The Value of Accounting

Bibliographical Data and Classifications

Library of Congress Classification	5001-HF 6182
(LCC)	HF 5601-5689
http://lcweb.loc.gov/catdir/cpso/lcco/lcco.h.pdf	HF 5601+
Journal of Economic Literature (JEL)	M
http://www.aeaweb.org/journal/jel_class_system.html	M41
Gemeenschappelijke Onderwerpsontsluiting (GOO)	
Classification GOO	85.00, 85.25
Keywords GOO	Bedrijfskunde / Bedrijfseconomie Accountancy, besliskunde Accountancy, Waardebepaling, Redes (vorm)
Free keywords	fair value, business valuation, accounting, fundamental analysis, mispricing, equity risk measurement

Erasmus Research Institute of Management - ERIM
The joint research institute of the Rotterdam School of Management (RSM)
and the Erasmus School of Economics (ESE) at the Erasmus Universiteit Rotterdam
Internet: www.erim.eur.nl

ERIM Electronic Series Portal:
http://hdl.handle.net/1765/1

Inaugural Addresses Research in Management Series
Reference number ERIM: EIA-2011-048-F&A
ISBN 978-90-5892-301-1

Design and layout: B&T Ontwerp en advies (www.b-en-t.nl)
Print: Haveka (www.haveka.nl)

This publication (cover and interior) is printed by haveka.nl on recycled paper, Revive®.
The ink used is produced from renewable resources and alcohol free fountain solution.
Certifications for the paper and the printing production process: Recycle, EU Flower, FSC, ISO14001.
More info: http://www.haveka.nl/greening

The Value of Accounting

Inaugural address

Address given in shortened form on the occasion of accepting the appointment
as Endowed Professor of Business Analysis and Valuation
at the Rotterdam School of Management, Erasmus University,
on behalf of Vereniging Trustfonds EUR and Duff & Phelps,
on Friday October 21, 2011

by

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Samenvatting

De inschatting van de reële waarde van schulden en aandelen speelt een belangrijke rol in de economie. Zo zijn bedrijven volgens de IFRS-richtlijnen (International Financial Reporting Standards) verplicht veel investeringen tegen reële waarde in de balans op te nemen of reële waarden te gebruiken bij de zogenaamde goodwill impairment toets (bijzondere waardevermindering van goodwill). Daarnaast wordt het dekkingspercentage van pensioenfondsen vaak berekend als het verschil tussen de reële waarde van investeringen en pensioenverplichtingen. Belangrijke economische beslissingen zijn hierdoor afhankelijk van een ingeschatte waardering, waardoor een waarheidsgetrouwe inschatting van groot belang is. Bijstellingen van de balanswaarde van de investeringsportfolio's van banken hebben bijvoorbeeld invloed op het wettelijk vereist kapitaal, waardoor banken in sommige gevallen gedwongen zijn hun activa en passiva te herstructureren. Op eenzelfde wijze heeft de reële waarde van de investeringsportfolio's van pensioenfondsen invloed op beslissingen over pensioenstortingen,-premies en -uitkeringen.

In deze oratie bespreek ik het gebruik van beurskoersen bij het meten van de reële waarde. Regelgevers tonen vaak een sterke voorkeur voor het hanteren van deze koersen als de basis voor de reële waarde, kennelijk gestoeld op de betrouwbaarheid van deze inschattingen. Ik vergelijk een dergelijke op prijs gebaseerde aanpak met fundamentele waarderingsmethoden, zoals het gebruik van multiples en waardering op basis van volledige informatie. Ook sta ik stil bij het gebruik van beurskoersen en rendementen bij het meten van bedrijfsrisico, waaronder de praktische toepassing van het Capital Asset Pricing Model (CAPM). Tenslotte bespreek ik waarom een risicometing met toepassing van fundamentele (accounting) gegevens hier als nuttig alternatief of aanvulling zou kunnen dienen.

Summary

Fair value estimates of debt and equity securities play an increasingly important role in the economy. For example, International Financial Reporting Standards require companies to report many of their investments at fair value on the balance sheet or to use fair values in goodwill impairment tests. Further, the funding status of pension plans is typically assessed as the difference between the fair values of pension plan assets and pension plan commitments. In many of these situations the use of fair value estimates results in economic decisions being dependent on valuation. That is, fair value adjustments to the carrying amounts of banks' investment portfolios affect their regulatory capital, forcing them to restructure their assets and liabilities in some extreme cases. Similarly, the fair value of pension assets affects decisions on pension funding, premiums and payouts. Although the exact use and implications of fair values may vary across these examples, what they have in common is that they stress the importance of having available accurate fair value estimates.

Commonly, regulators and standard setters such as the International Accounting Standards Board express a strong preference for using quoted market prices as the basis for fair value, seemingly focusing on the reliability of fair value estimates. In this inaugural address, I discuss such use of market prices in measuring fair values and benchmark the price-based approach against fundamental valuation approaches, such as multiples-based and full-information-based valuation. I also reflect on the dominance of market prices and returns in business risk measurement, as used, for example, in practical applications of the capital asset pricing model, and discuss why a risk measurement approach that makes use of fundamental (accounting) information could serve as a useful alternative or complement.

Content

1. Introduction

Mijnheer de Rector Magnificus,
Geacht College van Dekanen,
Distinguished Colleagues,
Ladies and gentlemen,

The idea of most inaugural addresses, like this one, is to discuss a balanced mixture of facts, opinions, and ideas. Let me thus start this address by discussing an apparently trivial fact: business valuation is about determining the value of a business, not its price – and value and price are not always equal. In the short-run, price does equal value, as a company is worth today what an investor is willing to pay for it today. However, in many decisions where we choose to take a long-run perspective, value is determined by the underlying fundamentals of a business, such as profitability or risk. Although these fundamentals certainly feed back into investors' supply of and demand for a company's securities, they are not the only factors affecting price. We must therefore be careful in drawing conclusions about what a company is worth based on the prices we observe in capital markets.

Estimates of the fair value of securities play an increasingly important role in our economy. International accounting rules require companies to report many of their investments at fair value on the balance sheet (see IFRS 9) or to use fair values in goodwill impairment tests (see IAS 36). Further, the funding status of pension plans is typically assessed as the difference between the fair values of pension plan assets and pension plan commitments. In many of these situations the use of fair value estimates results in economic decisions being dependent on valuation, thus stressing the importance of having accurate fair value estimates. To illustrate this, consider the assets and liabilities of Dutch pension funds between 1987 and 2009 in Figure 1 (source: Centraal Bureau voor de Statistiek).

