Bloomberg

Unstoppable $100 Trillion Bond Market Renders Models Useless

By Susanne Walker and Liz Capo McCormick - Jun 2, 2014

If the insatiable demand for bonds has upended the models you use to value them, you're not alone.

Just last month, researchers at the Federal Reserve Bank of New York retooled a gauge of relative yields on Treasuries, casting aside three decades of data that incorporated estimates for market rates from professional forecasters. Priya Misra, the head of U.S. rates strategy at Bank of America Corp., says a risk metric she's relied on hasn't worked since March.

After unprecedented stimulus by the Fed and other central banks made many traditional models useless, investors and analysts alike are having to reshape their understanding of cheap and expensive as the global market for bonds balloons to $100 trillion. With the world's biggest economies struggling to grow and inflation nowhere in sight, catchphrases such as "new neutral" and "no normal" are gaining currency to describe a reality where bonds are rallying the most in a decade.

"The world's gotten more complicated and it's a little different," James Evans, a New York-based money manager at Brown Brothers Harriman & Co., which oversees $30 billion, said in a telephone interview on May 30. "As far as predicting direction up and down, I don't think they have much value,"referring to bond-market models used by forecasters.

Flawed Consensus

With the Fed paring its $85 billion-a-month bond buying program this year and economists calling for the five-year-long U.S. expansion to finally take off, Wall Street prognosticators said at the start of the year that yields were bound to rise as central banks began employing tighter monetary policies.

Instead, investors poured into bonds of all types as global growth weakened, disinflation emerged in Europe and tensions between Ukraine and Russia intensified.

Globally, bonds have returned an average 3.89 percent this year for the biggest year-to-date gain since 2003, index data compiled by Bank of America Merrill Lynch show. The advance decreased yields on 10-year Treasuries by more than a half percentage point to 2.48 percent, the fastest pace over the same span since 1995, while borrowing costs for the riskiest U.S. companies tumbled to a record 5.94 percent last week.

Benchmark Treasury 10-year note yields rose six basis points, or 0.06 percentage point, to 2.53 percent as of 3:36 p.m. New York time.

In developed countries, benchmark yields in 24 of 25 nations tracked by Bloomberg have fallen this year, with those in Italy and Spain closing below 3 percent for the first time.

‘How Wrong’

“I don’t expect the consensus to be right, I’m just surprised by how wrong it has been,” Jim Bianco, president of Chicago-based Bianco Research LLC, said by telephone on May 28.

The seemingly unstoppable rally has caused bond-market professionals to reassess whether they’re using the right tools.

At the New York Fed, researchers Tobias Adrian, Richard Crump, Benjamin Mills and Emanuel Moench on May 12 released an updated methodology for a metric known as the term premium, which can be used to determine whether 10-year Treasuries are cheap or expensive relative to short -term rates.

After stripping out all human predictions and using only market prices to calculate future expectations, the researchers found the extra yield longer-term Treasuries offered has been“considerably higher since the onset of the financial crisis”than previous models, according to their blog post that included the data. That may be because the metric now suggests the Fed’s short -term interest rate may not rise as high as survey-based results predicted, wrote the economists.

Old Model

Based on the old model, last updated on March 31, the term premium on 10-year notes was 0.25 percentage point, versus 0.96 percentage point on the same day using the current methodology. The reading was at 0.67 percentage point last week.

The researchers declined to comment beyond the blog post, according to Eric Pajonk, a spokesman at the New York Fed.

Bank of America's Misra says she stopped looking at the gap between the rate on 10-year interest-rate swaps and yields on benchmark government debt as a measure of risk.

The gauge, which usually widens as investors seek out haven assets in times of stress, is being distorted as those betting on losses in Treasuries have unwound their trades, she said.

Hedge funds and other large speculators cut their net short positions in 10-year note futures by the most since February as of May 27, according to data from the U.S. Commodity Futures Trading Commission. Primary dealers, which had net shortpositions in March for the first time since 2011, have since reversed those wagers, data compiled by Bloomberg show.

Forced Buying

"Everyone is short and they are forced to cover," Misra said by telephone on May 28.

While economists and strategists have reduced their yield forecasts, they're still sticking to the view borrowing costs will end the year higher as the economy gains momentum.

They now see yields on 10-year Treasuries rising to 3.25 percent by year-end as the economy accelerates 3.1 percent in 2015, estimates compiled by Bloomberg show. At the start of the year, the median yield forecast was 3.44 percent.

Investors risk becoming lulled into complacency by six years of near-zero U.S. interest rates at a time when yields are so low, according to Zach Pandl, the Minneapolis-based senior interest-rate strategist at Columbia Management Investment Advisers, which oversees $340 billion.

Pandl, who developed his own version of the term premium, maintains that U.S. government bonds are too expensive.

"The Treasury market is overvalued," he said by telephone on May 28. "The funds rate has been at zero for so long so it becomes difficult to envision it being higher at all. Monetary policy is closer to exit."

Biggest Mistake

Traditional models are failing to explain the resilience of fixed-income assets as central banks led by the Fed pumptrillions of dollars into their economies and suppress short-term rates at historical lows, according to Bianco.

The Fed, Bank of Japan and Bank of England all have quantitative-easing programs in place, while at least two dozen nations have dropped benchmark rates to 1 percent or less.

"The biggest mistake for people is they think interest rates are merely a projection of where the economy is supposed to go," Bianco said. "It's the Fed and the way they have changed the marketplace." He foresees that yields on 10-year notes will end the year at 2 percent to 2.5 percent.

Fed Chair Janet Yellen said on May 7 there will be"considerable time" before the central bank raises its benchmark rate as slack in the jobs market keeps inflation below its 2 percent target.

Household spending declined in April, while the world's largest economy contracted in the first quarter for the first time since 2011, government reports showed last week.

"Given the outlook for the global economy and inflation, bonds are not a bad place to be," Gary Pollack, the New York-based head of fixed-income trading at Deutsche Bank AG's private-wealth management unit, which oversees $12 billion, said in a telephone interview on May 28.

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BUSINESS INSIDER

CHART OF THE DAY: Tepper, Birinyi, Damodaran, O'Neill, Ritholtz All Love This Bullish Stock Market Metric

Sam Ro
May 14, 2013, 12:36 PM

With the S&P 500 at an all-time high, many stock market pundits have grown increasingly cautious.

However, the savviest experts are reiterating their bullishness, and they are all pointing to one metric: the equity risk premium.

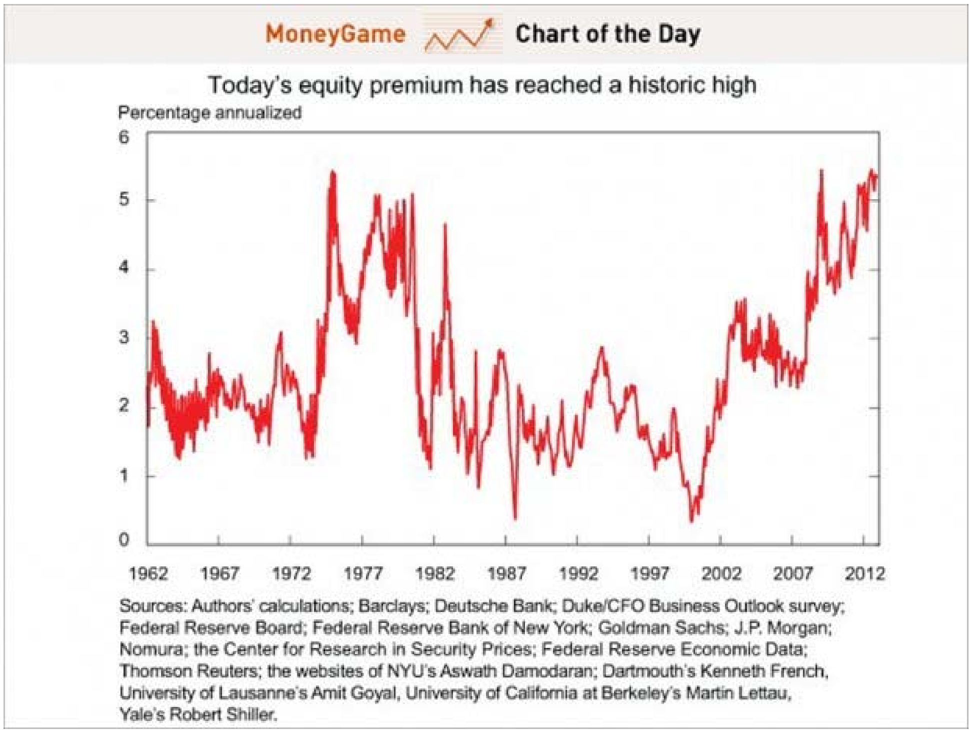
"The equity risk premium is the key to investing and valuation," says legendary NYU finance professor Aswath Damodaran,

The equity risk premium can be defined simply as the expected return on a broad stock market index in excess of the long-term risk-free rate, which is often measured by a government bond yield.

Markets spiked this morning when influential hedge fund manager David Tepper held up a chart of the equity risk premium as he presented his uber-bullish case for stocks during a CNBC appearance.

Blogger extraordinaire Barry Ritholtz and stock market legend Laszlo Birinyi each pointed us to Tepper's exact chart last week. Birinyi confident we'll see the S&P 500 pass 1,700 this year, and 1,900 relatively soon.

Jim O'Neill, the now retired economist from Goldman Sachs, has long been bullish on stocks thanks to the equity risk premium. In the final slide of his final presentation, O'Neill argued, "Current ERP levels continue to indicate that equity markets are still quite attractive in many parts of the world."



Liberty Street Economics

Why do Analysts Issue Long-term Earnings Growth Forecasts?

An Empirical Analysis

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ABSTRACT

We examine analysts' motives to issue long-term earning growth (LTG) forecasts. We find that analysts are more likely to issue LTG forecasts when their incentive to please managers is strong. In addition, analysts are more likely to choose firms that they are more optimistic about for LTG coverage. We find mixed evidence regarding whether analysts issue LTG forecasts to signal their ability or to meet investors' informational needs. Augmenting Ljungqvist et al (2006), we show that LTG forecasts are issued less likely to please managers, but more likely to meet investors' information needs in the presence of high institutional ownership.

1. Introduction

While the extant literature (e.g., Chan, Karceski and Lakonishok (2003)) yields overwhelming evidence on the over-optimism and inaccuracy of long-term earnings growth (LTG) forecasts, it remains silent on why analysts issue these forecasts, a question that becomes even more intriguing given the more voluntary nature of LTG forecasts compared with their near-term counterparts. That is, why do some analysts issue for some companies LTG forecasts, which are often deemed as extremely inaccurate and overly optimistic, when they can choose not to? This study offers insights into this question by empirically examining four non-exclusive hypotheses: analysts issue LTG forecasts to signal their ability, to reveal their optimism, to please the management (since these forecasts are overly optimistic), and to satisfy investors' informational needs.

With one-year-ahead annual earnings forecasts as the benchmark sample, we test our hypotheses jointly in a fixed-effect framework with analyst-year (or analyst) effect fixed to ensure that our results are not driven by unobserved analyst-level heterogeneity such as analyst peculiarities.

We document evidence for the manager pleasing and optimism revealing hypothesis, but mixed results for the analyst ability signaling and investor informational needs satisfying motives. Augmenting Ljungqvist et al (2006)'s finding about institutional investors' moderating role in analyst research, we find that analysts are less (more) likely to issue long-term forecasts for companies with large institutional ownership to please managers (to meet investors' information needs).

Our paper contributes to the literature in several ways. First, our results suggest that LTG forecasts may serve as a manipulative tool for analysts to please managers. Therefore, conflicts of interest may affect not only the quality of analyst research, such as the biases of analyst recommendations as examined by previous literature, but also the type of information included in the analyst reports. This motive may partly explain the documented over-optimism in LTG forecasts.

An examination of the providence of LTG forecasts offers several advantages in the investigation of interest conflicts. For example, due to reputation concerns, analysts are less likely to bias their near-term forecasts or recommendations. However, with accuracy, and thus reputation loss, not a primary concern, the voluntarily provided LTG forecasts provide a cleaner setting to study motives related to conflict of interest. Furthermore, the quality of analyst earnings forecasts and recommendations may depend not only on analyst incentives but also on analyst ability and even factors beyond analysts' control. For example, less able or less fortunate analysts may appear to issue biased recommendation in absence of incentives to please managers. The decision to provide LTG forecasts, however, is not affected by so many complicating influences. Instead, it is totally in analysts' control and involves little analyst ability.

Furthermore, our results augment Ljungqvist et al (2006)'s finding about the role of institutional investors in analyst research. We find evidence that higher institutional ownership reduces the likelihood of analysts issuing LTG forecasts to please mangers. Furthermore, we show that the presence of higher institutional ownership makes analysts more responsive to investors' information needs.

The remainder of the paper proceeds as follows. Section 2 develops hypotheses. Section 3 discusses our data, sample, variables, and summary statistics. Section 4 presents the main results. Section 5 examines the role of institutional investors in analysts' motives of LTG forecast issuance. Section 6 concludes.

2. Hypotheses development

2.1 Characteristics of LTG forecasts

There is a growing body of literature on LTG forecasts. La Porta (1996) finds that investment strategies seeking to exploit errors in analysts' forecasts earn superior returns because expectations about future growth in earnings are too extreme. Dechow and Sloan (1997) also document that naive reliance on analysts' forecasts of future earnings growth can explain over half of the higher returns to contrarian investment strategies. Harris (1999) reports three characteristics of LTG forecasts: (1) they are extremely low in accuracy; (2) they are inferior to the forecasts of a naïve model in which earnings are assumed to follow a martingale, and (3) they are significantly over-optimistic, exceeding the actual growth rate by an average of seven percent per annum. Chan, Karceski and Lakonishok (2003) analyze historical long-term growth rates across a broad cross section of stocks and show that I/B/E/S growth forecasts are overly optimistic and add little predictive power.

In the setting of IPOs, prior literature suggests that conflict of interests plays an important role in the optimism of LTG forecasts. For example, Rajan and Servaes (1997) examine data on analyst following for a sample of initial public offerings completed between 1975 and 1987, and find that analysts are overoptimistic about the earnings potential and long-term growth prospects of recent IPOs. They further document that, in the long run, IPOs have better stock performance when analysts ascribe low growth potential rather than high growth potential. Lin and McNichols (1998) find that lead and co-underwriter analysts' growth forecasts and recommendations are significantly more favorable than those made by unaffiliated analysts, although their earnings forecasts are not generally greater. Purnanandam and Swaminathan (2004) also document that, ex post, the projected high growth of overvalued IPOs fails to materialize, while their profitability declines from pre-IPO levels. Their results suggest that IPO investors are deceived by optimistic growth forecasts and pay insufficient attention to profitability in valuing IPOs.

2.2 Why do analysts issue LTG forecasts?

In this section, we develop four non-exclusive testable hypotheses about the supply of long-term forecasts, which are analyst ability signaling, optimism revealing, management pleasing, and investor information needs satisfying. We also discuss the role of analyst peculiarity in LTG forecast issuance.

A) Analyst ability signaling

At first sight, it may seem reasonable that the highly inaccurate and optimistic LTG forecasts are associated with low-quality analysts. However, while LTG forecasts are highly inaccurate and overly optimistic ex post, they may provide useful information to investors when they are published. The huge errors we observe ex post might just reflect the difficulty in projecting earnings growth far into the future.

Besides, analysts don't have to provide LTG forecasts. Since it is a challenging job to forecast the far future, only high-ability analysts are confident enough to issue LTG forecasts. Therefore, we argue that analysts are more likely to issue LTG forecasts when they are of higher ability, or at least, they perceive themselves as of higher ability.

H1: Analysts of higher ability are more likely to issue LTG forecasts.

B) Analyst optimism revealing

McNichols and O'Brien (1997) find evidence of self-selection bias in analyst coverage. Specifically, they show that analysts tend to add firms they view favorably and drop firms they view unfavorably. Along the same line of thinking, we argue that there is a self-selection bias in the providing of LTG forecasts as well. After all, analysts should have stronger incentives to collect long-term company-specific information when they are confident in the company's future.

The documented optimistic nature of LTG forecasts also appears to suggest that analysts who are more optimistic about the company are more likely to issue long-term forecasts. Thus, we expect analysts to be more likely to issue LTG forecasts when they are more optimistic about the company's future.

H2: Analysts are more likely to issue LTG forecasts for companies they are more optimistic about.

C) Management Pleasing

In practice, sell-side analysts often find themselves serving two masters. On the one hand, they serve investors, and thus aim at providing accurate and reliable research. On the other hand, their incentives to please the managers often obscure their goal of "objectivity", making the company they cover their other master. At the very least, analysts are often afraid to offend managers by providing unfavorable opinions partially because managers may withhold information from those analysts they are unhappy with (e.g., Lim (2001)).

In addition to informational concerns, analysts face an even higher stake when the company they cover is also an investment banking customer of the investment bank the analysts are affiliated with. There is a growing body of literature examining the role interest conflict plays in various aspects of analyst research. Dugar and Nathan (1995) show that analysts whose employers have an investment banking relationship with a company issue more favorable recommendations. Lin and McNichols (1998) find that lead and co-underwriter analysts' growth forecasts and recommendations are significantly more favorable than those made by unaffiliated analysts, although their earnings forecasts are not generally greater. Michaely and Womack (1999) document that stocks that underwriter analysts recommend perform more poorly than 'buy' recommendations by unaffiliated brokers prior to, at the time of, and subsequent to the recommendation date, and further show that the market does not recognize the full extent of this bias. Agrawal and Chen (2005a) find that potential investment banking relationship has no effect on quarterly earnings forecasts, but is positively associated with more optimistic long-term growth forecasts. Agrawal and Chen (2005b) show that analyst recommendation levels are positively associated with the magnitude of conflicts they face, but investors recognize analysts' conflicts and properly discount analysts' opinions. O'Brien, McNichols and Lin (2005) find that affiliated analysts are slower to downgrade from the "Buy" and "Hold" recommendations and significantly faster to upgrade from the "Hold" recommendations. James and Karceski (2006) document that underwriter-affiliated analysts provide protection in the form of "booster shots" of stronger coverage if the IPO firm experiences poor aftermarket stock performance. Ljungqvist et al (2006) confirm the positive relation between investment banking and brokerage pressure and analyst recommendations, and further show that both bank reputation and institutional investors serve as moderating forces that temper analyst optimism.

Regarding LTG forecasts, prior literature also finds substantial evidence that investment banking relationship contributes to the extreme optimism in long-term earnings growth forecasts (e.g., Rajan and Servaes (1997) and Purnanandam and Swaminathan (2004)). Agrawal and Chen (2005a) suggest that analysts do not respond to conflicts by biasing short-term (quarterly EPS) forecasts, but appear to succumb to conflicts when making LTG forecasts. After all, in the case of LTG forecasts, which are often neglected by investors who put heavy weight on analyst near-term forecasts and recommendations, there is only one master left: the company they cover. Furthermore, given that LTG forecast are relatively difficult to verify ex post, the reputation loss associated with an inaccurate LTG forecast is minimal.

One may argue that analysts should be indifferent to LTG forecast issuance because these forecasts are generally ignored by investors and thus do not benefit managers at the cost of investors. However, conflict of interest, although behavior-altering, does not necessarily affect the interest of the third party. Instead, it is rational for analysts to respond to conflict of interest in a way less harmful to investors. The voting behavior of mutual fund managers documented by Davis and Kim (2006) may lend support to this view. Specifically, Davis and Kim (2006) find that mutual fund managers appear to side with management especially when there is no clear evidence that the measure being voted on have an impact on shareholder wealth. Therefore, we argue that, due to the general ignorance by investors, LTG forecasts may be subject to analyst manipulation to please the companies they cover.

H3: The supply of (optimistic) LTG forecasts is positively related to analysts' incentive to please managers.

D) Investor Information Need Satisfying

Defond and Hung (2003) document that financial analysts respond to market-based incentives to provide investors with value-relevant information. In particular, they find that analysts tend to forecast cash flows for firms whose accounting, operating and financing characteristics suggest that cash flows are useful in interpreting earnings and assessing firm viability. Along the same line, we expect that analysts provide LTG forecasts for firms whose long-term prospects are especially important for the valuation of their stocks. Therefore, we expect companies with large growth options to be more likely to receive LTG forecasts.

H4.1: Companies with larger growth options are more likely to receive LTG forecasts.

Meanwhile, Ljungqvist et al (2006) suggest that institutional investors serve as the ultimate arbiters of an analyst's reputation. Furthermore, institutional investors tend to be sophisticated users of the information analysts provide, who are therefore more likely to demand long-term information in their decision process. Consequently, analysts should be more likely to supply detailed research including a firm's long-term prospects when they know that the report is more likely to be read by institutional investors. Therefore, we expect companies with higher institutional investor ownership to be more likely to receive LTG forecasts.

H4.2: Companies with higher institutional investor ownership are more likely to receive LTG forecasts.

E) Analyst peculiarity

In addition to the four hypotheses we develop above, it is possible that the issuance of LTG forecasts depends on the peculiarities of analysts, such as their working habits and tastes. If this is true, we should find no systematic pattern in the issuance of LTG forecasts. In addition, we should find little variation in the issuance decision of a particular analyst covering several companies.

2.3 Institutional investors' role in analysts' motives to issue LTG forecasts

Ljungqvist et al (2006) document the role of institutional investors in moderating conflicts of interest in analyst research. They argue that driven by their career concerns, analysts are less likely to succumb to investment banking pressure in stocks that are highly visible to their institutional investor constituency.

In addition, underlying our hypotheses, we assume that long-term forecasts can be manipulated because the little attention they receive from investors. However, unlike individual investors, who may be more focused on analyst recommendations and near-term earnings forecasts while totally neglecting long-term forecasts, institutional investors read analyst reports thoroughly and put more weights on the contents instead. Consistently, Mikhail, Walther, and Willis (2006) find evidence that large investors are more sophisticated processors of information, while small investors are more easily misled by analyst research. Therefore, we expect analysts less likely to issue LTG forecasts to please managers for companies heavily owned by institutional investors. For the same reason, we also expect the presence of institutional investors to enhance analysts' incentives to issue LTG forecasts when long-term information is valuable to investors.

Overall, we hypothesize that the presence of institutional investors is negatively (positively) relate to analysts' manager-pleasing (investor information needs satisfying) motives to issue LTG forecasts.

H5: Analysts are less (more) likely to issue LTG forecasts to companies with large institutional ownership to please managers (to meet investors' information needs).

3. Data, sample, variables, and summary statistics

3.1 Data and sample

As in Defond and Hung (2003), we collect one-year-ahead annual earnings forecasts (FY1) as our benchmark sample to control for other factors that affect the availability of LTG forecasts.[1] We collect the one-year-ahead annual earnings forecasts in the I/B/E/S detail history file from year 1991 to 2003. We identify each analyst-firm-(forecast) year combination[2] and check whether there is any LTG forecast associated with these analyst-firm-year combinations. LTG forecasts are the long-term earnings growth forecasts as collected by I/B/E/S, which usually covers a five-year period that begins on the first day of the current fiscal year.

Panel A of Table 1 reports the number and proportion of firm-analyst pairs, analysts,

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[1] The LTG forecasts, as collected by I/B/E/S, usually cover a five-year period that begins on the first day of the current fiscal year.

[2] Instead of using the year for which a forecast is made, we use the year during which a forecast is made. For example, the time stamp for a one-year-ahead forecast that is made in 2000 but for the Dec. 2001 fiscal quarter will be 2000 instead of 2001. We do so because we expect the decision to supply the forecasts are more economically related to the factors prevalent during the time the estimations are made

and firms associated with LTG forecasts by year. We observe significant variations in the size of the benchmark sample over the sample period. However, the proportions of analyst-firm associated with LTG forecasts demonstrate only small variations over years except for year 2003, which is associated with the lowest proportion of LTG forecast coverage. Specifically, the proportion of firm-analyst pairs that are associated with LTG forecasts is in the 42-47 percent range over period 1991-2002. Analysts who issue LTG forecasts account for around 58 percent of all the analysts who issue one-year-ahead earnings forecasts each year. The number of firms receiving analyst one-year-ahead forecasts peaked in 1996 with 1,149 firms covered, but dropped dramatically thereafter. In 2003, only 280 firms receive one-year-ahead forecasts from any analysts. The proportion of firms receiving LTG forecasts also seems to decrease over time.

3.2 Variables

(a) LTG Issuance

LTG is a dummy variable that equals one if the observation is associated with long-term earnings growth forecasts (LTG) as reported in I/B/E/S, and zero otherwise.

(b) Analyst Ability

We adopt three sets of analyst ability measures. The first is analyst experience, which is adopted by many prior studies as proxies for analyst ability and skill. For example, Clement (1999) finds that forecast accuracy is positively associated with analysts' experience. Mikhail, Walther and Willis (2003) find that analysts underreact to prior earnings information less as their experience increases, suggesting one reason why analysts become more accurate with experience. Following prior literature, we introduce two experience measures. The general experience of the analysts (Exp1) is defined as the number of years the analysts have issued earnings forecasts of any type for any company since 1983, when the sample period of I/B/E/S starts. Analysts' firm-specific experience (Exp2) equals the number of years the analysts have issued earnings forecasts of any type for the company since 1983.

Second, we use the accuracy of the analyst's previous near-term forecasts as a proxy for analyst ability. Prior studies generally suggest persistence in analysts' stock picking and earnings forecasting ability. For example, Sinha, Brown and Das (1997) document persistence in earnings forecast accuracy, that is, superior earnings forecasters in one period tends to be superior the next period. Mikhail, Walther and Willis (2004) find that analysts whose recommendation revisions earned the most (least) excess returns in the past continue to outperform (underperform) in the future. Therefore, we adopt the accuracy of the analysts' past near term earnings forecasts for the same company to proxy for analyst quality. We define net forecast error (NFE) as 100 times the absolute value of the difference between the actual earnings and the analyst forecasts divided by the company's stock price the company's stock price at the end of the previous fiscal year. Past_NFE equals NFE_{t-1}, that is, the net forecast error of the most recent near-term earnings forecasts made during the previous year.[3] We expect a positive (negative) relation between the experience variables (Past_NFE) with the likelihood of long-term forecast issuance.

Finally, analysts affiliated with prestigious brokers tend to be of higher quality, as suggested by prior studies (e.g., Clement (1999)). We use the analysts' brokerage house affiliation as the other proxy for analyst ability. We collect the broker names that appear as top 15 in "the leader list" of the Institutional Investor magazine (II) from year 1990 to year 2002. If a broker appears as top 15 on "the leader list" of Institutional Investor in year t, the broker is defined as high status broker for year t+1. The dummy variable *Top15* takes on value one for analysts affiliated with the high status brokers and zero otherwise.

(c) Analyst Optimism

We adopt the optimism in analysts' near-term forecasts to measure analyst optimism about the company. Given the management's incentive to manage market expectations and to beat analyst forecasts, analysts who are optimistic to please managers should be forced to restrict or even discontinue their optimism in near-term forecasts, and therefore, we argue that the optimism in near-term forecasts should mostly capture the analysts' genuine optimism. Specifically, we use the forecast bias the analysts reveal in their past near-term forecasts to measure the analysts' optimism towards the company. Forecast Bias (FB) is 100 times the difference between the actual earnings and the analyst

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[3] When we use the average NFE over the three-year period prior to the year under consideration as an alternative measure, the sample size is reduced, but the main results remain largely unchanged .

forecasts divided by the company's stock price at the end of the previous fiscal year. A negative (positive) FB indicates that the forecast overestimate (underestimate) the actual earnings, and that it is optimistic (pessimistic). We define FB_{t-1} as the past near-term forecast accuracy (Past_FB).[4] We expect the estimated coefficient to be negative. That is, increased analyst optimism, as measured by a more negative value of forecast bias, is associated with higher likelihood of long-term forecast issuance.

(d) Management Pleasing Incentives

We adopt the existence of equity underwriting relationship as a proxy for analysts' incentive to please the managers, and hypothesize that analysts are more likely to issue long-term forecasts for firms who are also their investment banking customers.

We extract all the new common stock issues in the U.S. market from 1989 to 2004 from the Securities Data Company (SDC) new issues database. We hand match the underwriters in the SDC database with the brokers in the I/B/E/S database. To enhance the quality of our match, we obtain the starting and ending dates of the appearance of the underwriter in the SDC database, and compare them with the starting and ending dates of the appearance of the broker in the IBES database. We also check the merger and acquisition history of the investment banks from the investment bank's website as well as by Google searching.[5] We are able to get a one-to-one match for most of the SDC

[4] When we use the average FB over the three-year period prior to the year under consideration as an alternative measure, the sample size is reduced, but the main results remain largely unchanged

[5] We also double check the matching with the investment bank M&A and name changes data complied by Cheolwoo Lee, who generously provides us with the data.

underwriters. For underwriters/brokers that have experienced mergers or acquisitions, we assume that the surviving investment banks/brokers inherit the investment banking business and research coverage from both the acquirer and the target to assure continuity if the target broker coverage stops at the year of the merger.

We assume that there is an investment banking relationship between the broker and the firm from one year before the issuing of the new common stock to one year after. We define IB as a dummy variable that equals one if the analyst is affiliated with the investment bank that serves as a book runner for the company's new common stock issues, and zero otherwise. Considering that it is possible for analysts to issue LTG forecasts for IPO firms because investors are in greater needs for long-term information of these companies, we introduce an IPO dummy. Specifically, IPO equals one for company i in year t if the company has an initial public offering as indicated by the IPO flag in SDC for year t and t-1, and zero otherwise.

(e) Firm Growth Options

We adopt a firm's capital expenditure and R&D expenditure to measure the firm's growth options. Specifically, *GrowthExp* equals the sum of the company's R&D (Compustat item 46) expenditure and capital expenditure (Compustat item 30) scaled by the company's total assets (Compustat annual item 6) of the most recent fiscal year. That is, *GrowthExp* measures how much the company invests for the future. We expect *GrowthExp* to be positively associated with the issuance of LTG forecasts.

We also include three control variables relating to a company's growth options.

Hitech is a dummy variable that equals one for firms with Compustat SIC code 3570-3577 (computer hardware), or 7371-7379 (computer software), or 2833-2836 (pharmaceutical), and zero otherwise. B/M is the ratio of the company's book value to market value at the end of the most recent fiscal year. We obtain a company's book value (Compustat item 60) and market value (Compustat annual item 199*25) from the Compustat database. Log(size) is the natural log of market value of equity (Compustat annual item 199*25) in millions of dollars for the most recent fiscal year.

(f) Institutional Ownership

We collect the institution ownership information from the Thomson Financial Ownership database. *Institution* equals the total number of shares held by institutions who report their equity ownership in the quarterly 13f filings to the SEC divided by the total number of shares outstanding at the end of the previous calendar year. For firms with the institutional investor holdings data missing, we assume that these firms are 100% individually-owned and set *Institution* to zero.[6]

3.3 Summary statistics

To be included in our sample, an observation needs to have all the above-mentioned variables available. We also delete 2,417 observations with negative book value and 69 observations with institutional holdings available but number of shares outstanding missing. Our final sample includes 170,139 one-year-ahead analyst-firm-year

[6] Ljungqvist et al (2005) suggest that it is possible that these companies are randomly missing. As a robustness check, we delete observations with missing institutional ownership and our results are similar.

combinations.

Table 2 presents summary statistics. For the combined sample, 30.7 percent of the firm-analyst-year combinations are associated with LTG forecasts. On average, the analysts have issued forecasts for any company for approximately seven and a half years, and issued forecasts for a particular company for more than four years. 35.2 percent of the sample is associated with analysts hired by brokers who appear as top 15 in "the leader list" of the Institutional Investor magazine (II) from year 1990 to year 2002. The net forecast error of the most recent one-year-ahead forecasts the previous year is 67 cents for a stock priced at 100 dollars. The mean past forecast bias is negative, indicating that the forecasts are optimistic, but the median is positive. On average, R&D and capital expenditures account for 10.1 percent of total assets. 13.8 percent of sample is associated with high technology companies. The mean percentage of institutional ownership is 52.6 percent.

4. Why do analysts issue LTG forecasts?

4.1 Univariate tests

We first conduct a series of univariate tests and report our results in Table 3. We find that high-status broker affiliated analysts with more experience who issue more accurate near-term forecasts in the past for the company are more likely to issue LTG forecasts. We also find that analysts who are less optimistic about the company are more likely to issue LTG forecasts. In addition, *IB* is significantly higher for the group with LTG forecasts. Firms with more growth options (only median) and more stocks held by institutional investors are more likely to receive LTG forecasts.

Overall, our univariate results largely support the analyst ability signaling, management pleasing, and investor informational need satisfying hypotheses, but contradict the analyst optimism revealing hypothesis.

4.2 Multivariate tests

We expect LTG issuance decisions to be partly driven by analyst peculiarities such as their working habits or tastes, and thus focus on the controlling of analyst-level heterogeneities. We estimate a fixed-effect model with analyst-year effect fixed.[7] That is, we focus on analysts' decision to issue long-term forecasts among all the companies they cover in a given year. As a robustness check, we re-estimate a fixed-effect and a random effect model with only analyst effect, which allow us to include independent variables that are within analyst-year groups such as Exp1 and Top15. To account for yearly variations, we also include year dummies.

In column 1 of Table 4, we report the estimation results with analyst-year effect fixed. 16,197 analyst-year pairs (80,224 observations) are dropped due to all positive or all negative outcomes, but still 11,300 analyst-year pairs (89,915 observations) remain,

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7 We also estimate a random-effect model including analyst effect as in Ljungqvist et al (2006). The results are similar.

indicating that a given analyst may issue LTG forecasts for only a subset of companies she covers in a given year. Therefore, the issuance decision of LTG forecasts goes beyond analyst peculiarity.

Although LTG forecasts are documented as extremely inaccurate and overly optimistic, analysts are more likely to choose the companies they had more accurate past near-term forecasts for LTG coverage. However, analysts are less likely to issue LTG forecasts as they gain more firm-specific experience for the company. This result may be driven by analyst picking firms newly added to coverage for LTG forecasts.

We also find the estimated coefficient of Past_FB to be significantly negative, indicating that analysts may be more likely to issue LTG forecasts for companies they are more optimistic about.

We document strong support for the manager pleasing hypothesis. Investment banking tie (IB) is significantly positive at the one percent level. The evidence regarding the investor informational need satisfying hypothesis is, however, mixed. Analysts are more likely to pick companies with higher institutional ownership. However, companies with larger growth expenditures are less likely chosen for LTG coverage after controlling for other firm characteristics such as size and B/M.

In Column 2 and 3, we report the estimation results from a fixed-effect model with analyst effect fixed, and a random effect model including analyst effect. For both models, we include year dummies, but do not report the estimated coefficients to conserve space. Overall, the results are similar. We find support for the management pleasing and optimism revealing motives, but mixed evidence regarding the analyst ability signaling and investor informational needs satisfying motives. For example, we find that analysts who have more general experience (only according to the random-effect model), who are able to issue more accurate near-term forecasts in the past, and who are affiliated with high status brokers are more likely to issue LTG forecasts, but again analysts seem to drop LTG coverage as they gain more firm-specific experience. Regarding the investor information needs satisfying hypothesis, we find that the coefficient of *Institution* is significantly positive as expected, but the coefficient of *Growth_Exp* is insignificant.

Taken together, we find evidence for the manger pleasing and analyst optimism revealing motives, but mixed evidence for investor informational needs satisfying and analyst ability signaling motives.

4.3 Bubble period evidence

It is likely that analyst motives change depending upon market factors such as the competitiveness in the underwriting market and the power of institutional investors. Therefore, analysts may have extra incentives to please managers during the bubble period. However, providing optimistic LTG forecasts is an implicit form of pleasing, and analysts may go to the extreme of providing optimistic recommendations when they are under extra pressure in the late nineties. Therefore, it is eventually an empirical question whether analysts are more likely to provide LTG forecasts to please managers during the bubble period. We introduce the dummy variables, *Bubble*, and its interactive terms with

IB. Following Bradley, Jordan, and Ritter (2006), we define the bubble period as year 1999 and 2000. Table 5 contains our results. We find no evidence indicating that LTG forecasts are more motivated by the manager pleasing incentives during the bubble period.

5. Institutional investors' role in analysts' motives to issue LTG forecasts

We introduce two explanatory variables: the interactive term between *Institution* and *GrowthExp,* and the interactive term between *Institution* and *IB*. We expect the estimated coefficient of *Institution***GrowthExp* to be positive and the estimated coefficient of *Institution***IB* to be negative.

In Table 6, we find that companies with higher institutional ownership are less likely to be chosen for LTG forecast coverage because of investment banking ties. In addition, we show that institutional investors' role goes beyond that. The coefficient of the interactive term between institutional ownership and growth expenditure is significantly positive, indicating that analysts are more likely to issue LTG forecasts for companies with higher R&D and capital expenditures given the presence of higher institutional ownership.

To summarize, our results confirm the important role institutional investors play in analyst research. We find that institutional ownership is positively associated with LTG issuance for the right reason (investor informational needs satisfying), but negatively associated with LTG issuance for the wrong reason (manager pleasing).

6. Conclusion

This paper examines analysts' motives to issue LTG forecasts. We develop four non-exclusive hypotheses, which are that analysts issue early forecasts to signal their ability, to reveal their optimism, to please the management (since these forecasts are overly optimistic), and to satisfy investors' informational needs. With one-year-ahead annual earnings forecasts as our benchmark sample, we test our hypotheses using a fixed-effect logit model with the analyst-year effect fixed, which ensures that our results are not driven by analyst peculiarities such as their working habits that equally affect analysts' decision to issue long-term forecasts for all the companies they cover.

