, Professor James Ohlson wrote a series of influential studies on valuation featuring what became known as the “residual income model” (RIM). The RIM had its origin in the early work of financial economists. Although the original model

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13 See, for example, Preinreich (1938), Edwards and Bell (1961), Peasnell (1982), and Lehman (1993).
predates his work by several decades, Ohlson helped many academics to refocus on the importance of the RIM as a means to understanding the relation between accounting data and firm value.\(^{14}\)

The most common form of the RIM in the academic literature expresses a firm’s value in terms of its current book value and future expected abnormal accounting rates-of-returns:

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P_t = B_t + \sum_{i=1}^{\infty} E_t[N_{t+i} - (r_e B_{t+i})] \left(1 + r_e\right)
\]

\[
= B_t + \sum_{i=1}^{\infty} E_t[(ROE_{t+i} - r_e B_{t+i})] \left(1 + r_e\right)
\]

where \(B_t\) = book value at time \(t\); \(E_t[.]\) = expectation based on information available at time \(t\); \(N_{t+i}\) = Net Income for period \(t+i\); \(r_e\) = cost of equity capital; and \(ROE_{t+i}\) = the after-tax return on book equity for period \(t+i\).\(^{15}\) In this formula, the Residual Income (RI) for period \(t\) is defined in terms of period \(t\) earnings, minus a normal rate-of-return on the beginning capital base. Notionally: \(RI_t = N_t - (r * B_{t-1})\).

An attractive aspect of the RIM is that it allows us to express Firm Value (i.e., the present value of a firm’s future cash flows) in terms of variables that appear in financial statements. In fact, with a sharp pencil and some high school algebra, it is easy to show that equation (1) is simply a mathematical re-expression of the dividend discount model (DDM), with the addition of the “Clean Surplus Relation” (CSR).\(^{16}\)

\(^{14}\) Bernard (1995) and Lundholm (1995) offer less technical discussions on the implications of Ohlson's work. Many excellent books, including Healy et al. (2012), Penman (2010, 2012), and Whalen et al. (2010), discuss implementation details.

\(^{15}\) In this formula, the Residual Income for period \(t\) is defined in terms of period \(t\) earnings, minus a normal rate-of-return on the beginning capital base. Notionally: \(RI_t = N_t - (r * B_{t-1})\).

\(^{16}\) Clean surplus accounting requires all gains and losses affecting the starting capital to flow through earnings. In short, any changes in the capital base must come either from earnings during the period or from net new capital flows. For example, if we define the starting capital base as the beginning-of-year book value, then the ending book value must equal the starting book value plus earnings minus net dividends: \(B_t = B_{t-1} + N_t - D_t\).
Setting aside the details on the right-hand-side of equation (1) for a moment, notice that this equation has decomposed firm value into two components:

\[
Firm\ Value_t = \text{"Capital"}_t + \text{"PVRI"}_t, \tag{2}
\]

where the book value at period \( t \) is “Capital\(_t\)”, or the initial Invested Capital base, and the rest of the right-hand-side is the “Present Value of Future Residual Income”, or “PVRI\(_t\)”.

Equation (2) highlights the fact that Firm Value (what the firm is worth today), is always a function of two things: Invested capital (the asset base we start with today), and “Present Value of Future Residual Income” (where this asset base is going; in other words, our projection of the future value-enhancing growth in the capital base).

As it turns out, what we use as our starting capital base (\( Capital\_t \)) really does not matter (see Penman (1996, 1997)). In equation (1), the current book value was used as the starting capital, but we could have chosen virtually any number as a starting capital. So long as our forecasts obey two simple rules of internal consistency, the resulting Firm Value estimate will be equivalent to the present value of a firm’s future dividends.\(^{17}\)

Subsequent studies featured several alternative measures of the invested capital base other than book value. For example, a firm’s capitalized one-year-ahead earnings forecast, or its current year sales revenue.\(^{18}\) The general RIM formula tells us that, for each invested capital choice, we can derive an equivalent expression for the present value of the corresponding residual income term. In other words, for each \( Capital\_t \) selected, we can compute a matching \( PVRI\_t \) such that the sum will always be mathematically equivalent to the present value of future payout to shareholders.

\(^{17}\) The two consistency requirements are: First, the three elements of RI need to be consistent defined: Having specified the capital base (\( Capital\_t \)), \( Earnings\_t \) must be the income to that capital base in year \( t \), and \( r \) must be the cost-of-capital associated with this source of capital. Second, the evolution of the capital base in this model must follow the Clean Surplus Relation (CSR).