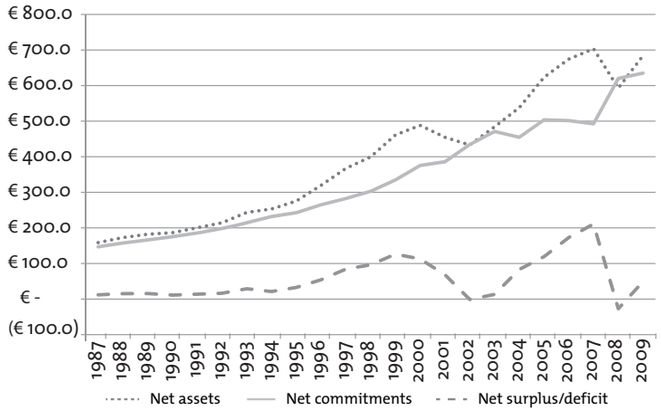


Figure 1. Total assets, total liabilities, and net funding status (in €bn) of Dutch pension funds from 1987 to 2009 (Source: Centraal Bureau voor de Statistiek).

A few things are worth noting in this graph. Obviously, the key measure used by government agencies to monitor and safeguard pensions, namely the difference between the fair value of investments and the present value of pension commitments, tends on average to be positive. This is not unexpected, given that when the value of a pension's investments drops below a pre-specified percentage of its commitments, the pension fund is typically placed under closer scrutiny. More interestingly, the graph shows that the value of pension assets significantly outgrew commitments in two stock market boom periods: the second half of the 1990s and the mid 2000s. In 2008, when stock markets declined and interest rates reached record-low levels, the situation changed dramatically and pension funds became underfunded.

Without taking stand on whether the current method for calculating pension commitments is correct, I would like to draw your attention to a pension's assets.[1] The way we calculate the fair value of pension assets is economically relevant as it affects real economic decisions, such as decisions on pension funding, premiums and payouts. For example, the abnormal growth in assets during the two boom periods, which in retrospect we may classify as bubbles, helped pension funds to push back the reforms that we currently believe are so desperately needed. Note, for instance, that after the first market crash, around 2004, almost 40 percent of the Dutch pension funds decided to change from pensions based on final pay to pensions based on average pay.[2]

Other examples of how estimates of the fair values of assets affect real economic decisions can easily be found. On October 4, Deutsche Bank, one of the largest European banks, issued a profit warning. One of the reasons for this warning was the negative sentiment on European capital markets. Like all banks, Deutsche Bank recognizes changes in the fair values of its trading securities as losses or profits in its income statement. Whether and to what extent market sentiments, which may or may not be justified by fundamentals, should affect the bank's profitability is a matter of debate. This question is of economic relevance, not least because fair value adjustments affect the bank's regulatory capital and hence could trigger national banking supervisors to intervene.

Another event that reminded us of how price and value might diverge, and how relevant this divergence can be, was the start of credit crisis. At the beginning of this crisis, high uncertainty among investors led to a halt in trading of many debt securities and the market prices of debt securities dropped substantially below their alleged values. The presumed deviation of market prices from fundamental values became the topic of an international debate about what banks' investments were worth exactly and, more particularly, about how useful market prices are in measuring bank's regulatory capital. This debate motivated accounting regulators to reconsider the use of market prices and to focus more on fundamentals-based valuation approaches in times of low market liquidity.

These are just a few examples of the importance of fair value estimates in our economy and of the reliance we place on market prices in determining such fair values. Often there's a potential choice between using prices observed in stock markets, using business value estimates based on fundamentals such as accounting information, or using a combination of both to determine the value

[1] An often-heard criticism of the way in which we evaluate pension funds is that we should not discount a pension's long-term commitments using the current interest rate, as this rate may not be reflective of the long-run discount rate.

[2] Source: DNB.

of a single business or a portfolio of businesses. An important question is whether there might be more situations in which a greater emphasis on fundamentals is warranted.

My research background motivates me to approach business valuation from an accounting perspective. A humble perspective on the role of accounting is that accounting information is just one of the many signals that stock markets receive. Practitioners and researchers typically assume that market prices produced by properly functioning stock markets summarize and subsume all available information. This assumption implies that the stock market optimally interprets and weighs all the signals it receives and consequently makes every small piece of accounting information redundant. What this perspective ignores, however, is that the stock market can be systematically biased and move away from fundamentals during longer periods.

In one of its most recent accounting standards, IFRS 13, the International Accounting Standards Board (IASB) assumes that under normal circumstances, market prices provide the best available estimate of the fair value of a financial asset, thus making other value estimates irrelevant. The absolute dominance of market prices in measuring the fair values and risks of securities, pensions and the like may be unjustified. Consider the following randomly selected statements made by analysts in the financial press. Recently a Goldman Sachs analyst suggested that "In order to justify current prices you need to have a pretty pessimistic view of long-term returns and growth." A partner at a large UK asset management fund confirmed that "We should take a deep breath and remember that the fundamentals are much better than in 2008; companies are generally in good shape...." Finally, a US banking analyst claimed that "Fundamentals are not playing into valuations now at all." What these quotes collectively suggest is that there is a potential role for fundamentals to provide information about value incremental to market prices. I thus invite you to explore the following questions with me:

- To what extent is it justified to rely strongly on market prices and ignore accounting fundamentals in settings such as fair value accounting, pension valuation or risk measurement?
- If not, then what role could accounting information possibly play?

These are questions I will focus on in the remainder of this address, after first discussing some characteristics of capital markets and accounting that affect their role in valuation.

2. Markets

Consider a world divided in two groups: investors who have excess cash available, and entrepreneurs who need cash, say, to start up a profitable but risky business. One of the key questions in business economics is how to ensure that entrepreneurs can convince investors to invest in their businesses at the cheapest possible rate – all under the assumption that investors make sure that they get compensated for any risk they run on their investments. An economic system that facilitates the exchange of funds for shares or bonds and, consequently, ensures the availability of funds to entrepreneurs when needed, helps to stimulate private investments and ultimately create economic growth (e.g., Bekaert et al., 2005; Levine, 1999; Levine and Servos, 1998; Wurgler, 2000).[3]

In a perfect world, where all information about investment opportunities and business values is complete and publicly known, the allocation of investors' funds among entrepreneurs would be a simple mathematical exercise (Hayek, 1945). In general, the information that we require to value an investment tends to be imperfect and potentially spread among individual investors. To pool and make full use of the information that investors possess, we therefore create public capital markets. We expect that on these markets trading activities by rational investors create an "invisible hand" that makes sure that funds get allocated efficiently among investment opportunities and that prices converge with intrinsic values. However, over the years we have learned to realize that capital markets have some limitations.

A first limitation is that, although capital markets collect and weigh investors' dispersed opinions, they consume rather than produce information. In fact, a garbage in, garbage out principle seems to apply here: if investors suspect managers of providing poor information to the public, they become unwilling to trade and transaction prices become a poor indicator of business value.[4]

[3] We have seen vivid proof of this effect during the recent credit crisis, when a lack of trust among investors, banks, and businesses substantially reduced the availability of funds and plunged the world into an economic crisis.