We find support for the manager pleasing and analyst optimism revealing hypothesis, but mixed results for the ability signaling and investor informational needs satisfying motives. In addition, we examine institutional investors' role in determining analysts' motives to issue long-term forecasts. We find that analysts are less (more) likely to issue long-term forecasts to companies with large institutional ownership to please managers (to meet investors' information needs).

This paper contributes to the literature in several ways. First, an examination of the providence of long-term forecasts offers several advantages in investigating conflicts of interests, and we show that long-term forecasts may serve as a manipulative tool for analysts to please managers. In addition, our results augment Ljungqvist et al (2006)'s finding about the role of institutional investors in analyst research.

Table 1. The Distribution of Long-term Forecasts by Calendar Year

Panel A, B, and C present the distribution of analyst-firm pairs that are associated with LTG forecasts, analysts who issue LTG forecasts, and firms who receive LTG forecasts by calendar year, respectively. We collect the one-year-ahead annual earnings forecasts (FY1) in the I/B/E/S detail history file from year 1991 to 2003. We identify each analyst-firm-year combination and check whether there are long horizon earnings growth forecasts (LTG), as reported in I/B/E/S, associated with these analyst-firm-year combinations.

	Analyst-firm pairs			**Analysts**			**Firms**		
	FY1	LTG	Proportion (%)	FY1	LTG	Proportion (%)	FY1	LTG	Proportion (%)
	(1)	(2)	(3)=(2)/(1)	(4)	(5)	(6)=(5)/(4)	(7)	(8)	(9)=(8)/(7)
1991	7572	3278	43.29	350	189	54.00	480	393	81.88
1992	6940	3072	44.27	287	181	63.07	651	551	84.64
1993	10546	4394	41.67	431	250	58.00	663	535	80.69
1994	11366	4930	43.37	536	335	62.50	795	650	81.76
1995	13109	5498	41.94	600	364	60.67	928	684	73.71
1996	14567	6730	46.20	795	479	60.25	1163	867	74.55
1997	15312	7207	47.07	826	497	60.17	1057	705	66.70
1998	15482	6579	42.49	971	527	54.27	952	605	63.55
1999	15086	6686	44.32	947	531	56.07	692	500	72.25
2000	14985	6359	42.44	1081	648	59.94	686	471	68.66
2001	13274	6243	47.03	1132	684	60.42	280	206	73.57
2002	14331	6486	45.26	1575	926	58.79	329	220	66.87
2003	13285	4714	35.48	1758	879	50.00	391	166	42.46
Mean	12758	5552	43	868	499	58	697	504	72
Median	13285	6243	43	826	497	60	686	535	74

Table 2. Summary Statistics

Table 2 reports the summary statistics of our sample, which includes 170,139 analyst-firm-year observations over the period 1991-2003. LTG is a dummy variable that equals one if the observation is associated with long-term earnings growth forecasts (LTG) as reported in I/B/E/S, and zero otherwise. The general experience of the analysts (Exp1) is defined as the number of years the analysts have issued earnings forecasts of any type for any company since 1983, when the sample period of I/B/E/S starts. Analysts' firm-specific experience (Exp2) equals the number of years the analysts have issued earnings forecasts of any type for the company since 1983. We define net forecast error (NFE) as 100 times the absolute value of the difference between the actual earnings and the analyst forecasts divided by the company's stock price the company's stock price at the end of the previous fiscal year. Past_NFE equals NFE $^{t-1}$, that is, the net forecast error of the most recent near-term earnings forecasts made during the previous year. Forecast Bias (FB) is 100 times the difference between the actual earnings and the analyst forecasts divided by the company's stock price the company's stock price at the end of the previous fiscal year. We define FB $^{t-1}$ as the past near-term forecast accuracy (Past_FB). We define IB as a dummy variable that equals one if the analyst is affiliated with the investment bank that serves as a book runner for the company's new common stock issues, and zero otherwise. IPO equals one for company i in year t if the company has an initial public offering as indicated by the IPO flag in SDC for year t and t-1, and zero otherwise. Hitech is a dummy variable that equals one for firms with Compustat SIC code 3570-3577 (computer hardware), or 7371-7379 (computer software), or 2833-2836 (pharmaceutical), and zero otherwise. B/M is the ratio of the company's book value to market value at the end of the most recent fiscal year. We obtain a company's book value (Compustat item 60) and market value (Compustat annual item 199*25) from the Compustat database. GrowthExp equals the sum of the company's R&D (Compustat item 46) expenditure and capital expenditure (Compustat item 30) scaled by the company's total assets (Compustat annual item 6) of the most recent fiscal year. Log(size) is the natural log of market value of equity (Compustat annual item 199*25) in millions of dollars of the most recent fiscal year. Institution equals the total number of shares held by institutions who report their equity ownership in quarterly 13f filings to the SEC divided by the total number of shares outstanding at the end of the previous year. For firms with the institutional investors data missing, we assume that these firms are 100% individually-owned and set Institution to zero.

Table 2 (Continue)

Variable	Mean	Std. Dev.	10%	25%	Median	75%	90%
LTG	0.307	0.461	0	0	0	1	1
Exp1	7.46	4.67	2	4	7	11	14
Exp2	4.06	3.29	1	2	3	5	9
Top15	0.352	0.475	0	0	0	1	1
Past_nfe	0.667	3.322	0.008	0.054	0.164	0.485	1.320
Past_fb	-0.082	3.387	-0.625	-0.099	0.036	0.213	0.643
IB	0.009	0.097	0	0	0	0	0
IPO	0.001	0.027	0	0	0	0	0
GrowthExp	0.101	0.010	0	0.032	0.078	0.143	0.220
Hitech	0.138	0.345	0	0	0	0	1
Log(size)	7.407	1.831	5.033	6.127	7.383	8.645	9.794
B/M	22.996	2395.12	0.142	0.253	0.424	0.642	0.909
Institution	0.526	0.227	0.210	0.380	0.551	0.687	0.793
Sample size	170139						

Table 3. Why Do Analysts Issue LTG Forecasts? Univariate tests

Table 3 presents the results from a series of univariate tests. We report the mean and median value for each subsample. Columns labeled as "Dif." contain the difference of mean (medain) between two subsamples. We report the t-statistics for means and an approximate z-statistic for a sum of ranks test under the hypothesis that the distributions are equal. LTG is a dummy variable that equals one if the observation is associated with long-term earnings growth forecasts (LTG) as reported in I/B/E/S, and zero otherwise. The general experience of the analysts (Exp1) is defined as the number of years the analysts have issued earnings forecasts of any type for any company since 1983, when the sample period of I/B/E/S starts. Analysts' firm-specific experience (Exp2) equals the number of years the analysts have issued earnings forecasts of any type for the company since 1983. We define net forecast error (NFE) as 100 times the absolute value of the difference between the actual earnings and the analyst forecasts divided by the company's stock price the company's stock price at the end of the previous fiscal year. Past_NFE equals NFE $^{t-1}$, that is, the net forecast error of the most recent near-term earnings forecasts made during the previous year. The dummy variable Top15 takes on value one for analysts affiliated with the high status brokers who appear as top 15 in "the leader list" of the Institutional Investor magazine (II), and zero otherwise Forecast Bias (FB) is 100 times the difference between the actual earnings and the analyst forecasts divided by the company's stock price the company's stock price at the end of the previous fiscal year. We define FB $^{t-1}$ as the past near-term forecast accuracy (Past_FB). IB is defined as a dummy variable that equals one if the analyst is affiliated with the investment bank that serves as a book runner for the company's new common stock issues, and zero otherwise. IPO equals one for company i in year t if the company has an initial public offering as indicated by the IPO flag in SDC for year t and t-1, and zero otherwise. Hitech is a dummy variable that equals one for firms with Compustat SIC code 3570-3577 (computer hardware), or 7371-7379 (computer software), or 2833-2836 (pharmaceutical), and zero otherwise. B/M is the ratio of the company's book value to market value at the end of the most recent fiscal year. We obtain a company's book value (Compustat item 60) and market value (Compustat annual item 199*25) from the Compustat database. GrowthExp equals the sum of the company's R&D (Compustat item 46) expenditure and capital expenditure (Compustat item 30) scaled by the company's total assets (Compustat annual item 6) of the most recent fiscal year. Log(size) is the natural log of market value of equity (Compustat annual item 199*25) in millions of dollars of the most recent fiscal year. Institution equals the total number of shares held by institutions who report their equity ownership in quarterly 13f filings to the SEC divided by the total number of shares outstanding at the end of the previous year. For firms with the institutional investors data missing, we assume that these firms are 100% individually-owned and set Institution to zero.

Table 3 (Continue)

Variable	LTG=0		LTG=1		Dif	T	Dif	Z
	Mean	Median	Mean	Median				
	(1)	(2)	(3)	(4)	(1)-(3)		(2)-(4)	
LTG	0.000	0	1.000	1				
Exp1	7.389	7	7.618	7	-0.229	-9.34	0	-6.10
Exp2	4.048	3	4.088	3	-0.04	-2.34	0	1.05
Top15	0.328	0	0.406	0	-0.078	-31.55	0	-31.46
Past_nfe	0.744	0.185	0.492	0.127	0.252	14.44	0.058	43.21
Past_fb	-0.101	0.036	-0.039	0.034	-0.062	-3.49	0.002	-1.83
IB	0.008	0	0.012	0	-0.004	-8.05	0	-8.05
IPO	0.001	0	0.001	0	0	-0.64	0	-0.64
GrowthExp	0.101	0.077	0.101	0.081	0	0.25	-0.004	-9.24
Hitech	0.130	0	0.157	0	-0.027	-15.17	0	-15.16
Bm	22.168	0.443	24.863	0.382	-2.695	-0.21	0.061	39.41
Logsize	7.305	7.285	7.635	7.610	-0.33	-34.42	-0.325	-33.11
Institution	0.517	0.544	0.546	0.567	-0.029	-23.81	-0.023	-22.81
Sample size	117882		52257					

Table 4. Why Do Analysts Issue LTG Forecasts? Multivariate Tests

Table 4 present our results with LTG as dependent variable estimated from the fixed-effect model with analyst-year effect fixed (Column 1), the fixed-effect model with analyst effect fixed including yearly dummies (Column 2), and the random effect model including analyst effect with yearly dummies (Column 3). We omit the estimated coefficients for the yearly dummies in Column 2 and 3. LTG is a dummy variable that equals one if the observation is associated with a long-term earnings growth forecast, and zero otherwise. The general experience of the analysts (Exp1) is defined as the number of years the analysts have issued earnings forecasts of any type for any company since 1983, when the sample period of I/B/E/S starts. Analysts' firm-specific experience (Exp2) equals the number of years the analysts have issued earnings forecasts of any type for the company since 1983. We define net forecast error (NFE) as 100 times the absolute value of the difference between the actual earnings and the analyst forecasts divided by the company's stock price the company's stock price at the end of the previous fiscal year. Past_NFE equals NFE $^{t-1}$, that is, the net forecast error of the most recent near-term earnings forecasts made during the previous year. The dummy variable Top15 takes on value one for analysts affiliated with the high status brokers who appear as top 15 in "the leader list" of the Institutional Investor magazine (II), and zero otherwise Forecast Bias (FB) is 100 times the difference between the actual earnings and the analyst forecasts divided by the company's stock price the company's stock price at the end of the previous fiscal year. We define FB $^{t-1}$ as the past near-term forecast accuracy (Past_FB). IB is defined as a dummy variable that equals one if the analyst is affiliated with the investment bank that serves as a book runner for the company's new common stock issues, and zero otherwise. IPO equals one for company i in year t if the company has an initial public offering as indicated by the IPO flag in SDC for year t and t-1, and zero otherwise. Hitech is a dummy variable that equals one for firms with Compustat SIC code 3570-3577 (computer hardware), or 7371-7379 (computer software), or 2833-2836 (pharmaceutical), and zero otherwise. B/M is the ratio of the company's book value to market value at the end of the most recent fiscal year. We obtain a company's book value (Compustat item 60) and market value (Compustat annual item 199*25) from the Compustat database. GrowthExp equals the sum of the company's R&D (Compustat item 46) expenditure and capital expenditure (Compustat item 30) scaled by the company's total assets (Compustat annual item 6) of the most recent fiscal year. Log(size) is the natural log of market value of equity (Compustat annual item 199*25) in millions of dollars of the most recent fiscal year. Institution equals the total number of shares held by institutions who report their equity ownership in quarterly 13f filings to the SEC divided by the total number of shares outstanding at the end of the previous year. For firms with the institutional investors data missing, we assume that these firms are 100% individually-owned and set Institution to zero. For each model, we report the estimated coefficient, the z statistics, the log-likelihood, and the sample size.

	Predicted Sign	1		2		3	
		Coef.	Z	Coef.	Z	Coef.	Z
Exp1	+			-0.059	-1.44	0.005	1.95
Exp2	+	-0.009	-2.86	-0.011	-4.24	-0.012	-4.44
Top15	+			0.076	2.77	0.114	5.39
Past_nfe	-	-0.024	-4.83	-0.022	-5.48	-0.028	-6.88
Past_fb	-	-0.008	-1.65	-0.012	-3.14	-0.014	-3.62
IB	+	0.376	5.23	0.318	5.29	0.333	5.55
IPO	+	-0.098	-0.34	0.134	0.59	0.185	0.83
Hitech	+	0.053	1.48	0.053	1.82	0.158	6.12
GrowthExp	+	-0.377	-3.47	-0.107	-1.23	-0.055	-0.65
Bm	-	0.000	2.18	0.000	2.26	0.000	2.09
Logsize	+	0.136	23.82	0.104	22.95	0.096	22.13
Institution	+	0.276	6.86	0.217	6.66	0.281	8.88
						-2.160	-41.56
Model		Analyst-year Fixed effect		Analyst fixed effect (with year dummies)		Analyst random effect (with year dummies)	
Log -likelihood		-37060		-70519		-86610	
# of obs.		89915		140689		170139	

Table 5. Bubble Period Evidence

We test whether managers have stronger incentive to issue LTG forecasts to please managers during the bubble period by adding a dummy variable Bubble, which equals one for year 1999 and 2000 and zero otherwise, and its interactive term with *IB*. LTG is a dummy variable that equals one if the observation is associated with a long-term earnings growth forecast, and zero otherwise. The general experience of the analysts (*Exp1*) is defined as the number of years the analysts have issued earnings forecasts of any type for any company since 1983, when the sample period of I/B/E/S starts. Analysts' firm-specific experience (*Exp2*) equals the number of years the analysts have issued earnings forecasts of any type for the company since 1983. We define net forecast error (NFE) as 100 times the absolute value of the difference between the actual earnings and the analyst forecasts divided by the company's stock price the company's stock price at the end of the previous fiscal year. *Past_NFE* equals NFE $^{t-1}$, that is, the net forecast error of the most recent near-term earnings forecasts made during the previous year. The dummy variable *Top15* takes on value one for analysts affiliated with the high status brokers who appear as top 15 in "the leader list" of the Institutional Investor magazine (II), and zero otherwise Forecast Bias (FB) is 100 times the difference between the actual earnings and the analyst forecasts divided by the company's stock price the company's stock price at the end of the previous fiscal year. We define FB $^{t-1}$ as the past near-term forecast accuracy (Past_FB). IB is defined as a dummy variable that equals one if the analyst is affiliated with the investment bank that serves as a book runner for the company's new common stock issues, and zero otherwise. IPO equals one for company i in year t if the company has an initial public offering as indicated by the IPO flag in SDC for year t and t-1, and zero otherwise. Hitech is a dummy variable that equals one for firms with Compustat SIC code 3570-3577 (computer hardware), or 7371-7379 (computer software), or 2833-2836 (pharmaceutical), and zero otherwise. B/M is the ratio of the company's book value to market value at the end of the most recent fiscal year. We obtain a company's book value (Compustat item 60) and market value (Compustat annual item 199*25) from the Compustat database. *GrowthExp* equals the sum of the company's R&D (Compustat item 46) expenditure and capital expenditure (Compustat item 30) scaled by the company's total assets (Compustat annual item 6) of the most recent fiscal year. Log(size) is the natural log of market value of equity (Compustat annual item 199*25) in millions of dollars of the most recent fiscal year. *Institution* equals the total number of shares held by institutions who report their equity ownership in quarterly 13f filings to the SEC divided by the total number of shares outstanding at the end of the previous year. For firms with the institutional investors data missing, we assume that these firms are 100% individually-owned and set Institution to zero. Bubble is a dummy variable that equals one for year 1999 and 2000, zero otherwise. For each model, we report the estimated coefficient, the z statistics, the log-likelihood, and the sample size.

		1		2		3	
	Predicted	Coef.	Z	Coef.	Z	Coef.	Z

	Sign						
Exp1	+			-0.059	-1.44	0.005	1.95
Exp2	+	-0.009	-2.86	-0.011	-4.23	-0.012	-4.44
Top15	+			0.076	2.76	0.114	5.38
Past_nfe	-	-0.024	-4.82	-0.022	-5.47	-0.028	-6.87
Past_fb	-	-0.008	-1.65	-0.012	-3.13	-0.014	-3.62
IB	+	0.402	5.13	0.351	5.37	0.360	5.52
IPO	+	-0.099	-0.35	0.133	0.59	0.185	0.83
Hitech	+	0.053	1.48	0.053	1.81	0.158	6.13
GrowthExp	+	-0.377	-3.48	-0.107	-1.22	-0.054	-0.64
Bm	-	0.000	2.18	0.000	2.26	0.000	2.09
Logsize	+	0.136	23.82	0.104	22.96	0.096	22.13
Institution	+	0.276	6.86	0.217	6.66	0.281	8.88
Bubble	?			-0.313	-1.9	-0.102	-3.15
*Bubble*IB*	+	-0.165	-0.84	-0.208	-1.29	-0.174	-1.07
Constant						-2.160	-41.56
Model		Analyst-year Fixed effect		Analyst fixed effect (with year dummies)		Analyst random effect (with year dummies)	
Log -likelihood		-37059		-70523		-86616	
# of obs.		89915		140689		170139	

Table 6. The Role of Institutional Investors in Analysts' Motive to Issue Long-term Forecasts

We test the effect of institutional investors on analyst motives. LTG is a dummy variable that equals one if the observation is associated with a long-term earnings growth forecast, and zero otherwise. The general experience of the analysts (*Exp1*) is defined as the number of years the analysts have issued earnings forecasts of any type for any company since 1983, when the sample period of I/B/E/S starts. Analysts' firm-specific experience (*Exp2*) equals the number of years the analysts have issued earnings forecasts of any type for the company since 1983. We define net forecast error (NFE) as 100 times the absolute value of the difference between the actual earnings and the analyst forecasts divided by the company's stock price the company's stock price at the end of the previous fiscal year. *Past_NFE* equals NFE^{t-1}, that is, the net forecast error of the most recent near-term earnings forecasts made during the previous year. The dummy variable *Top15* takes on value one for analysts affiliated with the high status brokers who appear as top 15 in "the leader list" of the Institutional Investor magazine (II), and zero otherwise Forecast Bias (FB) is 100 times the difference between the actual earnings and the analyst forecasts divided by the company's stock price the company's stock price at the end of the previous fiscal year. We define FB^{t-1} as the past near-term forecast accuracy (Past_FB). IB is defined as a dummy variable that equals one if the analyst is affiliated with the investment bank that serves as a book runner for the company's new common stock issues, and zero otherwise. IPO equals one for company i in year t if the company has an initial public offering as indicated by the IPO flag in SDC for year t and t-1, and zero otherwise. Hitech is a dummy variable that equals one for firms with Compustat SIC code 3570-3577 (computer hardware), or 7371-7379 (computer software), or 2833-2836 (pharmaceutical), and zero otherwise. B/M is the ratio of the company's book value to market value at the end of the most recent fiscal year. We obtain a company's book value (Compustat item 60) and market value (Compustat annual item 199*25) from the Compustat database. *GrowthExp* equals the sum of the company's R&D (Compustat item 46) expenditure and capital expenditure (Compustat item 30) scaled by the company's total assets (Compustat annual item 6) of the most recent fiscal year. Log(size) is the natural log of market value of equity (Compustat annual item 199*25) in millions of dollars of the most recent fiscal year. *Institution* equals the total number of shares held by institutions who report their equity ownership in quarterly 13f filings to the SEC divided by the total number of shares outstanding at the end of the previous year. For firms with the institutional investors data missing, we assume that these firms are 100% individually-owned and set *Institution* to zero. For each model, we report the estimated coefficient, the z statistics, the log-likelihood, and the sample size.

	Predicted	1		2		3	
	Sign	Coef.	Z	Coef.	Z	Coef.	Z
Exp1	+			-0.058	-1.43	0.005	1.94
Exp2	+	-0.009	-2.86	-0.011	-4.25	-0.012	-4.45
Top15	+			0.076	2.77	0.114	5.3
Past_nfe	-	-0.024	-4.84	-0.022	-5.5	-0.028	-6.9
Past_fb	-	-0.008	-1.67	-0.012	-3.16	-0.014	-3.65
IB	+	0.702	4.14	0.664	4.77	0.711	5.12
IPO	+	-0.072	-0.25	0.151	0.67	0.202	0.9
Hitech	+	0.052	1.45	0.052	1.79	0.157	6.05
GrowthExp	+	-0.914	-4.41	-0.473	-2.83	-0.335	-2.08
Bm	-	0.000	2.19	0.000	2.28	0.000	2.11
Logsize	+	0.136	23.75	0.104	22.91	0.096	22.08
Institution	+	0.171	3.13	0.148	3.35	0.230	5.33
*Institution*IB*	-	-0.633	-2.11	-0.688	-2.74	-0.757	-3.01
Institution GrowthExp*	+	1.128	3.08	0.765	2.59	0.596	2.07
constant						-2.135	-39.27
Model		Analyst-year Fixed effect		Analyst fixed effect(with year dummies)		Analyst random effect (with year dummies)	
Log-likelihood		-37053		-70512		-86610	
# of obs.		89915		140689		170139	

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9

The Capital Asset Pricing Model

Knowing how risk (market beta) and reward (expected rate of return) are measured, you are now ready to proceed to the punchline: a formula that tells you how much reward your investment projects have to offer to compensate your investors for their risks. If you can judge the risk of new corporate investment projects, you can then determine the appropriate costs of capital that you should use in your project's NPV calculations. Alas, like NPV, the formula may be simple, but the application is hard. The devil is in the details.

We will first briefly review what you already know. Then you will learn all about this new model—the CAPM. Finally, you will get to apply it.

One apology in advance: In this chapter, I do not fully explain where all the formulas come from. This is because it really takes a full investments course to derive them. (The appendix goes into more detail, but if you really want to learn about investments, you need to take a full course on the subject.)

9.1 What You Already Know and What You Want to Know

You are still after an estimate for your opportunity cost of capital.

Let's take stock. First, you already know the right train of thought for capital budgeting purposes: As a corporate manager, your task is to determine whether you should accept or reject a project. You make this decision with the NPV formula. To determine the discount factor in the NPV formula, you need to estimate an appropriate cost of capital—or, more precisely, the *opportunity* cost of capital for your investors. This means that you need to judge what a fair expected rate of return, $\mathcal{E}(\,r\,)$, for your project is, given your project's risk characteristics. If your project offers a lower expected return than what your investors can earn elsewhere in similarly risky projects, then you should not put your investors' money into your project but instead return their money to them. If your project offers more expected return, then you should go ahead and invest their money into your project. Put differently, your goal is to learn what your investors, if asked, would have wanted you to invest in on their behalves.

Assume perfect markets, that investors dislike risk and like reward, and more.

Second, the perfect market assumptions are not enough to proceed. We must assume that investors like overall portfolio reward (expected return) and dislike overall portfolio risk (variance or standard deviation of return). We also assume that investors are smart. Presumably, this means that they diversify, hopefully holding many assets and be reasonably close to the market portfolio. Somewhat less appealing, we also must assume that investors all have access to exactly the same set of assets. (This means we are ignoring investments in people's own houses or education, for example.) And finally, mostly for convenience, we assume that they want to maximize their wealth in the market for only one period.

This allows you to figure out how they—and you—should measure project risk and reward.

Third, for investors with these preferences and who are therefore already holding the overall market portfolio, you can follow their trains of thought. You can infer how they should view the risk and reward of your individual projects. Their reward is their expected rate of return. Their risk is their overall portfolio risk, *not* your project's own standard-deviation risk. Your project's contribution to your investors' overall portfolio risk is the market beta of your project—think of it as a measure of your project's "toxicity." A project that decreases in value when the market decreases in value, and increases when the market increases, has a positive market beta. It's toxic—investors don't like it. A project that increases in value when the market decreases in value, and vice versa, has a negative market beta. It's less toxic—investors like it more. That is, a project with a low market beta helps an investor who holds a portfolio similar to the market portfolio to reduce the overall investment risk.

This gives you a trade-off between risk and reward "in equilibrium."

You can also draw some additional conclusions without any math. In our assumed perfect world, you can guess that investors will have already snatched up the best projects—those that have low risk and high expected rates of return. In fact, anyone selling projects with lower risk contributions can sell them for higher prices, which in turn immediately drives down their expected rates of return. Consequently, what is available for purchase in the real world must be subject to some trade-off: Projects that have more market-risk contribution must offer a higher expected rate of return if their sellers want to convince investors to purchase them. But what *exactly* does this relationship between risk and reward look like? This is the subject of this chapter—it is the domain of the capital asset pricing model, the CAPM.

Q 9.1. What are the assumptions underlying the CAPM? Are the perfect market assumptions among them? Are there more?

9.2 Using The Capital Asset Pricing Model (CAPM)

The CAPM gives you the cost of capital if you give it the risk-free rate, the expected rate of return on the market, and your project's market beta.

The **capital asset pricing model** (**CAPM**) is a model that gives you an appropriate expected rate of return (cost of capital) for each project if you give it the project's relevant risk characteristics. The model states that an investment's cost of capital is lower when it offers better diversification benefits for an investor who holds the overall market portfolio—less required reward for less risk contribution. Market beta is its measure of risk contribution. Projects contributing more risk (market beta) require a higher expected rate of return for you to want them; projects contributing less risk require a lower expected rate of return for you to want them. This is the precise relationship that the CAPM gives you.

IMPORTANT

To estimate the required expected rate of return for a project or firm—that is, the cost of capital—according to the CAPM, you need three inputs:

1. The risk-free rate of return, r_F
2. The expected rate of return on the overall market, $\mathcal{E}(r_M)$
3. A firm's or project's beta with respect to the market, β_i

The CAPM formula is

$$\mathcal{E}(r_i) = r_F + [\mathcal{E}(r_M) - r_F] \cdot \beta_i \qquad (9.1)$$

where i is the name of your project and $\mathcal{E}(r_i)$ is your project's expected rate of return.

The difference between the expected rate of return on the risky (stock) market and the risk-free investment, $[\mathcal{E}(r_M) - r_F]$, is called the **equity premium** or **market risk premium**, discussed in more detail later.

You need to memorize the CAPM formula. It is *the* standard model in the finance.

A first quick use of the CAPM formula.

Let's use the formula. If you believe that the risk-free rate is 3% and the expected rate of return on the market is 7%, then the CAPM states that

$$\mathcal{E}(r_i) = 3\% + (7\% - 3\%) \cdot \beta_i = 3\% + 4\% \cdot \beta_i$$
$$\mathcal{E}(r_i) = r_F + [\mathcal{E}(r_M) - r_F] \cdot \beta_i$$

Therefore, a project with a beta of 0.5 should have a cost of capital of $3\% + 4\% \cdot 0.5 = 5\%$, and a project with a beta of 2.0 should have a cost of capital of $3\% + 4\% \cdot 2.0 = 11\%$. The CAPM gives an opportunity cost for your investors' capital: If the project with the beta of 2.0 cannot earn an expected rate of return of 11%, you should not take this project and instead return the money to your investors. Your project would add too much risk for its reward. Your investors have better opportunities elsewhere.

It is easier to work in required returns than in prices.

The CAPM is called an **asset-pricing model**, even though it is most often expressed in terms of a required expected rate of return rather than in terms of an appropriate project price. Fortunately, though messy, the two are equivalent—you can always work with the CAPM return first, and discount the expected cash flow into an appropriate price second. A given expected rate of return implies a given price. (If you do not know the fair price, you will however have to take two aspirins and work with a more difficult version of the CAPM formula. It is called **certainty equivalence** and explained in the chapter appendix.)

➤ *Certainty equivalence CAPM form*, *Sect.* App.9.A (Companion), *Pg.*≈*51*.

The CAPM formula tells you what investors care about: comovement with the market.

The CAPM specifically ignores the standard deviation of individual projects' rates of return. That is, the model posits that investors do not care about it, because they are smart enough to diversify away any idiosyncratic risk. The CAPM posits that investors instead care about the project market betas, because these measure the risk components that investors holding the market portfolio cannot diversify away. (This makes a lot of sense for highly-diversified investors, though not for liquidity-constrained entrepreneurs.)

The CAPM has three inputs. We will cover them in detail.

For the three CAPM inputs, as always, you are really interested in the future: the future expected rate of return on the market and the future beta of your firm/project with respect to the market. You really don't care about the past average rates of return or the past market betas. But, as usual, you often have no choice other than to rely on estimates that are based at least partly on historical data. In Section 9.4, you will learn how to estimate each CAPM input. But let's explore the model itself first, assuming that you know all the inputs.

➤ *Will history repeat itself?*, Sect. 7.1, Pg.175.

The Security Market Line (SML)

Examples of CAPM rates of return that individual securities should offer.

Let's apply the CAPM in a specific example. Assume that the risk-free rate is 3% per year and that the market offers an expected rate of return of 8% per year. The CAPM formula then states that a stock with a beta of 1 should offer an expected rate of return of $3\% + (8\% - 3\%) \cdot 1 = 8\%$ per year; that a stock with a beta of 0 should offer an expected rate of return of $3\% + (8\% - 3\%) \cdot 0 = 3\%$ per year; that a stock with a beta of $1/2$ should offer an expected rate of return of $3\% + (8\% - 3\%) \cdot 0.5 = 5.5\%$ per year; that a stock with a beta of 2 should offer an expected rate of return of $3\% + (8\% - 3\%) \cdot 2 = 13\%$ per year; and so on.

The SML is just a graphical representation of the CAPM formula.

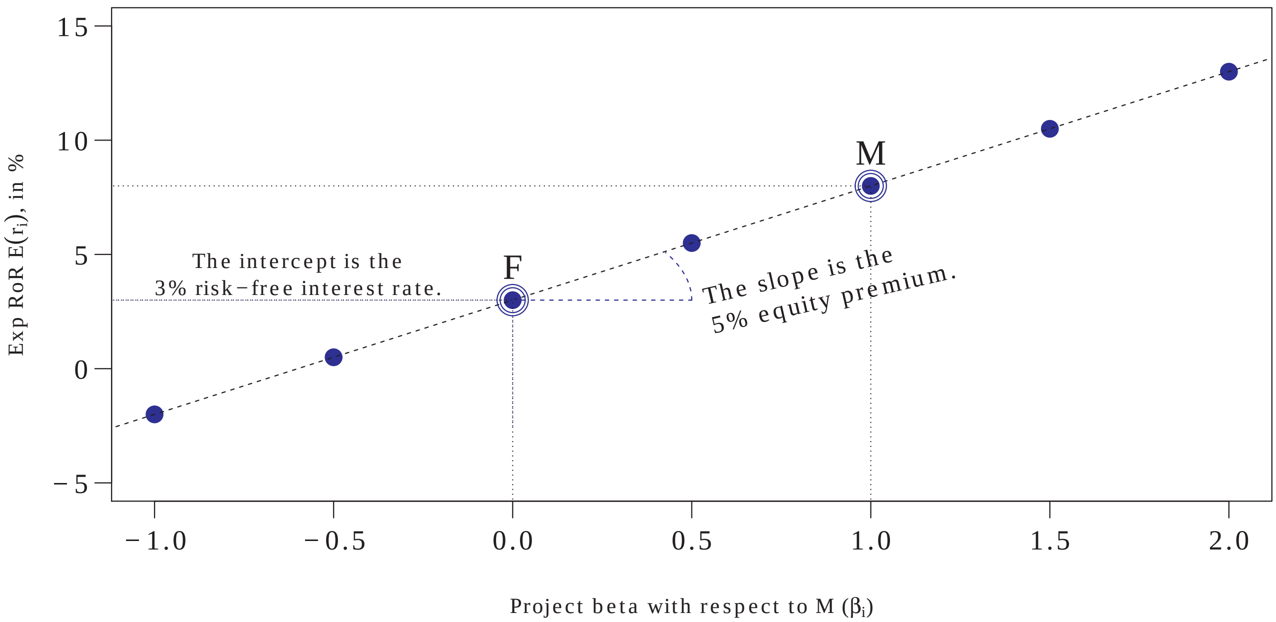
The CAPM formula is often graphed as the **security market line** (**SML**), which shows the relationship between the expected rate of return of a project and its beta. Exhibit 9.1 draws a first security market line for seven assets. Each investment asset (such as a stock or a project) is a point in this coordinate system. Because all assets properly follow the CAPM formula in our example, they must lie on a straight line. In other words, the SML is just a graphical representation of the CAPM formula. The slope of this line is the equity premium, $\mathscr{E}(r_M) - r_F$, and the intercept is the risk-free rate, r_F.

If you know the inputs, the SML is a sharp line; if you estimate them, it is a scatterplot.

Alas, in the real world, even if the CAPM holds, you would not have the data to draw Exhibit 9.1. The reason is that you do not know true expected returns and true market betas. Exhibit 9.2 plots two graphs in a perfect CAPM world. The top graph repeats Exhibit 9.1 and falsely presumes that you know CAPM inputs—the true market betas and true expected rates of return. This line is perfectly straight. In the bottom graph, you have to rely only on observables—estimates of expected returns and betas, presumably based mostly on historical data averages. Now you can only fit an "estimated security market line," not the "true security market line." Of course, you hope that your historical data provides good, unbiased estimates of true market beta and true expected rates of return (and this is a big assumption), so that your fitted line will look at least approximately straight. A workable version of the CAPM thus can only state that there should roughly be a linear relationship between the data-estimated market betas and the data-estimated expected rates of return, just as drawn here.

Q 9.2. The risk-free rate is 4%. The expected rate of return on the market is 7%. What is the appropriate cost of capital for a project that has a beta of 3?

Q 9.3. The risk-free rate is 4%. The expected rate of return on the market is 12%. What is the cost of capital for a project that has a beta of 3?



		Investment Asset						
		A	B	F	C	M	D	E
Market Beta	β_i	–1.0	-0.5	0.0	0.5	1.0	1.5	2.0
Expected Rate of Return	$\mathcal{E}(r_i)$	–2.0%	0.5%	3.0%	5.5%	8.0%	10.5%	13.0%

Exhibit 9.1: *The Security Market Line.* This graph plots the CAPM relation $\mathcal{E}(r_i) = r_F + [\mathcal{E}(r_M) - r_F] \cdot \beta_i = 3\% + (8\% - 3\%) \cdot \beta_i$, where β_i is the beta of an individual asset with respect to the market. In this graph, we assume that the risk-free rate is 3% and the equity premium is 5%. Each point is one asset (such as a stock, a project, or a mutual fund). The point M in this graph could also be any other security with a $\beta_i = 1$. F could be the risk-free asset or any other security with a $\beta_i = 0$.

Q 9.4. The risk-free rate is 4%. The expected rate of return on the market is 12%. What is the cost of capital for a project that has a beta of –3? Does this make economic sense?

Q 9.5. Is the real-world SML with historical data a perfect straight line?

Q 9.6. The risk-free rate is 4%. The expected rate of return on the market is 7%. A corporation intends to issue publicly-traded bonds that *promise* a rate of return of 6% and offer an *expected* rate of return of 5%. What is the implicit beta of the bonds?

Q 9.7. Draw the SML if the risk-free rate is 5% and the equity premium is 9%.

Q 9.8. What is the equity premium, both mathematically and intuitively?