\(^{18}\) For example, Ohlson and Juettner-Nauroth (2005) and Easton (2004) use capitalized one-year-ahead earnings (\( EARN\_{t+1} \)) as the starting capital base in developing the Abnormal Earnings Growth Model (AEGM). Bhojraj and Lee (2002) use the RIM formula to estimate a matching PVRI for each firm’s enterprise-value-to-sales (EV/S) ratio.
How might RIM help us to do fundamental analysis? For one thing, it gives us a much clearer view into the performance indicators that should drive market multiples. For example, dividing both sides of equation (1) by a company’ book value, we can re-express the price-to-book ratio in terms of expected ROEs:

\[
\frac{P_t^*}{B_t} = 1 + \sum_{i=1}^\infty \frac{E_t[(ROE_{t+i} - r_e) B_{t+i-1}]}{(1 + r_e)^i B_t},
\]

where \(P_t^*\) is the present value of expected dividends at time \(t\), \(B_t\) = book value at time \(t\); \(E_t[.]\) = expectation based on information available at time \(t\); \(r_e\) = cost of equity capital; and \(ROE_{t+i}\) = the after-tax return on book equity for period \(t+i\).

This equation shows that a firm’s price-to-book ratio is a function of its expected ROEs (ROE), its cost-of-capital (\(r_e\)) and its future growth rate in book value (which itself depends on future ROEs, and \(k\), the dividend payout ratio).19 Firms that have similar price-to-book ratios should have present values of future residual income (the infinite sum in the right-hand-side of equation (3)) that are close to each other.

Likewise, we can derive an expression for a firm’s enterprise-value-to-sales (EV/S) ratio. Following Bhojraj and Lee (2002), if we model the firm’s growth in terms of an initial period (say \(n\) years) of high growth, followed by a period of more stable growth in perpetuity, a firm’s enterprise-value-to-sales ratio can be expressed as:

\[
\frac{EV_t^*}{S_t} = E_t \left[ PM \times k \times \left( \frac{(1 + g_1)(1 - \left(\frac{(1 + g_1)^n}{(1 + r)^n}\right))}{r - g_1} + \frac{(1 + g_1)^n (1 + g_2)}{(1+r)^n (r - g_2)} \right) \right]
\]

19 Recall from the CSR, \(B_{t+1} = B_t + NI_t - DIV_t = B_t \times (1 + (1-k) ROE_{t+1})\), therefore, the growth in book value is simply: \(B_{t+1} / B_t = 1 + (1-k) \text{ROE}_{t+1}\).
where $EV_t$ is the total enterprise value (debt plus equity) at time $t$, $S_t = \text{total sales at time } t$; $E_{t[,]}$ = expectation based on information available at time $t$; $PM$ is operating profit margin; $k$ is a constant payout ratio; $r = \text{cost of capital}$; $g_1$ is the initial earnings growth rate, which is applied for $n$ years; and $g_2$ is the constant growth rate applicable from period $n+1$ onwards.

Equation (4) shows that a firm’s enterprise-value-to-sales ratio is a function of its expected operating profit margin ($PM$), payout ratio ($k$), expected growth rates ($g_1$ and $g_2$), and cost of capital ($r_e$). This equation helps us answer the following question: which firms deserve a higher EV/S ratio? In short, the firms with higher expected profit margins, higher growth rates, higher payout ratios, and lower cost-of-capital.

2.3 The Two Sides of Value Investing

A key insight that falls directly from this analysis is that “value companies are not just those that are cheap relative to capital-in-place, but include those that are cheap relative to the present value of their future residual income.” A common misperception about value investing is that it simply involves buying stocks that are “cheap” relative to measures of capital-in-place. For example, many academic studies (mostly from finance) define “value stocks” as firms that trade at lower market multiples of book value, earnings, or enterprise value (e.g., P/B, P/E, or EV/S). Accounting-based valuation demonstrates the seriousness of this error, because cheapness (as expressed through lower market multiples) is only one (and arguably the much less interesting) part of value investing.