[4] In these situations, we expect institutional investors or professional analysts to step in and independently produce the information that the market needs to keep running. Their incentive to do so is that they can earn profits from informed trading that potentially offset the costs they incur from collecting and processing information. However, given that at some point the marginal benefits of informed trading may not outweigh the marginal costs of becoming better informed, prices typically do not fully converge with intrinsic values.

Because improving the set of public information about a business is a costly exercise that requires time and skills, professional information intermediaries such as analysts cannot remove all the adverse effects of poor management disclosures, thus leaving some residual mispricing in equilibrium (Grossman and Stiglitz, 1980).[5]

A second limitation of public capital markets is that investors in these markets may not trade only on fundamental information. In particular, there is sufficient evidence that investors exhibit herding behavior, copying each others' investment decisions. Researchers have offered rational as well as psychological explanations for such behavior (see e.g., Devenov and Welch, 1996; Hirshleifer and Teoh, 2003; Shiller, 2005). Whatever the origin of this type of investor behavior, an important implication of it is that prices may start to deviate from intrinsic values for a prolonged period of time, leading to the well-known and feared stock market bubbles and crashes (e.g., Abreu and Brunnermeier, 2003; Blanchard, 1979).

A third limitation is that investors may be averse to states of ambiguity or, to put it in another way, may be averse to situations in which they are uncertain about the quality of the information they have. A possible consequence of this is that investors become pessimistically biased during times of ambiguity in capital markets, such as during the recent credit crisis (Epstein and Schneider, 2008). Although this bias may seem justified from the perspective of an individual investor – and labeled by some as a time-varying risk premium – it is debatable whether it should also affect estimates of business value used in, for example, fair value accounting or bank and pension supervision.[6]

[5] In some particularly extreme cases, residual mispricing problems may grow too large and lead to the collapse of a market or market segment (cf. Akerlof's (1970) 'lemons' problem). Recent examples of such cases are the collapse and disappearance of some hightech stock market segments (such as Germany's Neuer Markt) in the early 2000s or the aforementioned trading halts in some debt securities during the credit crisis.

[6] Another limitation of public capital markets may be created through the intervention of regulators placing restrictions on allowed trading activities. For example, to protect investors and ensure their willingness to trade, regulators typically prohibit insiders such as business managers to trade on private information. A potential consequence of such a ban on informed insider trading is that it delays the speed with which management's private information gets incorporated into prices. Similarly, a ban on speculative short-selling, such as was recently imposed on various European markets, may protect markets from speculative crashes but, at the same time, could impair price discovery by forcing pessimistic investors out of the market (e.g., Ofek and Richardson, 2003).

In summary, although public capital markets perform a crucial function in the economy by coordinating the allocation of investors' funds, prices formed on these markets are certainly not a perfect measure of business values. Formally, (the natural logarithm of) price can be defined as the sum of (the natural logarithm of) the "true" fair value and a measure of error, which I label 'pricing error' (cf. Lee et al., 1999):

$$\log(\text{Price}_{it}) = \log(\text{Fair Value}_{it}) + \text{Pricing Error}_{it}$$

In this equation Pricing Error is a random variable, consisting of a time-specific component that reflects the effects of, for example, bubbles, crashes and ambiguity, and a firm-time-specific component that reflects the effects of residual mispricing.

3. Accounting

As an alternative to using prices, we can also directly estimate business values from the accounting fundamentals of a business. From a fundamental perspective, business value depends on future profitability, growth and risk. During the past decades, regulators and standard setters have been working intensively on improving the information value of financial statements to investors. Financial statements therefore contain a wide variety of information that is helpful in assessing the fundamental drivers of value. Also, current measures of accounting performance possess some particular features that are useful in valuation. For brevity, I will discuss two such features:

1. One of the basic features of accounting is that accounting performance measures are based on the principles of accrual accounting.[7] Under accrual accounting, persistence in a firm's operating activities and operating efficiency creates persistence in the firm's accounting performance. Such persistence is useful from the perspective of investors: it makes current accounting profits informative predictors of future performance.

2. The second useful characteristic of accounting performance is that it recognizes economic gains and losses, such as changes in the value of production facilities, only once such gains or losses are reasonably certain. To give one example of why this is useful, consider the difference between the accounting or book value and the market value of a business. Under current accounting rules, book value approaches the lowest possible and immediately realizable value of a business, whereas market value represents the value that investors assign to the business' future profits. A substantial gap between the two measures reflects the fact that a large proportion of the market value still needs to be realized and hence is inherently uncertain. This information is of use to investors, for example, in measuring business risk.

7 Accrual accounting ensures that the revenues and expenses of an operating activity get included in accounting profits at the time that the operating activity is carried out. The typical example used to illustrate this in many introductory accounting courses is the sale of inventory purchased in a prior period. The accounting profit of this sale is derived from the cash payment in the prior period and the expected cash receipts that may possibly occur in a future period.

Accounting-based estimates of value can take many forms. A simple example of this type of value estimate is one based on accounting multiples, such as historical price-earnings or market-to-book ratios.[8] A more complicated example would be a full-information-based valuation approach, using all available information, as explained in many valuation textbooks.

Of course we know that accounting cannot provide a perfect estimator of fair business values. One factor reducing the usefulness of accounting information in estimating business value is that accounting rules are imperfect.[9] Every accounting rule must trade off the information benefits of allowing reporting flexibility against the costs involved, such as the risk of strategic earnings management or accounting fraud. A recent example of this trade-off is the debate that arose at the beginning of the credit crisis. In 2008, a lack of trust among investors led to a halt in trading on markets for debt securities. As a consequence, observed market prices for these securities came primarily from forced sales and were claimed to be significantly lower than the securities' "true" fair values.[10] Sticking to the use of market prices to value banks' financial assets, even in these times of low liquidity, has the advantage that balance sheet values of the financial instruments are easily verifiable. A clear disadvantage of sticking to this approach is that it leads to the use of prices that might not be informative about the assets' "true" fair values. Hence, whatever approach is chosen in this complex dilemma, it will be imperfect.

[8] For example, one could take the average ratio between the market price and the book value of equity in a particular industry during the past five years and then multiply this ratio with a business's current book value to estimate its fair value.

[9] The essence of accrual accounting is that management has some flexibility in making accounting choices or estimates. For example, international accounting rules ask managers to estimate the percentage of uncollectible receivables possibly using internal information sources. The advantage of doing so is that ultimately the balance sheet value of receivables will reflect management's perception of what proportion of the company's debtors will most likely pay their bills, thereby revealing part of the company's internal information to the investing public. A possible disadvantage is that management may be unexpectedly inaccurate in estimating uncollectible amounts, thus introducing forecast errors into financial statements, or it may misuse its reporting flexibility to strategically overstate or understate the accounting performance of the business.