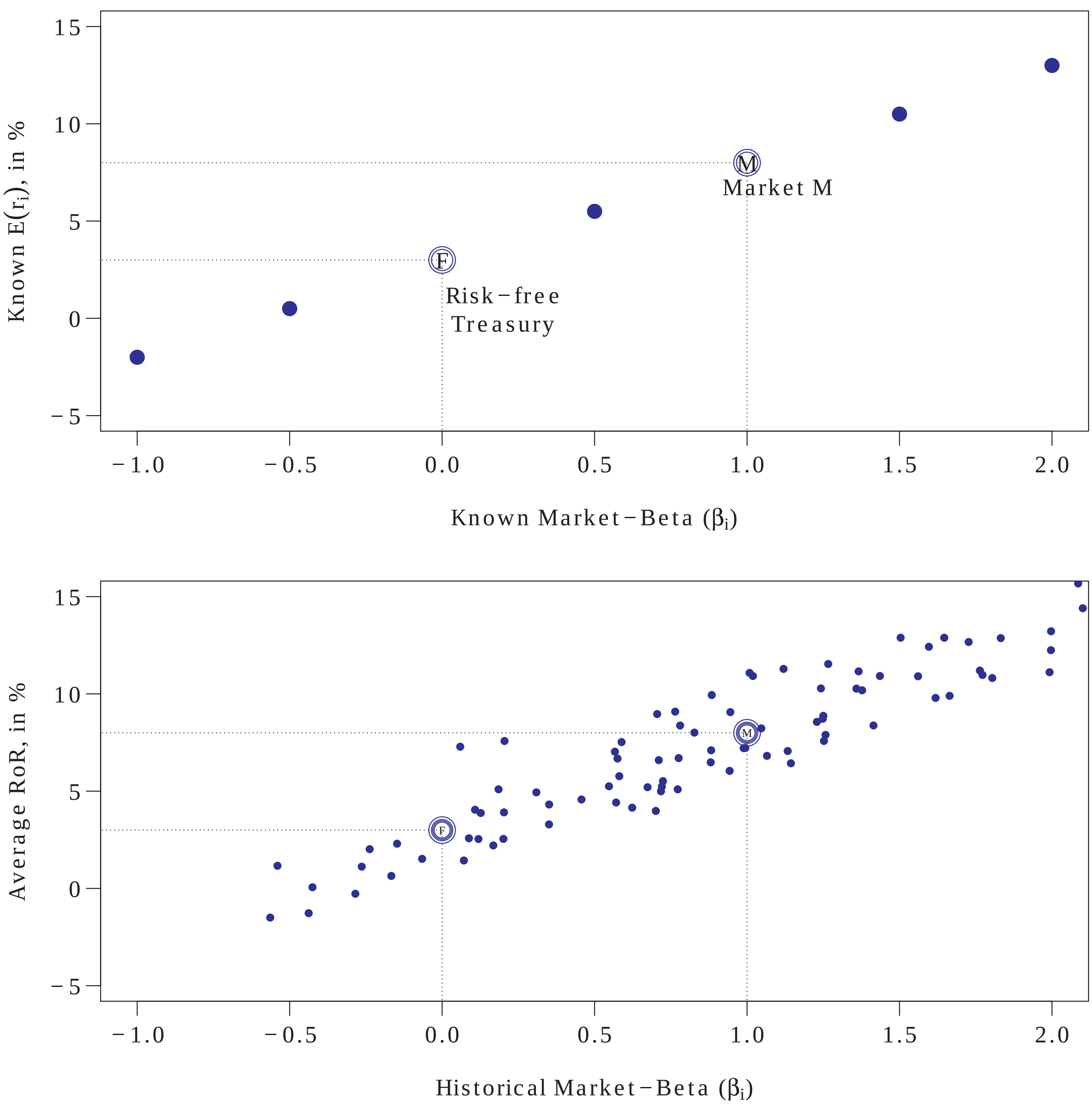


Exhibit 9.2: *The Security Market Line in an Ideal CAPM World.* The lower panel shows what we are usually confronted with: Historical average returns and historical betas are just estimates from the data. We hope that they are representative of the true underlying mean returns and true betas, which in turn would mean that they will also be representative of the future means and betas.

9.3 The CAPM Cost of Capital in the Present Value Formula

We usually use the CAPM output, the expected rate of return, as our discount rate.

For a corporate manager, the CAPM is needed to get the denominator in the NPV formula, the opportunity cost of capital, $\mathcal{E}(r)$:

$$\text{NPV} = C_0 + \frac{\mathcal{E}(C_1)}{1+\mathcal{E}(r_1)} + \frac{\mathcal{E}(C_2)}{1+\mathcal{E}(r_2)} + \cdots$$

Together, the CAPM and the NPV formulas tell you again that cash flows that correlate more with the overall market are of less value to your investors and therefore require higher expected rates of return ($\mathcal{E}(r)$) in order to pass muster (well, the hurdle rate, which is determined by the alternative opportunities that your model presumes your investors have).

Deconstructing Quoted Rates of Return— Risk Premiums

Reminder: Stated bond yields contain time and default premiums.

Let me return to the subject of Section 6.2. You learned that in a perfect and risk-neutral world, stated rates of return consist of a time premium and a default premium. On average, the default premium is zero, so the expected rate of return is just the time premium.

➤ *Time and default premiums, Sect.* 6.2, *Pg.129*.

The CAPM extends the expected rate of return to a world in which investors are risk averse. It gives you an expected rate of return that adds a **risk premium** (as a reward for your willingness to absorb risk) to the time premium.

The CAPM gives you the time and risk premiums.

$$\begin{aligned}
\text{Promised Rate of Return} &= \text{Time Premium} + \text{Default Premium} + \text{Risk Premium}\\
\text{Actual Earned Rate} &= \text{Time Premium} + \text{Default Realization} + \text{Risk Premium}\\
\underbrace{\text{Expected Rate of Return}}_{\text{provided by the CAPM}} &= \text{Time Premium} + \text{Expected Risk Premium}
\end{aligned}$$

In the risk-neutral perfect world, there were no differences in *expected* rates of return across assets. There were only differences in *stated* rates of return. The CAPM changes all this—different assets can now also have different *expected* rates of return.

Important: *The CAPM ignores default risk and, thus, does not provide a default premium. You must take care of it yourself!*

However, the CAPM does *not* take default risk into account, much less give you an appropriate stated rate of return. You should therefore wonder: How do you find the appropriate quoted rate of return in the real world? After all, it is this stated rate of return that is usually publicly posted, not the expected rate of return. Put differently, how do you put the default risk and CAPM risk into one valuation?

A specific bond example: First compute the price necessary to make you "even" relative to the Treasury if you are risk-neutral. This price is based on the time premium and the default premium.

Here is an example. Say you want to determine the PV of a corporate zero-bond that has a beta of 0.25 and promises to deliver $200 next year. This bond pays off 95% of the time, and 5% of the time it totally defaults. Assume that the risk-free rate of return is 6% per annum and that the expected rate of return on the market is 10%. Therefore, the CAPM states that the expected rate of return on your bond must be

$$\begin{aligned}
\mathcal{E}(r_{\text{Bond}}) &= 6\% + 4\% \cdot 0.25 = 7\%\\
&= r_F + [\mathcal{E}(r_M) - r_F] \cdot \beta_{\text{Bond}}
\end{aligned}$$

This takes care of the time and risk premiums. To take the bond's default risk into account, you must still find the numerator. You cannot use the promised payment. You must adjust it for the probability of default. You expect to receive not $200, but

$$\mathscr{E}(C_{\text{Bond}}) = 95\% \cdot \$200 + 5\% \cdot 0 = \$190$$
$$= \mathscr{P}rob(\text{No Default}) \cdot \text{Promise} + \mathscr{P}rob(\text{Default}) \cdot \text{Nothing}$$

Therefore, the present value formula states that the value of the bond is

$$PV_{\text{Bond}} = \frac{\mathscr{E}(C_{\text{Bond}})}{1 + \mathscr{E}(r_{\text{Bond}})} = \frac{\$190}{1 + 7\%} \approx \$177.57$$

Given this price, you can now compute the promised (or quoted) rate of return on this bond:

$$\frac{\$200 - \$177.57}{\$177.57} \approx 12.6\%$$
$$\frac{\text{Promised Cash Flow} - \text{PV}}{\text{PV}} = \text{Promised Rate of Return}$$

The risk premium is above and beyond the time and default premiums. On average, risky investments earn more than risk-free investments now.

You can now quantify the three components in this example. For this bond, the time premium of money is 6% per annum—it is the rate of return that an equivalent-term Treasury offers. The time premium plus the risk premium is provided by the CAPM, and it is 7% per annum. Therefore, 1% per annum is your "average" compensation for your willingness to hold this risky bond instead of the risk-free Treasury. The remaining $12.6\% - 7\% = 5.6\%$ per annum is the default premium: You do not expect to earn money from this default premium "on average." You only earn it if the bond does not default.

$$12.6\% = 6\% + 5.6\% + 1\%$$
$$\text{Promised Interest Rate} = \text{Time Premium} + \text{Default Premium} + \text{Risk Premium}$$

In the real world, most bonds have fairly small market betas (often much smaller than 0.25) and thus fairly low risk premiums. Instead, most of the premium that ordinary corporate bonds quote above equivalent risk-free Treasury rates is not due to the risk premium, but due to the default premium. They simply won't pay as much as they promise, on average. However, for corporate projects and equity shares, the risk premium can be quite large. (Watch out—there are also some important imperfect market premiums that you will only learn in the next chapter.)

IMPORTANT

> Never forget:
>
> - The CAPM provides an expected rate of return.
> - This return is not a stated (promised, quoted) rate of return, because it does not include a default premium.
> - The probability of default must be handled in the NPV numerator (through the expected cash flow), and not in the NPV denominator (through the expected rate of return).

Q 9.9. A corporate bond with a beta of 0.2 will pay off next year with 99% probability. The risk-free rate is 3% per annum, and the equity premium is 5% per annum.

1. What is the price of this bond?
2. What is its promised rate of return?
3. Decompose the bond's quoted rate of return into its components.

Q 9.10. Going to your school has total additional and opportunity costs of $30,000 *this year and up-front*. With 90% probability, you are likely to graduate from your school. If you do not graduate, you have lost the entire sum. Graduating from the school will increase your 40-year lifetime annual salary by roughly $5,000 per year, but more so when the market rate of return is high than when it is low. For argument's sake, assume that your extra-income beta is 1.5. Assume the risk-free rate is 3%, and the equity premium is 5%. What is the value of your education?

9.4 Estimating the CAPM Inputs

How can you obtain reasonable estimates of the three inputs into the CAPM formula $\mathcal{E}(r_i) = r_F + [\mathcal{E}(r_M) - r_F] \cdot \beta_i$?

The Risk-Free Rate and Multi-Year Term-Structure Considerations

Which risk-free rate?

The first input into the CAPM formula is the risk-free rate of return (r_F). First, don't forget to use nominal rates to discount nominal expected cash flows. Now, this nominal risk-free rate is relatively easy to obtain from U.S. Treasuries. There is one small issue, though—which Treasury? What if the yield curve is upward sloping (as it usually does) and Treasuries yield 1% per year over one year, 3% per year over ten years, and 5% per year over thirty years? Which risk-free interest rate should go into the CAPM?

➤ *US Treasuries, Sect.* 5.3, *Pg.97*.

Advice: Pick the interest rate for a Treasury that is "most similar" to your project.

Unfortunately, the CAPM offers no guidance, because it has no concept of more than one single time period and thus no concept of a yield curve. However, from a practical perspective, it makes sense to match projects to similar risk-free bond benchmarks. That is, pick the risk-free zero-bond yield that is closest to each of your project's specific expected cash flows at the same time. For example, to value a machine that operates for three years, use the 1-year T-bond yield to discount the expected cash flow in the first year's NPV term, the 2-year T-bond yield for the second year's NPV term, and the 3-year T-bond yield for the third year's NPV term. If you had to use just one risk-free rate for multiple cash flows (because your pointy-haired boss says so), choose an average of the three rates or simply the 2-year bond. (There are better ways to do this, but the extra precision is rarely worth it.)

➤ *Yield Curve, Chapter* 5, *Pg.85*.

But don't we need formal guidance? Isn't this violating the letter of the law?

You may think this is a pretty loose method to handle an important question, and you would be right. However, it is also a reasonable method. Think about the opportunity cost of capital for a small investment with a market-beta of 0. If your corporation's investors are willing to commit their money for ten years, they could earn the yield on a ten-year risk-free Treasury bond instead. It is this ten-year rate that would then be the opportunity cost of capital on your own project cash flow that will materialize in ten years. If your project's cash flow will occur in three months, your investors could only earn the rate of return on a three-month T-bill instead. Indeed, there is almost universal agreement that companies should use a risk-free rate lined up with the project cash flow timing in the first part of the CAPM formula (where r_F appears by itself).

Q 9.11. What is today's risk-free rate for a 1-year project? For a 10-year project?

Q 9.12. If you can use only one Treasury, which risk-free rate should you use for a project that will yield $5 million each year for 10 years?

The Equity Premium

You want to know the equity premium, regardless of the CAPM

Your second CAPM input, the equity premium ($\mathcal{E}(r_M) - r_F$), is much more difficult to estimate. It is the extra expected rate of return that risky equity projects have to offer above and beyond what risk-free bond projects are offering. (It is a difference, so you can use either two nominal or two real rates.) By the way, regardless of whether the CAPM holds or not, this is a number of first-order importance to *you*—it helps you decide whether you should invest your own money in risky equities or in safer bonds.

You must provide the CAPM with the equity premium. *Good luck!*

The theoretical CAPM model assumes that you already know the *expected* rate of return on the market perfectly, not that you have to estimate it. But in real life, the equity premium is not posted anywhere, and *no one really knows the correct number*. Worse: Not only is it difficult to estimate, but your estimate often has a large influence over the CAPM's estimated cost of capital. C'est la vis.

Do not use a short-term-Treasury based equity premium for benchmarking your far-into-the-future cash flows.

Many other finance text books quote just one equity-premium estimate, and it is often the expected rate of return on stocks relative to the short-term Treasury yield. This choice can be reasonable if your own cash flows (that you want to discount) are also very short-horizon. Stock market investors, who can buy one day and sell the next, can defend this practice. It also means that an investment in a project with a beta of 1 has an expected rate of return equal to that in the stock market, because the risk-free rates in the intercept and slope cancel. Unfortunately, corporate-finance executives can rarely move in and out of projects on a moment's notice. They usually need to use the CAPM to decide on investments that have cash flows expected to materialize only many years into the future. In this case, everyone agrees that your CAPM equity premium should not be expected stock returns above short-term Treasuries. Instead, you should use the same equivalent-term-to-your-project-cash-flows Treasury rate in your estimate of the equity premium that you used as your risk-free Treasury in the constant term in the CAPM formula. (In fact, there is even a second argument to use long-term risk-free rates in the equity premium: equities are long-term investments, so you should always net out the long-term Treasury rate from expected stock returns, regardless of your own cash flows' horizons.)

There are a number of methods to guesstimate the equity premium. Unfortunately, for many decades, these methods have not tended to agree with one another. It should thus not come as a surprise that practitioners, instructors, finance textbook authors have also been confused and confusing. Exhibit 9.3 shows that each text book seems to have had its own estimate. (Fortunately, both the disagreement and the average recommended estimate seem to be slowly declining.)

Should I just give it to you?

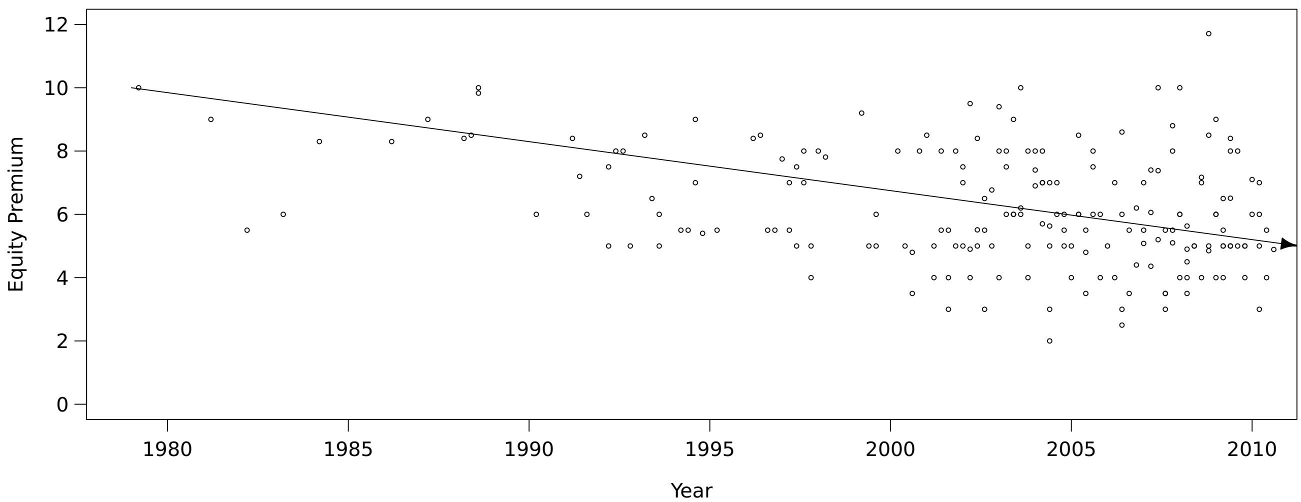


Exhibit 9.3: *Equity Premia from Different Textbooks. Source: Pablo Fernandez, SSRN, 2013..*

Ultimately, we finance-textbook authors have two choices: The first is to throw you one estimate, pretend it is the correct one, and hope you forget to ask hard questions. If you like a formulaic painting-by-numbers approach, this would leave you (wrongly) satisfied. The second is to tell you about the different methods that lead to different estimates. This is the route I will take—explaining different reasoning behind different estimates—if only because the first would eventually leave you startled to discover that your boss is using some other equity-premium and therefore has come up with a different cost-of-capital estimate. I will both explain the intuition behind the most-common methods and describe the magnitude that each suggests nowadays. You can make up your own mind what you deem to be the best estimate. (I will tell you my own personal estimate only at the end.)

Let's show you how people are reasoning.

Historical Averages I

Here are the historical numbers.

The first and most common guesstimation method is to assume that whatever the equity premium was in the past will also be the case in the future. Let's look at the historical performance of stocks vs. bonds in two different time samples, 1926-2012 and 1970-2012:

	1926-2012			1970-2012		
	Ari	Geo	$\mathcal{S}dv$	Ari	Geo	$\mathcal{S}dv$
Value-Weighed Stock Market	11.6%	9.7%	19.8%	11.3%	9.8%	17.3%
net of 1-Year Treasuries	**7.9%**	6.1%	20%	**5.8%**	4.4%	17%
net of 30-Year Treasuries	5.5%	**4.0%**	22%	1.7%	**0.8%**	20%
net of Long-Term Corporates	5.2%	3.6%	20%	1.7%	0.7%	18%

Stocks returned about 11.5% in arithmetic terms with a standard deviation of about 17-20% per year. (The value-weighted stock market is actually the correct portfolio from a CAPM perspective, but it wouldn't be much different if you used the S&P 500 instead.) The geometric return of about 9.5% was in line with the rule-of-thumb formula on Page 162. Although the stock market rate of return was pretty much the same in both samples, the equity premium was not: bond returns were higher after 1970, especially the long-term Treasuries. Thus, the historical equity premium you would want to use depends on the (matched) duration of your own project cash flow, not only for the aforementioned r_F, but also for the $\mathcal{E}(r_M) - r_F$ term.

PS: 30-Year Treasuries had market betas of < 0.1.

➤ *Morningstar Ibbotson Averages*, *Exhibit* 7.5, *Pg.168*.

We can roughly reconcile the difference between the highest equity-premium figure of 7.9% and the lowest figure of 0.7% in the table as follows:

Arithmetic Equity Premium 1926 to 2012 vs. Short-Term Bonds	≈ 8%
Minus Later Sample Period 1970 to 2012	–2%
Minus Long-Term T-Bonds Instead of Short-Term T-Bills	–2%
Minus Use of Geometric Return	–2%
Minus Cross-Product of Above Three	–1%
Geometric Equity Premium 1970-2012 vs. Long-Term Bonds	≈ 1%

Earlier textbooks touted the equivalent of the 7.9% figure, which thus etched itself into the minds of generations of students, practitioners, and finance professors. (*In fact, many other finance textbooks still etch it, without a second thought!*) But 7.9% is not necessarily the right one to use. Let's go through the three differences one by one:

1. **Sample Period?:** You have to judge what historical sample is appropriate. You probably want to end the sample recently (say 2012). But it is not clear whether you should start, say, in 1926 (when most of our data series become available) or in 1970 (about half-way). Although your estimate can seem statistically more reliable if you use more years, using the long sample means that you are then leaning more heavily on the (heroic) assumption that the world has not changed. Is the world really still the same in 2013 as it was in 1926? (And is the United States really the right country to consider alone? Maybe it just had an unusually lucky streak during (first half of) the "American Century," which is unlikely to

repeat. In this case, the average country's experience may be a better forecast for today's U.S., too.) No one knows the correct choice. I prefer the latter sample, and more so not because (noisier) stocks have performed differently, but because (less noisy) Treasuries have performed better—and continue to perform better.

➤ CAPM Term Structure, Sect. 9.4, Pg.227.

2. **Long-Term or Short-Term Bonds?:** You have to judge whether short-term or long-term bonds are the appropriate benchmark. As already mentioned, the CAPM theory itself does not understand the concept of a term structure (Chapter 5). Thus, it does not understand yield differentials for cash flows over different horizons. And thus, it offers you no easy guidance which one you should use. As with our choice for the risk-free rate in the first term of the CAPM, we have no theory guidance. We need a reasonable approach here, too.

   Again, from the perspective of an investor who can make monthly decisions and shift effortlessly between risk-free bonds and stocks, using short bonds as your benchmark makes sense. From the perspective of a manager who needs to decide on a short-term project, using short T-bills as your benchmark can also make sense. However, from the perspective of a manager who needs to commit funds to a long-term project with cash flows over decades, it does not. If all investors can earn a higher yield in Treasuries if they commit their money for 20 years, and if your own project requires them to commit their money for 20 years, too, then your project should also be benchmarked to this long-term expected rate of return.

   Conveniently, we already know a reasonable approximation of the term premium that your firm has to offer for your own longer-term projects vs. your shorter-term projects: the prevailing yield differential that similar-horizon long-term Treasuries are offering over short-term Treasuries. And, better yet, you can use the yield curve to (simultaneously) reduce your equity premium estimate and raise your risk-free rate. And, more better yet, for projects with betas around 1, this means that risk-free rates cancel and you would expect a rate of return similar to that of the overall stock market. Just don't commit the mistake of using a (high) long-term risk-free rate in the first CAPM term, and a (high) equity premium over the short-term T-bill rate in the second CAPM term.

3. **Geometric or Arithmetic?:** Should you use geometric or arithmetic rates of return in your benchmark cost of capital in the NPV formula? The answer is not clear, as you can may recall from Section 7.1. There was a convention of assuming that past returns represent equally likely future outcomes, many CAPM users compound the annual arithmetic average stock return or equity premium. However, doing so means that you expect the future multi-year stock performance relative to bonds to be better than it was in the past.

   ➤ Geometric vs. Arithmetic Returns and Extrapolation, Sect. 7.1, Pg.161.

   You should probably compound an equity premium estimate somewhere in between the arithmetic and geometric averages. (The correct value depends on your own cash flow's duration. Besides, your own expected future cash flows are normally geometric, too. If you think in terms of arithmetic expected cash flows compounded over many periods—i.e., if you consider the expected cash flow on a project that first earns +200% and then –100% [for a complete overall loss] to be a positive, then you should use the arithmetic average. Hardly anyone thinks this way.)

My recommendation.

My own preference is to use the later 40 years, to use bonds with similar maturity as the cash flow that are discounted, and to use an average between the arithmetic and geometric historical average stock returns. Thus, to discount expected cash flows that will occur in about 10 years and beyond, my own equity-premium estimate is around 1.5%—which is much lower than the 3-5% that would be touted in other books. Conveniently, my way of estimating means that I can also use the same risk-free rate in both the first and the second term of the CAPM. It also means that **my equity premium estimate is lower for longer-term cash flows, but my cost of capital estimate is usually not**. I still assign higher costs of capital to Longer-term cash flows, but this just manifests itself more through the first term (the risk-free rate) than the second term (the equity premium).

Yet another problem: your margin of error.

We are not done with all the problems. Small (and often seemingly innocuous) variations in how you estimate the CAPM inputs can lead to very different cost-of-capital estimates—think 3% vs 5%. Even if the CAPM were correct under one definition, neither you nor I nor anyone else know exactly which one it is. And besides the problem of assessing the expected equity premium point estimate, there is also the problem of the fairly large margin of error. The standard deviation of annual returns of 20% translates into a standard error of error of about $0.2/\sqrt{86} \approx 2\%$ over 86 years and $0.2/\sqrt{43} \approx 3\%$ over 43 years. If you are willing to assume that nothing has changed over the sample, then you can use some additional statistical artillery: You are then about 95% sure (a confidence range popular in statistics) that the mean geometric stock return over long bonds was between 0% and 8% from 1926 to 2012. From 1970 to 2012, you are about 95% sure that the same number was between –2% and +7%. Frankly, this large a range doesn't tell you much. We already knew, or at least believed, that the equity premium should not have been negative.

Peso Problems

To make matters even more complex, some economists believe that the historical data are not telling the full story. There are tiny probability of desasters that just happened not to happen. (This is sometimes called a **Peso problem**, based on a similar unobserved crash situation first described in an otherwise obscure academic paper about the Mexican Peso.) If you might have lost all your money, it's no wonder that you would have earned more in the scenario in which this big disaster did not occur. We just happened to have lived in this world, and so we now see superior returns when we look back. There is some empirical evidence that investors behave exactly as if they fear such a crash—but we do not know whether such a fear is (or was) rational and we are not sure how much of the historical or future equity premium such fear can explain. A reasonable order of magnitude is that extra compensation for crash risk could account for no more than a 1% equity premium per annum and perhaps for nothing (given that stock investors lost more than a third of their investments from 2000-2002 and in 2008 alone).

A sarcastic view: It ain't great!

If your estimate of the forward-looking equity premium is based on the "historical averages I" method, then you can defend a choice of 1% (for long-term cash flows). If you are aggressive, you can defend even a choice of 8% (for short-term cash flows), and ranges from 0% to beyond 10% if need be (or, more cynically, if you are an expert witness paid to opine so). Are you in awe (or disgust) of the wide possible range here?

Historical averages II

Method 2: Inverse historical averages.

The second method is to look at historical equity premiums in the opposite light. If stocks have become more desirable, perhaps this is because investors have become less risk averse, because more investors thus competed to own stocks, drove up the prices, and thereby lowered their future expected rates of return. High historical rates of return would then be indicative of low future expected rates of return.

An even more extreme version of this argument suggests that high past equity returns could have been not just due to high ex-ante equity premiums, but due to historical "bubbles" in the stock market. The proponents of the bubble view usually cannot quantify the appropriate equity premium, but they do argue that it is lower after recent market run-ups—exactly the opposite of what proponents of the historical averages I method argue.

However, you should be aware that not everyone believes that there were bubbles in the stock-market.

Current predictive ratios

Method 3: Dividend or earnings yields.

The third method is to try to predict the stock market rate of return actively with historical dividend yields (i.e., the dividend payments received by stockholders). Higher dividend yields should make stocks more attractive and therefore predict higher future equity premiums. The equity premium estimation is usually done in two steps: First, you must estimate a statistical regression that predicts next year's equity premium with this year's dividend yield; then, you substitute the currently prevailing dividend yield into your estimated regression to get a prediction. Sometimes, as in 2008, current dividend yields were so low that the predicted equity premium was negative—which would make no sense. Variations of this method have used interest rates or earnings yields, typically with similar results. In any case, the empirical evidence suggests that this method does not yield great predictions—for example, it predicted low equity premiums in the 1990s, which was a period of superb stock market performance.

Philosophical prediction

Method 4: Introspection and philosophy.

The fourth method is to wonder how much rate of return is required to entice reasonable investors to switch from bonds into stocks. Even with an equity premium as low as 3%, over 25 years, an equity investor would end up with more than twice the money of a bond investor. Naturally, in a perfect market, nothing should come for free, and the reward for risk-taking should be just about fair. Therefore, equity premiums of 6-8% just seem too high for the amount of risk observed in the stock market. This philosophical method generally suggests equity premiums of about **1%** to **3%**.

Sidenote: A **bubble** is a runaway market, in which rationality has temporarily disappeared. There is a lot of debate as to whether bubbles in the stock market ever occurred. A strong case can be made that technology stocks experienced a bubble from around 1998 to 2000. It is often called the **dot-com bubble**, the **internet bubble**, or simply the **tech bubble**. There is no convincing explanation based on fundamentals that can explain *both* why the NASDAQ Index climbed from 2,280 in March 1999 to 5,000 by March 2000, *and* why it then dropped back to 1,640 by April 2001.

Consensus survey

Method 5: Just ask!

What to choose? Welcome to the club! No one knows the true equity premium. So, the fifth method is to ask the experts—or anyone else who may *or may not* know. It's the blind leading the blind. The ranges of estimates have varied widely (and they are often also conveniently tilted in the interest of those giving them):

- The Social Security Administration uses an estimate of around 4%.
- The consulting firm McKinsey uses a standard of around 5%.

Analysts' estimates are all over the map, too. Estimates between 2% and 6% per annum seem reasonable.

- Around the turn of the millenium, the most common equity premium estimates recommended by professors of finance were **5%** for a 1-year horizon and **6%** for a 30-year horizon, both with a range from 3% to 8%. The estimates were generally similar in the U.S., Spain, Germany, and the UK.
- On Monday, February 28, 2005, the *Wall Street Journal* reported the following average *after-inflation* forecasts from then to 2050 (per annum):

			Government	Corp.	Equity Premium	
Name	**Organization**	**Stocks**	**Bonds**	Bonds	**Rel Gov**	**Rel Corp**
William Dudley	Goldman Sachs	5.0%	2.0%	2.5%	3.0%	2.5%
Jeremy Siegel	Wharton	6.0%	1.8%	2.3%	4.2%	3.7%
David Rosenberg	Merrill Lynch	4.0%	3.0%	4.0%	1.0%	0.0%
Ethan Harris	Lehman Brothers	4.0%	3.5%	2.5%	0.5%	1.5%
Robert Shiller	Yale	4.6%	2.2%	2.7%	2.4%	1.9%
Robert LaVorgna	Deutsche Bank	6.5%	4.0%	5.0%	2.5%	1.5%
Parul Jain	Nomura	4.5%	3.5%	4.0%	1.0%	0.5%
John Lonski	Moody's	4.0%	2.0%	3.0%	2.0%	1.0%
David Malpass	Bear Stearns	5.5%	3.5%	4.3%	2.0%	1.2%
Jim Glassman	JP Morgan	4.0%	2.5%	3.5%	1.5%	0.5%
		Arithmetic Average (Difference):			2.0%	1.4%
		Volatility-Adjusted Geometric Average ≈ −1% :			1.0%	0.4%

As you already know, it matters (a) whether you quote geometric or arithmetic averages; and (b) whether you quote the equity premium with respect to a short-term or a long-term interest rate. If you want to use the short rate, then you need to add another 1-2% to the equity-premium estimates in this table. (Unrelated, for the equity premium, it does not matter whether equity premium numbers are inflation adjusted. Inflation cancels out, because the equity premium is itself a difference in nominal rates.)

- In 2005, a poll by Graham and Harvey (from Duke) and *CFO Magazine* reported an average equity premium estimate of CFOs of around 3%.
- In mid-2008, Merrill Lynch's survey of 300 institutional investors reported 3%.
- In 2012, Fernandez reported that analysts and companies in the U.S., Spain, Germany and the U.K. all used average estimates between 5% and 6%—just like finance professors, and with the same typical range from about 3% to 8%.

Of course, these estimates are themselves based on the first four methods, they do not take your own cash flow duration into account, and they occur in echo chambers—they are what analysts, companies, consultants, students, and professors have been reading in corporate finance textbooks (like this one) for many years now.

One aspect that does not make sense is that these estimates seem to correlate too strongly with very recent stock market returns. For example, in late 2000, right after a huge run-up in the stock market, surveys by *Fortune* or *Gallup/Paine Webber* had investors expecting equity premiums as high as 15% per year. (They were acutely disappointed: The stock market dropped by as much as 30% over the following two years. Maybe they just got the sign wrong?!)

Internal Cost of Capital (ICC)

Method 6: Ask and Use!

A hybrid method combining survey methods and analysis is the "Internal Cost of Capital." Basically, this uses analysts' consensus projections about S&P 500 earnings over the next few years, and then uses a perpetuity model to back out the cost of capital that makes the price equal to the analysts discounted future earnings. These estimates vary over the business cycle, which is why one usually uses an average ICC over many years. The estimates that come out of these models are about 2.5%-3% per annum relative to 10-year bonds in arithmetic terms, and about 1.5% in geometric terms. (And, as with historical estimates, different variants can give estimates with a much larger range, say from 0% all the way to 7%.)

Conclusion

Remain consistent: Don't use different equity premium estimates for different projects.

You now know that no one can tell you the authoritative number for the equity premium. Such authority does not exist. Everyone is guessing, but there is no way around it—you have to take a stance on the equity premium. I could not shield you from this problem. I could only give you the arguments that you should contemplate when you are picking *your* number. My own take is this: First, I have my doubts that equity premiums will be 8% in the future. (The twentieth century was the "American Century" for a good reason: There were a lot of positive surprises for American investors.) I personally prefer equity premium estimates around **2%**, and this is actually in line with the majority of methods mentioned above. But realize that reasonable expert witnesses can cherry-pick equity premium estimates as low as 1% or as high as 8%. Of course, I personally find their estimates less believable the farther they are from my own personal estimate. And I find anything outside this 1% to 8% range just too tough to swallow. Second, whatever equity premium you do choose, *be consistent*. Do not use 3% for investing in one project and 8% for investing in another similarly-timed project. And do not use a risk-free rate based on long-term bonds as your risk-free rate in the CAPM and an equity premium estimate based on short-term bills. Being consistent can sometimes reduce your relative mistakes in choosing one project over another.

The equity premium is an extremely important number, even without the CAPM.

Yes, the equity premium is difficult to estimate, but there is really no way around your taking a stance. Even if you had never heard of the CAPM, you would still consider the equity premium to be one of the two most important numbers in finance (together with the risk-free rate, the other CAPM input). **If you believe that the equity premium is**

ANECDOTE **Was the 20th Century Really the "American Century?"**

The compound rate of return in the United States was about 8% per year from 1920 to 1995. Adjusted for inflation, it was about 6%. In contrast, an investor who had invested in Romania in 1937 experienced not only the German invasion and Soviet domination, but also a real annual capital appreciation of about –27% per annum over its 4 years of stock market existence (1937–1941). Similar fates befell many other Eastern European countries, but even countries not experiencing political disasters often proved to be less than stellar investments. For example, Argentina had a stock market from 1947 to 1965, even though its only function seems to have been to wipe out its investors. Peru tried three times: From 1941 to 1953 and from 1957 to 1977, its stock market investors lost *all* their money. But the third time was the charm: From 1988 to 1995, its investors earned a whopping 63% real rate of return. India's stock market started in 1940 and offered its investors a real rate of return of just about –1% per annum. Pakistan started in 1960 and offered about –0.1% per annum.

Even European countries with long stock market histories and no political trouble did not perform as well as the United States. For example, Switzerland and Denmark earned nominal rates of return of about 5% per annum from 1920 to 1995, while the United States earned about 8% per annum. A book by Dimson, Marsh, and Staunton looks at 101 years of global investment returns and argue that measurement and hindsight biases can account for much of this superior return.

Nevertheless, the United States stock market was an unusual above-average performer in most of the twentieth century. Will the twenty-first century be the Chinese century? And do Chinese asset prices already reflect this? Or already reflect *too much* of this?

Goetzmann and Jorion (1999)

high, you would want to allocate a lot of your personal assets to stocks. Otherwise, you would allocate more to bonds. You really do need to know the equity premium even for basic investing purposes, too—no escape possible.

The CAPM is about relative pricing, not absolute pricing.

In a corporate context, like every other corporate manager, you cannot let your limited knowledge of the equity premium stop you from making investment decisions. In order to use the CAPM, you do need to judge the appropriate reward for risky projects relative to risk-free projects. Indeed, you can think of the CAPM as telling you the *relative* expected rate of return for projects, not the *absolute* expected rate of return. Given *your* estimate of how much risky average stock market projects should earn relative to safe projects, the CAPM can tell you the costs of capital for projects of a specific beta. But the basic judgment of the appropriate spread between high-beta and low-beta projects is left up to you.

Q 9.13. What are appropriate equity premium estimates? What are not? What kind of reasoning are you relying on?

Investment Projects' Market Betas

Your third CAPM input is your project's **market beta** (β_i). It measures how the rate of return of your project fluctuates with that of the overall market. Unlike the previous two inputs, which are the same for every project in the economy, the beta input depends on your specific project characteristics: Different investments have different betas.

Unlike the risk-free rate and the equity premium, beta is specific to each project.

The Implications of Beta for a Project's Risk and Reward

You already understand the role of market beta in determining the expected rate of return for an asset. This is the security market line—that is, the CAPM formula itself is an upward-sloping line when the expected rate of return is plotted against beta. But market beta also has implications for the standard deviation of assets. First, note that assets with a low beta are not very exposed to market risk. Thus, assets that have either a very high or a very low market beta tend to have higher standard deviation. Second, note that you can only learn much about an asset's market-beta in months in which the market does not turn in the same performance as the risk-free security. If the market and the risk-free asset turn in the same performance in a given month, then *any* asset's expected rate of return is just the risk-free rate, regardless of its market-beta.

Projects with higher betas have more market risk, so their own idiosyncratic variances tend to be higher, too.

Beta Estimation

How do you find good forward-looking market-beta estimates for your own project? As usual, when we do not know the input, we rely on statistical analysis of past data. The mechanics of finding the beta for a stock are easy. You run a **market-model** regression on historical stock returns. The independent variable is the rate of return on the stock-market (the S&P500 percent change, even without dividends, is usually good enough). The dependent variable is the rate of return on your project. Usually, you should run such regressions with daily rather than with monthly returns and you should use about 3-5 years of data. Any statistical package (and common computer spreadsheet programs) readily give you the regression coefficients. The slope is the historical market-beta.

Ways to estimate beta.