As the residual-income (RIM) framework makes transparent, a firm’s true fundamental value is made up of two key elements: **Firm Value = Capital-in-place + Growth-opportunities.** The problem with typical “cheapness” indicators is that they only compare the price of a stock to its capital-in-place (book value, capitalized-earnings, or sales), and miss entirely the second element in equity valuation.
The most successful fundamental investors, beginning with Ben Graham, have always viewed Value Investing as consisting of two key elements: (1) Finding “Quality” companies, (2) Buying them at “Reasonable Prices”. In simple notation:

\[
\text{Value Investing} = \text{Cheapness} + \text{Quality}
\]

A firm’s market multiple is a measure of cheapness relative to assets-in-place, but that is the easier and arguably less interesting part of value investing. The more interesting part requires an investor to assess a firm’s “quality” – that is, the present value of its expected future residual income (PVRI), using various currently available performance indicators. That is, of course the heart of what we call fundamental analysis. The best fundamental investors focus on buying Quality, for a given level of cheapness. It is in this spirit that Ben Graham built his original stock screen. Looking back at his Quality factors (factors #6 to 10), Graham intuitively recognized that firms with lower leverage, higher liquidity, and a high rate of steady growth are those with the best chance of generating high rates of return in the future. Or, in RIM parlance, he believed these are the high PVRI stocks.

2.4 Lessons from the Field
This overarching theme of “cheapness+quality” is extremely helpful to bear in mind when trying to understand the investment approaches of investors, such as Warren Buffett, Charlie Munger, Joel Greenblatt, Julian Robertson, and a host of others who grew up under their tutelage (e.g. the extremely successful “Tiger Cub” funds, such as Lone Pine, Viking, and Maverick Capital, all of which had their roots in Julian Robertson’s Tiger Fund (1980-2000)). Let us consider one such example.

Joel Greenblatt and the Magic Formula
Joel Greenblatt is an American academic, hedge fund manager, investor, and writer. Like Graham, Greenblatt’s career straddled academia and Wall Street. In 1985, he founded started a hedge fund, Gotham Capital, which focused on special situation investing. Greenblatt and his cofounder, Robert Goldstein, compounded Gotham’s capital at a phenomenal 40 percent annually before fees for the 10 years from its formation in 1985 to its return of outside capital
in 1995. After returning all outside capital, Greenblatt and Goldstein continued to invest their own capital in special situations. In 1999, he wrote his first best-seller, *You Can Be a Stock Market Genius*, which described the special situation investment strategy responsible for Gotham’s success.

What Greenblatt is best known for, however, is his second book, *The Little Book that Beats the Market*. Published in 2005, the first edition sold over 300,000 copies and was translated into 16 languages, thus propelling Greenblatt to celebrity-investor status. As Greenblatt described it, this book was the product of an experiment, in which he wanted to see whether Warren Buffett’s investment strategy could be quantified. He knew that the subtle qualitative judgment of “the Sage from Omaha” was probably beyond the reach of machines. Still, he wondered whether some of Buffett’s magic might be bottled.

Studying Buffett’s public pronouncements, most of which came in the form of Chairman’s letters from Berkshire Hathaway, Inc., Greenblatt discerned a recurrent theme. As Buffett often quipped: “It is far better to buy a wonderful company at a fair price than a fair company at a wonderful price.” Buffett was not just buying cheap companies, Greenblatt observed, he was looking for quality companies at reasonable prices. What would happen if we tried to create a mechanical stock screen that bought shares in wonderful businesses at reasonable prices?

The results were so impressive that in *The Little Book that Beats the Market*, Greenblatt called this strategy *The Magic Formula*. The details of the formula are laid out in Appendix A. As you will see from this Appendix, it is a remarkably simple strategy. Greenblatt ranked companies based on just two factors: Return-on-capital (ROC) and earnings-yield (EY). The Magic Formula, in a nutshell, looks for companies with a history of consistently high past ROC (5 years of at least 20% annually), and bought the ones currently trading at the lowest earnings-yield. That’s it!

21 At least one other accounting academic came to the same conclusion about Buffett’s investment strategy. In his 2010 book, *Buffett beyond Value*, Professor Prem Jain studied over 30 years of Buffett pronouncements and also came to the same conclusion. Buffett favored quality growth (or in RIM parlance, high PVRI firms) over cheapness.
Several points are worth noting. First, the formula works (or more precisely, it has worked for a long time). This basic formula has been thoroughly tested using U.S. data, both by Greenblatt and by others. Firms ranked at the top of this screen have outperformed their peers by a wide margin over the past 50 years. Second, it is really very similar to what Ben Graham was doing many years earlier! Five years of high and consistent growth… low P/E ratios… sounds familiar? The more things change the more they stay the same.