[10] Banks felt forced by the accounting rules, either directly or indirectly (e.g., through the threat of litigation), to write-down the value of financial instruments such as mortgage-backed securities, reflecting the declines in market price. These write-downs led to the recognition of huge losses, which some investors, bankers, regulators or politicians claimed were unjustified, and ultimately exacerbated the crisis.

Economic dynamics, such as crises, competition or innovation, also affect the usefulness of accounting. These dynamics create complexities that potentially distort the relationship between current accounting measures and future performance or growth (e.g., Dichev and Tang, 2009).[11] Another complication is that businesses have real options, such as starting up new operations in an emerging market, which are rarely reflected in the current financial statements. The usefulness of accounting also varies over time. Crises such as the credit crisis help accounting regulators to learn about accounting's limitations, motivate them to change the rules and, consequently, lead to changes – presumably improvements – in the usefulness of accounting.[12]

In sum, several firm-specific or period-specific factors create noise in the value estimates we make based on accounting information. We can therefore write accounting based-estimates as the sum of the "true" business value and a noise component, which I label "Valuation Error" (cf. Lee et al., 1999):

$$\log(\text{Accounting-based value}_{it}) = \log(\text{Fair Value}_{it}) + \text{Valuation Error}_{it}$$

I will now turn to discussing how we can potentially make use of accounting in tasks such as fair value accounting or pension valuation.

[11] The same economic dynamics affect managers' ability to make accurate accounting estimates, such as the percentage of uncollectible receivables, which consequently makes accounting performance measures relatively noisier in dynamic environments.

[12] Some have argued that accounting information has become more informative over the years because of gradual improvements in accounting standards and enforcement; others have argued that changes in characteristics of firms, such as a stronger reliance on intangible assets, have made accounting less informative (see e.g., Collins et al., 1997; Francis and Schipper, 1999; Lev and Zarowin, 1999).

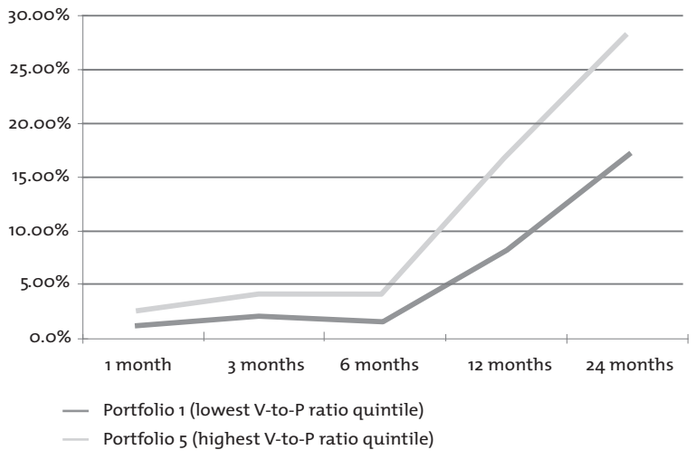
4. Combining market-based and accounting-based estimates of value

Following the prior discussion, we can conclude that accounting-based and price-based estimates are both informative but imperfect measures of fair business values. It is relatively safe to predict that, on average, price-based estimates will have smaller errors. However, in contrast to what is often assumed, this does not imply that the accounting-based estimates are useless or incrementally uninformative about business value. In fact, because the sources of pricing errors and valuation errors are different, it is reasonable to expect that we can create a better value measure by combining the estimates.

To illustrate this idea, consider a sample of US stocks for which I calculate two value estimates at the end of the fourth month of each fiscal year between 1984 and 2008. One estimate has been calculated by multiplying the average price-to-book ratio in the stock's industry during the previous five years with the stock's most recent book value of equity. The other estimate has been calculated using an abnormal earnings valuation model and analysts' consensus expectations of future earnings. If these accounting-based value estimates have any incremental information value over prices, their ratios to market prices would help to predict future stock returns. For example, high value-to-price ratios would reflect market underpricing and predict that prices revert to higher levels following the valuation date.

Panel A of Figure 2, which focuses on the market-to-book based value estimates, confirms that this prediction holds true. The portfolio containing the stocks with low values relative to price has an almost 12 percent lower stock return during the two years following the valuation date than the portfolio containing the stocks with high values. A relatively simple multiples-based valuation approach thus seems to provide information about value that is not reflected by market prices. The graph in Panel B of Figure 2, which displays the performance of portfolios based on forecast-based value estimates, exhibits a similar pattern.

Panel A: Market-to-book based value estimates



Panel B: Forecast based value estimates

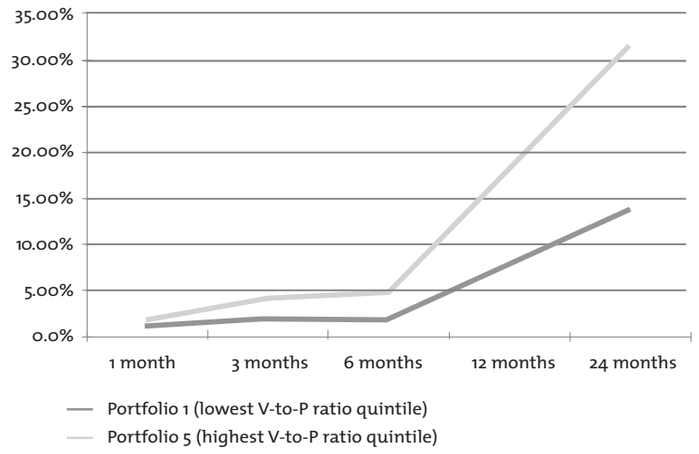


Figure 2. Future stock returns (following the valuation date) of equal-sized portfolios based on value-to-price ratios. Value estimates are based on historic industry market-to-book ratios (Panel A) or analysts' consensus earnings forecasts (Panel B) and calculated at the end of the fourth month of each fiscal year between 1984 and 2008.

The effect displayed in these graphs has received significant attention in the finance and accounting literature during the past decade-plus (see e.g., Frankel and Lee, 1998; Lee et al., 1999). Some authors have shown that this value-to-price effect can be at least partly attributed to investor sentiment (see e.g., Brown and Cliff, 2005), which would be consistent with my earlier arguments. Some may argue, however, that the observed effect can be fully explained by risk differences across firms (see e.g., Penman and Zhu 2011). I will discuss this possibility in more detail later.

First I will discuss a practical implication of the value-to-price effect that in my view has received little attention. In particular, if a value measure reflects information that is not revealed by prices, assuming that it is not risk-related, we should try to find a way to use this information in our fair value estimates.

Following Bayesian theory, an improved measure of business value could be calculated as a weighted average of the accounting-based and price-based value estimates, where the weights are proportional to the precision of the estimates:

$$\text{Combined measure} = w \times \text{Price - based value}_{it} + (1 - w) \times \text{Model - based value}_{it}$$

$$\text{where: } w = \frac{\text{Price precision}}{(\text{Price precision} + \text{model precision})}$$

Without going in detail on the underlying mathematics of this equation, there are a few things worth mentioning at this point.