Unfortunately, although estimates of future betas are better than estimates of the future equity premium, they are still not great. The reason is that stock returns are very, very noisy. (And projects are rarely the same as stock, and project and stocks both often change their characteristics over time, too, but let's ignore this for the moment.) Thus, statisticians recommend that you should "shrink" your beta estimates further. **Shrinking** comes in two forms:

- Instead of using your own historical rates of returns, use the historical rates of return on a broader portfolio. For example, if you want to estimate the future market-beta of AMD, do not use the historical rates of return of AMD in your market-model, but those of the "computer hardware sector" instead. In other words, assume that all computer hardware makers have about the same stock market beta, and that AMD's own future beta will look more like that of its sector in the past than like that of its own past.
- Instead of using the coefficient estimate from the regression, use an average between the regression estimate and the number "1" (which is the average of

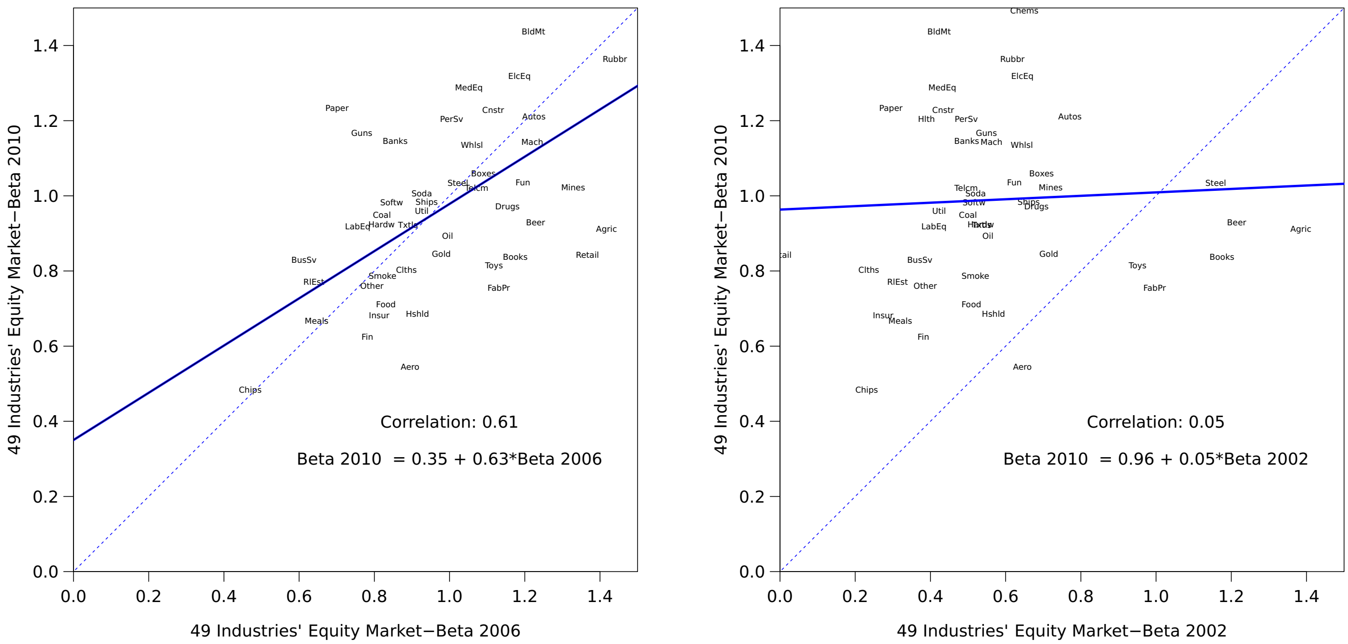


Exhibit 9.4: *Betas For 49 Industries Far Into The Future.* These figures plot industry market betas at the end of 2010 against their own value a few years earlier. Industries that had high market-betas in 2006 still tended to have high market-betas in 2010—although you should have not have used your exact estimates but shrunk them towards 1 to reflect their tendency to mean-revert. In contrast, industries that had high market-betas in 2002 unfortunately did not have high market-betas in 2010. If you had to guess market-betas in 2002 for 2010, you may as well have guessed the same value for every industry, ignoring the prevailing 2002 market-betas. The 0.05 coefficient is unusually low. In other eight-year samples, it was more like 0.3. Data Sources: 49 industries from Fama-French. Betas from 3 years of daily data.

all stock's market-betas). For example, if your market-model coefficient estimate based on past data is 2.6, use $1/2 \cdot 2.6 + 1/2 \cdot 1.0 = 1.8$ for your estimate of the future. Many studies have confirmed that such shrunk market-betas perform better in predicting subsequent market-betas than the unshrunk coefficient estimates themselves. The market-betas that are posted on many websites, such as YAHOO! FINANCE, are also shrunk.

Unfortunately, while these two shrinkages combined work reasonably well for predicting stock market-betas over the next quarter, they do not work so well for predicting stock market betas for cash flows that will occur in many years. Figure 9.4 shows how the stock market-betas for 49 different industries and then shrunk again. These industry betas typically range from about 0.3 to about 1.5, but change over time. The left panel shows that 2006 market-betas were still similar to those in 2010. The right panel shows that 2002 market-betas were not. (The left panel was better than usual, the right panel was worse than usual.) Based on a more detailed statistical study, my advice is to shrink the market-betas for cash flows in more than 2-5 years a second time. In our example of an industry market-beta of 2.6, shrunk once to 1.8 for cash flows that occur within the next year, if you had to assess the market betas of cash flows in about 5 to 15 years, you would shrink your beta a second time, say to $1/2 \cdot 1.8 + 1/2 \cdot 1.0 = 1.4$.

Unfortunately, as a corporate manager, you are rarely interested in the market-beta of an industry or even a stock. Usually, you are interested in the market-beta of a new project that you are considering. Sometimes, your firm is not even publicly traded, so you would not even have historical data if you wanted to. (And, if not publicly traded, then it is quite possible that your investors would not have been fully diversified, which is an essential assumption in the CAPM. If your main investor is undiversified, you may care about idiosyncratic standard deviation more than about the market-beta.) In this case, corporate CAPM users must thus rely more on economic intuition than pure statistics. You can rearrange the CAPM formula to obtain a beta estimate. Now, do you think your project cash flows and its future project value (which is influenced by changes in the economy) is likely to move more or less with the overall stock market (and, possibly, the overall economy)?

$$\mathscr{E}(r_i) = r_F + [\mathscr{E}(r_M) - r_F] \cdot \beta_i \iff \beta_i = \frac{\mathscr{E}(r_i) - r_F}{\mathscr{E}(r_M) - r_F}$$

The right side of this formula helps translate your intuition into a beta estimate. What rate of return (above the risk-free rate) will your project have if the market were to have +10% or –10% rate of return (above the risk-free rate)? Clearly, such guesswork is difficult and error-prone—but it can provide a beta estimate when no other is available. Or, perhaps you can "start" with an industry market-beta and shrink it appropriately, perhaps adjusting for the fact that some (smaller) firms typically have higher betas?

Equity and Asset Betas Revisited

Don't use the equity beta to estimate your project's hurdle rate. Use the asset beta instead.

No matter how good your estimates of your stock betas are, it is important that you always distinguish between asset betas and equity betas. Let me remind you with an example. Assume that the risk-free rate is 4% and the equity premium is 5%. You own a $100 million project with an asset beta of 2.0 that you can finance with $20 million of risk-free debt. By definition, risk-free debt has a beta of 0. To find your equity beta, write down the formula for your asset beta (firm beta):

➤ *Asset and equity betas, Formula 8.7, Pg.212.*

$$\begin{array}{ccccccccc} & & 20\% & \cdot & (0) & + & 80\% & \cdot & (\beta_{Equity}) = 2.0 \\ \beta_{Firm} & = & \left(\frac{\text{Debt value}}{\text{Firm value}}\right) & \cdot & \beta_{Debt} & + & \left(\frac{\text{Equity value}}{\text{Firm value}}\right) & \cdot & \beta_{Equity} \end{array}$$

Solve this to find that your equity beta is 2.5. This is what you would find on YAHOO! FINANCE. You would not want to base your hurdle rate for your firm's typical average project on the equity beta: Such a mistake would recommend you use a hurdle rate of $\mathscr{E}(r_i) = r_F + [\mathscr{E}(r_M) - r_F] \cdot \beta_i = 4\% + 5\% \cdot 2.5 = 16.5\%$. This would be too high. Instead, you should require your average projects to return $\mathscr{E}(r_i) = 4\% + 5\% \cdot 2.0 = 14\%$.

➤ *Typical, average, and marginal betas, Sect. 12.3, Pg.343.*

If you use comparables, first unlever them.

Conversely, if your project is private but the potential future owners are well-diversified, you may have to find its hurdle rate by looking at public comparables. Let's presume you find a similarly-sized firm with a similar business that YAHOO! FINANCE lists with a beta of 4, or perhaps better yet, the firm's industry. Remember that financial websites always list only the equity beta. The CAPM tells you that the expected rate of return on the equity is $4\% + 5\% \cdot 4 = 24\%$. However, this is not necessarily the hurdle rate for your project. When you look further on YAHOO! FINANCE, you may notice that your comparable is financed with 90% debt and 10% equity. (If the comparable had very little debt, a debt beta of 0 might have been a good assumption, but, unfortunately, in this case it is not.) Corporate debt rarely has good historical return data that would allow you to estimate a debt beta. Consequently, practitioners often estimate the expected rate of return on debt via debt comparables based on the credit rating. Say your comparable's debt is rated BB and say that BB bonds have offered *expected* rates of return of 100 basis points above the Treasury. (This might be 200 basis points *quoted* above the Treasury). With the Treasury standing at 4%, you would estimate the comparable's cost of capital on debt to be 5%. The rest is easy. The expected rate of return on your project should be

➤ *Credit ratings, Sect.* 6.2, *Pg.130*.

$$\begin{aligned} \mathscr{E}(r_{\text{Project}}) &= 90\% \cdot 5\% + 10\% \cdot 24\% = 6.9\% \\ &= w_{\text{Debt}} \cdot \mathscr{E}(r_{\text{Debt}}) + w_{\text{Equity}} \cdot \mathscr{E}(r_{\text{Equity}}) \end{aligned}$$

This would make a good hurdle rate estimate for your project.

Q 9.14. According to the CAPM formula, a zero-beta asset should have the same expected rate of return as the risk-free rate. Can a zero-beta asset still have a positive standard deviation? Does it make sense that such a risky asset would not offer a higher rate of return than a risk-free asset in a world in which investors are risk averse?

Q 9.15.A comparable firm (with comparable size and in a comparable business) has a YAHOO! FINANCE–listed equity beta of 2.5 and a debt/asset ratio of 2/3. Assume that the debt is risk free.

1. Estimate the equity beta for your firm if your projects have similar betas, but your firm will carry a debt/asset ratio of 1/3.
2. If the risk-free rate is 3% and the equity premium is 2%, then what should you use as your firm's hurdle rate?
3. What do investors demand as the expected rate of return on the comparable firm's equity and on your own equity?

Q 9.16. You own a stock portfolio that has a market beta of 2.4, but you are getting married to someone who has a portfolio with a market beta of 0.4. You are three times as wealthy as your future significant other. What is the beta of your joint portfolio?

9.5 Is the CAPM the Right Model?

Q: What happens if a stock offers too much or too little expected rate of return? A: Investor stampedes.

Now you know how securities should be priced in a perfect CAPM world, in which investors have good knowledge of the parameters. What would happen if a stock offered more than its appropriate expected rate of return? Investors in the economy would want to buy more of the stock than would be available: Its price would be too low. It would be too good a deal. Investors would immediately flock to it, and because there would not be enough of this stock, investors would bid up its price and thereby lower its expected rate of return. The price of the stock would settle at the correct CAPM expected rate of return. Conversely, what would happen if a stock offered less than its due expected rate of return? Investors would not be willing to hold enough of the stock: The stock's price would be too high, and its price would fall. Neither situation should happen in the real world.

Assets not priced according to the CAPM do not allow you to make money for nothing. However, it could imply good deals.

Is this an arbitrage—a "free money situation"? No. When stocks do not to follow the CAPM formula, buying them is still risky. Yes, some stocks would offer a higher or lower expected rate of return and thus seem to be too good or too bad a deal, attracting too many or too few investors chasing a limited amount of value in this stock—but these stocks would still remain risky investments. No investor could earn risk-free profits. There is no arbitrage here. The market forces working on correcting the (CAPM) mispricing are modest. And remember that there are good reasons why the CAPM may not hold in the first place, too. For example, it relies on many perfect-market assumptions. If investors are taxed or liquidity-constrained (that is, they cannot easily diversify, e.g., because the firm is a startup or family firm) or do not agree on the inputs, then it is quite plausible that some firms or even sectors (such as "value firms" or "growth firms") would offer higher or lower expected rates of return than the CAPM suggests.

What is The Scientific Evidence?

Why use the CAPM?

Unfortunately, in real life, despite its wide use, the evidence in favor of *practical use and application* of the CAPM is either weak or non-existent. If you use the CAPM, you do so based primarily on a belief that it should work, not based on empirical evidence. Say again: the evidence suggests that, even if the CAPM held, input estimates for corporate cash flows that will occur far in the future are usually so imprecise that they render the CAPM practically useless.

Huh? Did you really read me right?

If there is no empirical evidence that CAPM use is justified, then why do we torture you with it? This is a much easier question to answer than how stocks are priced in the real world or what the best estimate of the appropriate hurdle rates for your project is.

The CAPM is based on the important concept of diversification.

Good intuition: The CAPM has impeccable intuition. It is a model that shines through its simplicity and focuses on what *should* matter when owners are many—diversification. It gets executives away from the false notion that many small public investors care about the idiosyncratic risk of projects that the investors can diversify away. It also helps you understand that corporate diversification into a conglomerate is not likely to add value. Your investors can diversify themselves.

They don't need your firm to diversify you for them. And, it explains nicely why stocks should have higher rates of returns than bonds and how to "lever" and "unlever" assets. In general, it is a nice conceptual framework that helps you think about what should matter.

Faith.

Strong Belief: Many instructors and practitioners find the CAPM to be so plausible that they are willing to live with "absence of CAPM evidence." They do not take this absence to mean "evidence of CAPM absence." Thus, they adopt the CAPM based on their prior belief and faith, not based on evidence. Doing this is acceptable as long as you are fully aware that this is really what you are doing. (However, even if you do adopt the CAPM and even if this is not a Rumsfeld-level blunder, you still have to realize that you should greatly shrink your beta and equity-premium inputs for long-term cash flows.)

A crutch

Standin for Expected Cash Flow Default: The CAPM often assigns higher costs of capital to projects that are more likely to fail. If you have not fully adjusted your expected cash flow estimates downwards to adjust for failure (a common human error), the CAPM cost of capital often helps to impose a higher hurdle rate on riskier cash flows.

Important: Everyone expects you to know the CAPM!

Everyone uses it: The CAPM is *the* standard. Exhibit 9.5 shows that 73% of the CFOs reported that they always or almost always use the CAPM. (And use of the CAPM was even more common among large firms and among CFOs with an MBA.) No alternative method was used very often. Consequently, you have no choice but to understand the CAPM model well—*if you will work for a corporation, then the CAPM is the benchmark model that your future employer will likely use and will expect you to understand well*. Again, the CAPM is simply *the* standard. The CAPM is also used as a benchmark by many investors rating their (investment) managers, by government regulatory commissions, by courts in tort cases, and so on. It is literally the dominant, if not the only, widely-used model to estimate the cost of capital. Indeed, there is a whole section on the CFA exam about the CAPM!

There is no generally-used alternative to the CAPM.

Alternatives—please stand up: The famous sociologist Lewin wrote that "there is nothing more practical than a good theory." If not the CAPM, then what else would you use? There are no commonly-accepted alternatives. (A related justification for the CAPM has been that we consider the CAPM like linguists consider Latin—a good language that prepares you well to learn other languages that descended from it. The problem is that the CAPM-descendant models don't work well, either. At best, they are so flexible and slippery that we cannot know whether they work or not. At worst, they or their use has been rejected by the data, too.)

Do you want a bedtime story that "the world is ok" in order to be able to go to sleep?

Be aware that my treatment of the CAPM in an introductory corporate-finance textbook borders on heresy. Most corporate finance text-books make the CAPM their centerpiece. They do this not because the authors believe in it, but because it is dogma that new finance students are too fragile to deserve the hard truth. I am sorry—I wish I could have told you a happy bed-time story about how the world is nice and orderly, too. But it would have been a lie.

Never make the following errors, please.

Now, if you still want to use the CAPM, here is my advice. As a corporate executive, you should always first think hard about when you want to use the CAPM. Think about

Method	Usage Frequency	Usage Recommendation	Explained in
CAPM	(73%)	With Caution	Chapter 9
Historical Average Returns	(39%)	Rarely	Chapter 8
Modified CAPM	(34%)	With Caution	Chapter 9
Backed Out from Gordon Model	(16%)	Occasionally	Chapter 3
Whatever Investors Tell Us	(14%)	Occasionally	Chapter 2

Exhibit 9.5: *CFO Valuation Techniques for the Cost of Capital.* Rarely means "usually no, and often used incorrectly." Not reported, use of the CAPM is more common among managers with an MBA—and in firms who rely on consultants who in turn use the CAPM. Original Source: John Graham and Campbell Harvey, 2001.

ANECDOTE **"Cost of Capital" Expert Witnessing**

When Congress tried to force the "Baby Bells" (the split-up parts of the original AT&T) to open up their local telephone lines to competition, it decreed that the Baby Bells were entitled to a fair return on their infrastructure investment—with fair return to be measured by the CAPM. (The CAPM is either the de facto or legislated standard for measuring the cost of capital in many other regulated industries, too.) The estimated value of the telecommunication infrastructure in the United States is about $10 to $15 billion. A difference in the estimated equity premium of 1% may sound small, but even in as small an industry as local telecommunications, it meant about $100 to $150 million a year—enough to hire hordes of lawyers and valuation consultants opining in court on the appropriate equity premium. Some of my colleagues bought nice houses with the legal fees.

I did not get the call. I lack the ability to keep a straight face while stating that "the equity premium is exactly *x* point *y* percent," which was an important qualification for being such an expert. In an unrelated case in which I did testify, the opposing expert witness even explicitly criticized my statement that my cost-of-capital estimate was an imprecise range—unlike me, he could provide an exact estimate, and it was 11% per year!

Bradford Cornell, UCLA

whether it is useful for your own cost-of-capital estimates, or whether the CAPM errors seem too large to be useful for your particular needs. Here is what I would definitely warn about:

Don't expect accuracy and don't use it for financial investing.

Accuracy: The CAPM is a poor model if you want precision. If you believe that CAPM expected rates of return should be calculated with any digits after the decimal point, then you are deluded. Please realize that, at best, the CAPM can only offer expected rates of return that are of the "right order of magnitude," plus or minus a few percentage points perhaps. Actually, if accuracy and precision are important, you are in trouble. We do not have *any* models that can offer it. (Fortunately, it is often less important to be accurate than it is to be *better* estimating value than your competitors. And always remember that valuation is as much an art as it is a science.)

Avoid using the CAPM for financial investment purposes.

Investment purposes: If you are not a corporate executive looking to determine your project hurdle rate, but a financial investor looking for good investments from the universe of financial instruments, with an ability to shift your money around every day, then please do not use the CAPM. Although the CAPM offers the correct intuition that wide diversification needs to be an important part of *any* good investment strategy, there *are* many better investment strategies than just investing in the market index. Some are explained in Section App.9.C (Companion); more will be discussed in an advanced investments course.

➤ *Mean-variance optimization in detail,* *Sect.* App.8.C (Companion), *Pg.*≈*35*.

Please do not confuse the CAPM with the mean-variance framework discussed in the previous chapter. Mean-variance optimization is an asset-selection technique for your individual portfolio, and it works, regardless of whether or not the CAPM holds.

➤ *Corporate Time-Varying Costs of Capital,* *Sect.* 5.5, *Pg.112*.

Long-Term Differences: If you are a corporate executive, be cautious. Look at your cost of capital more holistically. The CAPM has two terms.

The first term is the risk-free rate which applies to all projects, regardless of beta. Fortunately, there is great evidence what you should use. You should use higher costs of capital for cash flows that will occur in the more distant future. And you have a great estimate of the premium that long-term projects need to offer over short-term projects, based on the Treasury yield-curve. You don't even need historical estimates: you can use the prevailing Treasury yield curve. *Use it! It works!*

It is the second term (the beta multiplied by the risk-premium), i.e., your beta risk-adjustment, that is dubious. If your cash flows will occur in many years, be modest. Do not overstate the risk-inputs in the CAPM. Shrink and shrink again.

- As a corporate manager, compare the cost of capital on *your equity* vs. the cost of capital on *your debt* for your long-term cash flows. With an equity premium based on the performance of stocks vs. long-term Treasuries of about 1-2% from 1970 to today, it may not matter much whether your project A has a beta of 0.8 and your project B has a beta of 1.2. The implied cost-of-capital difference between these two projects of under $(1.2-0.8)\cdot 2\% \approx 1\%$/year is already small.
- For long-term cash flows, your best estimate of your equity market-betas should be tilted much more towards 1 than what you think your market-beta is today. Thus, if you fit your historical market-beta to be 0.5 for A and 1.5 for B today, you may well want to use a market-beta shrunk to around 0.9 for A and 1.1 for B if those equity cash flows will occur in 10-20 years. Think about this: A and B would now have a different implied cost of equity capital of $0.2\cdot 2\% \approx 0.4\%$. This is way below your noise-and-uncertainty threshold.

  Asset betas are often even closer—they often give it time-stability, though.

  But let's continue. Say your projects are partly debt-financed, too. Now you need to calculate asset-betas rather than equity betas. Let's say both projects have 50% debt that is almost risk-free. Then your asset beta would be $0.5\cdot 0.0+0.5\cdot 0.9 = 0.45$ for A and $0.5\cdot 0.0+0.5\cdot 1.1 = 0.55$ for B.

Now you have a project cost of capital difference $(0.55 - 0.45) \cdot 2\% \approx 0.2\%$ between A and B.

How does this expected rate of return difference between A and B compare to your own uncertainty about your projects' relative expected cash flows? Does the CAPM beta risk-adjustment really matter much in light of your uncertainty?

The estimated CAPM cost of capital for long-term cash flows are fragile.

Alternatives

Let me summarize what I believe the data do tell us that is solid enough a rock to build a house on it:

What is solid empirical evidence?

- There definitely is a time-value of money.
- There definitely is a term structure. Long-term cash flows usually require higher costs of capital than short-term cash flows. Your investors can earn higher expected rates of return elsewhere for longer-term commitments, too.
- There definitely is a credit component. Assets with higher probabilities of default have to make up for it with higher promised yields; that is, higher yields when they succeed.
- As a preview to Chapter 10, market imperfections seem to play a role. There seems to be a liquidity premium. Assets that can be quickly liquidated in a market crash are more expensive, and different asset classes seem to have different degrees of liquidity. Because of their collateral, mortgage debt tend to have lower costs of capital than general bonds. Firms with less access to capital markets, such as startups, seem to pay higher costs of capital, although adjusting for default makes this difficult to measure. Investors pay more in personal income tax for interest receipts than they do for capital gains, which makes equities relatively more desirable and reduces their after-tax income. And sentiment and agency considerations seem to play a role in equity trading that is not unimportant. Many of these market imperfections embody some concept of risk, but it is not the market-beta.

➤ *Market Imperfections*, *Chapter* 10, *Pg.257*.

- After taking into account the premia just mentioned, the remaining equity premium is probably relatively small (1-2%), although we do not know for sure. Our uncertainty is much larger than our certainty about its magnitude. And you need to realize that betas for cash flows far into the future are much closer to 1 than historical regressions would suggest. The "CAPM" beta impact is relatively unimportant.

So what would I do if I was not constrained by my boss? My best alternative cost-of-capital recommendation would start out just like the CAPM: As the first term in a formula, I would recommend that you use the rate of return on bonds of similar maturity as the cash flow that you want to value. Usually, this means that you assign higher costs of capital to cash flows farther in the future. It is only on the second term, the equity risk-adjustment, that I would tinker. Instead of the (shrunk) CAPM market-beta multiplied by the historical equity premium (of 2% or less per annum), I would recommend a more holistic approach.

Use reasonable risk adjustments.

- Take into consideration that projects with high volatility and/or with high leverage are more risky. The equity on these projects probably requires a higher expected rate of return to keep your investors happy. Projects with higher idiosyncratic risk are also the same projects where executives are often the most over-optimistic. (Check again: are you sure your expected cash flows in the NPV numerator are not over-confident?)
- Take into consideration whether you and your owners are well-diversified. If you are not, then you should require higher rates of return on riskier projects. In this case, it is not "beta risk" that matters, but "total risk."
- Take into consideration that your investors may "like" growth firms and are often willing to pay higher prices and thus accept lower average rates of returns for some such projects.

There is little harm if you calculate a (repeatedly-shrunk) CAPM market-beta with a low equity premium (say 2%) to assess whether any other non-CAPM cost-of-capital assessments seems reasonably similar to your CAPM assessment. In this sense, the CAPM can still be a little helpful. Finally, realize that it is in general very difficult to assess over many years whether corporate projects will offer higher or lower average rates of return than the average project in the economy. If you make smart decisions, after your project's initial growth phase is over, would it be reasonable to assume that it will earn similar rates of returns as most other good projects in the economy—not better, not worse?

➤ *Long-Run Excess Profits,* *Sect.* 20.3, *Pg.*672.

What would I do if the boss liked the CAPM?

And if my boss required an approach like the CAPM, what would I do?

- If I ran a large firm with good access to capital markets, I would assume an equity premium of 1-2% per annum and apply this to the equity components of all my long-term cash flows. The exception would be projects for which I would have a strong prior that their market-betas will be very extreme, say, below –1 or greater than 3 (and I would then shrink those betas further to, say, 0 and 1.5, respectively, to account for long-term uncertainty about betas). I would consider long-term corporate debt to have a higher cost of capital than equivalent Treasuries but a lower cost of capital than my own equity—the latter primarily because debt provides a corporate income tax shield (as you will learn in Chapter 17) and not because the equity premium over long-term corporate bonds is high.
- Deviating from the CAPM, if I ran a startup firm, I would assume a cost of capital of 2% to 6% above the *expected* rate of return on my uncollateralized debt. The expected rate of return on my debt could be very high—it could even be in the double digits. (This reflects the fact that more volatile cash flows and firms that struggle with more market imperfections must pay higher costs of capital.) Risk definitely plays a role, but not in the strict CAPM market-beta sense. Alternatively, I would abandon NPV-based models altogether and try to estimate what other similar projects are offering their investors. This is the route we take in Chapter 14.

➤ *Income Taxes and Cost of Capital,* *Chapter* 17, *Pg.*545.

➤ *Comparables,* *Chapter* 14, *Pg.*431.

And I would never use any of my schemes here (or the CAPM) for the pricing of bonds, derivatives, or other extreme kinds of projects.

NPV or Comparables? Eugene Fama thinks Comparables are better.

Am I the only professor who recommends against using the CAPM? No. Eugene Fama, perhaps the most famous active finance professor alive and partly responsible for the original spread of the CAPM, nowadays strongly recommends against the combined use of NPV models with asset-pricing models like the CAPM, where you use the CAPM expected rate of return as your cost of capital in an NPV calculation. Such use means you divide one uncertain number by another. This practice combines your errors and uncertainty about expected cash flows in the numerator with your errors and uncertainty about expected returns in the denominator. Yikes!

Conclusion

IMPORTANT

- The CAPM is the benchmark model in the real world. Most corporations use it.
- Everyone will expect you to understand the CAPM. Regardless of whether the model holds or not, you have to know it.
- The empirical evidence suggests that the CAPM is not a great model for predicting expected rates of return.
- The first CAPM term (that long-term projects have to offer higher expected rates of return) seems to hold better than the second CAPM term (the risk adjustment).
- For cash flows many years into the future, you must realize (a) that market-betas revert back towards 1 and (b) that the equity premium is low.
- The CAPM never offers great accuracy.
- Mean-variance optimization (Section 8.2) works even if the CAPM does not.

Q 9.17. Does the empirical evidence suggest that the CAPM is correct?

Q 9.18. If the CAPM is wrong, why do you need to learn it?

Q 9.19. Is the CAPM likely to be more accurate for a project where the beta is very high, one where it is very low, or one where it is zero?

Q 9.20. To value an ordinarily risky project, that is, a project with a beta in the vicinity of about 1, what is the relative contribution of your personal uncertainty (lack of knowledge) in (a) the risk-free rate, (b) the equity premium, (c) the beta, and (d) the expected cash flows? Consider both long-term and short-term investments. Where are the trouble spots?

Summary

This chapter covered the following major points:

- The CAPM provides an "opportunity cost of capital" for investors, which corporations can use as the cost of capital in the NPV formula. The CAPM formula is

$$\mathscr{E}(r_i) = r_F + [\mathscr{E}(r_M) - r_F] \cdot \beta_i$$

  Thus, there are three inputs: the risk-free rate of return (r_F), the expected rate of return on the market ($\mathscr{E}(r_M)$), and the project's or firm's market beta (β_i). Only the latter is project-specific.
- The line plotting expected rates of return against market beta is called the security market line (SML).
- The CAPM provides an expected rate of return, consisting of the time premium and the risk premium. It ignores the default premium. In the NPV formula, the default risk and default premium work through the expected cash flow in the numerator, not through the expected rate of return (cost of capital) in the denominator.
- For r_F, you should use bonds that match the timing of your project's cash flows. Thus, cash flows farther in the future often require higher opportunity costs of capital. Even if you do not believe the CAPM, term adjustment is important.
- The expected rate of return on the market is a critical CAPM input if market beta is high—but it is difficult to guess. There are many guesstimation methods, but no one really knows which one is best. Reasonable estimates for the equity premium ($\mathscr{E}(r_M) - r_F$) can range from about 1% to 8% per annum, although 2% seems most reasonable to me for cash flows more than a few years into the future.
- There are a number of methods to estimate market beta. Many users rely on industry betas and not on firms' own historical betas as estimates of future market betas, *and* they shrink them towards 1. When your cash flows are farther in the future, you have to shrink your beta estimates even more drastically towards 1.
- Never believe the CAPM blindly. Its estimates are poor. Use it more like a "general direction" estimate than like an "accurate guide" estimate.
- Even though its estimate are poor, understand the CAPM well. Everyone will expect you to.
- The chapter appendix discusses certainty equivalence and CAPM alternatives (such as the APT and the Fama-French-Momentum model). You must use the certainty equivalence form of the CAPM when projects are purchased or sold for prices other than their fair market values. It is also often the only method if only underlying cash flows rather than value estimates are available.

This negative perspective on the CAPM is so uncommon in a textbook (but not among the experts actually studying the models) that it is important that you don't misunderstand it. Let's end this chapter with a FAQ:

- **Q**: Should riskier projects not have to promise higher rates of return?

  A: Riskier projects have to promise a higher rate of return, i.e., offer higher default premiums. This is not the same as higher risk premiums in the CAPM sense. In NPV applications, make sure to reflect the default risk in the expected cash flow numerator. Riskier projects need to pay off a lot more when they succeed, just to make up for the fact that they fail more often.

- **Q**: Should riskier long-term cash flows not require higher expected rates of return?

  A: Long-term projects command term premiums. Thus, in NPV applications, you should usually use higher required costs of capital for more distant cash flows. You can but do not need the CAPM for this. The U.S. Treasury Yield Curve gives you a working first estimate about how much extra premium long-term cash flows should require.

- **Q**: Should riskier stocks and cash flows have higher expected discount rates?

  A: Maybe, but be careful. First, make it modest. Don't be too overconfident in your ability to judge equity risks. If you can judge the risks well, make sure your estimates first flow into your expected cash flows in the NPV numerator. Second, don't be too wedded to the CAPM for an extra "risk-premium kicker." Instead, combine your cost-of-capital estimate with judgment-based and other risk measures, such as volatility (especially if your owners are not fully diversified).

Preview of the Chapter Appendix in the Companion

In the Appendix

The appendix to this chapter explains

- the "certainty equivalence value" (CEV) which allows you to use the CAPM for projects that you are not buying at the appropriate equilibrium price. For example, you need the CEV to work out how to value an inheritance that will be higher if your business fails. (Being free today does not mean that there is no value to such a promise.)
- how to use the CEV formula to estimate the value of a project for which you have historical cash flows, but no market value information.
- how the CAPM is derived from the fact that the optimal portfolio is always the combination of two portfolios, one of which may be the risk-free asset.
- what the CAPM alternatives are and how to use them. The first alternative is the APT (arbitrage pricing theory) and its relative, the Intertemporal CAPM. The

second alternative are Fama-French value and momentum models. These seem to predict better than any alternatives, but are less grounded in theory (or, you may say, reason) than the former.

Keywords

Answers

Q 9.1 Yes, the perfect market is an assumption underlying the CAPM. In addition,

1. Investors are rational utility maximizers.
2. Investors care only about overall portfolio mean rate of return and risk at one given point in time.
3. All parameters are known (not discussed until later in the chapter).
4. All assets are traded. Every investor can purchase every asset.

Q 9.2 With $r_F = 4\%$ and $\mathscr{E}(r_M) = 7\%$, the cost of capital for a project with a beta of 3 is $\mathscr{E}(r) = r_F + [\mathscr{E}(r_M) - r_F] \cdot \beta_i = 4\% + (7\% - 4\%) \cdot 3 = 13\%$.

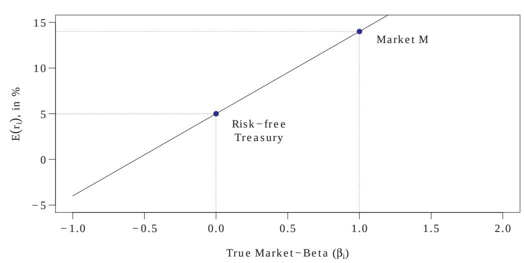
Q 9.3 With $r_F = 4\%$ and $\mathscr{E}(r_M) = 12\%$, the cost of capital for a project with a beta of 3 is $\mathscr{E}(r) = r_F + [\mathscr{E}(r_M) - r_F] \cdot \beta_i = 4\% + (12\% - 4\%) \cdot 3 = 28\%$.

Q 9.4 With $r_F = 4\%$ and $\mathscr{E}(r_M) = 12\%$, the cost of capital for a project with a beta of –3 is $\mathscr{E}(r) = r_F + [\mathscr{E}(r_M) - r_F] \cdot \beta_i = 4\% + (12\% - 4\%) \cdot (-3) = -20\%$. Yes, it does make sense that a project can offer a negative expected rate of return. Such projects are such great investments that you would be willing to expect losses on them, just because of the great insurance that they are offering.

Q 9.5 No—the real-world SML is based on historical data and not true expectations. It would be a scatterplot of historical risk and reward points. If the CAPM holds, a straight, upward-sloping line would fit them best.

Q 9.6 Write down the CAPM formula and solve $\mathscr{E}(r_i) = r_F + [\mathscr{E}(r_M) - r_F] \cdot \beta_i = 4\% + (7\% - 4\%) \cdot \beta_i = 5\%$. Therefore, $\beta_i = 1/3$. Note that we are ignoring the promised rate of return.

Q 9.7 The security market line is



Q 9.8 The equity premium, $\mathscr{E}(r_M) - r_F$, is the premium that the market expects to offer on the risky market above and beyond what it offers on Treasuries.

Q 9.9 It does not matter what you choose as the per-unit payoff of the bond. If you choose \$100, you expect it to return \$99.

1. Thus, the price of the bond is $PV = \$99/(1 + [3\% + 5\% \cdot 0.2]) \approx \$95.19$.
2. Therefore, the promised rate of return on the bond is $\$100/\$95.19 - 1 \approx 5.05\%$.
3. The risk-free rate is 3%, so this is the time premium (which contains any inflation premium). The (expected) risk premium is 1%. The remaining 1.05% is the default premium.

Q 9.10 The cost needs to be discounted with the current interest rate. Because payment is up-front, this cost is \$30,000 now! The appropriate expected rate of return for cash flows (of your earnings) is $3\% + 5\% \cdot 1.5 = 10.5\%$. You can now use the annuity formula to determine the PV if you graduate:

$$\frac{\$5{,}000}{10.5\%} \cdot \left[1 - \left(\frac{1}{1+10.5\%}\right)^{40}\right] \approx \$47{,}619 \cdot 98.2\%$$
$$\approx \$46{,}741.46$$

With 90% probability, you will do so, which means that the appropriate risk-adjusted and discounted cash flow is about \$42,067.32. The NPV of your education is therefore about \$12,067.32.

Q 9.11 Use the 1-year Treasury rate for the 1-year project, especially if the 1-year project produces most of its cash flows at the end of the year. If it produces constant cash flows throughout the year, a 6-month Treasury rate might be more appropriate. Because the 10-year project could have a duration of cash flows much shorter than 10 years, depending on use, you might choose a risk-free Treasury rate that is between 5 and 10 years. Of course, it would be even better if you match the individual project cash flows with individual Treasuries.

Q 9.12 The duration of this cash flow is around, or a little under, 5 years. Thus, a 5-year zero-coupon U.S. Treasury would be a reasonably good guess. You should not be using a 30-day or 30-year Treasury. A 10-year zero-coupon Treasury would be a better match for a project that yields cash only once at the end of 10 years. That is, for our project that has cash flows each year for 10 years, the 10-year Treasury as a benchmark would have too much of its payments as principal repayment at the end of its 10-year term.

Q 9.13 An estimate between 1% and 8% per year is reasonable. Anything below 0% and above 10% would seem unreasonable to me. For reasoning, please see the different methods in the chapter.

Q 9.14 Yes, a zero-beta asset can still have its own idiosyncratic risk. And, yes, it is perfectly kosher for a zero-beta asset to offer the same expected rate of return as the risk-free asset. The reason is that investors hold gazillions of assets, so the idiosyncratic risk of the zero-beta asset will just diversify away.