But of course, in the context of the RIM, all this makes sense. Ben Graham, Warren Buffett, and Joel Greenblatt, they are all trying to do the same thing – find firms with high expected PVRI trading at reasonable market multiples. Consider Buffett’s most often repeated four-fold dictum: (1) Only invest in a business you can understand; (2) Look for companies with a sustainable competitive advantage, (3) Bet on companies with high-quality management teams, and (4) Buy with a good “Margin of Safety.” The last point is easiest to understand and implement – buy firms with an attractive valuation relative to its capital base. What do the first three principles tell us? Are they not simply pointing us towards firms with a greater likelihood of high sustainable ROE’s in the future? The verdict from the field is clear: Quality pays.

2.5 Empirical Evidence from Academic Studies

Once we have the overarching valuation framework firmly in place, it is remarkable how well the evidence from empirical studies line up with the theory, and with the field evidence from investors. Let us now turn to this evidence.

Cheapness

An enormous body of literature in accounting and finance documents the “value effect”, which is the tendency of value stocks (stocks with low prices relative to their fundamentals) to outperformance glamour stocks (stocks with high prices relative to their fundamentals). Common measures of value are the book-to-market ratio (Stattman (1980), Rosenberg et al. 22

22 See for example, Gray and Carlisle (2013, Chapter 2) for a detailed replication of the formula using U.S. data from 1964-2011.
(1985), Fama and French (1992)), the earnings-to-price ratio (Basu (1977), Reinganum (1981)), the cashflow-to-price ratio (Lakonishok et al. (1994), Desai et al. (2004)), and the sales-to-enterprise-value ratio (O’Shaughnessy (2010)). The strength of the value effect varies over time and across stocks, but the broad tendency of value stocks to outperform glamour stocks is quite a robust finding in the academic literature.

While academics generally agree on the empirical facts, there is much less consensus on the reason behind these findings. Some feel the evidence clearly indicates that Value stocks are underpriced (they are “bargains”); others believe Value stocks are cheap for a reason, and that common measures of Value are also indicators of some sort of risk. For example, Fama and French (1992) suggest low P/B stocks are more vulnerable to distress risk, and Zhang (2005) argue that these stocks have more “trapped assets,” and are thus more susceptible to economic downturns.23

Quality
The academic evidence in favor of Quality investing has been perhaps a bit more difficult to recognize. Up to now, academics have not always agreed on what a “quality” firm might look like. Many papers have examined the persistence of earnings, for example, or the ability of accounting-based variables to predict future returns, but most have not done so under the “Quality” rubric. Yet once we begin to piece together the evidence, and the composite sketch begins to fill it, the picture that emerges bears a remarkable resemblance to “quality” as first expressed by Ben Graham in his original screen. Delightfully, the evidence also concords extremely well with what we might expect from valuation theory.

Holding a company’s market multiple (e.g. its price-to-book ratio) constant, what kind of firm should an investor pay more for? If we define Quality firms as those that deserve a higher multiple, then valuation theory tells us the answer. According to the RIM, quality firms are those with a high present value of future residual income (high PVRI). The task of the empiricist is to examine which company characteristics, or perhaps performance metrics, might serve as useful indicators of future PVRI.

23 For a much more detailed review of this debate, see Zacks (2011; Chapter 10).
What are the key components of a company’s PVRI? Of first order importance would be measures of future **Profitability** and **Growth**, since these elements are the primary drivers of firms’ future ROE. Also important would be measures of **Safety**. To the extent that safer firms deserve a lower cost-of-capital ($r_e$), and holding future expected cash flows constant, safer firms will deserve a higher PVRI. Finally, the expected rate of **Payout** should play a role. Firms that maintain the same profitability and growth rates while paying back more capital to investors are, all else equal, deserving of a higher PVRI.

Prior evidence is largely consistent with these observations. In general, stable, safe, profitable firms with solid growth, good cash flows, lower risk, and higher payouts do in fact earn higher future returns.