- First, the idea of Bayesian belief updating is that a combined measure puts relatively more weight on the most accurate value estimate, which, in practice, is the market price. Note that this idea is consistent with regulators' belief that market prices are the most relevant input to fair value estimates.
- Second, any measure that provides information about business value, however small the amount of information, would receive a positive weight in the combined measure. This idea would go against the pure dominance of market prices in fair value estimation and proposes to use a combination of various valuation approaches. This is an approach commonly taken by practitioners when valuing an individual business.
- Third and finally, because the precision of prices cannot be observed, it seems complicated to determine the optimal weights in the equation. Luckily, there is a way to approximate the optimal historical weights, such that I am able to illustrate the potential economic relevance of using fundamental approaches in fair value estimation.

To estimate the optimal weights in the equation, I make use of the idea that the association between the value-to-price ratios and future returns can be fully

attributed to pricing errors. Following on from this idea, the coefficient on the value-to-price ratio in a regression of post-valuation date returns on the ratio forms a direct estimate of the weight. In the pooled sample of US stocks, the coefficients measuring the optimal historical weights are close to 7% for the market-to-book based value estimate and 9% for the analyst forecast-based value estimate. These weights are not shockingly high, but are still economically significant, especially so when one considers that the two relatively simple accounting-based value estimates can easily be improved. For example, if I take the average of the two accounting-based estimates to create a new value estimate, the newly created variable has a coefficient of 11.2%.

Now why do we tend to ignore accounting-based value estimates in practice? The reason for this is simple: in many situations there will be high uncertainty about exactly what the optimal weight is. That is, my estimate of the optimal weight is just an historical average weight. The true optimal weights are spread around this average and thus vary across stocks and years.

Another argument against combining accounting-based and price-based estimates is that the value-to-price ratio of an individual stock could measure the stock's risk, rather than mispricing. In fact, if market prices perfectly account for firm-specific risk but the accounting-based value estimate only accounts for economy-wide or industry-wide risk, the value-to-price ratio would start to reflect the relative riskiness of the stock and for this reason predict the stock's future returns. In such case the (natural log of the) ratio between the accounting-based value estimate and the market price would consist of three components, one of which reflects the relative riskiness of the stock:

$$\log(\text{Accounting-based value}_{it} / \text{Price}_{it}) =$$
$$\text{Valuation Error}_{it} - \text{Pricing Error}_{it} - (\text{Firm Risk Adjustment}_{it} - \text{Average Risk Adjustment})$$

I must admit that whether risk or mispricing explain the observed effects remains an open question, the answer to which also depends on our assumptions about market efficiency. Based on my previous discussion, my prior is that temporary mispricing, such as in bubbles, explains many of the observed effects. However, more research is certainly needed to get a more definite answer to this question.[13]

Just as importantly, I would argue that the propensity of the value-to-price ratio to reflect firm-specific risk is much less of a problem if we value a portfolio of stocks, which is essentially more relevant to banks or pension funds. Aggregation of market-based and accounting-based value estimates in portfolios leads to a gradual decrease in the size of the firm-specific noise and risk components of value estimates. In the limit, this would imply that only the time series variation in pricing and valuation errors matters to the valuation of portfolios.

Let me illustrate the effect of aggregation on pricing versus valuation errors, using the sample of US stocks. In a simulation study reported in Peek (2011a), I create random portfolios of stocks at the end of each month during the period 1984 to 2008. Using the previously described procedure I calculate optimal weights on accounting-based estimates for portfolios of different sizes. Figure 3 displays the upper and lower bounds of the distribution of weights as a function of the size of the portfolios of stocks.

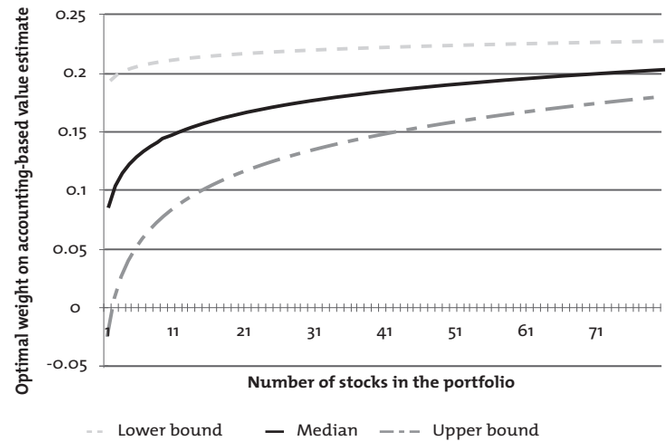


Figure 3. The relationship between optimal weights on accounting-based (market-to-book) portfolio value estimates and the number of stocks in a portfolio (Peek 2011a).

[13] To alleviate these concerns a little I have re-estimated the relationship between the value-to-price ratios and future returns after controlling for Fama and French's three risk factors. Also after controlling for risk in this way, the systematic relationship between value-to-price ratios and future returns remains significant.

Two important conclusions can be drawn from this figure. The first is that the average optimal weight on accounting-based value estimates increases if the size of the portfolio increases. This finding implies that in stock portfolios valuation errors appear to decrease faster than pricing errors. A reason for why pricing errors may persist also in portfolios is the presence of market-wide pricing errors, such as market bubbles, crashes or time-varying risk premiums.

A second conclusion is that the spread in the optimal weights decreases as a function of portfolio size, showing that there is more certainty about how to optimally combine price-based and accounting-based estimates of value in the valuation of portfolios rather than of individual stocks. All in all, these observations underline that accounting-based value estimates are especially helpful in correcting the mispricing of portfolios.

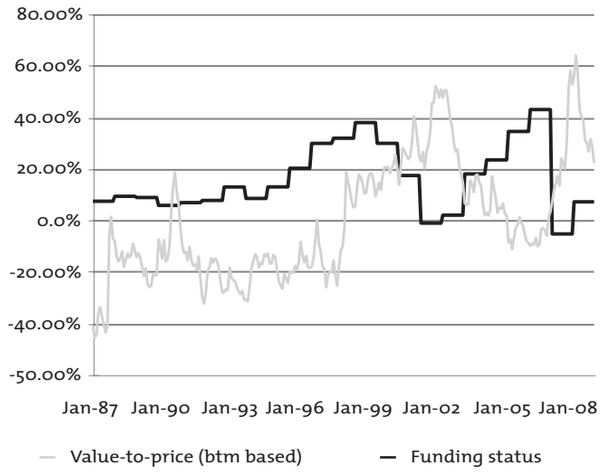
Some implications for regulators and standard setters

I now turn to describing implications of these observations for regulators and standard setters. In particular, I will briefly discuss two situations in which combining accounting-based value estimates with market prices may help to determine the value of the long-run pay-offs of a portfolio of businesses. These situations are: (1) pension valuation and (2) fair value accounting.