Q 9.15 This is an asset beta versus equity beta question. Because the debt is almost risk free, we can use $\beta_{\text{Debt}} \approx 0$.

1. First, compute an unlevered asset beta for your comparable with its debt-to-asset ratio of 2 to 3. This is $\beta_{\text{Asset}} = w_{\text{Debt}} \cdot \beta_{\text{Debt}} + w_{\text{Equity}} \cdot \beta_{\text{Equity}} = (2/3) \cdot 0 + (1/3) \cdot 2.5 \approx 0.833$. Next, assume that your project has the same asset beta, but a smaller debt-to-asset ratio of 1 to 3, and compute your own equity beta: $\beta_{\text{Asset}} = w_{\text{Debt}} \cdot \beta_{\text{Debt}} + w_{\text{Equity}} \cdot \beta_{\text{Equity}} \Rightarrow 0.833 \approx (1/3) \cdot 0 + (2/3) \cdot \beta_{\text{Equity}} \Rightarrow \beta_{\text{Equity}} = 1.25$.
2. With an asset beta of 0.83, your firm's asset hurdle rate should be $\mathcal{E}(r_i) = 3\% + 2\% \cdot 0.83 \approx 4.7\%$.
3. Your comparable's equity expected rate of return would be $\mathcal{E}(r_{\text{Comps Equity}}) = 3\% + 2\% \cdot 2.5 = 8\%$. Your own equity's expected rate of return would be $\mathcal{E}(r_{\text{Your Equity}}) = 3\% + 2\% \cdot 1.25 = 5.5\%$

Q 9.16 Your combined happy-marriage beta would be $\beta_{\text{Combined}} = (3/4) \cdot 2.4 + (1/4) \cdot 0.4 = 1.9$.

Q 9.17 No, the empirical evidence suggests that the CAPM does not hold. The most important violation seems to be that value firms had market betas that were low, yet average returns that were high. The opposite was the case for growth firms.

Q 9.18 Even though the CAPM is empirically rejected, it remains the benchmark model that everyone uses in the real world. Moreover, even if you do not trust the CAPM itself, at the very least it suggests that covariance with the market could be an important factor.

Q 9.19 The CAPM should work very well if beta is about 0. The reason is that you do not even need to guess the equity premium if this is so.

Q 9.20 For short-term investments, the expected cash flows are most critical to estimate well (see Section 4.1 on Page 64). In this case, the trouble spot (d) is really all that matters. For long-term projects, the cost of capital becomes relatively more important to get right, too. The market betas and risk-free rates are usually relatively low maintenance (though not trouble free), having only modest degrees of uncertainty. The equity premium will be the most important problem factor in the cost-of-capital estimation. Thus, the trouble spots for long-term projects are (b) and (d).

End of Chapter Problems

Q 9.21. What are the assumptions underlying the CAPM? Are the perfect market assumptions among them? Are there more?

Q 9.22. If the CAPM holds, then what should you do as the manager if you cannot find projects that meet the hurdle rate suggested by the CAPM?

Q 9.23. In a perfect world and in the absence of externalities, should you take only the projects with the highest NPV?

Q 9.24. Write down the CAPM formula. Which are economy-wide inputs, and which are project-specific inputs?

Q 9.25. The risk-free rate is 6%. The expected rate of return on the stock market is 8%. What is the appropriate cost of capital for a project that has a beta of 2?

Q 9.26. The risk-free rate is 6%. The expected rate of return on the stock market is 10%. What is the appropriate cost of capital for a project that has a beta of –2? Does this make economic sense?

Q 9.27. Draw the SML if the true expected rate of return on the market is 6% per annum and the risk-free rate is 2% per annum. How would the figure look if you were not sure about the expected rate of return on the market?

Q 9.28. A junk bond with a beta of 0.4 will default with 20% probability. If it does, investors receive only 60% of what is due to them. The risk-free rate is 3% per annum and the risk premium is 5% per annum. What is the price of this bond, its promised rate of return, and its expected rate of return?

Q 9.29. What would it take for a bond to have a larger risk premium than default premium?

Q 9.30. A corporate zero-bond promises 7% in one year. Its market beta is 0.3. The equity premium is 4%; the equivalent Treasury rate is 3%. What is the appropriate bond price today?

Q 9.31. Explain the basic schools of thought when it comes to equity premium estimation.

Q 9.32. If you do not want to estimate the equity premium, what are your alternatives to finding a cost-of-capital estimate?

Q 9.33. Explain in 200 words or less: What are reasonable guesstimates for the market risk premium and why?

Q 9.34. Should you use the same risk-free rate of return both as the CAPM formula intercept and in the equity premium calculation, or should you assume an equity premium that is independent of investment horizon?

Q 9.35. Should a negative-beta asset offer a higher or a lower expected rate of return than the risk-free asset? Does this make sense?

Q 9.36. An unlevered firm has an asset market beta of 1.5. The risk-free rate is 3%. The equity premium is 4%.

1. What is the firm's cost of capital?
2. The firm refinances itself. It repurchases half of its stock with debt that it issues. Assume that this debt is risk free. What is the equity beta of the levered firm?
3. According to the CAPM, what rate of return does the firm have to offer to its *creditors*?
4. According to the CAPM, what rate of return does the firm have to offer to its *levered equity holders*?
5. Has the firm's weighted average cost of capital changed?

Q 9.37. Consider the following historical rate of return series:

Year	IBM	S&P 500	Year	IBM	S&P 500
1991	–0.175	0.263	2001	0.430	–0.130
1992	–0.400	0.045	2002	–0.355	–0.234
1993	0.156	0.071	2003	0.205	0.264
1994	0.322	–0.015	2004	0.072	0.090
1995	0.257	0.341	2005	–0.158	0.030
1996	0.676	0.203	2006	0.198	0.136
1997	0.393	0.310	2007	0.129	0.035
1998	0.775	0.267	2008	–0.208	–0.385
1999	0.175	0.195	2009	0.586	0.235
2000	–0.208	–0.101	2010	0.143	0.128

Assume that IBM had so little debt that it was practically risk-free.

1. What was IBM's equity beta over this sample period?
2. If IBM had a debt-equity ratio of 70%, what was its asset beta? (Hint: To determine a D/A ratio, make up an example in which a firm has a 70% D/E ratio.)
3. How important is the 1992 observation to your beta estimate?

4. If HP is similar to IBM in its business but has a debt-equity ratio of 10%, what would you expect HP's levered equity beta to be? (Hint: Use the same leverage conversion trick.)

Q 9.38. Look up betas on YAHOO! FINANCE today, and compare them to those in Exhibit 8.6 on Page 209.

1. How does the beta of Intel today compare to its earlier estimate from May 2008? Was its beta stable (over time)?
2. How does the beta of AMD today compare to its earlier estimate from May 2008? Was its beta stable?
3. AMD is a much smaller firm than Intel. How do their betas compare?

Q 9.39. A comparable firm (in a comparable business) has an equity beta of 2.5 and a debt-equity ratio of 2. The debt is almost risk free. Estimate the beta for your equity if projects have constant betas, but your firm will carry a debt-equity ratio of 1/2. (Hint: To translate a debt-equity ratio into a debt-asset ratio, make up an example.)

Q 9.40. A Fortune 100 firm is financed with $15 billion in debt and $5 billion in equity. Its historical equity beta has been 2. If the firm were to increase its leverage from $15 billion to $18 billion and use the cash to repurchase shares, what would you expect its levered equity beta to be?

Q 9.41. The prevailing risk-free rate is 5% per annum. A competitor to your own firm, though publicly traded, has been using an overall project cost of capital of 12% per annum. The competitor is financed by $^1/_3$ debt and $^2/_3$ equity. This firm has had an estimated equity beta of 1.5. What is it using as its equity premium estimate?

Q 9.42. Apply the CAPM. Assume the risk-free rate of return is the current yield on 5-year bonds. Assume that the market's expected rate of return is 3% per year above this. Download 5 years of daily rate of return data on four funds: NAESX, VLACX, VUVLX, and VWUSX.

- What were the historical average rates of return?
- What were the historical market betas?
- What were the historical market betas, adjusted (shrunk) toward 1 by averaging with 1?
- How do these estimates compare to the market beta estimates of the financial website from which you downloaded the data?
- Does it appear as if these funds followed a CAPM-like relationship?

Q 9.43. Draw some possible security markets relations that would not be consistent with the CAPM. The x axis would be the true market beta, the y axis would be the true expected rate of return.

Q 9.44. Does the empirical evidence suggest that the CAPM is correct?

Q 9.45. Why do you need to understand the CAPM?

Q 9.46. Under what circumstances is the CAPM a good model to use? What are the main arguments in favor of using it? When is it not a good model?

Q 9.47. If you use the CAPM, explain for what kinds of projects it is important to get accurate equity-premium estimates.

The Consensus Estimate For The Equity Premium by Academic Financial Economists in December 2007

An Update to Welch (2000)

Ivo Welch
Brown University

January 17, 2008

Abstract

A sample of about 400 finance professors estimates the 1-year equity premium and the 30-year geometric equity premium to be about 5%, as of year-end 2007. The sample interquartile range is 4% to 6%. The typical range recommended in their classes is a little higher (from 4% to 7%, with a mean of 6%). Since 2001, participants have become more bearish (by about 0.5%).

The participants estimate the 30-year arithmetic equity premium estimate to be about 75 basis points higher than its geometric equivalent; and they estimate the 30-year geometric expected rate of return on the stock market to be about 9%.

75% of finance professors recommend using the CAPM for corporate capital budgeting purposes; 10% recommend the Fama-French model; 5% recommend an APT model.

Together with the risk-free rate of return, the equity premium may well be the single-most important number in financial economics. It holds sway not only over asset-allocation choices (whether to invest in equities or fixed-income securities), but also influences the capital budgeting choices of many firms through its critical role in the capital-asset-pricing model. Unfortunately, there is not only no generally accepted equity premium point estimate, there is not even a commonly agreed-upon *method* to estimate it.[1] This is why it is interesting to investigate a meta-estimate obtained from many different methods and/or many individuals.

The opinions of financial economics professors are intriguing for a number of reasons. First, financial economists in academic departments themselves influence the general opinion of practitioners. After all, many practitioners have enrolled in academic finance courses at one point in their careers. Second, academic financial economists have little at stake in a particular estimate—they do not need to convince themselves and others that the equity premium is either high or low. Third, thinking about issues such as the equity premium is their essential job function.

Nevertheless, this survey does not advocate that the academic professorial consensus equity premium estimate should be seen as the best availableestimate. Instead, this consensus estimate should be viewed as the best "common practices" estimate for use in an academic setting.

Surveying academic financial economists about their equity premium opinions has a history. In October 1997 and October 1998, I took a first survey of academic financial economists. Welch (2000) reported that their consensus arithmetic equity premium estimate was about 7% per annum over 10-30 year horizons, and 6-7% over 1- to 5-year horizons. The optimistic/pessimistic range was from 2% to 13% per annum. Respondents claimed that they would revise their forecasts downward when the stock market rose. They believed other professors had a higher consensus estimates than their own.

[1] Section I of Welch (2000) enumerates these methods. (Since then, there have been many interesting variations on these basic methods.) Welch (2007) is a less conventional alternative—possibly for good reason!

In August 2001 (after the end of the Tech rally of the late 1990s), I conducted a shorter version of the original survey. The answers of about 400 individuals were described in Welch (2001). By this point, the 1-year equity premium estimate had falled to 3%, the 30-year equity premium estimate had fallen to about 5% to 5.5%.

In December 2007, I conducted the survey described in this update. Again, just under 400 finance professors participated. Participants estimate the 1-year equity premium and the 30-year geometric equity premium to be about 5%. The sample interquartile range is 4% to 6%. The typical range that these professors recommend in their classes is a little higher (from 4% to 7%, with a mean of 6%), but comfortably encompasses their own estimates. Since 2001, participants have become more bearish (by about 0.5%).

My respondents estimate the 30-year arithmetic equity premium estimate to be about 75 basis points higher than its geometric equivalent; and they estimate the 30-year stock market expected rate of return to be about 9%. The difference suggests an annual standard deviation of about 12-15%. This is also generally in line with their estimates of the probability of a decline in the stock market.

Finally, I asked one question not directly related to the equity premium—what method my survey participants would recommend for corporate capital budgeting purposes. 75% of finance professors recommend the CAPM, 10% recommend the Fama-French model, and 5% recommend an APT model. (The rest recommend a variety of other methods.)

I The Web Survey Form

On December 20, 2007, the American Finance Association kindly posted a note requesting participation in my survey on its web site. I also sent a short email requesting survey participation to about 6,600 email address culled from my own and the Ohio State University list of finance professors. (Many of the addresses were invalid, outdated, or duplicates.) Its text read:

> Most of us are teaching the CAPM, where we have to use some estimate of the equity premium. Clearly, none of us know what the expected equity premium really is. However, many of us find it valuable to know what other finance professors are using. If nothing else, it provides a "standard practice" number.
>
> In 1998, I conducted such a survey, and published it in the Journal of Business (also available from SSRN). Of course, this is now quite dated. It is quite possible that the consensus has changed. Therefore, I would like to take a new survey. I will post the results on my website and on SSRN in a short note for common use.
>
> Of course, we are all just making educated guesses here. So, please don't leave answering this survey only to "other experts." (The survey has a field that allows you to tell me how comfortable or uncomfortable you are in providing your guestimates.)
>
> So, I am begging you to go to
> http://welch.econ.brown.edu/equpdate-form2008.html
> and fill out as much as you deem reasonable. It should not take you more than 5 minutes.
>
> And, of course, I would very much appreciate your help.

[Table 1]

Table 1 reproduces the html form that was used to administer the survey.[2]

By January 7, 2008, I had received 630 responses. Of these, 369 respondents had [a] provided an email address that ended with the string “edu” (or had filled out the survey from a host ending its domain name in “edu”), and [b] answered affirmatively that they were a finance professor.

II The Results

83 of the 543 respondents stated that they had participated in my original survey in 1998-9, 92 had participated in 2001. 235 respondents were not familiar with the resulting paper (Welch (2000)); 214 stated that it had no influence on them. 53 participants stated that the paper had lowered their own estimates; and 10 participants stated that it had raised their original estimates. (Among U.S. finance professors, 32 indicated it had lowered their estimates, 6 that it had raised their estimats.)

[2] Over the course of the week, I made small corrections and improvements to the web survey. None of them was significant enough to influence the results.

A Parametric Estimates

[Table 2]

Table 2 reports the main findings of this December 2007 update. The table distinguishes between my aforementioned core sample 369 U.S. financial economics professors and the 219 other respondents.

- In general, medians are fairly uninformative, because most participants rounded their estimates to integers. Thus, truncated means are better statistics.
- The average and typical equity premium estimate among the sample of U.S. financial economists was around 5%. This applies both to the geometric 30-year estimate and to the 1-year estimate.
- The arithmetic 30-year equity premium estimate was about 0.7% to 0.8% higher than its geometric equivalent. The arithmetic/geometric difference implies an annual volatility estimate of about 12% to 13% per annum.
- Most of the remaining participants identified themselves as foreign finance professors. (Unlike U.S. economists, where an .edu address helps confirm the identity, there was no easy way for me to get a second piece of information confirming identity.) Table 2 shows that foreign finance professors were more conservative. For the 1-year forecast, their average estimate is about 90 basis points lower. For the 30-year forecast, it is about 40-50 basis points lower. [Figure 1]

  Figure 1 plots the density of *all* responses. The non-parametric smoother shows that 4% and 5% were the most common attractors.

The remainder of this paper focuses on the core sample of identified U.S. finance professors.

- In class, survey participants use a 6% estimate, which is higher than their own beliefs—but they also advocate a range from 4% to 7% that comfortably encompasses their own opinion.

- The participants suggest that they have lowered their estimates over the last 6 years by about 0.6% to 0.7%.
- The expected stock market rate of return exceeds the equity premium by about 3%.

B Volatility Estimates

[Table 3]

Table 3 shows the estimates of equity risk perceived by my survey participants. The average and typical probability of a decline in the stock market over the next year is estimated to be about 1/3. This is consistent with the aforecomputed volatility estimate of about 12-13% per annum.

A decline of more than 20% is perceived to have a probability of around 10%. This suggests a fat-tailed distribution. If the return distribution were normal, the probability estimate should be under 2.5%.

On the other hand, the probability of losing 20% or more under the aforementioned normal distribution (mean 5.8%, standard deviation 13%) is about 4%. This is reasonably close to the 5% median estimate provided by the survey participants.

C Heterogeneity

[Table 4]

Table 4 shows that the average participant in the survey (not surprisingly) believes that (s)he has thought more about the relevant issues. There is no clear pattern between the self-assessed expertise of participants and their 1-year forecasts. There were only 12 participants who stated that they had thought a lot less than their peers about the issue. Of the remaining participants, there seems to be a mild relation between having thought more about the issue and believing in a smaller equity premium estimate.

[Table 5]

Table 5 shows that there is no important relationship between perceiving the survey as clear and the answers.

[Table 6]

Table 6 shows that 47 respondents who claimed to have become more bullish since 2004 had 1-year and 30-year arithmetic equity premium estimates about 30-50 basis points higher than the average. Their 30-year geometric estimate was however only 10 basis points higher than average. 122 respondents who had become more bearish were about 30 to 80 basis points more pessimistic than average.

D Method of Capital Budgeting

[Table 7]

I took the opportunity to ask respondents what method they would recommend for corporate capital budgeting. Table 7 shows that the CAPM is recommended by 265 out of 360 respondents. The strong theoretical underpinning of the CAPM seems to outweigh the fact that it has almost no empirical evidence supporting it. In contrast, the Fama-French model, which lacks a strong theoretical underpinning but performs well empirically, can garner only 41 supporters. General APT approaches to capital budgeting are even less prominent.

III Data

The data (sans identifying information) from this survey will be available at

http://welch.econ.brown.edu/academics/.

This paper will not be published and may move. Please cite the original Welch (2000) paper, and refer to this paper as the 2007 update.

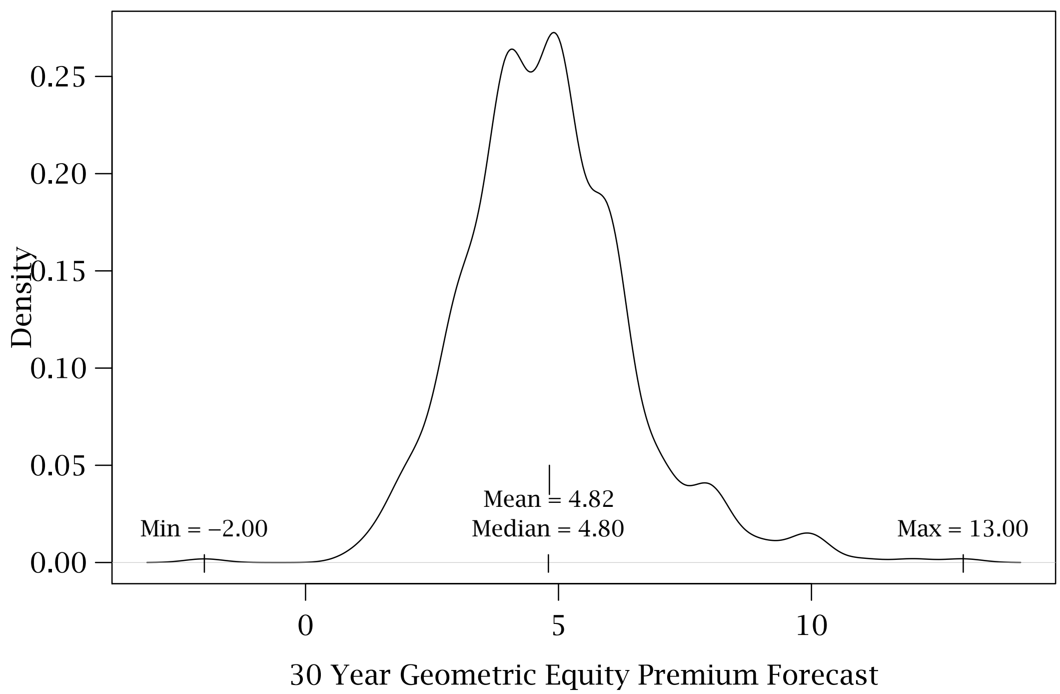
References

Welch, I., 2000, "Views of Financial Economists on the Equity Premium and on Professional Controversies," *Journal of Business*, 73(4), 501–537.

——— , 2001, "The Equity Premium Consensus Forecast Revisited," working paper, Yale University.

——— , 2007, "A Different Way to Estimate the Equity Premium (for CAPM and One-Factor Model Use Only)," working paper, Brown University.

Figure 1: Density Plot of 30-Year Geometric Equity Premium Estimates



Explanation: This plot includes *all* responses. The few extreme non-sensical responses drop out of the subsample of U.S. finance professors.

Table 1: The HTML Survey Form

Short Academic Equity Premium Survey

Your answers to this short survey will be used to update my Journal of Business equity premium survey from 1998 (and its follow-up from 2001). Your answers will be held strictly confidential. If you have difficulties filling out this survey, please send an email to Ivo Welch.

Background Information: For the prevailing yield curve, click [yahoo link]. For the prevailing S&P500, click [yahoo link]

Personal Information

My email address is:	______________
I am a finance or economics professor:	Yes. No. Soon.
Relative to other financial economists, I would guess that I have thought about the equity premium	no answer, a lot more carefully, more carefully, about the same, less carefully, a lot less carefully
I participated in Ivo Welch's previous equity premium survey in 1998/1999:	Yes. No.
I participated in Ivo Welch's update for the equity premium survey in 2001:	Yes. No.
If you read either my original JB survey paper or its update, did it influence you to lower or raise your estimate?	no answer did not read read it, but it had no influence read it, lowered my own estimate read it, raised my own estimate
Relative to my views 6 years ago, my views about the stock market's long term performance are today:	no answer a lot more bullish than in 2001 more bullish about the same more bearish a lot more bearish

(Table 1 continued.)

Parametric Equity Premium Estimates

I expect the average equity premium over the next 1 year to be (define avg equity premium as the expected return on the value-weighted US market net of short-term T-bills)	______ percent per year.
I expect the average arithmetic equity premium over the next 30 years to be (relative to future contemporaneous short-term (3 month) T-Bills*)	______ percent per year.
I expect the average geometric* equity premium over the next 30 years to be (relative to future contemporaneous short-term (3 month) T-Bills)	______ percent per year.
G30-A.1: Same question: In your classes, what is the main number you are recommending for long-term CAPM purposes?	______ percent per year.
G30-A.2: Same question: In your classes, if you give a reasonable range for CAPM use, what is it?	______ to ______ percent per year.
G30-B: Same question: What would you have answered to the main question (30 year geo equity premium forecast) 6 years ago, i.e., in 2001?	______ percent per year.
I expect the average nominal geometric stock return (not equity premium!) over the next 30 years to be	______ percent per year.

(Table 1 continued.)

Non-Parametric and Probability Equity Premium Estimates

Please give me an over/under bet for the S&P500 for December 31, 2008: your level estimate should result in a risk-neutral, fair bet for either side (i.e., not adjusted for hedging/risk premia)	______________
What is the probability that the stock market will go down over the next 12 months? think of the market here as the Vanguard S&P500 fund (level plus dividends) total rate of return, not the equity premium.	______ percent probability
What is the probability that the stock market will decline (lose money) over the next 12 months by 20% or more?	______ percent probability
What is the probability that the stock market will decline (lose money) over the next 10 years?	______ percent probability
Off-hand question: How should non-financial corporations do project capital budgeting? Pick most applicable.	no-answer Use CAPM (or CAPM variant), equity premium 2-3% Use CAPM (or CAPM variant), equity premium 3-5% Use CAPM (or CAPM variant), equity premium 5-6% Use CAPM (or CAPM variant), equity premium 6-7% Use CAPM (or CAPM variant), equity premium 7-8% Use Fama-French-type Model Use APT-type Model Use Statistical Model—Historical Market Model Use Statistical Model—Historical Industry Model Use Equity Premium Estimate, no matter what Use 10 percent, no matter what
(continued:) Is this what you tell your students?	no-answer yes no
Were the questions in this survey clear?	no answer clear muddy unclear
Do you want me to email you with the results when I have them?	no answer yes no

Table 2: The Parametric Predictions

	Percentiles							Moments			
	00	05	25	**50**	75	95	100	mean	|**mean**|	sd	N
1-Year Equity Premium	−10.0	1.0	4.0	**5.0**	6.0	8.0	12.0	4.86	**4.95**	2.53	369
Omitted Self-Id'ed Finance Profs			*3.0*	*4.0*	*6.0*				*4.00*	*3.11*	*183*
Same for All Omitted Individuals			*3.0*	*4.0*	*6.0*				*4.01*	*3.33*	*219*
30-Year Ari Eq Prem	2.0	3.0	4.5	**5.8**	7.0	8.6	12.0	5.74	**5.69**	1.67	370
Omitted Self-Id'ed Finance Profs			*4.0*	*5.0*	*6.0*				*5.20*	*1.65*	*186*
Same for All Omitted Individuals			*4.0*	*5.0*	*6.0*				*5.21*	*1.69*	*218*
30-Year Geo Eq Prem	−2.0	2.8	4.0	**5.0**	6.0	8.0	13.0	5.00	**4.97**	1.68	363
Omitted Self-Id'ed Finance Profs			*3.5*	*4.0*	*5.0*				*4.46*	*1.74*	*172*
Same for All Omitted Individuals			*3.5*	*4.0*	*5.0*				*4.46*	*1.70*	*202*
Used in class	2.0	4.0	5.0	**6.0**	7.0	8.5	20.0	5.96	**5.89**	1.70	360
Min in class	−2.0	2.0	3.0	**4.0**	5.0	7.0	10.0	4.34	**4.35**	1.51	333
Max in class	3.0	5.0	6.0	**7.0**	8.0	11.0	85.0	7.76	**7.50**	4.67	336
30-Year Geo Eq Prem in 2001	−4.0	3.0	4.5	**6.0**	7.0	8.0	12.0	5.69	**5.68**	1.81	325
Change from 2001 (Geo 30)	−4.5	−3.0	−2.0	**−0.6**	0.0	1.6	5.8	−0.77	**−0.81**	1.52	316
Same for All Omitted Individuals			*-2.0*	*−0.5*	*0.0*				*−0.75*	*1.48*	*166*
30-Year Stock Market Return	1.0	6.0	8.0	**9.0**	10.0	12.0	16.0	9.08	**9.11**	1.97	368
Over-under Bet	1,000	1,360	1,500	**1,558**	1,600	1,650		2,900	**1,547**	1,544	245

Explanation: Most numbers are quoted in percent per year, except the over-under bet (and of course the number of observations).

Table 3: Probability of A Stock Market Decline

	Percentiles							Moments			
	00	05	25	**50**	75	95	100	mean	|mean|	sd	N
over next 12 months	1	15	30	**35**	50	60	90	37.79	35.96	16.40	355
20% or more over 12 months	1	2	5	**10**	15	30	80	11.94	11.44	10.94	348
20% or more over 10 years	0	1	2	**5**	10	30	95	7.96	6.86	12.02	318

Explanation: |mean| is the trimmed mean, where answers are winsorized at the 5th and 95th percentiles. The rest should be self-explanatory.

Table 4: Estimates By Expertise, in Percent Per Year

	N	1-Year Equity Premium	30-Year Arithmetic	30-Year Geometric	Difference Ari vs. Geo
Thought Lot Less	12	5.1	5.0	4.7	0.35
Thought Less	57	5.1	6.1	5.5	0.69
Same	172	4.8	5.8	5.1	0.82
Thought More	95	4.7	5.6	4.8	0.85
Thought Lot More	41	5.2	5.3	4.3	0.78
Missing	10+	4.9	5.9	5.6	0.37

Explanation: The reported statistics are trimmed means, quoteed in percent.

Table 5: Estimates By Perception of Clarity, in Percent Per Year

	N	1-Year Equity Premium	30-Year Arithmetic	30-Year Geometric	Difference Ari vs. Geo
Unclear	7	5.0	6.3	5.8	0.53
Muddy	64	4.9	5.5	4.8	0.69
Clear	277	4.8	5.7	5.0	0.80
Missing	30+	5.0	6.1	5.6	0.76

Explanation: The reported statistics are trimmed means, quoteed in percent.

Table 6: By History: More Bearish or Bullish since 2001? (In Percent Per Year)

	N	1-Year Equity Premium	30-Year Arithmetic	30-Year Geometric	Difference Ari vs. Geo
more bearish	122	4.2	5.5	4.7	0.79
same	163	5.2	5.8	5.1	0.80
more bullish	47	5.4	6.1	5.1	0.86
Missing	55+	4.8	5.9	5.4	0.62

Explanation: This combines the categories of bullish with very bullish, and bearish with very bearish. The reported statistics are trimmed means, quoteed in percent.

Table 7: Recommended Model of Capital Budgeting, in Percent Per Year

	N	1-Year Equity Premium	30-Year Arithmetic	30-Year Geometric	Difference Ari vs. Geo
CAPM, 2-3%	23	2.4	3.6	2.7	0.92
CAPM, 3-5%	19	4.1	4.5	3.7	0.87
CAPM, 5-6%	150	5.0	5.7	4.9	0.84
CAPM, 6-7%	24	5.9	6.1	5.4	0.80
CAPM, 7-8%	49	6.1	7.6	6.6	1.00
Fama-French	41	4.7	5.9	5.5	0.48
APT	21	4.0	5.7	4.7	0.69
Industry Model	14	4.7	5.8	5.0	0.92
Market Model	4	4.9	4.9	5.3	0.25
Equity Premium	8	4.3	5.1	5.4	–0.35
10%	7	3.9	4.5	4.0	0.74
Missing	29	4.5	5.1	4.7	0.50

Explanation: The reported statistics are trimmed means, quoteed in percent.

Welcome to bull country

Have investors grown more courageous, or just more foolish? The outlook for the world economy may turn on the answer—and that depends on an elusive measure known as the "equity premium"

EVERY day, it seems, another official joins the throngs who are warning the western world about overvalued stockmarkets. Even cautious central bankers have been speaking out. Alan Greenspan, chairman of America's Federal Reserve, has mostly kept his counsel since the markets rudely ignored his mutters, 18 months ago, about "irrational exuberance". But recently Hans Tietmeyer, president of Germany's Bundesbank, joined the doom merchants, promising that a gathering of central bankers this week would discuss the problem "intensively". And the International Monetary Fund has also declared that stockmarkets should be watched carefully.

Investors seem singularly unimpressed. The lead continues to be set by Wall Street, whose bulls have driven American share prices ever higher into the stratosphere. The Dow Jones Industrial Average hit a new all-time high of 9,246 on July 14th; European markets were not far behind. Triumphant bulls have come up with many different explanations for the markets' exuberance. America's corporations have discovered new, world-beating skills; the computer age has created a wholly different economy; the Asian crisis means money is desperately searching safer havens; or, in a nod to those central bankers, monetary policy has killed inflation and even the business cycle. Yet none of these has converted the doomsters.

So now a new explanation is on offer. The key to Wall Street's continuing miracle, bulls have started arguing, is more enduring even than their other claims: the new courage of small investors. The suggestion is that the rules they have followed in the past may no longer apply. Having overcome a previously irrational fear of the risks of equities, they are now pouring into them. And since their enlightenment is irreversible, the bulls conclude, the trend should continue indefinitely.

Although most popular in America, this argument is starting to be heard elsewhere too. Fund managers in Europe may be impressed by America's low unemployment and high growth. But what they most want to borrow from across the Atlantic is the apparent change in investors' attitudes. If governments would get out of the pension business and investors could be persuaded to buy more equity mutual funds, Europe could enjoy a similar bull run to Wall Street's. Indeed, optimists believe that the recent run-up in European shares—they have mostly outpaced America's this year—shows this is already happening.

Of course, there are still bulls who prefer to justify high share prices in traditional ways, predicting rampant growth in profits far into the future. But as America's expansion starts to stutter, these claims are wearing thin. The total value of American equities is now $12 trillion—double the level of two years ago—but profit growth has been slowing sharply. Thus the new reliance on investors' changed attitudes. The message is: forget the New Economy; say hello to the New Investor.

Returns to go

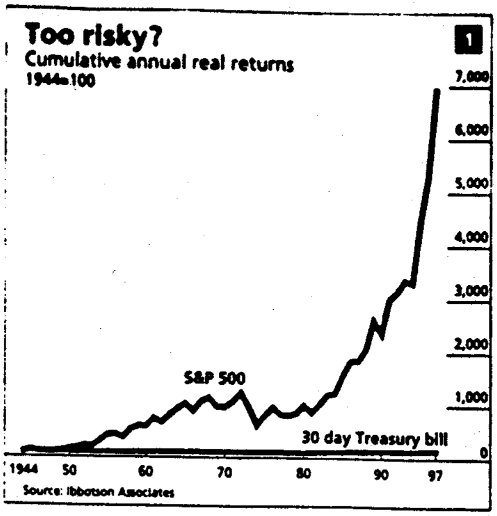
It is not just giddy portfolio managers who herald the New Investor's arrival. As with most financial fashions, this one claims support from economists as well. They may use different jargon. But their belief in the New Investor is just as strong—perhaps because they have spent so long trying, and failing, to understand the old one.

The reason for their confusion is something called the "equity premium". In essence, this is the average extra return (including dividends and capital gains) that investors expect to earn above that on safer investments—such as American Treasury bonds—if they invest in riskier equities instead. This number, which can be thought of as the current price of risk, has a huge influence on share prices.

The equity premium has particularly troubled economists since 1985, when Rajnish Mehra and Edward Prescott published a paper* arguing that it was too big to be consistent with prevailing theories. They assessed this by looking at almost a century of returns for American stocks and bonds. After adjusting for inflation, equities had average real returns of around 7% a year, compared with only 1% for Treasury bonds—a 6% equity premium (see chart 1 on next page).

A small premium seemed justified, since returns on equities had bounced around more than those on bonds—that is, stocks were riskier. But since they found a relatively small difference in risk between bonds and shares, a six-point premium looked ridiculously high. A smaller premium (prevailing theory suggested less than a percentage point) should have been enough to lure investors into shares; six points implied that investors were cowed by even the slightest risk of a loss. If people made daily decisions in the same way they invested money, few would ever cross the street. The economics profession, the authors concluded, had a puzzle on its hands.

* "The Equity Premium: a Puzzle". Journal of Monetary Economics. 1985.



Economists have been struggling to solve it ever since. Market watchers are starting to take a keen interest. It is not hard to see why. If the equity premium fell, it should be easier to persuade investors to buy shares. At present, when compared with the six-point premium investors appear to have demanded in the past, potential returns look too low to do that. But a smaller equity premium could make those low returns more than adequate—even with no improvement in the economic (and profit) outlook.

The upper half of chart 2 shows how heavily share prices can be affected by even small changes in investors' expected returns. Suppose, for example, that investors demand a 9% return on equities before they are willing to buy. And suppose that the expected growth in profits—and hence in dividends—is around 7½% for the foreseeable future. With 7½% dividend growth, investors would need only a 1½% dividend "yield" (the ratio of dividends to share prices) to be induced to buy. That is roughly the yield on the S&P 500 at the moment, suggesting that shares are currently priced about right.

Premium prices 2

Required returns and market values

Required investor returns, %	Expected dividend growth, %	Implied S&P 500 dividend yield, %	Implied S&P 500 market capitalisation, $trn
9	7.5	1.5	[illegible]
10	7.5	2.5	[illegible]

Equity premiums and dividend growth

Dividend yield, %		Treasury bond yield, %	[illegible]	[illegible]
(A	–	B)	[illegible]	[illegible]
1.5		6	[illegible]	[illegible]
1.5		6	[illegible]	[illegible]
1.5		6	[illegible]	[illegible]
1.5		6	[illegible]	[illegible]

Source: Datastream/ICV

Suppose, however, that investors really wanted a 10%, rather than a 9%, return. That may seem only a small difference. But if dividend growth remained unchanged, this small difference could have a devastating effect on shares. To deliver the extra percentage point in returns—with no change in future dividend growth—the current dividend yield would have to rise from 1½% to 2½%. And since dividends are unchanged, the only way for the yield to rise is for the price of shares to fall—in this case by a heart-stopping 40%. If you doubt whether the equity premium matters, the difference between a Dow above 9,000 and one of 5,400 ought to convince you.

What level of returns are investors in American markets demanding at present? Unfortunately, it is impossible to say. The current value of shares reflects a balance between the returns that investors want and the returns they actually expect. But neither figure can be estimated on its own. The best one can do is to work out combinations of equity premiums and dividend growth that are consistent with the current level of share prices.

The lower part of chart 2 does this. The third column shows different levels of the equity premium, ranging from zero to six percentage points. The fourth column shows different rates of growth in dividends (which over the long term must equal the growth in corporate profits). If the equity premium is still at its historic rate of six points, investors should require returns of 12% a year (the current yield on America's long bond is around 6%) before they buy shares. Since the current dividend yield is around 1½%, that means that profits must grow by around 10½% a year to justify the present price level of American equities.

By contrast, if the equity premium has vanished completely, the required return on shares is only 6%. Current share prices could then be supported by profit growth of only 4½% a year. No wonder America's bulls have discovered the equity premium. A determined optimist needs only to plug a lower risk premium into his trusty equation and—hey presto!—share prices look just right, or even a bit low.

To the uninitiated, this argument may seem circular. It amounts to saying that share prices have soared because investors are more confident, something most people might consider obvious. Yet focusing on the equity premium can still be useful. If it has shrunk, examining why can illuminate what has made investors more confident—and whether their confidence is sustainable.