**Profitability and Growth** For example, Piotroski (2000) show that firms earning higher ROAs, have higher Operating Cash Flows, better Profit Margins, and higher Asset Turnovers, consistently earn higher returns. Using eight fundamental indicators of firm performance and general health, he created a composite “F-Score.” His evidence shows that F-Score is able to separate winners from losers from among stocks in the lowest P/B quintile (“value” stocks). Mohanram (2005) performs a similar exercise among high P/B firms (“growth” stocks) and find growing firms outperform firms with poor growth. Piotroski and So (2013) use the F-Score to show the value/glamour effect is attributable to errors in market expectation about future fundamentals. Using I/B/E/S analysts’ forecasts, Frankel and Lee (1998) show that, holding P/B constant, firms with higher forecasted earnings earn higher returns, particularly when correcting for predictable errors in the analysts’ consensus estimates. Overall, the evidence suggests that firms with higher profitability (past or forecasted) earn higher subsequent returns.

**Earnings Quality** It is not simply the *quantity* of earnings that matters, the *quality* (the expected sustainability or persistence) of that earnings also matters. For example, Sloan (1996) and Richardson et al. (2005) show that the cash flow component of earnings is more persistent than the accrual component. Novy-Marx (2013) show that Gross Margin (Sales –
Cost of Goods Sold) is an even better measure of core profits than bottom-line earnings. In this study, profitable firms generate significantly higher returns than unprofitable firms, despite having significantly higher valuation ratios. Overall, these studies show that profitability measures based on cash flows or gross margin are even better predictors of future returns than simple earnings measures.

**Safety**  Safer stocks earn higher returns. This result is remarkably robust across many measures of safety. For example, *lower volatility* firms actually earn higher, not lower, returns (Falkenstein (2012), Ang et al. (2006)). *Lower Beta* firms in fact earn higher returns (Black et al. (1972), Frazzini and Pedersen (2013)). Firms with *lower leverage* earn higher returns (George and Hwang (2010), Penman et al. (2007)). Most strikingly, firms with *lower levels of financial distress* also earn higher returns (Altman (1968), Ohlson (1980), Dichev (1998), Campbell, Hilscher, and Szilagyi (2008)). In short, firms that are safer, by many measures of safety, actually earn higher returns.

Put simply, firms with higher volatility, higher Beta, higher leverage, and higher bankruptcy risk actually earn lower returns. This finding does not make sense in an equilibrium asset pricing context – in equilibrium, firms with higher risk should be rewarded with higher future returns. However, the result makes perfect sense if we believe that these risk measures are associated with the discount rate markets use to compute a firm’s PVRI. Viewed in this context, “safer” firms have lower cost-of-capital ($r_c$), and we would expect their PVRI (and thus their firm value) to be higher than the “riskier” firms, all else equal. If the market underappreciates a firm’s true PVRI (as we have seen in the case of firms’ Profitability and Growth indicators), then safer firms will in fact earn higher future realized returns.\(^{25}\)

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\(^{24}\) Both Dichev (1998) and Campbell et al. (2008) find strong evidence that distress risk is actually *negatively* associated with subsequent returns. Dichev used Altman’s Z-score and Ohlson’s O-Score and show that going long in the 70% of firms with low bankruptcy risk, and shorting the remaining 30%, yields *positive* returns in 12 out of 15 years (1981-1995). Campbell et al. (2008) sort stocks by into value-weighted portfolios by failure probability, and find that average excess returns are strongly, and almost monotonically, negatively related with the probability of failure. The safest 5% of stocks have an average excess yearly return of 3.4%, while the riskiest 1% of stocks have an average return of -17.0%.

\(^{25}\) Consistent with this argument, Chava and Purvnanadam (2009) show that although distress risk is *negatively* correlated with future realized returns, it is *positively* correlated with a firm’s market-implied cost of capital. In other words, the market *does* use a higher implied discount rate when discounting the future earnings of high
Payout. Finally, companies who make higher payouts to shareholders and creditors also earn higher future returns. For example, companies that repurchase their shares tend to do well (Baker and Wurgler (2002), Pontiff and Woodgate (2008), McLean, Pontiff, and Watanabe (2009)), while firms that issue more shares tend to do worse (Loughran and Ritter (1995), Spiess and Affleck-Graves (1995)). A similar pattern is observed for debt issuances. Firms that issue more debt earn negative abnormal returns (Spiess and Affleck-Graves (1999), Billett et al. (2006)), while firms that retire their debt earn positive abnormal returns (Affleck-Graves and Miller (2003)). In fact, Bradshaw et al. (2006) show that it is possible to measure these effects using a measure of net external financing activities computed from companies’ Statement of Cash Flow. Taken together, these findings are quite consistent with the RIM framework: firms that are returning capital at a faster rate (firms with a higher k), have more positive PVRI.