Pensions

In most pension funds the key issue is whether the pension's assets will generate sufficient cash flows in the long-run to cover all expected pension payments. This idea implies that what matters most to pension managers or participants is the fundamental value of pensions' assets, to which prices may eventually converge. For reasons explained earlier, at times the market prices of pension's assets may substantially deviate from their fundamental values. To illustrate this, Figure 4 displays an annual measure of Dutch pensions' funding status between 1987 and 2008 as well as the monthly averages of the value-to-price ratios estimated earlier. An obvious picture emerges from this figure, especially during the second half of the period when Dutch pension funds started to invest more in stocks: in times of high value-to-price ratios or negative market sentiment, pension funds are more likely to be underfunded.

Panel A: Market-to-book based value estimates



Panel B: Forecast based value estimates

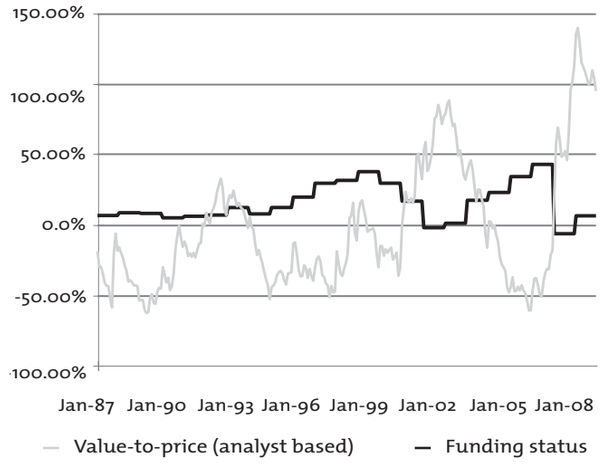


Figure 4. Monthly averages of value-to-price ratios and Dutch pension funds' funding status between 1987 and 2008. In Panel A value estimates are based on historic industry market-to-book ratios. In Panel B value estimates are based on analysts' consensus earnings forecasts.

The million-dollar question is, of course, what our pensions' funding status would be if we remove all variation in market sentiment. Answering this question with certainty is unfortunately not possible.[14] Nevertheless, the clear patterns in the figure on the slide help to get a preliminary answer and suggest that the impact of market sentiment on pensions' funding status can be substantial. In fact, the patterns seem to suggest that including accounting-based value estimates in the valuation of pensions at the end of 2008 could have turned pensions' deficit into a surplus.

Note that some might argue that stock prices at the end of 2008 were much closer to their "true" intrinsic values then ever before. If this holds true, however, it would certainly not invalidate my claim that pension valuation is over-reliant on market prices. On the contrary, an assumption that market prices were correct during the crisis would imply that more use of accounting-based value estimates in pension valuation before the crisis could have reduced the funding status of pensions earlier, which might have stimulated pension fund managers to take earlier precautionary action.

Fair value accounting

As indicated, corporations and banks must also sometimes value assets or liabilities at their fair values. If so, the International Financial Reporting Standards require that fair values reported in financial statements are measured following a fair value hierarchy (see IFRS 13). Only if quoted prices in active markets are not available can firms choose to use other observable inputs, such as adjusted prices, to measure fair value. Firms can use non-observable inputs, such as internal records, only as a last resort. To underline the relevance of my discussion, the accounting-based value estimates I have described earlier would be considered inputs of the lowest level in the fair value hierarchy.

The fair value hierarchy reflects the IASB's belief that market prices are the most accurate estimates of intrinsic value if such prices come from active markets.[15] One reason for this choice might be that they give preference to the reliability of quoted prices over the relevance of potentially subjective valuations. As I have shown that even value estimates that are based purely on audited accounting information can still be incrementally informative to market prices, I believe that reliability concerns should not withhold the IASB from giving greater weight to non-price value estimates.[16]

In sum, I believe that there is sufficient reason to develop and evaluate possible alternatives to a purely price-based approach to fair value accounting. Note that I am not proposing to abandon fair value accounting. Instead, I would argue that the fair value discussion has had the characteristics of a false dilemma. Historical cost accounting may not be the only alternative to market-to-market accounting. A potentially good alternative is an approach that mixes quoted prices and one or more accounting-based estimates. Alternatively, standard setters could consider requiring companies to disclose accounting-based value estimates in footnote disclosures.

Some implications for research(ers)

To conclude, my discussion also has implications for research, including my own research. Important questions that deserve our attention are, for example:[17]

- Which valuation models efficiently produce informative and reliable value-to-price ratios?
- To what extent do these value-to-price ratios reflect risk versus mispricing?
- What determines the optimal weights on such models in valuation?
- What determines the stability of optimal weights over time?
- If accounting-based value estimates were separately disclosed in the footnotes to financial statements, how would investors use this type of information?

[14] An additional complication is that pensions' funding status positively depends on the market interest rate, which in turn systematically varies with the market sentiment.

[15] Soon after the beginning of the credit crisis, when the markets for many of banks' financial instruments dried up, the IASB stressed the option of replacing quoted prices with adjusted prices in times of temporary illiquidity. Outside these periods, however, quoted prices are considered superior to any other type of input.

[16] In its Basis for Conclusions the IASB also defends its price-based approach by arguing that prices accurately reflect cash flow expectations. In fact, paragraph 39 of the Basis for Conclusions states that "Even if an entity intends to generate cash inflows from an asset by using it rather than by selling it, an exit price embodies expectations of cash flows arising from the use of the asset by selling it to a market participant that would use it in the same way. That is because a market participant buyer will pay only for the benefits it expects to generate from the use (or sale) of the asset" (BC39). As indicated, much research has shown that market prices do not always accurately reflect all cash flow information, thus invalidating this argument.

[17] On a more philosophical level, an interesting question might be whether the time variation in mispricing should affect pension valuation or fair value accounting in the same way as the time variation in risk or risk premiums.

I will now turn to discussing the use of fundamental information in risk measurement.

5. Accounting-based risk measurement

The challenge in business valuation is not only to accurately estimate the future pay-offs of a business, but also to assess the risk of such pay-offs. The impact of priced risk on the value of businesses can be substantial. Consider the example of the German sports manufacturer Puma, which had a share price of close to 220 euro at the end of September. Puma's share price can be broken down into three parts:

– The first component is the book value of the amount invested in the company by its shareholders, labeled the book value of equity, which was close to €92 per share.

– The second component is the value of the earnings that Puma is expected to generate in the foreseeable future, in excess of the return required by investors. In fact, given analysts' expectations about Puma's net profits in the next three years, this component has a current (incremental) value of slightly more than €20 per share.[18]

– The third and final component is the value generated in the more distant future, which, given the current share price, equals almost €108 per share.