Has the equity premium really shrunk? That depends on why it was so high in the first place. There is no shortage of explanations on offer. Some economists argue that the premium only seemed to be high because it was not measured properly. Economists can estimate the premium only retrospectively, assuming that over the long run investors have received roughly what they expected. If the American stockmarket has done better than anyone could have hoped, they might argue, using its performance to measure the equity premium may make it seem artificially high.

One recent study* argues that this is precisely what the evidence from other stockmarkets shows. Using data from 39 national stockmarkets going back to the 1920s, William Goetzmann of Yale University and Philippe Jorion of the University of California, Irvine, found that investors in America were by far the luckiest, earning an annual real return of 5%, compared with an average of 1½% everywhere else. So measuring the equity premium using only American data could make it appear 3½ percentage points higher than it really is.

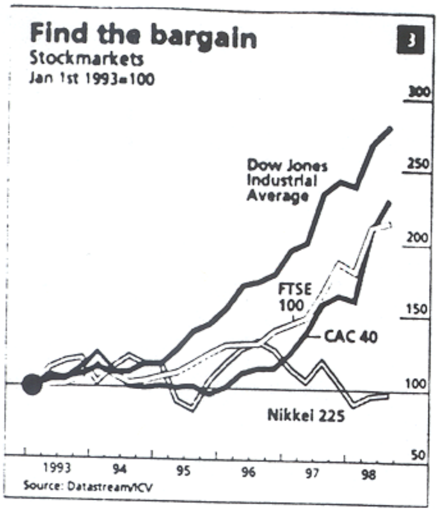
Unprofitable future

If this argument is right, it is mixed news for today's investors. It may justify the present level of the market, but it also means that the extra rewards from investing in shares rather than bonds could be lower in future than they have been in the past 70 years. However, in a survey† of academic research on the equity premium, two other economists—Jeremy Siegel of the Wharton School and Richard Thaler of the University of Chicago—suggest that this argument is wrong. They agree that returns on American equities have been high by international standards, but point out that returns on American Treasury bonds have also been relatively high. In countries such as Germany and Japan, which have experienced massive share-price collapses in the 20th century, bond prices have fallen at the same time. They argue that since good and bad luck have extended to bonds as well as shares, the equity premium has not been artificially inflated.

These arguments offer several interesting ways of looking at the equity premium. One lies in a distinction between people's attitudes towards risk and the actual level of risk. Economists find the risk premium puzzling mainly because they do not understand why people are put off by the stockmarket's apparently low risk. But the $12 trillion question is whether, in the long run, the market is really as safe as economists think it is. The past may not be a sure guide to the future. Equally, especially

* "A Century of Global Stockmarkets". NBER Working paper. January 1997.

† "Anomalies: The Equity Premium Puzzle". Journal of Economic Perspectives. Winter 1997.



given the risk of inflation, bonds may not be as safe as markets assume—and equities, a better inflation hedge, may be safer.

Second, it is pointless to evaluate the stockmarket in isolation. The question is whether the market is fairly valued relative to the alternatives. The equity premium measures how the market is priced relative to American Treasury bonds. Since American interest rates are low, and investors no longer seem to fear inflation, shares look attractive relative to other domestic investments. But that says nothing about whether investors have too much money in America. The economies of continental Europe are beginning to grow faster; asset prices in Asia are a lot lower than they were a year ago. If investors have funnelled too large a proportion of their savings into American assets, both bonds and shares could be overvalued, even if the equity premium is about right.

The fact that economists cannot measure risk accurately, or explain why American investors have been so reluctant to diversify abroad, suggests that they have a long way to go before they understand investors' behaviour. They have crunched enough numbers over the years to know that, overall, the stockmarket behaves remarkably efficiently—more so than most investors realise. Yet when they come across a problem they cannot explain, their weak comprehension of investors' behaviour leaves them at a loss.

One example is to be found in the differences between the short and long terms. Young investors should have different priorities from older ones, since some of the risks of stocks balance out over time. Yet economists cannot agree on how to take account of these time horizons. In a recent study with two other co-authors*, Mr Mehra, one of the economists who started it all, argues that the equity premium is so high because there is a fundamental gap between the investment goals of young and middle-aged workers. The stockmarket, he argues, offers a good hedge against uncertain wages: a worker skilled at, say, making cars risks seeing the value of his skills fade over time, but he can partly offset this by investing in different industries that contain future Microsofts as well as future GMs.

Many workers would be far better off if they could borrow lots of money while they are young and invest it in equities. When they are older, they might want to place more of their money in bonds, since uncertainty about their future wages has diminished and they no longer need equities to hedge their bets. However, since job skills do not make good collateral, young and old workers are unable to strike this bargain. This has the effect, Mr Mehra argues, of weakening the demand for equities. So buyers of equities get them cheap, earning a higher premium over time.

If this is right, the equity premium will have fallen permanently only if the constraints on would-be young investors have weakened. It is conceivable that defined-contribution pension accounts and easier access to loans have had this effect. But Mr Mehra argues that it is still almost impossible for young workers to borrow fully against expected future earnings. And according to his model, even small constraints on borrowing are able to generate a hefty premium on equities.

From theory to practice

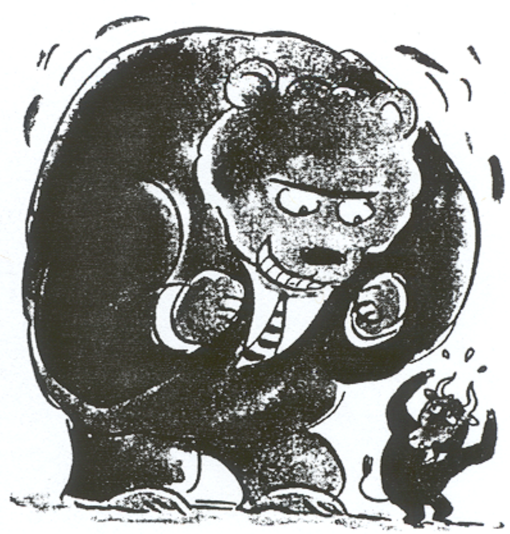
These explanations are far from the only ones that economists have come up with. One of the most intriguing has been put forward by Mr Thaler. He asks what would happen if investors were to deviate from economists' textbook models in two ways: by focusing on the returns they earn, rather than the money they have to spend; and by judging the risk of an investment according to how often they look at their portfolio—even if their plan is never to change it. If investors do behave this way, Mr Thaler argues, a high equity premium becomes easier to understand. That is because the more often investors study their portfolios, the worse they will feel, and the more they will be intimidated by even small risks.

He shows this by inverting the logic of the equity premium debate. Using reasonable estimates of people's risk aversion, and taking into account the historic volatility of bond and share prices, he concludes that an average evaluation period of around 13 months is enough to explain investors' past behaviour. Such a period may seem all too familiar to fund managers dealing with league tables based on annual performance. But it also implies that as more of people's money is given to those fund managers, the equity premium should go up, not down.

The more economists grapple with the puzzle, in other words, the more different images of the stockmarket they come up with. In fact, to get their models to make sense, economists often assume that the equity premium changes over time—hardly a reassuring concept for those who are betting their pensions. Moreover, a recent survey of financial economists suggests that, even after 15 years of pondering the premium, estimates of its level still vary wildly. Ivo Welch, at the University of California, Los Angeles, surveyed over 100 financial economists at top business schools. A quarter of them think the premium is less than three percentage points; but another quarter put it above seven. For those who like to bet the averages, the economists' median estimate for the risk premium over the next 30 years is around six percentage points—suggesting that little has changed.

All of this should remind investors that they face another kind of risk, very different from those that economists and fund managers usually discuss. That is the risk that they have no idea what they are doing. Yes, the equity premium seems to have been inexplicably high in the past. And since investors in America (and, increasingly, Europe) have unprecedented access to mutual funds and to financial information, it is conceivable that their attitudes towards risk have changed fundamentally.

But given the slowdown in corporate profits, and the inflated price of American equities, it would take a massive drop in the equity premium—perhaps to only a percentage point or two—to make Wall Street seem cheap. And even if the premium had indeed fallen by that much, there could be no guarantee it will stay that low for ever. In short, since nobody really knows how big the equity premium is or what influences it, it would seem wise to assume that what goes up will also come down—eventually.



* "Junior Can't Borrow: A New Perspective on the Equity Premium Puzzle". Working paper. November 1997.

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Journal Title: Journal of the Midwest Finance Association.

Volume: **Issue:**
Month/Year: 1993
Pages: 95-101

Article Author: Midwest Finance Association.

Article Title: Annie Wong; Utility stocks and the size effect; an empirical analysis

OCLC Number: 1644391

Imprint: [Des Moines, Iowa, etc.] Midwest Finance

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JUN 20 2006

UTILITY STOCKS AND THE SIZE EFFECT: AN EMPIRICAL ANALYSIS

Annie Wong*

I. Introduction

The objective of this study is to examine whether the firm size effect exists in the public utility industry. Public utilities are regulated by federal, municipal, and state authorities. Every state has a public service commission with board and varying powers. Often their task is to estimate a fair rate of return to a utility's stockholders in order to determine the rates charged by the utility. The legal principles underlying rate regulation are that "the return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks," and that the return to a utility should be sufficient to "attract capital and maintain credit worthiness." However, difficulties arise from the ambiguous interpretation of the legal definition of *fair and reasonable rate of return* to an equity owner.

Some finance researchers have suggested that the Capital Asset Pricing Model (CAPM) should be used in rate regulation because the CAPM beta can serve as a risk measure, thus making risk comparisons possible. This approach is consistent with the spirit of a Supreme Court ruling that equity owners sharing similar level of risk should be compensated by similar rate of return.

The empirical studies of Banz (1981) and Reinganum (1981) showed that small firms tend to earn higher returns than large firms after adjusting for beta. This phenomenon leads to the proposition that firm size is a proxy for omitted risk factors in determining stock returns. Barry and Brown (1984) and Brauer (1986) suggested that the omitted risk factor could be the differential information environment between small and large firms. Their argument is based on the fact that investors often have less publicly available information to assess the future cash flows of small firms than that of large firms. Therefore, an additional risk premium should be included to determine the appropriate rate of return to shareholders of small firms.

The samples used in prior studies are dominated by industrial firms, no one has examined the size effect in public utilities. The objective of this study is to extend the empirical findings of the existing studies by investigating whether the size effect is also present in the utility industry. The findings of this study have important implications for investors, public utility firms, and state regulatory agencies. If the size effect does exist in the utility industry, this would suggest that the size factor should be considered when the CAPM is being used to determine the fair rate of return for public utilities in regulatory proceedings.

II. Information Environment of Public Utilities

In general, utilities differ from industriales in that utilities are heavily regulated and they follow similar accounting procedures. A public utility's financial reporting is mainly regulated by the Securities and Exchange Commission (SEC) and the Federal Energy Regulatory Commission (FERC). Under the Public Utility Holding Company Act of 1935, the SEC is empowered to regulate the holding company systems of electric and gas utilities. The Act requires registration of public utility holding companies with the SEC. Only under strict conditions would the purchase, sale or issuance of securities by these holding companies be permitted. The purpose of the Act is to keep the SEC and investors informed of the financial conditions of these firms. Moreover, the FERC is in charge of the interstate operations of electric and gas companies. It requires utilities to follow the accounting procedures set forth in its Uniform Systems of Accounts. In particular, electric and gas utilities must request their Certified Public Accountants to certify that certain schedules in the financial reports are in conformity with the Commission's accounting requirements. These detailed reports are submitted annually and are open to the public.

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*Western Connecticut State University. The author thanks Philip Perry, Robert Hagerman, Eric Press, the anonymous referee, and Clay Singleton for their helpful comments.

The FERC requires public utilities to keep accurate records of revenues, operating costs, depreciation expenses, and investment in plant and equipment. Specific financial accounting standards for these purposes are also issued by the Financial Accounting Standards Board (FASB). Uniformity is required so that utilities are not subject to different accounting regulations in each of the states in which they operate. The ultimate objective is to achieve comparability in financial reporting so that factual matters are not hidden from the public view by accounting flexibility.

Other regulatory reports tend to provide additional financial information about utilities. For example, utilities are required to file the FERC Form No. 1 with the state commission. This form is designed for state commissions to collect financial and operational information about utilities, and serves as a source for statistical reports published by state commissions.

Unlike industriales, a utility's earnings are predetermined to a certain extent. Before allowed earnings requests are approved, a utility's performance is analyzed in depth by the state commission, interest groups, and other witnesses. This process leads to the disclosure of substantial amount of information.

III. Hypothesis and Objective

Due to the Act of 1935, the Uniform Systems of Accounts, the uniform disclosure requirements, and the predetermined earnings, all utilities are reasonably homogeneous with respect to the information available to the public. Barry and Brown (1984) and Brauer (1986) suggested that the difference of risk-adjusted returns between small and large firms is due to their differential information environment. Assuming that the differential information hypothesis is true, then uniformity of information availability among utility firms would suggest that the size effect should not be observed in the public utility industry. The objective of this paper is to provide a test of the size effect in public utilities.

IV. Methodology

1. Sample and Data

To test for the size effect, a sample of public utilities and a sample of industriales matched by equity value are formed so that their results can be compared. Companies in both samples are listed on the Center for Research in Security Prices (CRSP) Daily and Monthly Returns files. The utility sample includes 152 electric and gas companies. For each utility in the sample, two industrial firms with similar firm size (one is slightly larger and the other is slightly smaller than the utility) are selected. Thus, the industrial sample includes 304 non-regulated firms.

The size variable is defined as the natural logarithm of market value of equity at the beginning of each year. Both the equally-weighted and value-weighted CRSP indices are employed as proxies for the market returns. Daily, weekly and monthly returns are used. The Fama-MacBeth (1973) procedure is utilized to examine the relation between risk-adjusted returns and firm size.

2. Research Design

All utilities in the sample are ranked according to the equity size at the beginning of the year, and the distribution is broken down into deciles. Decile one contains the stocks with the lowest market values while decile ten contains those with the highest market values. These portfolios are denoted by MV_1, MV_2, ..., and MV_{10}, respectively.

The combinations of the ten portfolios are updated annually. In the year after a portfolio is formed, equally-weighted portfolio returns are computed by combining the returns of the component stocks within the portfolio. The betas for each portfolio at year t, $\hat{\beta}_{pt}$'s, are estimated by regressing the previous five years of portfolio returns on market returns:

$$\tilde{R}_{pt} = \alpha_p + \hat{\beta}_{pt}\tilde{R}_{mt} + \tilde{U}_{pt} \qquad (1)$$

where

R_{pt} = periodic return in year t on portfolio p

R_{mt} = periodic market return in year t

U_{pt} = disturbance term.

Banz (1981) applied both the ordinary and generalized least squares regressions to estimate β; and concluded that the results are essentially identical (p.8). Since adjusting for heteroscedasticity does not necessarily lead to more efficient estimators, the ordinary least squares procedures are used in this study to estimate β in equation (1).

The following cross-sectional regression is then run for the portfolios to estimate γ_{it}, i = 0, 1, and 2:

$$R_{pt} = \gamma_{0t} + \gamma_{1t}\hat{\beta}_{pt} + \gamma_{2t}\hat{S}_{pt} + U_{pt} \qquad (2)$$

where

$\hat{\beta}_{pt}$ = estimated beta for portfolio p at year t, t=1968, ..., 1987

$\hat{S}_{pt}$ = mean of the logarithm of firm size in portfolio p at the beginning of year t

U_{pt} = disturbance term.

Depending on whether daily, weekly or monthly returns are used, a portfolio's average return changes periodically while its beta and size only change once a year. The γ_1 and γ_2 coefficients are estimated over the following four subperiods: 1968-72, 1973-77, 1978-82 and 1983-1987. If portfolio betas can fully account for the differences in returns, one would expect the average coefficient for the beta variable to be positive and for the size variable to be zero. A t-statistic will be used to test the hypothesis. The coefficients of a matched sample are also examined so that the results between industrial and utility firms can be compared.

V. Analysis of Results

1. Equity Value of the Utility Portfolios

The mean equity values of the ten size-based utility portfolios are reported in Table 1. Panels A and B present the average firm size of these portfolios at the beginning and end of the test period, 1968-1987. The first interesting observation from Table 1 is that the difference in magnitude between the smallest and the largest market value utility portfolios is tremendous. In Panel A, the average size of MV_1 is about \$31 million while that of MV_{10} is over \$1.4 billion. In Panel B, that is twenty years later, they are \$62 million and \$5.2 billion, respectively. Another interesting finding is that there is a substantial increase in average firm size from MV_9 to MV_{10}. Since these two findings are consistent over the entire test period, the average portfolio market values for interim years are not reported. These results are similar to the empirical evidence provided by Reinganum (1981).

The utility sample in this study contains 152 firms whereas Reinganum's sample contains 535 firms that are mainly industrial companies. Two conclusions may be drawn from the results of the Reinganum study and this one. First, utilities and industriales are similar in the sense that their market values vary over a wide spectrum. Second, the fact that there is a huge jump in firm size from MV_9 to MV_{10} indicates that the distribution of firm size is positively skewed. To correct for the skewness problem, the natural logarithm of the mean equity value of each portfolio is calculated. This variable is then used in later regressions instead of the actual mean equity value.

2. Betas of the Utility and Industrial Samples

The betas based on monthly, weekly and daily returns are reported for the utility and industrial samples. For simplicity, they will be referred to as monthly, weekly, and daily betas. In all cases, five years of returns are used to estimate the systematic risk. The betas estimated over the 1963-67 time period are used to proxy for the betas in 1968, which is the beginning of the test period. By the same token, the betas obtained from the time period 1982-86 are used as proxies for the betas in 1987, which is the end of the test period.

The betas from using the equally-weighted and value-weighted indices are calculated in order to check whether the results are affected by the choice of market index. Since the results are similar, only those obtained from the equally-weighted index are reported and analyzed.

Table 2 reports the monthly, weekly and daily betas of the two samples at the beginning and end of the test period. Panel A shows the various betas of the industrial portfolios. Two conclusions may be drawn. First, in the 1960's, smaller market value portfolios tend to have relatively larger betas. This is consistent with the empirical findings by Banz (1981) and Reinganum (1981). Second, this trend seems to vanish in the 1980's, especially when weekly and daily returns are used.

The betas of the utility portfolios are presented in Panel B. The table shows that none of the utility betas are greater than 0.71. A comparison between Panels A and B reveals that utility portfolios are relatively less risky than industrial portfolios after controlling for firm size. The comparison also reveals that, unlike industrial stocks, betas of the utility portfolios are not related to the market values of equity.

The negative correlation between firm size and beta in the industrial sample may introduce a multicolinearity problem in estimating equation (2). Banz (p.11) had addressed this issue and concluded that the test results are not sensitive to the multicolinearity problem. For the utility sample, this problem does not exist.

3. Tests on the Coefficients of Beta and Size

The beta and firm size are used to estimate γ_1 and γ_2 in equation (2). A t-statistic is used to test if the mean values of the gammas are significantly different from zero. The tests were performed for four 5-year periods which are reported in Table 3. The mean of the gammas and their t-statistic are presented in Panel A for the utilities and in Panel B for the industrial firms.

The empirical results for the utility sample are reported in Panel A of Table 3. When monthly returns are used, 60 regressions were run to obtain 60 pairs of gammas for each of the 5-year periods. When daily returns are used, over 1200 regressions were run for each period to obtain the gammas. The results are similar: in all of the time periods tested, none of the average coefficients for beta and size are significantly different from zero. When weekly returns are used, 260 pairs of gammas were obtained. The average coefficients for beta are not significant in any test period, and the average coefficients for size are not significant in three of the test periods. For the test period of 1978-82, the average coefficient for size is significantly negative at a 5% level.

The test results for the industrial sample are reported in Panel B of Table 3. When monthly returns are used, the average coefficient estimates for size and beta are significant and have the expected sign only in the 1983-87 test period. When weekly returns are used, only the size variable is significantly negative in the 1978-82 period. When daily returns are used, the coefficient estimates for betas and size are not significant at any conventional level.

According to the CAPM, beta is the sole determinant of stock returns. It is expected that the coefficient for beta is significantly positive. However, the empirical findings reported in this study and in Fama and French (1992) only provide weak support for beta in explaining stock returns. The empirical findings in this study also suggest that the size effect varies over time. It is not unusual to document the firm size effect at certain time periods but not at others. Banz (1981) found that the size effect is not stable over time with substantial differences in the magnitude of the coefficient of the size factor (p.9, Table 1). Brown, Kleidon and Marsh (1983) not only have shown that size effect is not constant over time but also have reported a reversal of the size anomaly for certain years.

The research design of this study allows us to keep the sample, test period, and methodology the same with the holding-period being the only variable. The size effect is documented for the industrial sample in one of the four test periods when monthly returns are used and in another when weekly returns are used. When daily returns are used, no size effect is observed. For the utility sample, the size effect is significant in only one test period when weekly returns are used. When monthly and daily returns are used, no size effect is found. Therefore, this study concludes that the size effect is not only time-period specific but also holding-period specific.

VI. Concluding Remarks

The fact that the two samples show different, though weak, results indicates that utility and industrial stocks do not share the same characteristics. First, given firm size, utility stocks are consistently less risky than industrial stocks. Second, industrial betas tend to decrease with firm size but utility betas do not. These findings may be attributed to the fact that all public utilities operate in an environment with regional monopolistic power and regulated financial structure. As a result, the business and financial risks are very similar among the utilities regardless of their sizes. Therefore, utility betas would not necessarily be expected to be related to firm size.

The objective of this study is to examine if the size effect exists in the utility industry. After controlling for equity values, there is some weak evidence that firm size is a missing factor from the CAPM for the industrial but not for the utility stocks. This implies that although the size phenomenon has been strongly documented for the industriales, the findings suggest that there is no need to adjust for the firm size in utility rate regulations.

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Table 1

Average Equity Size of the Utility Portfolios at the Beginning and End of the Test Period
(Dollar figures in millions)

	A: Beginning (1968)	B: End (1987)
MV_1	$31	$62
MV_2	$77	$177
MV_3	$113	$334
MV_4	$161	$475
MV_5	$220	$715
MV_6	$334	$957
MV_7	$437	$1,279
MV_8	$505	$1,805
MV_9	$791	$2,665
MV_{10}	$1,447	$5,399

Table 2

Betas of the Two Samples at the Beginning and End of the Test Period

	Monthly Betas		Weekly Betas		Daily Betas	
	1963-67	1982-86	1963-67	1982-86	1963-67	1982-86
Panel A: Industrial Firms						
MV_1	0.89	1.00	1.15	0.95	1.11	0.92
MV_2	0.94	0.87	1.07	1.01	1.14	1.01
MV_3	0.88	0.82	1.12	0.86	1.14	1.04
MV_4	0.69	0.74	1.00	0.83	1.03	0.86
MV_5	0.73	0.80	1.05	0.96	1.13	1.01
MV_6	0.66	0.82	1.03	1.01	1.05	1.04
MV_7	0.64	0.81	0.97	1.04	0.98	1.09
MV_8	0.62	0.75	0.97	1.11	1.00	1.20
MV_9	0.52	0.78	0.84	1.06	0.94	1.16
MV_{10}	0.43	0.65	0.78	1.01	0.86	1.22
Panel B: Public Utilities						
MV_1	0.30	0.37	0.31	0.43	0.30	0.40
MV_2	0.28	0.38	0.37	0.47	0.36	0.44
MV_3	0.22	0.42	0.33	0.42	0.31	0.49
MV_4	0.27	0.35	0.36	0.52	0.34	0.54
MV_5	0.25	0.45	0.37	0.61	0.35	0.62
MV_6	0.25	0.41	0.39	0.54	0.40	0.65
MV_7	0.20	0.35	0.34	0.54	0.37	0.63
MV_8	0.17	0.38	0.34	0.65	0.33	0.68
MV_9	0.19	0.34	0.35	0.60	0.34	0.71
MV_{10}	0.18	0.29	0.38	0.59	0.39	0.71

Table 3

Tests on the Mean Coefficients of Beta (γ_1) and Size (γ_2)

$$R_{pt} = \gamma_{ot} + \gamma_{1t}\hat{\beta}_{pt} + \gamma_{2t}\hat{S}_{pt} + U_{pt}$$

Returns Used:		Monthly (t-value)	Weekly (t-value)	Daily (t-value)
Panel A: Utility Sample				
1968-72	γ_1	-0.46% (-0.26)	-0.32% (-0.42)	-0.02% (-0.18)
	γ_2	-0.07% (-0.78)	-0.01% (-0.51)	-0.00% (-0.46)
1973-77	γ_1	-0.28% (-0.13)	0.14% (0.14)	-0.03% (-0.21)
	γ_2	-0.11% (-0.70)	-0.03% (-0.67)	-0.00% (-0.53)
1978-82	γ_1	0.55% (0.36)	0.54% (1.00)	0.05% (0.43)
	γ_2	-0.10% (-0.75)	-0.05% (-1.71)*	-0.01% (-1.60)
1983-87	γ_1	1.74% (1.28)	-0.24% (-0.51)	-0.02% (-0.18)
	γ_2	-0.16% (-1.54)	-0.03% (-0.86)	-0.01% (-0.63)
Panel B: Industrial Sample				
1968-72	γ_1	-0.36% (-0.27)	-0.28% (-0.55)	-0.02% (-0.32)
	γ_2	0.07% (0.43)	-0.01% (-0.19)	0.00% (0.51)
1973-77	γ_1	1.34% (0.64)	-0.23% (-0.31)	0.14% (1.45)
	γ_2	-0.01% (-0.06)	-0.04% (-0.85)	-0.00% (-0.64)
1978-82	γ_1	-0.84% (-0.28)	-0.56% (-0.91)	-0.09% (-0.81)
	γ_2	-0.29% (-0.75)	-0.01% (-1.72)*	-0.00% (-1.33)
1983-87	γ_1	2.51% (1.83)*	0.34% (0.64)	0.11% (1.40)
	γ_2	-0.25% (-1.90)*	-0.01% (-0.43)	0.00% (0.14)

* Significant at the 5% level based on a one-tailed test.

The Accuracy of Analysts' Long-Term Earnings Per Share Growth Rate Forecasts

January 24, 2008

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ABSTRACT: In this study we examine the accuracy of analyst long-term and one-year earnings per share growth rate forecasts over the last 20 years. We find that analysts' earnings growth rate estimates are consistently overly-optimistic and are about two times the level of GDP growth. Analyst predictions of earnings are better for one-year projections than for long-term projections, but are still overly-optimistic. We find that analyst coverage does not have a significant impact on the optimistic bias in analysts EPS growth rate forecasts. We do find that a contributing factor for the bias in analysts' earnings estimates is the resistance of analysts to project negative earnings growth. Furthermore, we find that earnings estimates have a continued bias after the 2003 Global Analyst Research Settlements.

Introduction

The expected growth rate of long-term earnings plays a critical role in investment management and corporate finance. An essential element in valuation modeling and cost of capital estimation, long-term earnings growth is periodically forecasted by Wall Street analysts to provide investors with a better understanding of the current and future cash flows likely to be generated by a firm's operations. Periods of high earnings growth rates are usually accompanied with bull markets, and periods of low or negative earnings growth rates tend to produce bear markets. In addition, companies with high earnings growth rates usually sell at high price-to-earnings (P/E) ratios, and stocks with low earnings growth rates trade at low P/E ratios.

A number of studies have indicated that analysts' forecasts of earnings are upwardly biased. For example, Barefield and Comiskey (1975), DeBondt and Thaler (1990), Butler and Lang (1991), Abarbanall (1991), and Brown (1997) find an overall optimism in analysts' earnings forecasts. Becchetti, Hasan, Santoro, and Anandarajan (2007) find evidence that an over-optimism bias is highest during bull markets. Hong and Kubik (2003) find that brokerage houses reward optimistic analysts who promote stocks. In addition, the popular press occasionally highlights evidence of analysts forecast bias.[1]

However, these studies assessing the accuracy of analysts' earnings estimates are based on forecasts of quarterly earnings. That is, these studies evaluate the accuracy of analysts' earnings forecasts for periods up to one quarter before a quarterly EPS figure is released. Our study examines analysts' long-term (three- to five- year) and one-year

[1] See for example, Brown (2003) and Smith (2003).

ahead EPS growth rate forecasts. According to financial theory, long-term expected earnings growth drives the valuation of the overall stock market and individual common stocks. As such, long-term EPS growth rate forecasts are an essential component of cash flow valuation models for firms and the market and are used in estimating the cost of capital.

We begin by evaluating historic EPS growth. Many have argued that there is an upward limit on EPS growth as determined by sustainable GDP growth. Bernstein and Arnott (2003) and Arnott (2004) indicate that EPS growth must be below sustainable growth in economic productivity. We show that the historic growth rate in EPS and GDP in the U. S. is in the 7.0% range. As an initial indication of accuracy of analysts' forecasts, we find that analysts' estimates of long-term EPS growth are substantially above this level.

We examine the accuracy of analysts' long-term earnings and one-year ahead EPS growth rate estimates over the last 20 years. We find that analysts' earnings growth rate estimates are consistently overly-optimistic. Analyst predictions of earnings growth are better for one-year growth rate projections than for long-term growth rate projections, but are still significantly overly-optimistic. Analysts only underestimate EPS growth following periods of economic recession which are associated with EPS recovery after large declines in earnings. We also evaluate whether the number of analysts covering a company is associated with the overly-optimistic bias in projected EPS growth rates. We find that analyst coverage does not have a significant impact on the bias in projected EPS growth rates. We do find that a contributing reason for the bias in analysts' long-term and one-year EPS growth rate estimates is the resistance of analysts to project negative earnings growth. We find that analysts rarely project negative EPS growth, despite the fact that companies commonly experience negative earning growth over three- to –five-year time periods. Based on the research of others, we suggest three explanations for the upward bias in analysts' earnings estimates. The first explanation is based on career concerns or conflicts of interest. Analysts are rewarded for biased forecasts by their employers (brokerage houses) who want them to hype stocks so that the brokerage house can garner trading commissions and win underwriting deals. The second explanation is based on selection bias. Analysts only follow stocks that they recommend and do not issue forecasts on those that they do not like. The third explanation is a cognitive or behavioral bias. Analysts become attached to the companies that they cover and lose objectivity. This would imply that analysts are systematically biased. Since they are only projecting the companies they follow, and not the market, the end result is a strong upward bias on earnings projections.

Finally, we assess the optimistic bias in analysts' EPS growth rate estimates for the period after the Global Analyst Research Settlements in 2003. Presumably, any bias in the research of Wall Street investment firms should have been impacted by New York Attorney General (now Governor) Elliot Spitzer's investigation and the $1.5B payment made by nine major brokerage firms. Nonetheless, we find a continued optimistic bias in long-term earnings growth rate estimates after the Settlements.

This study is organized as follows. Initially, the historic growth of earnings on S&P 500 companies is compared to the growth in GDP to establish the historic relationship between corporate earnings growth and economic growth. Then, analysts' forecasts of earnings growth for long-term and one-year time horizons are compared to actual earnings growth. We also evaluate analyst coverage as a possible contributing factor in earnings forecast bias. Next, negative earnings growth projections are examined as a possible explanation for the earnings estimate bias. Finally we investigate analysts' earnings estimates following the Global Research Regulatory Settlement to see if analysts have adjusted their bias.

Data and Methodology

One of the most common approaches to estimating the long-term earnings growth rates for companies is to use the mean estimates of the forecasts of Wall Street securities' analysts as published by such services as Zack's Investment Research, Thomson First Call Research, or the Institutional Brokers' Estimate System (I/B/E/S). I/B/E/S has a more comprehensive coverage of brokerage firms and financial analysts than the other databases. It includes many more analysts from smaller brokerage firms, and also includes important brokerage firms such as Merrill Lynch, Goldman Sachs, and Donaldson, Lufkin & Jenrette that are not included in Zack's Investment Research.

Using the I/B/E/S database, we collect long-term and one-year ahead annual growth rate estimates for all firms from 1984 to 2006, inclusive. We require that companies not only have projected EPS growth rate estimates, but also have EPS figures for the four-year ahead period (for the long-term forecasts) and the one-year ahead period (for the one-year forecasts) so that forecasted and actual EPS growth rates can be compared. Based on projected and actual earnings per share, we calculate implied geometric growth rates. We compare analysts' projected and actual EPS growth rates for long-term EPS growth rate forecasts and one-year EPS growth rate estimates. The data result in an average of 1,383 firms and 1,275 firms per year, for one-year and long-term growth rates, respectively. The descriptive statistics for the data are reported by year in Table 1.

Table 1
Number of Companies and Average Number of Analysts:
One-Year and Long-Term Analyst Forecast Data

	One-Year Forecasts		Long-Term Forecasts	
Year	Number of Companies	Average Number of Analysts	Number of Companies	Average Number of Analysts
1984	1,245	8.61	--	--
1985	1,154	10.30	--	--
1986	1,140	10.44	--	--
1987	1,047	11.02	--	--
1988	1,095	10.70	808	6.09
1989	1,245	10.64	899	6.29
1990	1,260	10.78	892	6.49
1991	1,138	10.01	921	6.34
1992	1,192	9.60	1,003	5.49
1993	1,314	9.55	1,125	5.90
1994	1,475	9.71	1,175	5.69
1995	1,557	9.11	1,148	5.86
1996	1,652	8.74	1,158	5.68
1997	1,489	8.33	1,218	5.51
1998	1,375	7.75	1,466	4.99
1999	1,258	8.54	1,490	4.95
2000	1,176	8.26	1,503	5.08
2001	1,469	7.68	1,467	5.26
2002	1,367	7.13	1,518	5.39
2003	1,464	7.78	1,577	5.56
2004	1,565	8.60	1,663	5.24
2005	1,620	8.73	1,578	5.07
2006	2,502	6.92	1,628	5.59
Mean	1,383	9.08	1,275	5.61
Median	1,314	8.74	1,218	5.56

Source: I/B/E/S. Long-term numbers are based on the average of quarterly numbers for each year.

Analysts Long-Term EPS Growth Rate Forecasts

For the analysts' long-term growth rate estimates, I/B/E/S reports the number of analysts as well as the mean and median EPS growth rate estimates for a 'three-to-five' year period. Given that I/B/E/S projected EPS growth rate is for a 'three-to-five' year period, the projected EPS growth rate is assumed to be four years. For each company in the I/B/E/S database with long-term analysts' EPS growth rate forecasts, as of the end of each quarter we obtain the annual EPS, EPS_t, as the sum of the trailing four quarters' EPS and the mean projected three-to-five year projected EPS growth rate, g. As an example, assume that EPS_t for a particular company as of the end of the fourth quarter of 2000 is \$1.00 and g is 10%, as shown in Table 2. The projected EPS in four years, EPS_{t+4}, for this company is calculated as:

$$EPS_{t+4} = (EPS_t)(1+g)^4$$

Table 2
Example: EPS and Projected Growth for a Hypothetical Company

Actual Quarterly EPS					
First Quarter 2000	**Second Quarter 2000**	**Third Quarter 2000**	**Fourth Quarter 2000**	**Actual Annual EPS**	**I/B/E/S Projected EPS Growth**
0.25	0.35	0.25	0.15	1.00	10.0%

In this example, the company's projected EPS is calculated as:

$$\text{EPS}_{t+4} = (1.00)(1.10)^4 = \$1.46.$$

This figure is compared to the company's actual annual EPS growth rate from the end of 2000 to the end of 2004. The actual EPS growth rate is calculated as the compound annual growth rate in earnings over the time period, g_a, as shown below:

$$g_a = 1 - \left(\frac{EPS_{t+4}}{EPS_t} \right)^{.25}$$

As an example, if the company's actual annual EPS as of the fourth quarter of 2004 is \$1.25; the company's actual four-year EPS growth rate is calculated as 5.74%. This is shown in Table 3. In this example, analysts projected this company to grow EPS at 10% over the four-year time period, and the company had an actual EPS growth rate of 5.74%. This procedure is repeated on a quarterly basis for each company in the I/B/E/S database.

Table 3
Example: Actual Long-Term EPS
Growth Rate Calculation for a Hypothetical Company

Actual Quarterly EPS					
First Quarter 2004	**Second Quarter 2004**	**Third Quarter 2004**	**Fourth Quarter 2004**	**Actual Annual EPS**	**Actual EPS Growth (2000 – 2004)**
0.30	0.35	0.25	0.35	1.25	5.74%

Analysts' One-Year EPS Growth Rate Estimates

For one-year EPS estimates, I/B/E/S reports the number of analysts as well as the mean and median one-year EPS estimates. We compare the growth rates associated with the one-year projected EPS estimates with the actual EPS as of the end of the calendar year. For this reason, we limit this analysis to firms with December 31st fiscal year-ends.

As an example, using the hypothetical company in Table 4, of the end of the fourth quarter of 2004, the company's EPS_t is \$1.00. If the analysts' projected one-year growth in EPS, EPS_{t+1}, is \$1.15, the company's projected one-year EPS growth rate is calculated as 15.0%. This figure is compared to the company's actual EPS growth rate based on quarterly earnings in 2005. In the example in Table 4, the company's actual one-year EPS growth rate is 10.0%. This procedure is then repeated on an annual basis for each company in the I/B/E/S database

Table 4
Example: Actual Annual EPS Growth
Rate Calculation for a Hypothetical Company

Actual EPS						
First Quarter 2004	**Second Quarter 2004**	**Third Quarter 2004**	**Fourth Quarter 2004**	**2004 Actual Annual EPS**	**2005 Actual Annual EPS**	**Projected One-Year EPS Growth (2004 – 2005)**
0.30	0.30	0.20	0.20	1.00	1.10	15.0%

We calculate forecast errors, *FE*, based on the ratio of the forecasted and actual estimated growth rates, as follows:

$$FE = \frac{g}{g_a} - 1$$

Based on this calculation, a positive forecast error indicates an upward bias in forecasted earnings and a negative forecast error indicates a downward bias in forecasted earnings.