In short, what types of firms might be deemed higher quality? In other words, which firm characteristics are associated with higher future ROEs, lower cost-of-capital, and higher payouts? Prior studies suggest these are safe, profitable, growing firms that are also returning more of their capital to their investors. These facts are exactly what we would expect if markets underappreciate fundamental value, as reflected in current financial statements. They are much more difficult to reconcile with popular explanations of the value effect as a risk premium, as the Quality firms are more profitable, less volatile, less prone to distress, have more persistent future cash flows, and lower levels of operating leverage.

Asness, Frazzini, and Petersen (2013)

In a fascinating new study, Asness, Frazzini, and Petersen (2013) pulls these disparate strands of Quality investing together. In this study, the authors define “Quality” firms as stocks that are “safe, profitable, growing, and well-managed.” They argue that all else equal investors should be willing to pay more for such firms. They show that in fact the market does not pay a high enough premium for these Quality stocks. Sorting firms on the basis of distress firms; however, because these firms are still over-priced on average, they still earn lower future realized returns.
their Quality metric, they create a “Quality Minus Junk” (QMJ) portfolio, and find that this portfolio earns positive risk-adjusted returns in 22 out of 23 countries.

For their empirical tests, they compute a composite “Quality” score for each firm based on the following 21 performance indicators, grouped into four categories. Each variable is ranked, and then normalized by subtracting its own mean and dividing by its own standard deviation:

I. Profitability (6 variables)
Bet in favor of firms with high earnings (ROA, ROE), high gross-profit (GPOA, GMAR) and high operating cash flow (CFOA, ACC). The numerators are current year earnings, gross margin, or operating cash flows; the denominators are total assets, book equity, total sales, or (in the case of ACC) total earnings.

II. Growth (6 variables)
Bet in favor of firms with the most positive changes in these profitability variables over past 5 years. E.G. $\Delta$GPOA = (GP$_t$ – GP$_{t-5}$) / TA$_{t-5}$; where GP = REV – COGS. In other words, they defined growth firms as those whose gross margin, or earnings, or cash flows, have grown the most over the past five years, relative to the year t-5 capital base.

III. Safety (6 variables)
Bet-Against-Beta (BAB), Against-Volatility in Returns and in Earnings (IVOL, EVOL), Against High-Levered Firms (LEV), Against Financially Distressed Firms (O-score, Z-score). For this composite, the authors consolidate six measures of “safety” based on prior studies. In essence, safe firms are defined as those with low Beta, low volatility, low leverage, and low financial distress.

IV. Payout (3)
Bet against firms with: High net equity issuance (EISS), High net debt issuance (DISS), Low net payout ratio (NPOP) over past five years. Again, consistent with prior studies,
Asness et al. (2013) define high payout firms in terms of net new issuances, plus dividends.

Notice how well these concepts map into the RIM framework. The first six indicators (past ROE, ROA, GPOA, GMAR, CFOA, and ACC) capture profitable firms that have higher gross margin, and a higher proportion of cash flow to accruals in their reported earnings. The next six indicators measure improvements in these variable dimensions of profitability. In the RIM framework, these 12 variables are all likely to be associated with higher future ROEs. Not surprisingly, Asness et al. (2013) find that these measures are strongly correlated with P/B ratios in the cross-section.

More interestingly, this study shows that these variables also predict cross-sectional returns – that is, more profitable firms and firms with strong growth over the past five years consistently earn higher returns than firms with low profitability and low growth. To be fair, most of these variables have been reported by prior studies as being useful in returns prediction. Nevertheless, this study provides compelling evidence in support of the prediction from a simple RIM analysis – firms with high and persistent profits have high PVRI, and the market does not seem to fully price in this Quality metric.

Interestingly, Asness et al. (2013) show that “safer” firms also earn higher future returns. They define “safe” firms as those with lower Beta, lower volatility (measured in terms of both idiosyncratic returns (IVOL) and past earnings (EVOL)), lower leverage (LEV), and lower financial distress (O-Score and Z-Score). While this result might be counter-intuitive for efficient market advocates, it is in fact quite easy to understand in terms of the RIM framework. Holding expected cash flows constant, safer firms are worth more (i.e. they should have lower discount rates). To the extent that markets underappreciate this dimension of firm valuation, the safer firms would yield higher future returns.