The second and third components are based on expectations and could therefore be classified as "risky" components. In a world without risk, where an investment in Puma would be just as risky as a savings account, the current value of Puma's expected profits would be significantly higher. In fact, under some strict assumptions we could calculate that Puma's value would be close to g1000, or 4.5 times its current share price. In the sample of US stocks, this ratio between "risk-free values" and actual stock prices is, on average, 2.3, underlining the economic relevance of risk.[19]

[18] I assume that shareholders' required return is 9 percent. Expected net profits equal €14.94, €16.76, and €19.26 per share.

[19] I must admit that, before interpreting these ratios, a caveat is in order here. A systematic optimistic bias in the forecasts that I use to estimate the theoretical values might potentially inflate the difference between the risk-free values and the observed market prices. Nonetheless, even with some conservatism, the ratios clearly show that the market's average discount for equity risk is significant.

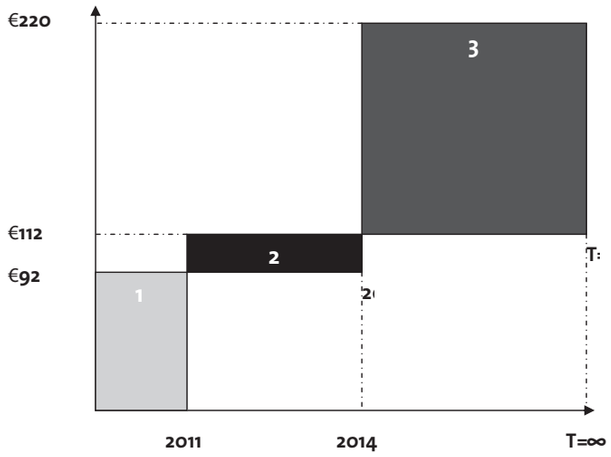


Figure 5. Components of Puma's 30/9/2011 share price.

A large number of (primarily) finance studies have dealt with understanding and predicting the discount for equity risk. Finance theory predicts that investors demand compensation for the risk that the return on an investment in, for example, Puma positively correlates with the returns on other investments, such that the investment in Puma offers little income insurance. Following this basic principle, researchers and practitioners typically derive risk estimates from the historical associations between stock returns and economic factors or market returns.[20]

In my view, there is something strange about the way in which we typically measure risk in a business valuation. As shown in the Puma example, the first step in valuation consists of predicting future pay-offs, such as profits. Given this starting point, the most obvious second step would be to assess the risk that each realization of expected pay-offs depends on future changes in one or more economic factors. These risk estimates would ultimately determine the weights that we assign to each future profit figure in calculating value.

[20] For example, in many practical applications risk is measured as the correlation between, say, sixty monthly returns of a security and sixty monthly returns of a market index. If I estimate this same measure for the sample of US stocks regress the decile-ranked measure on the annual risk adjustments (i.e., the difference between the risk-free present values and the market price, scaled by the market price), it explains close to 3 percent of the adjustments.

In contrast to taking this obvious approach, traditionally we measure the risk of past stock returns rather than future pay-offs, and apply an average "backward-looking" discount rate to all future pay-offs. For example, based on past returns we could classify the Puma stock as a cyclical stock, a stock whose value closely follows the fluctuations of the market. For such a stock, we would then assume that investors demand a constant future risk premium that is close to the historical market risk premium of, say, 5 percent. In light of the first part of my discussion, this backward-looking approach seems to have some obvious limitations. Short-term returns can be correlated across securities and thus appear risky for other reasons than fundamental risk.[21] If we wish to take a long-run perspective to valuation, short-term return covariances may therefore not be the appropriate basis for risk measurement.

A possible way around the disconnect between the fundamentals-based approach to pay-off forecasting and the return-based approach to risk estimation is to use fundamentals also in the estimation of risk (Nekrasov and Shroff, 2009; Pope, 2010). To illustrate the potential relevance of accounting information in risk measurement, it is helpful to reframe the capital asset pricing model in terms of value and future cash flows. In particular, the current value of a future cash flow can be written as the sum of the risk-free value of the cash flow and a risk adjustment term (Fama, 1976; Lambert et al., 2007):

$$\text{Current value} = \frac{\text{Future Cash Flow}_{t+n}}{(1+\text{risk free rate})^n} - \text{Risk adjustment}$$

$$= \frac{\text{Future Cash Flow}_{t+n}}{(1+\text{risk free rate})^n} - \pi \times \text{Future Cash Flow - Market Covariance}_{t+n}$$

In this equation, π is the price of market risk.

This cash-flow-based version of the CAPM model illustrates at least two issues that are relevant from an accounting perspective:

1 First, considering that the value of a business is the sum of the current values of a set of individual cash flows, each with its own covariance term, the model shows that risk adjustment is essentially a cash-flow-specific exercise.

2 Second, the covariance driving the risk adjustment is an expected covariance, estimated conditional on the information that is currently available to investors.

[21] Such other reasons could be, for example, the occurrence of investor herding, bubbles, and crashes.

I will discuss a few implications of these two observations that, in my view, deserve more attention.

One implication of the first observation is that a risk measurement approach based on historical returns and constant discount rates is inevitably noisy. Another implication is that risk measurement should be an integral part of forecasting. For example, a sensitivity analysis of how cash flow predictions change if future economic circumstances change could help to estimate the risk adjustment. A clear advantage of such an approach is not only that it would be theoretically correct but also that it would not rely on the availability of a set of accurate and unbiased historical stock returns. This approach could therefore be helpful in valuing private firms or in estimating risk when historical return-based risk estimates are instable or otherwise unreliable.

There is certainly much work to be done for accounting researchers in this area. As argued, it is well established that accounting information is helpful in predicting future cash flows. A relevant research question is what role accounting information can play in informing investors about the sensitivities of future cash flows to economic factors. To illustrate this, consider an alternative version of the previous equation, defining the risk premium in terms of returns:

$$\text{Risk premium} = \frac{\text{Expected return - risk freerate}}{(1 + \text{expected return})(1 + \text{risk free rate})}$$

$$= \pi \times \frac{\text{Future Cash Flow - Market Covariance}_{t+n}}{(\text{Future Cash Flow})_{t+n}}$$

What this equation shows is that the risk premium decreases if the expected cash flow increases without affecting the covariance term. Some firm-specific factors that could potentially influence the expected ratio between cash flow covariance and cash flow are: future changes in the efficiency of inventory management, selling or overhead activities, changes in economies of scale, or expected economic losses arising from fraud or poor governance. Financial statements offer a wide variety of information that could help in identifying these factors and measuring their impact on future risk. Understanding, exploring and communicating this potential role of accounting is, in my view, one of the challenging tasks of accounting researchers and educators.