The tabulated growth rates are based only on firms who survive for the following one or four years, for one-year and long-term growth rates, respectively. The survivorship bias may induce an upward bias in actual earnings growth rates. Moreover, we do not calculate growth rates when the base-year value is negative.

Historic Growth Rate in Earnings

The historic record for EPS and GDP growth provides a benchmark for long term growth estimates. Ibbotson and Cheng (2003) show that growth in earnings is in line with overall growth in economic productivity. Bernstein and Arnott (2003) and Arnott (2004) make the point that corporate earnings growth rates cannot exceed sustainable GDP growth, even though analysts consistently forecast growth rates that indicate the opposite.

We begin by examining the actual five-year earning per share (EPS) growth for the S&P 500 and five-year Gross Domestic Product (GDP) growth from 1960 to 2006. EPS for the S&P 500 has averaged 7.02% with a median of 7.08%. GDP has averaged 7.42% with median of 7.40%. The results are presented in Figure 1.

Historically, EPS growth has been is more volatile than GDP growth. EPS growth rates range from -2.71% to 16.89% with a standard deviation of 4.51%. Growth rates for GDP range from 4.62% to 11.38% with a standard deviation of 2.03%. In addition, average GDP growth has exceeded EPS growth. This result corresponds with previous research.

Figure 1
Five-Year S&P 500 EPS Growth Versus Five-Year GDP Growth

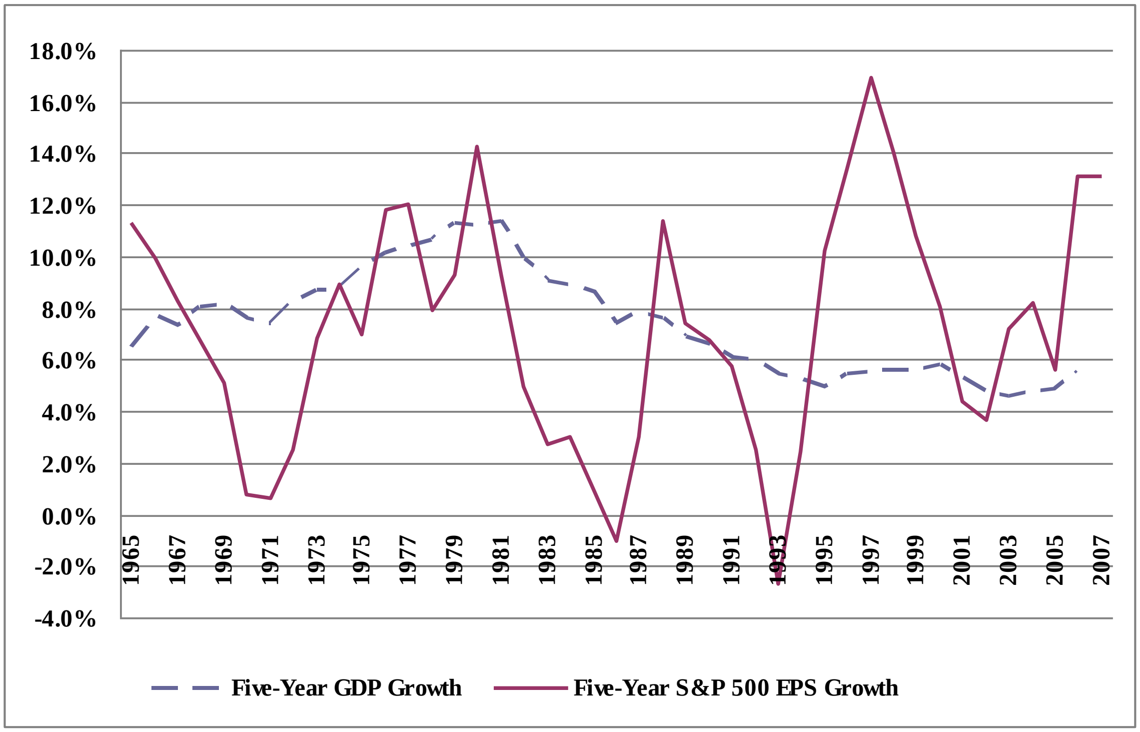
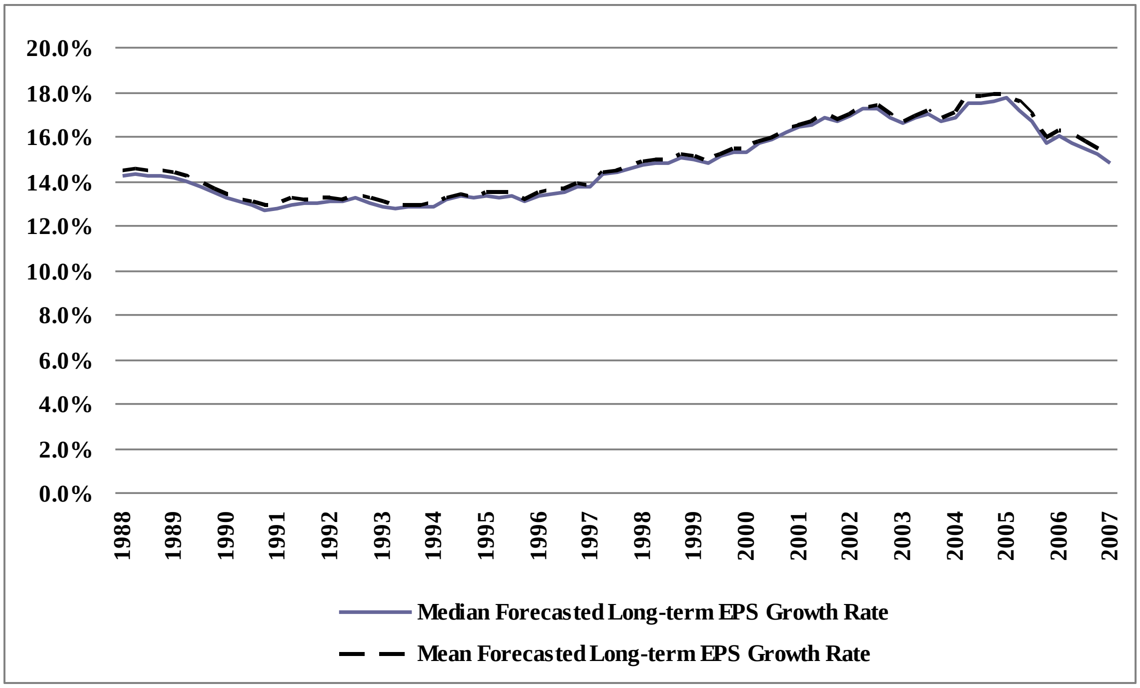


Figure 2 shows the mean and median long-term analysts EPS forecasts from 1988 through the first quarter of 2007. Although GDP growth has averaged 7.42% with median of 7.40% over the last 40 years, analysts over our sample period project long-term growth at an average rate of 14.71%. This suggests that analysts consistently forecast long-term EPS growth at a level that is two times that of historic GDP growth.

Several observations can be made from Figure 2. First, analysts consistently project long-term growth rates in a range of 13% to 18%. Second, mean and median observations are practically identical suggesting that these results are not driven by outliers. Finally, analysts' forecasts have increased over time, even though GDP growth has decreased over time.

In the sections that follow, we examine analysts' long-term and one- year ahead forecasts relative to actual EPS growth rates.

Figure 2
Long-Term IBES Forecasted EPS Growth Rates
1988-2006



Analysts IBES Forecast Versus Actual EPS Growth Rates: Long-Term Projections

We examine forecasted long-term EPS growth versus actual three-to-five-year EPS growth based on IBES data from 1984 to 2006. The results are presented by quarter in Table 5 and Figure 3.

. Over the entire time period, analysts continually forecast long-term EPS growth for the sample between 13% and 18%. Actual EPS growth for the sample ranges between 1.23% and 19.93%. Firm's meet or exceed analysts' expectations in periods around 1996 and 2006, both of which followed a large decline in corporate earnings. This is the most likely scenario for corporations to attain the lofty growth rates projected by analysts. This pattern is seen clearly in Figure 3.

Over the entire period analysts' long-term forecasted EPS growth averaged

14.71% per year, but companies only averaged long-term EPS growth of 9.10%. The analyst bias is obvious and clearly significant. A test for a difference in means--the null hypothesis is the difference in the mean actual EPS growth is equal to the mean projected EPS growth--has a t-stat of -10.68 which is significant at the .005 level (n=77).

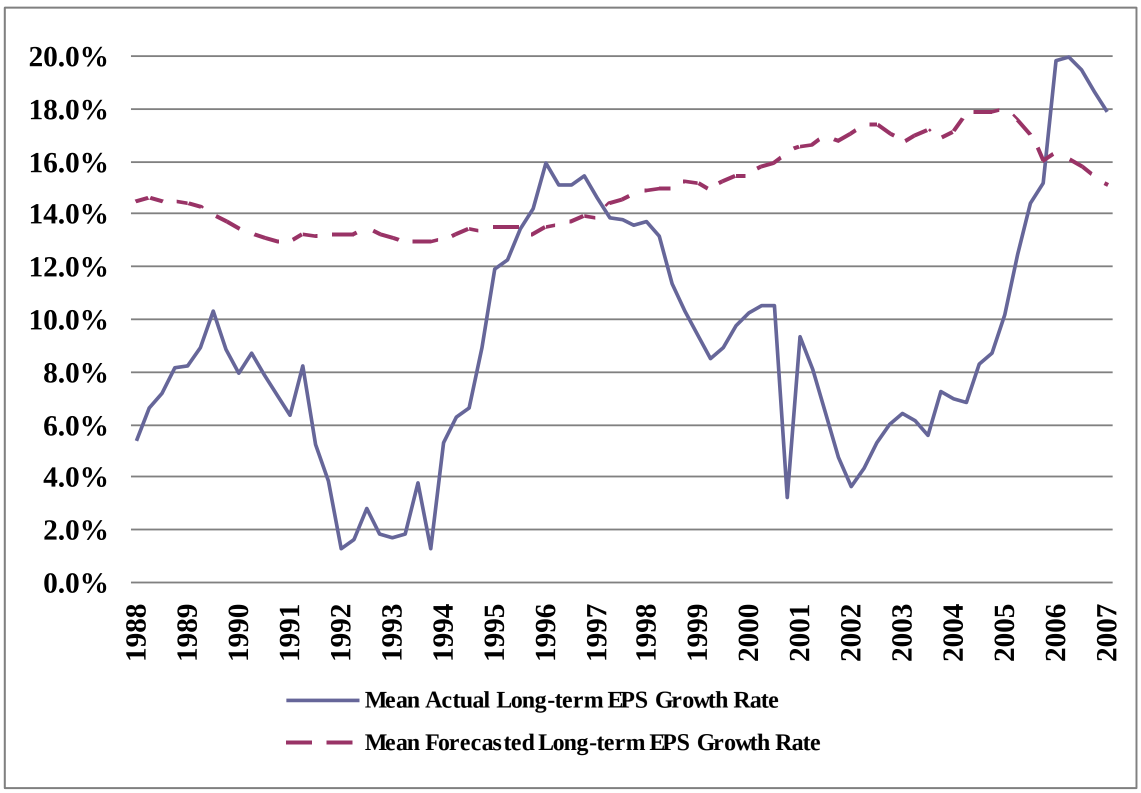
Table 5
Summary of Forecasted and Actual Long-Term EPS Growth Rates by Quarter

Year	Quarter Ended	Mean Actual Long-term EPS Growth Rate	Mean Forecasted Long-term EPS Growth Rate	Forecast Error for Mean (%)	Number of Companies	Average Number of Analyst Estimates
1988	Mar-88	5.36%	14.47%	170.07%	768	6.24
	Jun-88	6.61%	14.55%	120.32%	797	6.26
	Sep-88	7.12%	14.45%	102.96%	817	5.96
	Dec-88	8.12%	14.46%	78.13%	850	5.88
1989	Mar-89	8.20%	14.35%	75.08%	910	6.09
	Jun-89	8.92%	14.21%	59.34%	892	6.36
	Sep-89	10.28%	13.88%	35.03%	889	6.57
	Dec-89	8.81%	13.65%	55.00%	905	6.15
1990	Mar-90	7.94%	13.41%	68.98%	907	6.42
	Jun-90	8.66%	13.23%	52.76%	863	6.46
	Sep-90	7.84%	13.05%	66.44%	880	6.48
	Dec-90	7.10%	12.89%	81.48%	916	6.62
1991	Mar-91	6.35%	12.89%	103.13%	939	6.70
	Jun-91	8.21%	13.19%	60.63%	914	6.68
	Sep-91	5.20%	13.14%	152.80%	897	6.07
	Dec-91	3.84%	13.18%	243.60%	932	5.90
1992	Mar-92	1.25%	13.22%	955.21%	950	5.58
	Jun-92	1.57%	13.18%	737.49%	986	5.41
	Sep-92	2.75%	13.40%	387.75%	1008	5.47
	Dec-92	1.83%	13.22%	621.01%	1068	5.52
1993	Mar-93	1.64%	13.04%	697.33%	1062	5.79
	Jun-93	1.81%	12.90%	612.01%	1183	5.93
	Sep-93	3.76%	12.89%	243.17%	1115	5.98
	Dec-93	1.23%	12.92%	951.11%	1140	5.90
1994	Mar-94	5.31%	12.98%	144.61%	1143	5.66
	Jun-94	6.27%	13.21%	110.79%	1158	5.56
	Sep-94	6.61%	13.42%	103.17%	1207	5.75
	Dec-94	8.89%	13.34%	49.99%	1192	5.81
1995	Mar-95	11.88%	13.47%	13.39%	1166	5.88
	Jun-95	12.20%	13.44%	10.21%	1144	5.84
	Sep-95	13.37%	13.45%	0.61%	1147	5.87

	Dec-95	14.14%	13.18%	-6.78%	1134	5.87
1996	Mar-96	15.88%	13.47%	-15.20%	1115	5.76
	Jun-96	15.05%	13.59%	-9.74%	1154	5.62
	Sep-96	15.07%	13.65%	-9.38%	1177	5.70
	Dec-96	15.42%	13.87%	-10.04%	1185	5.63
1997	Mar-97	14.62%	13.83%	-5.37%	1213	5.55
	Jun-97	13.82%	14.36%	3.92%	1223	5.55
	Sep-97	13.72%	14.49%	5.61%	1260	5.48
	Dec-97	13.52%	14.69%	8.67%	1174	5.45
1998	Mar-98	13.67%	14.88%	8.85%	1477	5.14
	Jun-98	13.13%	14.95%	13.85%	1448	4.92
	Sep-98	11.33%	14.91%	31.68%	1475	4.98
	Dec-98	10.27%	15.22%	48.16%	1462	4.93
1999	Mar-99	9.37%	15.13%	61.49%	1510	4.88
	Jun-99	8.50%	14.90%	75.28%	1480	4.96
	Sep-99	8.89%	15.20%	70.90%	1490	4.89
	Dec-99	9.70%	15.39%	58.64%	1481	5.06
2000	Mar-00	10.21%	15.45%	51.25%	1491	5.00
	Jun-00	10.48%	15.78%	50.53%	1515	4.94
	Sep-00	10.48%	15.93%	51.96%	1503	5.12
	Dec-00	3.19%	16.31%	412.19%	1502	5.25
2001	Mar-01	9.30%	16.53%	77.61%	1502	5.26
	Jun-01	8.09%	16.63%	105.58%	1485	5.26
	Sep-01	6.36%	16.97%	166.79%	1465	5.33
	Dec-01	4.72%	16.76%	255.42%	1414	5.18
2002	Mar-02	3.63%	17.02%	369.17%	1461	5.37
	Jun-02	4.28%	17.35%	305.30%	1517	5.26
	Sep-02	5.27%	17.38%	229.93%	1541	5.45
	Dec-02	5.98%	16.98%	183.88%	1553	5.50
2003	Mar-03	6.37%	16.68%	161.92%	1537	5.55
	Jun-03	6.11%	16.92%	177.12%	1566	5.46
	Sep-03	5.52%	17.15%	210.57%	1598	5.58
	Dec-03	7.25%	16.85%	132.37%	1605	5.65
2004	Mar-04	6.93%	17.08%	146.39%	1629	5.70
	Jun-04	6.80%	17.76%	161.30%	1664	5.18
	Sep-04	8.28%	17.81%	115.12%	1687	5.23
	Dec-04	8.70%	17.84%	104.95%	1670	4.87
2005	Mar-05	10.11%	17.92%	77.23%	1616	4.93
	Jun-05	12.45%	17.53%	40.74%	1578	4.87
	Sep-05	14.39%	16.96%	17.82%	1599	5.16
	Dec-05	15.15%	15.95%	5.32%	1517	5.33
2006	Mar-06	19.82%	16.22%	-18.18%	1563	5.33
	Jun-06	19.93%	16.07%	-19.40%	1580	5.65
	Sep-06	19.45%	15.75%	-19.05%	1644	5.83
	Dec-06	18.60%	15.41%	-17.14%	1723	5.57
2007	Mar-07	17.81%	15.07%	-15.39%	1734	5.25
	Mean	**9.10%**	**14.89%**	**143.06%**	**1,281**	**5.60**
	Median	**8.50%**	**14.55%**	**75.08%**	**1,223**	**5.56**

Also presented in Table 5 are forecast errors. Previous studies based on quarterly estimates (see, for example, Kwag and Shrieves (2006)) find that forecast errors are mixed. Our findings indicate that forecast errors for long-term estimates are predominantly positive, which indicates an upward bias in growth estimates. The mean and median forecast errors over the observation period are 143.06% and 75.08%, respectively. They are only negative for 11 time periods: five consecutive quarters starting at the end of 1995 and six consecutive quarters starting in 2006. As can be seen in Figure 3, the negative forecast errors clearly follow periods of declined earnings growth when higher growth rates can be attained. Overall, there is evidence of a persistent upward bias in long-term EPS growth forecasts.

Figure 3
Long-Term Forecasted Versus Actual EPS Growth Rates
1988-2006



Long-Term EPS Forecasts: Breakdown by Number of Analysts

It is possible that the results from the previous section are affected by the level of analyst coverage. Smaller and newly-traded companies tend to have less analyst coverage. It is possible that companies with fewer analysts would bias the results. Earnings for small or newly-traded companies are more difficult to forecast and would be expected to lead to higher forecasted earnings growth rates. For this reason we divide the sample into two groups: companies with three or fewer analysts and companies with more than three analysts.

While our data averages 5.61 analysts per company, many companies have three or fewer analysts. The two groups evenly divide the data. On average, of 1,273 companies, 628 have three or fewer analysts and 645 have more than three analysts. The data is described in Table 6 and displayed in Figure 4.

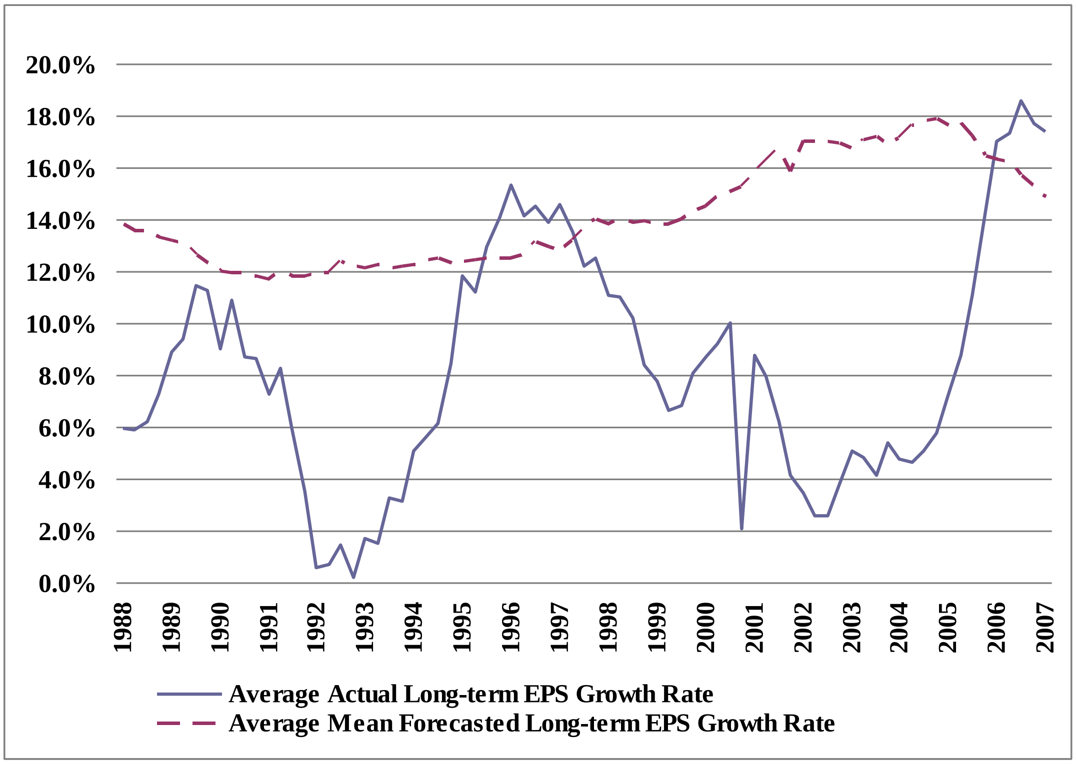
The results indicate that the group of companies with more than three analysts has lower long-term earnings growth rate forecasts. However, that group also has significantly lower actual growth in earnings, as indicated by a difference in means test (t-stat = -5.77, n = 77). Furthermore, while there is no significant difference between the forecasted growth rates by group since 2002, actual earnings continue to be lower for the group with more than three analysts. Overall, the forecast errors by group are very close. The median forecast error for the group with fewer than three analysts is 48.65%. For the group with more than three analysts the median forecast error is 48.68%.

Table 6
Number of Companies by
Analyst Coverage for Long-Term IBES Data

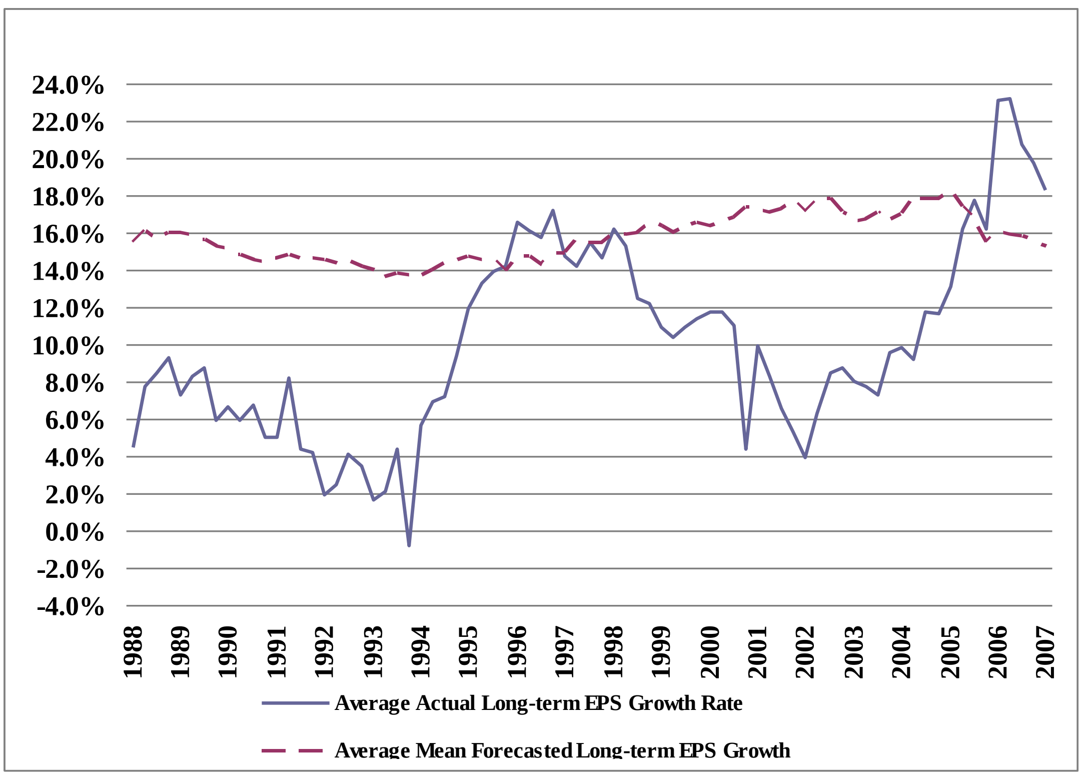
Year	Total Number of Companies	Companies with 3 and fewer Analysts	Companies with more than 3 Analysts
1988	808	325	485
1989	899	379	522
1990	892	389	508
1991	921	410	511
1992	1,003	502	505
1993	1,125	535	577
1994	1,175	561	615
1995	1,148	533	616
1996	1,158	530	633
1997	1,218	576	646
1998	1,466	731	735
1999	1,490	735	756
2000	1,503	747	756
2001	1,467	759	707
2002	1,518	825	693
2003	1,577	871	705
2004	1,663	875	788
2005	1,578	809	769
2006	1,628	898	730
Mean	**1,273**	**628**	**645**
Median	**1,218**	**576**	**646**

Source: I/B/E/S. Based on the average of quarterly numbers for each year.

Figure 4
Long-Term IBES Forecasted EPS Growth Rates by Analysts Coverage
Panel A: Greater Than Three Analysts



Panel B: Three Analysts of Fewer



Analysts IBES Forecast Versus Actual EPS Growth Rates: One-Year Projections

Although we have shown a significant bias in growth rate forecasts, we realize that long-term growth is difficult to forecast. Over longer forecast periods, analysts face a greater probability of unexpected events that will lead to inaccurate estimates. One possible explanation for the persistent bias is that analysts consistently project long-term growth estimates higher than short-term estimates to allow for the possibility of unforeseen events. For this reason, we extend the analysis to one-year EPS growth rate forecasts, expecting that analysts' estimates will be more accurate over a shorter period of time with less event risk.

We collect forecasted and actual one-year EPS growth rate data for firms from 1984 to 2006. We compare the analysts' forecasted EPS growth rates to the actual annual growth rates over the year. The results are presented by year in Table 7.

Analysts consistently project upwardly biased growth rates, even for shorter time horizons. Analysts forecasted one-year EPS growth at an average rate of 13.80% while the actual EPS growth rate over the time period averaged 9.77%. These growth rates are significantly different as indicated by a difference in means test (t-stat = -4.91, n=23).

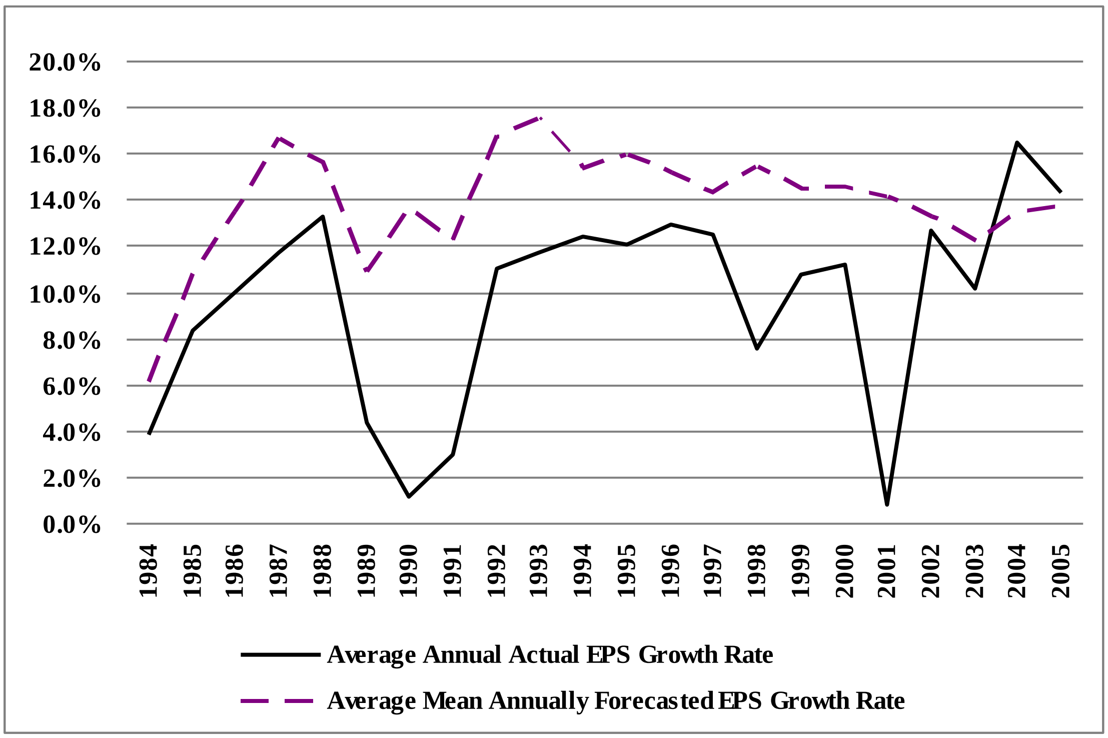
Although the one-year forecast errors are lower, they are still large and predominantly positive. The mean and median forecast errors over the observation period are 165.94% and 32.51%, respectively. Forecast errors are only negative for the last three years, indicating an overall negative bias to earnings estimates.

Table 7
Summary of IBES Forecasted and Actual One-Year Growth Rates by Year

Year	Mean Annual Actual EPS Growth Rate	Mean Annual Forecasted EPS Growth Rate	Forecast Error for Mean Growth Rate	Number of Companies	Average Number of Analyst Estimates
1984	3.79%	6.10%	61.24%	1245	8.61
1985	8.33%	10.77%	29.40%	1154	10.30
1986	9.96%	13.43%	34.84%	1140	10.44
1987	11.68%	16.67%	42.71%	1047	11.02
1988	13.22%	15.62%	18.16%	1095	10.70
1989	4.32%	10.81%	150.19%	1245	10.64
1990	1.15%	13.60%	1082.97%	1260	10.78
1991	2.97%	12.20%	311.26%	1138	10.01
1992	10.98%	16.72%	52.24%	1192	9.60
1993	11.66%	17.49%	50.09%	1314	9.55
1994	12.42%	15.31%	23.34%	1475	9.71
1995	12.05%	15.97%	32.51%	1557	9.11
1996	12.88%	15.15%	17.63%	1652	8.74
1997	12.50%	14.26%	14.11%	1489	8.33
1998	7.52%	15.38%	104.62%	1375	7.75
1999	10.76%	14.46%	34.32%	1258	8.54
2000	11.20%	14.51%	29.55%	1176	8.26
2001	0.77%	14.08%	1730.98%	1469	7.68
2002	12.64%	13.27%	5.04%	1367	7.13
2003	10.16%	12.23%	20.37%	1464	7.78
2004	16.46%	13.40%	-18.62%	1565	8.60
2005	14.25%	13.79%	-3.20%	1620	8.73
2006	13.10%	12.17%	-7.09%	2502	6.92
Mean	**9.77%**	**13.80%**	**165.94%**	**1383**	**9.08**
Median	**11.20%**	**14.08%**	**32.51%**	**1314**	**8.74**

The one-year analysts' forecasts and actual EPS growth rates are presented in Figure 5. The persistent upward bias is evident from the graph. As with long-term analyst forecasts, the only negative forecast errors follow a period of lower actual EPS growth. Higher growth is most likely to be attained after such a period.

Figure 5
One-Year Forecasted versus Actual EPS Growth Rates



Negative Earnings Growth Rate Forecasts

One explanation of the persistent bias of analysts' projections is a resistance to report negative earnings growth rates. A resistance to report negative earnings growth could be linked to the investment banking influences addressed by the Global Analyst Research Settlements. It could also be caused by a cognitive bias often called familiarity. Familiarity is a behavioral flaw common to investors. Investors have a tendency to favor investments they know, such as the common stock of their employer. Similarly, analysts may become attached to companies they follow and lose objectivity.

Using long-term growth projections, we begin by comparing the number of companies with projected negative EPS growth rates to those with actual negative EPS growth rates in each time period. The differences are striking. The results are summarized in Panel A and Panel B of Figure 6.

Panel A shows the percent of companies with actual negative EPS growth. The average number of companies with actual negative EPS growth is 391 with a minimum of 227 and a maximum of 644. An average of 31.12% of all companies had negative earnings growth in each quarter.

Shown in Panel B is the percent of companies with forecasted negative EPS growth. The average number of companies with forecasted negative EPS growth by quarter is only 2.10 with a minimum of 0 and a maximum of 13. Only 0.17% of all companies were projected to have negative earnings growth. [2]

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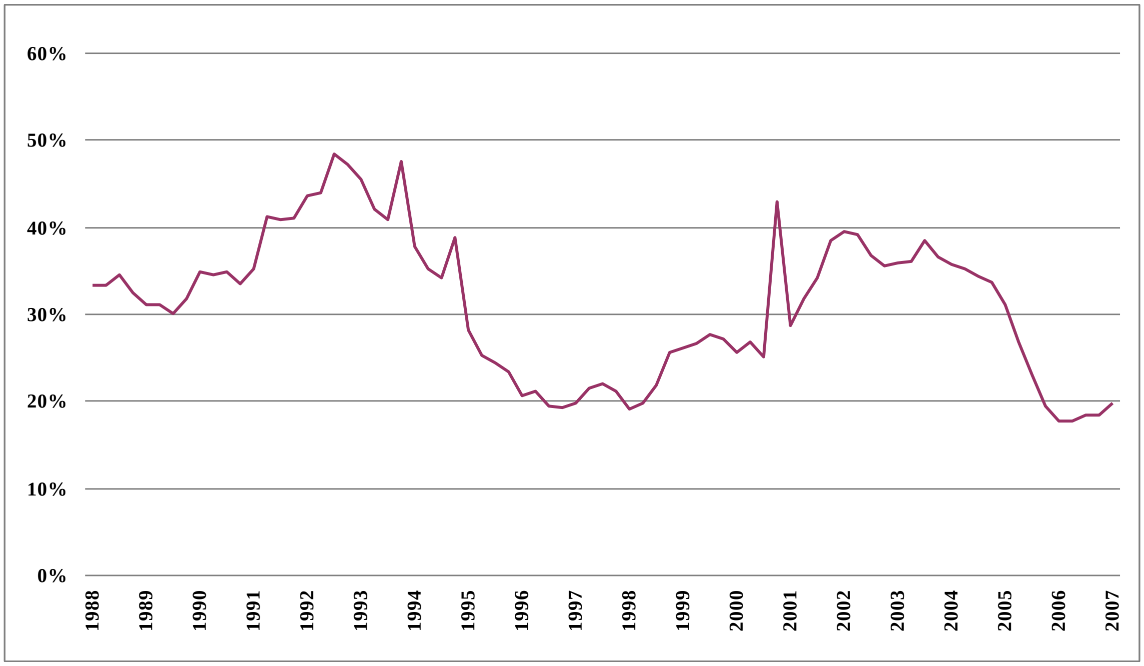
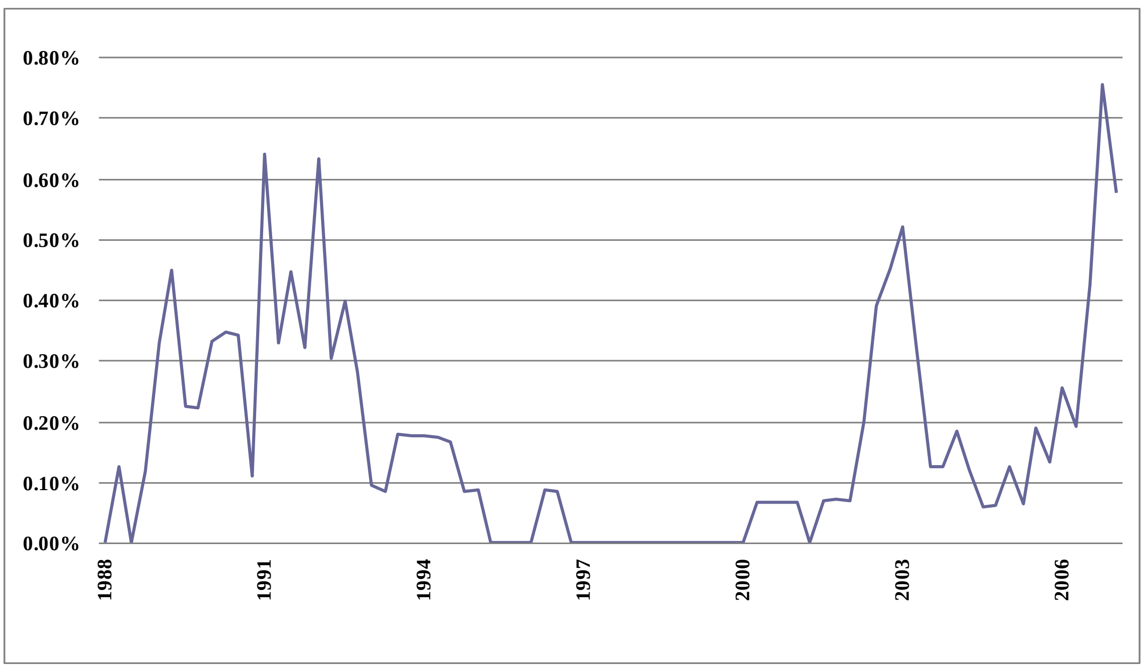
[2] We also examine the percentage of negative earnings growth that is captured by analysts' projections. We begin by collecting all companies that experienced negative long-term growth in each time period. Then we calculate the percentage of those companies that were project to have long-term negative EPS growth. An average of 0.55% of companies that reported negative EPS growth was captured by analysts' estimates. The average number of companies with negative earnings growth that were missed by analysts was 389 out of an average 391 companies that reported an actual decline in earnings. There is clear resistance by analysts to project negative growth.