Finally, Asness et al. (2013) show that firms with high net payouts (i.e. those with low net equity issuances, low debt issuances, and high dividends), are also worth more. In the RIM framework, this is not surprising either. Firms which are able to produce the same level of
growth as other firms while paying back more of their capital to investors are worth more. Again, when we measure the quality component of firm value (PVRI) more accurately, we are better able to identify firms that earn higher future returns.

**Summary**

In my view, accounting information best serve investor needs when it helps to facilitate forecasting. Investors need to estimate a firm’s “core wealth-creation potential,” as represented by the present value of its future residual income. From an investor’s perspective, GAAP-based financial statements provide a language for forecasting, a settling-up mechanism for ensuring ex post accuracy, and a wealth of information to help facilitate the forecast. While I understand “fair value accounting” might be useful in some settings, I believe its overall emphasis on valuing “assets-in-place” is misguided.

Recent studies such as Asness et al. (2013) provide some of the most compelling evidence yet that historical accounting numbers are informative, and are already playing a useful role in fundamental investing. None of the 21 indicators in the Quality composite featured in Asness et al. rely on a company’s stock price. They are all variable constructed from historical GAAP-based financial statements. Yet together these variables provide a good composite sketch of companies that tend to earn higher returns in the future.

The RIM helps us to understand why. Careful fundamental analysis can help us to derive performance measures that help predict the future profitability and growth of firms. It can also help us assess the riskiness of a firm, as well as its likely future payout to shareholders. As valuation theory shows, all of these elements are useful in evaluating the present value of a firm’s future growth opportunities.

We might not be there yet, but we are good ways down the road mapped out for us by Ben Graham almost 80 years ago. The verdict from the field agrees with the verdict from the ivory tower. Buy quality firms at reasonable prices, and use historical accounting numbers to help you achieve that task. It will give you an edge in your investing, and help make markets more efficient as well!
References


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Appendix A  
Joel Greenblatt’s Magic Formula

The following basic instructions for the Magic Formula are extracted from *The Little Book that Still Beats the Market*, written by Joel Greenblatt and published in 2010. They are included here for illustrative purposes. Interested readers are encouraged to either buy the book or visit Greenblatt’s website: magicformulainvesting.com for more details.

**Greenblatt’s Basic Principle:**

- Buy good businesses (high return on capital) at bargain prices (high earnings yield).

- Do this consistently by maintaining a portfolio of 20 to 30 stocks, and spreading out the timing of your purchases (buy a few stocks each month throughout the year).

- Hold the winners for at least one year (for tax efficiency reasons).

**Implementing Greenblatt’s “Magic Formula”**

- Look for companies with an average ROC of 20% or higher over the past 5-years (see below for details on ROC calculation).

- Among these, pick those ones with the highest earnings-yield (EY).

- Limit stocks to those with at least $200m in Market Cap; Exclude Utilities; Financials; ADRs; and firms that have reported earnings within the past week.

- Also consider excluding firms with and earnings yield in excess of 20% (which may indicate a data problem or an unusual situation).

**Detailed Factor Definitions:**

- **Return-on-Capital (ROC) = EBIT / Capital**
  
  Where EBIT is Earnings before interest and taxes, and Capital is defined as: Net PP&E + Net Working Capital.

- **Earnings Yield (EY) = EBIT / TEV**
  
  Where EBIT is Earnings before interest and taxes, and TEV is defined as: Market capitalization + total debt – excess cash + preferred stock + minority interests (excess cash is cash + current assets – current liabilities).
Figure 1. The Twelve-month stock returns of Apple Inc. (AAPL) as compared to the returns on the NASDAQ index, as of the close of market on November 8, 2013
Figure 2. Portfolio Returns for the Levin-Graham Stock Screen
Test Period 01/02/1999 to 11/13/2013

This figure depicts the results of a backtest conducted using a sample of U.S. companies over the 1/2/1999 to 11/9/2013 time period. At the beginning of each quarter, firms are sorted into 10 portfolios according to their Levin-Graham score (based on the original Ben Graham stock screen described in the text). A firm is assigned a +1 score if it meets each condition in the screen; top firms can receive a maximum score of 10, bottom firms can score as low as 0. This figure depicts the equal-weighted return to each of these 10 portfolios over the next three months (annualized, assuming quarterly rebalancing). The left-most column is the return to the S&P500 (value-weighted) index over the same time period. All variables are computed using publicly available data as of portfolio formation, and all firms with available Compustat and CRSP data and a stock price of $3 or more are included.