Let me give one brief example of how this might work. Prior research has found much evidence that the expected returns of large firms are significantly smaller than those of small firms. Despite the evidence, we still do not seem to know much about the causes of the firm size effect (van Dijk, 2011).[22] Analyzing the accounting data of small and large firms may help to find some new explanations for this effect. To illustrate this, Figure 6 displays the covariance of firm-specific accounting returns on assets with the market-wide return on assets, estimated by size portfolio. What the pattern in covariance terms confirms is that smaller firms have greater systematic risk. From an accounting perspective, an equally interesting observation is that smaller firms are also systematically less profitable than larger firms. As a consequence, the ratio between the covariance and the mean, which combines the two effects, decreases with firm size. This exploratory analysis suggests that the firm size effect on the cost of equity may not only result from differences in systematic risk but also from differences in operational efficiency, possibly caused by economies of scale. It illustrates how accounting may help in understanding risk adjustments from a more fundamental perspective.

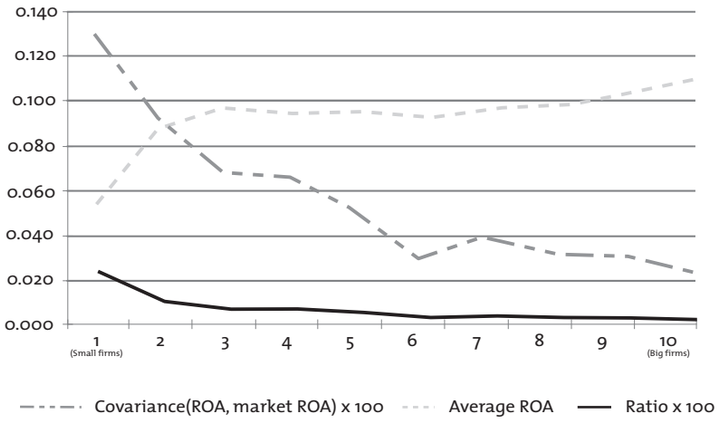


Figure 6. The ratio between (a) the covariance of firm-specific ROA and market ROA and (b) average ROA, estimated by firm size portfolio.

[22] This uncertainty about what drives the size effect in turn motivates many researchers and practitioners to question the existence of the effect.

The second observation made earlier implies that there is a clear role for the precision of pay-off estimates in risk measurement. Recall, for example, the three components of Puma's stock value. It is intuitive that the risk adjustment for the third value component is larger than the risk adjustment for the second component. This is because the conditionally expected covariance of future pay-offs with economic factors tends to increase with the forecast horizon.

In Peek (2011b), I derive a way to estimate the covariance of firm-specific abnormal accounting returns and market-wide returns, conditional on analysts' expectations of future earnings. Having an estimate of conditional covariance creates new opportunities to examine the drivers of risk adjustments. To illustrate this, consider Figure 7. In this figure, I have plotted estimates of the conditional covariance against the length of the analysts' forecast horizon, measured in months. This figure clearly shows that the more distant the realization of an earnings estimate, the greater the expected covariance of the estimate with the market. This effect is also stronger for smaller firms, which suggests that differences in information quality between small and large firms may contribute to explaining the firm size effect on expected returns. All in all, this example also illustrates how shifting our focus from the traditional returns-based risk measurement approach to a more fundamental approach can help to generate new insights into risk measurement.

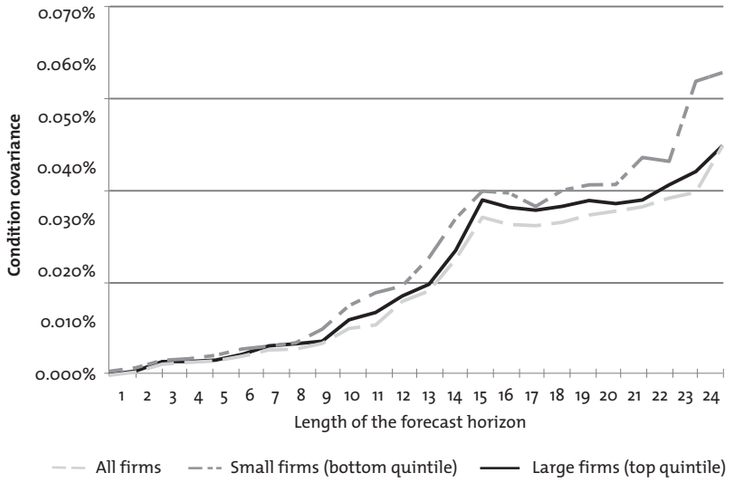


Figure 7. The relationship between (a) estimates of the covariance of firm-specific abnormal accounting returns and market-wide returns, conditional on analysts' expectations of future earnings, and (b) the length of analysts' forecast horizon.

6. Conclusion

In summary, in this inaugural address I describe that two systems – a market-based system and an accounting-based system – can provide incrementally useful information about business values and business risk. Acknowledging this, rather than assuming that estimates and techniques based on market prices are superior by default, not only creates new research opportunities but could ultimately improve business valuation practices.

7. Thanks

At the end of this inaugural address I wish to thank all those who have made my appointment at Erasmus University possible and those who have supported or inspired me during the years leading up to this moment.

Distinguished Board, President and Deans of Erasmus University, Vereniging Trustfonds Erasmus University, Duff & Phelps, and Members of the Appointment and Advisory Committee, I thank you for your joint efforts in establishing the Chair in Business Analysis and Valuation and for the confidence you have placed in me. I gratefully accept the position and will do my very best to make this a great success.

Henk Oosterhout, Roger Grabowski, and many others at Duff & Phelps, I thank you for a fruitful cooperation so far. I look forward to continuing our journey and hope that our joint projects will not only inspire us but also help in bringing academics and professionals closer together.

Frank and Gerard, I thank you for asking me to join RSM and for supporting me during a sometimes turbulent first year. Gerard, working with you has been a pleasure that I hope will continue in the future, despite the distance. Frank, I look forward to working with you on a great future for our department.

My Accounting and Finance colleagues at RSM and ESE, thank you for creating an enjoyable working environment. I'm confident that we are at the beginning of great developments and I am proud to be part of this group of ambitious researchers.

My former colleagues at Maastricht University, I owe you much gratitude for creating a research environment and social environment that helped me develop into the researcher I am today. I often still miss the intense discussions and enjoyable coffee breaks we had and look forward to some frequent future visits.

Lieve ouders, ik ben jullie dankbaar voor jullie onuitputtelijke steun. Jullie steun heeft mij altijd weer geholpen om met vertrouwen nieuwe avonturen aan te gaan. Ook bij dit nieuwe avontuur is jullie steun van grote waarde.

Lieve Mariella, Max, Lars en Joris, in de afgelopen jaren heb ik jullie van de ene naar de andere plek gesleept, dit alles in het teken van mijn carrière. Ondanks alle veranderingen in een korte tijd, heb ik jullie nooit horen klagen. Het heeft ons nog dichter bij elkaar gebracht. Ik ben jullie dankbaar voor alle liefde en plezier die we hebben gedeeld en verheug me op een toekomst met minder hectiek.

Ik heb gezegd.

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