Figure 6
Comparison of Companies with
Actual and Forecasted Negative EPS Growth
Panel A: Percent of Companies with Actual Negative EPS Growth



Panel B: Percent of Companies with Forecasted Negative EPS Growth



Results after the Global Analyst Research Settlements

The Global Analysts Research Settlements (GARS) is a set of agreements reached on April 23, 2003 between the SEC, NASD, NYSE and ten of the largest U.S. investment firms. GARS, as outlined by the Securities and Exchange Commission (2003), addresses conflicts of interest within firms that have investment banking and analysts operations. A conflict of interest can exist between the investment banking and analysis departments of the large investment firms. The investment firms involved in the settlement had engaged in practices involving the influence by investment bankers seeking favorable analysts' projections within their firm.

As part of the settlement decision several regulations were introduced to prevent investment bankers from pressuring analysts to provide favorable projections. These regulations include (1) firms must separate their investment banking and analysis departments with firewalls; (2) budget allocation to management in research departments must be independent of investment departments; (3) research analysts are prohibited from attending pitches with investment bankers during advertising and promotion of IPOs; and (4) historical analysts' ratings must be made available to investors.

One possible explanation for the upward bias in analysts' forecasts is the conflict of interest that exists between analysts and investment bankers. This presumably would have been removed by the GARS. For this reason, we compare long-term actual and forecasted growth rates for the periods prior to and following the GARS. The persistence of a bias following the GARS would indicate another explanation for the bias.

Table 8 shows descriptive statistics for long-term analysts' earnings growth rates estimates before and after the GARS. Actual and forecasted growth rate estimates are higher since the GARS and forecast errors have decreased. While forecast errors have decreased, they are still significantly positive.

It is evident that analysts' growth rate forecasts have remained around their historic levels of about 15%. Growth rates remain at levels that are unattainable given historic and expected GDP growth. Hence, there is no evidence that analyst behavior has changed since the GARS.

Table 8
Comparison of Long-Term Analysts' EPS Growth Rate Forecasts Before and After GARS

1988 – 2002(1)			
	Actual	Forecasted	FE
Mean	8.25%	14.40%	141.65%
Median	8.20%	13.88%	65.29%
SD	4.06%	1.36%	197.57%
n	61	61	61
2003 – 2007(2)			
Mean	12.33%	16.77%	66.94%
Median	11.28%	16.94%	51.60%
SD	5.49%	0.92%	61.70%
n	16	16	16

(1) Based on data beginning in 1984. (2) From April 2003 to and including the first quarter of 2007.

Possible Explanations for the Upward Bias

There are three suggested explanations for the upward bias. The first, as suggested by previous research, is based on career concerns or conflicts of interest. Analysts are rewarded for biased forecasts by their employers who want them to hype stocks so that the brokerage house can garner trading commissions and win underwriting deals. However, the scrutiny of the GARS should have removed this influence. We find little evidence of a change in forecast bias following the GARS. Therefore another explanation is likely.

A second explanation is based on selection bias. Analysts only follow stocks that they recommend and do not issue forecasts on those that they do not like. A third explanation is a cognitive or behavioral bias commonly called familiarity. Analysts become attached to the companies that they follow and lose objectivity.

The second and third explanations imply that analysts are systematically biased. If analysts systematically believe that they follow companies that are superior to others, they will be reluctant to issue negative earnings forecasts. Since they are only projecting the companies they follow, and not the market, the end result is a strong upward bias on earnings projections.

Summary

In this study we examine the accuracy of analysts' long-term and one-year ahead EPS growth rate forecasts over the last 20 years. Unlike previous studies, we examine long-term and one-year analysts' earnings growth rate forecasts and not quarterly EPS forecasts. Long-term EPS growth rate projections are consistently overly-optimistic. Analysts' growth rate forecasts of earnings are better for one-year than for three- to five-years, but are still over-optimistic. We discover that analysts only underestimate EPS growth rates for periods of earnings recoveries after economic recession. We find that analyst coverage does not have an impact on the overly-optimistic bias in projected EPS growth rates. We do discover that a contributing factor in the bias in analysts' long-term and one-year EPS growth rate estimates is the resistance of analysts to project negative earnings growth rates. We show that analysts' projections fail to capture the majority of negative earnings growth realized by corporations they follow. Finally, we examine the level of long-term analysts' EPS growth rate forecasts following the GARS. We find that analysts' forecasts have not significantly changed and continue to be overly-optimistic. Analysts' long-term EPS growth rate forecasts before and after the GARS, are about two times the level of historic GDP growth.

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Beats' Get the Brush-Off

Despite Rise In Topped Forecasts, Stocks Hold Firm

By ALEXANDRA SCAGGS

More companies are beating Wall Street profit expectations. But their shares are hardly budging.

So far, "beats" on first-quarter earnings have prompted share prices to rise by an average of 0.5%, or half the size of the usual jumps over the past three years.

The high number of beats and the muted reaction to them comes after companies and analysts lowered forecasts heading into the first quarter, worried about instability in Europe and the sustainability of the U.S. recovery. At the same time, the abundance of better-than-expected results is prompting investors to look beyond the beats.

Enlarge Image

Shares of Google fell even after the company topped earnings estimates.

That has left investors underwhelmed by overall results, a sentiment reflected in the broader market. Since the unofficial start to first-quarter earnings season in early April, the Standard & Poor's 500-stock index is up about 0.6%. That's a slowdown from the first quarter, when the index surged 12%.

The S&P 500 on Monday shed 11.59 points, or 0.84%, to 1366.94.

"The proof is in the pudding, in terms of the response this time around," said Eric Lascelles, chief economist with Royal Bank of Canada RY +0.76%. He added that with earnings beats so commonplace, "investors are certainly becoming more skeptical and discerning" on what is in the reports.

While companies have been massaging investor expectations for decades, the pace at which they are registering earnings beats is unusual.

Of the companies in the S&P 500 index that have announced results by the market's opening Monday morning, 79% have posted earnings-per-share results that beat analyst estimates, according to Thomson Reuters data. That's on par with the record rate set for earnings for the third quarter of 2009. In a typical quarter, from 1994 to present, 62% of companies surpassed expectations.

As of Monday's market opening, 101 companies had reported earnings beats for the first quarter of calendar-year 2012. Those companies saw their shares rise an average of 0.5% from two days before the report until two days after it, according to FactSet. FactSet uses that period of time so it can measure the effect of reports on companies that report results during market hours.

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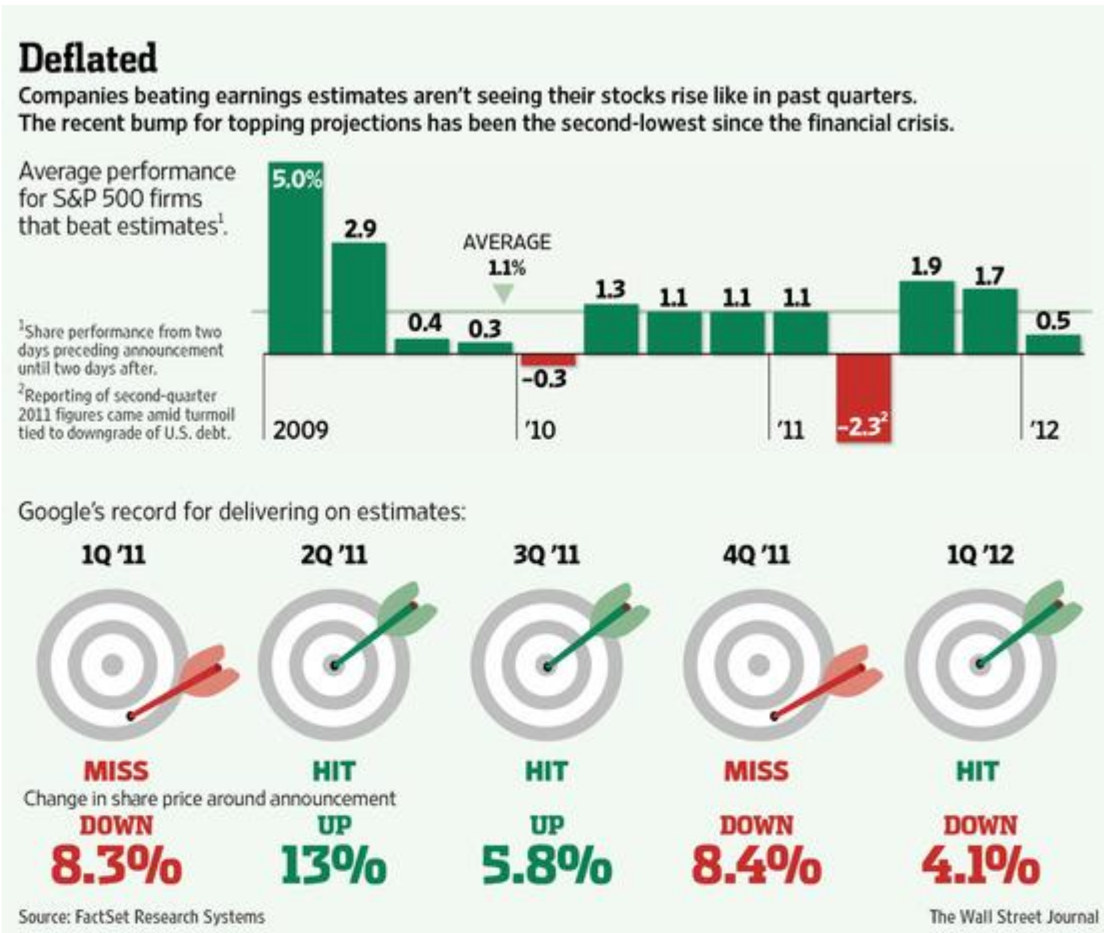

To be sure, earnings season is still young. Through Friday only a little more than 20% of the S&P 500 has reported. These numbers could change over the next few weeks as a slew of reports are expected to be released.These numbers could change over the next few weeks as a slew of reports are expected to be released.

Michelle Clayman, chief investment officer at New Amsterdam Partners, which has $2.7 billion under management, said her firm looks at companies' guidance issued two months before quarter-end, and weighs that against analyst estimates and updated projections from the company.

"Over the last couple of years, people have realized you can't just look at the earnings beat," Ms. Clayman said.

Investors are watching to see how shares of Apple Inc. AAPL -1.33%fare after the company releases results after the close of markets on Tuesday.

The company has missed estimates only once since 2007, as far back as FactSet has tracked that data. Apple posted an earnings blowout for the fourth quarter of 2011, sending its market capitalization briefly above $600 billion.leading a broader stock market rally in the first three months of the year. Since then, though, shares have slid.

This year's relative weakness was led by a handful of high-profile firms. Google, GOOG +0.44%Wells Fargo, WFC +0.81%J.P. Morgan JPM +0.30%and Intel INTC +0.42%are among the companies that posted profits above Street expectations, only to see their stock prices drop.

Until this month, Google hadn't seen its shares fall after an earnings beat for over a year. When the company topped earnings estimates in its January 2011 report, it also announced it would move Eric Schmidt from his role as chief executive. In the four days surrounding that report, the company saw shares fall 2.4%. This year, the company beat estimates solidly but the stock still fell more than 4%.

Companies in the S&P 500-stock index were cutting guidance in the first quarter at nearly twice the rate that they were increasing it, for the first time since the first quarter of 2009, according to Thomson Reuters data.

"There's been a tendency for everyone to be very conservative over the past couple of years," said Gregory Harrison, an analyst with Thomson Reuters.

But, as RBC's Mr. Lascelles warns, investors may not pay as much attention to whether a company beats estimates if the projections are seen as low-ball numbers.

"If you mislead too many times, you lose your credibility," he said.

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http://www.wsj.com/articles/dont-fight-the-fed-its-lower-for-longer-for-bond-yields-1447583404

MARKETS | STOCKS | ABREAST OF THE MARKET

Don’t Fight the Fed: It’s Lower for Longer for Bond Yields

Few analysts and traders expect rates to keep rising for long

The central bank’s Federal Open Market Committee is expected to raise interest rates at its Dec. 15-16 meeting.
PHOTO: ANDREW HARRER/BLOOMBERG NEWS

By MIN ZENG

Updated Nov. 15, 2015 9:41 p.m. ET

Bond investors aren’t fighting the Fed, but they aren’t panicking about higher interest rates, either.

Futures-market bets on rising U.S. interest rates have reached a six-month high, reflecting expectations that the Federal Reserve will raise short-term rates next month for the first time since 2006. The yield on the benchmark 10-year Treasury note has risen, too, trading Friday at 2.280%, near the highest level since July.

Yet, few analysts and traders expect rates to keep rising for long. Many investors say the yield on the 10-year note is likely to trade between 2.25% and 2.5% for the remainder of this year, reflecting uneven economic growth, soft inflation and strong demand for high-quality debt that has consistently foiled expectations for rising rates since the financial crisis.

“It is very hard for long-term Treasury yields to rise substantially in this environment,” said John Bellows, portfolio manager at Western Asset Management Co., which had $446.1 billion in assets under management at the end of September. “It could take a long time for long-term Treasury yields to normalize.”

Even so, signs are abundant that investors are preparing for higher rates.

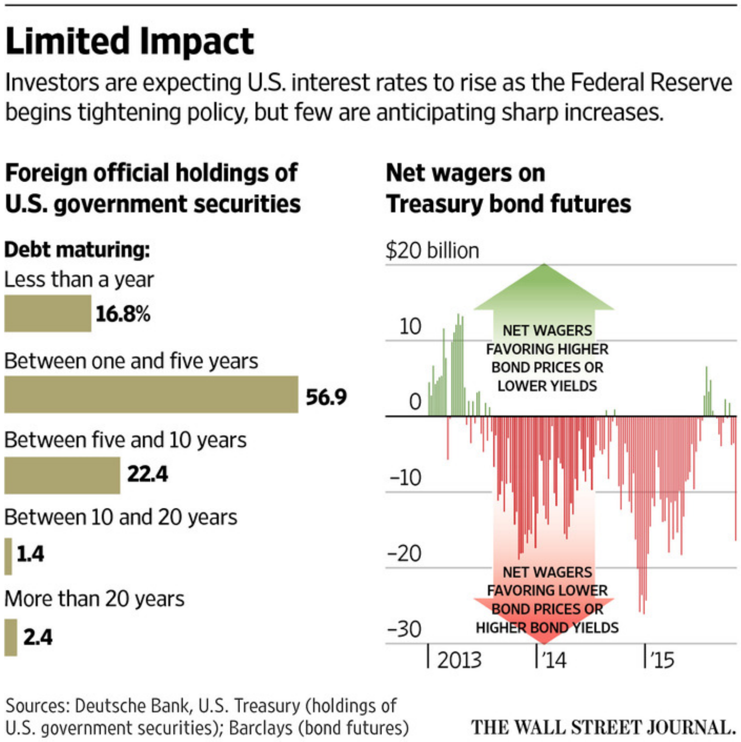
Fed funds futures, used by investors and traders to place bets on central-bank policy, have risen to reflect a 70% likelihood of a rate increase in December, according to data from CME Group. That is up from 38% on Oct. 28, when the Fed said a rate increase at the December meeting remains on the table.

Investors including hedge funds and money managers have accumulated $16.4 billion in net short positions on 10-year Treasury note futures for the week that ended Nov. 3, the highest level since May, according to data from Cheng Chen, interest-rate strategist at TD Securities. A short position is a wager on lower bond prices and higher yields.

U.S. bond funds and exchange-traded funds targeting U.S. government bonds posted $2.126 billion net cash outflow for the week ended Nov. 11, according to data from fund tracker Lipper. It was the biggest weekly outflow since May and the fifth consecutive week of net redemption, a sign that fundholders are selling bonds in anticipation that their prices will fall as rates increase.

At the same time, robust demand will set a cap on rates. Sales of 10-year and 30-year Treasury debt last week attracted strong demand from home and abroad. Indirect bidding, a gauge of foreign demand, was 60.5% for the 10-year note auction, the fourth largest on record for a 10-year-note sale.

Sales by foreign central banks prevented bond yields from falling significantly in August and September when global stock and commodity prices swooned.



Foreign private investors have been filling the void. Such investors bought a net $208.5 billion of Treasury notes and bonds in the 12 months through August, the fastest pace since May 2014, according to Deutsche Bank. The purchases reflect in part a global stock selloff in August, which prompted many investors to buy government debt.

Torsten Slok, chief international economist at Deutsche Bank Securities, said the nature of overseas central banks’ Treasury holdings helped mitigate the impact of their selling on U.S. rates.

Foreign central banks held 56.9% of their overall investments in U.S. government debt in securities maturing in one to five years. Investments in Treasury debt maturing in a decade or more accounted for only 3.8% of the total, which cushioned the impact on long-term bond yields, Mr. Slok said.

Many investors say low inflation driven by weak commodities prices and a stronger dollar supports the case for the Fed to raise rates slowly, minimizing the impact on markets.

“With the Fed signaling a very shallow tightening campaign and with inflation where it is, why should the 10-year yield rise dramatically?” said Tom Girard, head of Fixed Income Investors, an investment division of NYL Investors, which has $137 billion of assets under management.

Mr. Girard said he has bought long-term Treasury bonds recently as yields rose. He said the 10-year yield could fall to 2% or lower by the end of the year should riskier markets such as stocks suffer a large pullback.

The S&P 500 Index fell 3.6% last week to 2023.04, snapping a six-week winning streak. U.S. crude-oil futures tumbled 8% for the week, to $40.74 a barrel, and copper prices dropped to the lowest level since July 2009.

To be sure, not everyone is certain the Fed’s tightening campaign will be as measured as the market expects.

“The Fed’s gradual and shallow path has been on people’s radar screen for a while, so the risk for the bond market is that the Fed may tighten more aggressively than people think,” said David Donabedian, chief investment officer at Atlantic Trust Private Wealth Management, which has $26.1 billion assets under management.

In part, limited rate-increase expectations reflect gains in the dollar against other currencies, which has driven up returns on U.S. assets for overseas investors.

U.S. government debt overall has posted a total return—including bond-price gains and interest payments—of 0.5% this year through Thursday, according to data from Barclays PLC. The return amounts to 13% in euro terms, 3.1% in British pounds and 3% in yen.

Andrew Milligan, head of global strategy at Standard Life Investments, which has $393.1 billion of assets under management, said a stronger dollar “is doing part of the Fed’s work” by tightening financial conditions in the U.S.

Write to Min Zeng at min.zeng@wsj.com

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http://www.wsj.com/articles/u-s-bond-market-takes-flight-an-upbeat-sign-for-economy-1446402762

MARKETS | STOCKS | ABREAST OF THE MARKET

Corporate Bond Market Booms, a Bright Sign for U.S. Economy

Corporate-debt issuance heads for another record year as sales rebound after summer lull

Microsoft Corp. issued $13 billion in bonds last week, and opened this store on New York's Fifth Avenue.
PHOTO: STEPHANIE KEITH/BLOOMBERG NEWS

By MIKE CHERNEY
Updated Nov. 1, 2015 3:57 p.m. ET

The bond market is booming again, a sign of investors' faith in the resilience of the U.S. economy.

U.S. bond sales by companies with good credit ratings hit $103 billion in October, a record for the month, according to deal tracker Dealogic. Corporate-bond sales in the U.S. are on track for their fourth straight annual record, according to data from the Securities Industry and Financial Markets Association.

Many analysts say they expect bond sales to continue at a vigorous pace through the end of the year, reflecting steady economic growth, pent-up investor demand following a late-summer slowdown in bond issuance, and efforts by corporate treasurers to lock in low interest rates before a possible Federal Reserve interest-rate increase in December.

Microsoft Corp. sold $13 billion in new bonds on Thursday, a day after the Fed said it might raise rates this year for the first time since 2006. Earlier in the week, insurer ACE Ltd. sold $5.3 billion and Nike Inc. sold $1 billion, its first debt sale in more than two years. Oil-field services giant Halliburton Co. is planning a large bond sale that could hit the market as early as this week.

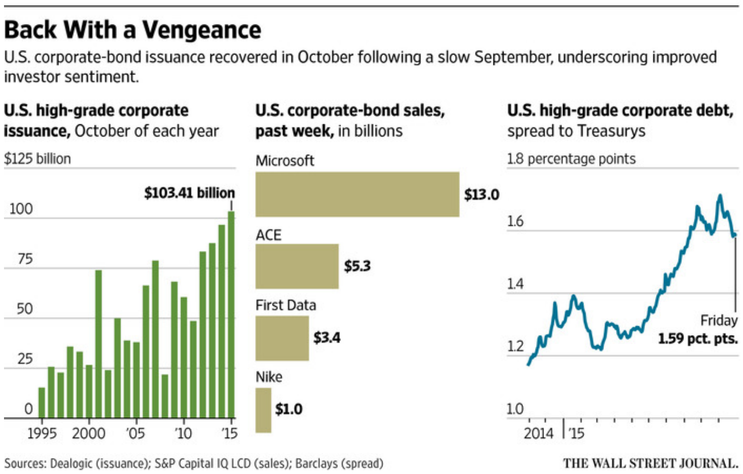
The gap in yields between highly rated corporate bonds and benchmark Treasurys had fallen from 1.71 percentage points at the beginning of October to 1.59 percentage points as of Friday, according to Barclays data. A smaller spread means buyers are willing to accept lower interest payments relative to Treasurys to own corporate bonds, and suggests investors perceive that default and other risks are falling. High-grade corporate bonds yielded 3.22% as of Friday, according to the S&P U.S. Investment Grade Corporate Bond Index.

Overall, high-grade U.S. corporate bonds have returned 0.32% this year, a figure that includes price changes and interest payments, according to Barclays.

Even some riskier companies are finding strong demand. Payment-technology company First Data Corp. , which carries ratings in the “junk” category, said on Friday that it sold $3.4 billion in bonds with a 7% interest rate, after preparing to sell just $750 million.

The bond market’s bounceback is a positive sign for a U.S. economy that was perceived to have lost some momentum in the second half of 2015. U.S. economic growth cooled in the third quarter, and job gains have slowed, but the economy appears to be plodding along despite a sharp slowdown in emerging markets.

Corporate bonds are a “better leading indicator for the economy than most of the other market metrics out there,” said Gene Tannuzzo, who helps oversee the $2.3 billion Columbia Strategic Income Fund. “If we see a nice rebound, that will tell you that the economy is in an OK spot.”



Risk appetite has recovered from a late-summer swoon that swept markets and sharply reduced bond sales in September. U.S. stock indexes are again up this year after deep declines late this summer.

Investment-grade companies sold $105 billion in September, down roughly 23% from a year earlier and the lowest figure for September since 2011, according to Dealogic. September is typically a much stronger month for debt issuance than October, as investors and bankers return from summer vacations.

The slowdown in debt deals highlighted growing worries that corporate financial health has already peaked and that the credit cycle—the ease with which companies can borrow money—could be in its latter stages, presaging an economic downturn.

"When nothing is happening in major parts of the market, that's when you worry," said Mark Bamford, global head of fixed income syndicate at Barclays.

For the bond market, September was "unique in that we hadn't had a period where access was questioned," said Andrew Karp, co-head of Americas investment-grade capital markets at Bank of America Merrill Lynch.

Johnson & Johnson, one of the few companies that maintain a pristine triple-A credit rating, plans to finance a $10 billion share-repurchase program with new debt.

Other companies are also laying the groundwork for debt issuance.

"We will be adding debt to the balance sheet," Tony Tripeny, chief financial officer at glassmaker Corning Inc., said on a conference call Tuesday, according to a transcript from FactSet. He didn't give an exact time frame but said it would be "over the next few years."

There are still some signs that the credit cycle may be peaking. Defaults on junk-rated companies are expected to increase, and more companies are getting downgraded by credit-rating firms. Corporate executives are pursuing more acquisitions amid difficulty finding revenue growth, which could mean bigger debt loads for some companies down the road.

Write to Mike Cherney at mike.cherney@wsj.com

THE WALL STREET JOURNAL.

Tuesday, October 9, 2012
Page B1

Companies Feast on Cheap Money

Market for 30-Year Bonds, Priced at Stark Lows, Brings Out GE, UPS and Other Once-Shy Issuers

By VIPAL MONGA

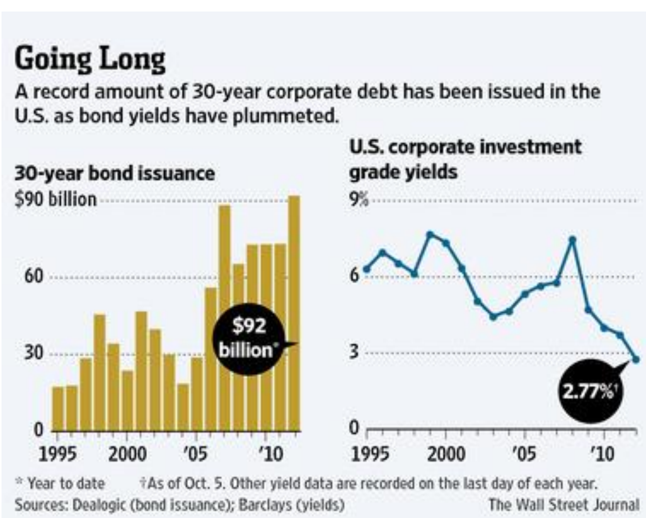
Companies are taking advantage of investors' appetite for yield—and fear of riskier bets—by issuing more long-term bonds, aiming to reduce their refinancing needs in coming years, when interest rates are likely to be higher.

Investment-grade companies have sold more 30-year bonds in the U.S. so far in 2012 than in any full year since 1995, according to data provider Dealogic.

The $91.9 billion of 30-year bonds sold in 166 offerings this year, is about 26% more than the $73.2 billion sold in 145 deals during all of 2011.

Issuers are being drawn to the longer maturities by low interest rates, the result of the Federal Reserve's loose monetary policy and the global economy's continuing weakness.

For investors, the longer maturities provide better returns than shorter-term debt without the default worries associated with the high-yielding debt of some of Europe's troubled economies.



However, more long-term debt issuance now could limit the supply of bonds in the future, meaning investors will need to find other places to put their cash.

For corporations, there is a sense that now is as good a time as any to raise debt, particularly as the near-term economic outlook dims.

That view helped make September the second busiest month for 30-year issuance this year, with 24 companies raising $12.3 billion.

"No treasurer or CFO wants to be the one treasurer or CFO who didn't get cheap long-term money when it was available," says Mark Gray, an analyst with Moody's Investors Service.

Among those tapping the market was United Parcel Service Inc. UPS +0.09%On Sept. 24, UPS refinanced $1.75 billion of five-year bonds coming due in January 2013 through a three-part bond deal, including $375 million of 30-year bonds that paid 3.625% annually.

The timing of the deal "was a combination of the current credit market and looking at avoiding fourth-quarter uncertainty," said UPS spokeswoman Susan Rosenberg.

Ms. Rosenberg said that there was seven times the demand for the bonds than the amount available.

She added that the company wanted to raise the funds ahead of any disruption to the economy caused by government negotiations over tax and spending cuts.

The corporate-debt market is enticing many companies that haven't issued long-dated bonds for years. General Electric Co. GE +0.02%jumped in on Oct. 1, selling $7 billion of bonds, including $2 billion of 30-year bonds.

Although GE's finance arm, GE Capital, is a frequent bond issuer, the recent offering was the first by the parent company in five years.

The company plans to use part of the proceeds to refinance $5 billion of debt coming due in February 2013.

A GE spokesman said the issuance was consistent with its strategy of being "opportunistic in accessing markets and prefunding maturities, particularly with interest rates at historically low levels."

On Sept. 28, Comcast Corp. CMCSA -1.13%sold $1 billion of 30-year bonds for its NBCUniversal subsidiary, with a 4.45% rate, compared with rates ranging between 6.5% and 7% for 30-year bonds Comcast sold in past years.

That difference represents an annual interest-payment savings of roughly $20 million on $1 billion of debt.

Investor demand for corporate bonds has narrowed their spread with benchmark 30-year U.S. Treasurys.

The spread measures how risky investors consider the bonds relative to U.S. Treasurys, which are considered among the safest investments.

On Thursday, the spread between 30-year Treasurys, which yielded 2.89%, and 30-year corporate debt was 1.83 percentage points, the lowest since Aug. 10, 2011, according to S&P Capital IQ's Leveraged Commentary & Data unit.

The tighter spread suggests investors see less risk in corporate bonds.

The low yields present a problem to investors, because they are buying bonds at historically high prices that will fall if the Fed begins raising interest rates. Bond prices move in the opposite direction of interest rates.

However, bond-fund managers have little choice but to buy the debt, if they can, especially when highly regarded issuers like GE re-enter the market.

Investment-grade companies have been very stable lately. Moody's Mr. Gray said that only four companies have suffered ratings downgrades since July, "which speaks to the fact that things are pretty stable out there."

He added that the long-term issuance is a positive for companies.

"If a company can lock in cheap long-term money for a refinancing, it takes maturity risk out of the equation for a long time. Over the near term it gives a company breathing room," Mr. Gray said.

The demand is making it easy for companies to come to market, particularly those with the higher ratings. "Whether you're mid-BBB or mid-A, if you're a solid, large market cap company in a noncyclical industry, you've got very, very good access," said one investment-grade bond banker.

Write to Vipal Monga at vipal.monga@wsj.com

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HEARD ON THE STREET | April 26, 2010

Wall Street's Missed Expectations

By LIAM DENNING

Wall Street's sell-side analysts are a famously Panglossian tribe. But it turns out that they are actually too pessimistic when it comes to predicting company earnings, particularly in the wake of recession.

With 172 of the S&P 500's members having so far reported quarterly earnings, 143 have beaten their consensus forecast, according to data collated by Thomson Reuters. On average, their numbers came in 21% above the Street's collective wisdom.

Less than 40% of the index's members have reported, so the current score of 83% having beaten forecasts—easily the highest for any quarter since at least 1999—may not stand. But having a high percentage of companies beat the Street isn't unusual. Thomson's data show that, on average, 64% of companies have done so in any given quarter since the start of 1999, compared with 18% that miss. The average earnings "surprise" is 2%, although these data swing erratically.

This is less surprising than it appears. Corporate management, for better or worse, go to great lengths to guide analysts toward the right numbers. After all, the last thing you want to do is deliver a nasty surprise. Just ask Ingersoll Rand, which missed the consensus forecast by 11% on Friday and saw its shares plunge 8.5% at one point.

Analysts are also prone to the same greed and fear that fuel the financial markets' gyrations. The most optimistic quarter since 1999, in which only 52% of S&P 500 companies beat the consensus forecast, was the last three months of 2000, just as the tech bubble was turning to bust.

With that in mind, it is little wonder that pessimism has really taken hold recently, with the percentage of companies beating earnings forecasts well above average since the second quarter of 2009. But there could be more to this than mere psychology. So far this quarter, for example, 69% of S&P 500 companies that have reported have beaten revenue estimates, according to Thomson. The implication is that final demand is stronger than anticipated.

Tobias Levkovich of Citigroup points to the importance of labor. Corporate America cut costs rapidly as recession took hold. That helped offset some of the damage inflicted on earnings by falling sales. But the ranks of the unemployed weigh heavily on expectations for a recovery in sales. That leaves scope for surprisingly good revenue numbers, relative to estimates, which in turn provides great operating leverage at the profit line, given earlier cost cutting.

So there is reason to suspect analysts' expectations will continue to be trumped by better results as the current reporting season progresses. But at some point, that unemployment rate has to fall if optimism is to be restored on a sustainable basis.

—Liam Denning

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http://www.wsj.com/articles/u-s-productivity-dropped-at-0-5-pace-in-the-second-quarter-1470746092

ECONOMY | ECONOMIC DATA

Productivity Slump Threatens Economy’s Long-Term Growth

Measure’s longest losing streak since 1979 could keep Fed from raising rates to past levels

An employee inspecting an Action Craft Boats vessel at the company's manufacturing facility in Cape Coral, Fla., on Aug. 2. Nonfarm business productivity, measured as the output of goods and services produced by American workers per hour worked, decreased at a 0.5% seasonally adjusted annual rate in the second quarter as hours increased faster than output, the Labor Department said Tuesday. *PHOTO: MARK ELIAS/BLOOMBERG NEWS*

By BEN LEUBSDORF

Updated Aug. 9, 2016 2:33 p.m. ET

The longest slide in worker productivity since the late 1970s is haunting the U.S. economy’s long-term prospects, a force that could prompt Federal Reserve officials to keep interest rates low for years to come.

Nonfarm business productivity—the goods and services produced each hour by American workers—decreased at a 0.5% seasonally adjusted annual rate in the second quarter as hours worked increased faster than output, the Labor Department said Tuesday.

It was the third consecutive quarter of falling productivity, the longest streak since 1979. Productivity in the second quarter was down 0.4% from a year earlier, the first annual decline in three years. That was a further step down from already tepid average annual productivity growth of 1.3% in 2007 through 2015, itself just half the pace seen in 2000 through 2007, and the trend shows little sign of reversing.

"In the short term, it's hard to be anything other than pessimistic, just because this has been going on for so long now," said Paul Ashworth, chief U.S. economist at consultancy Capital Economics.

Productivity is a key ingredient in determining future growth in wages, prices and overall economic output. It has slowed dramatically since the information technology-fueled boom of the late 1990s, when strong productivity gains translated into robust growth for household incomes and the overall economy.

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The slowdown in recent quarters has likely been reinforced by weak business investment in new equipment, software and facilities that could help boost worker efficiency.

Over time, persistently weak productivity would weigh on American living standards by restraining the economy's ability to grow quickly and generate higher incomes without stoking too much inflation. Already, some economists say slow productivity may be restraining wage growth.

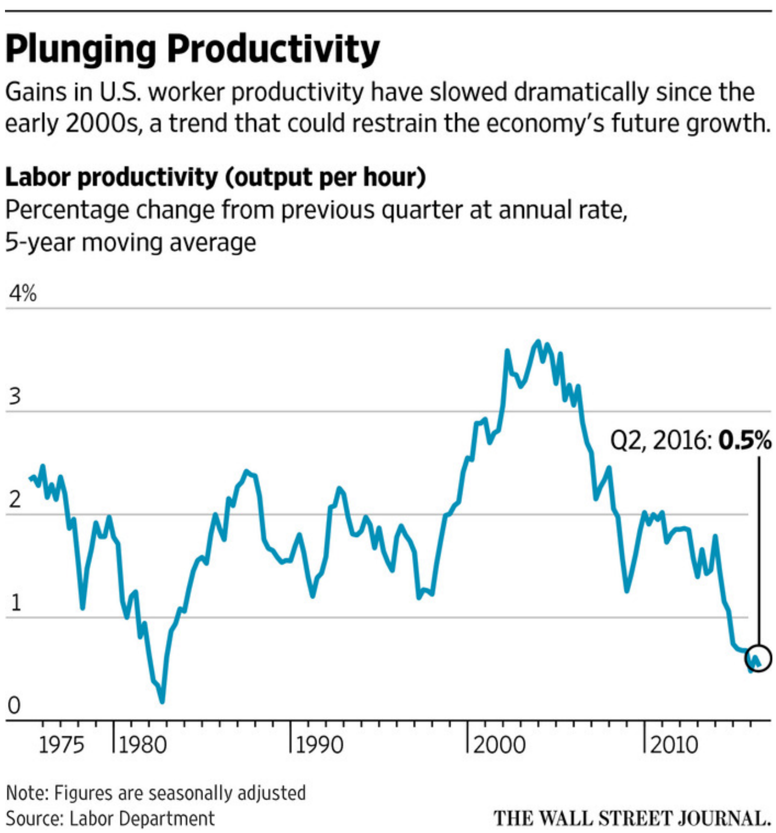
Stagnant productivity and rising labor costs also could squeeze corporate profits, which have been under pressure from the energy sector's downturn and other forces.

To be sure, economic growth and wages could pick up in the near term despite slumping prospects for productivity. Forecasting firm Macroeconomic Advisers on Tuesday said it expected gross domestic product, the broadest measure of goods and services produced across the economy, to expand at a 3% annual rate in the third quarter. An Atlanta Fed gauge predicted 3.7% growth. The Commerce Department last month estimated that GDP expanded at a modest 1.2% pace in the second quarter.

There are signs of acceleration in wages and income as the labor market has tightened in recent years. Average hourly earnings of private-sector workers rose 2.6% in July from a year earlier, matching the fastest annual growth since mid-2009, the Labor Department said last week. Unit labor costs at nonfarm businesses rose at a 2% annual rate in the second quarter, up from a 0.2% decline in the first three months of 2016, according to Tuesday's report.

Fed officials will decide whether to raise short-term interest rates in the coming months based on the health of the labor market, the outlook for inflation and their assessment of risks to growth at home and overseas. A move could come as soon as mid-September; the Fed in late July said that "near-term risks to the economic outlook have diminished."

But in the long run, slow productivity growth and other forces could keep interest rates depressed compared with levels seen in the past.



"It's a signal that the economy is not going very fast and interest rates should stay low," said IHS Global Insight economist Patrick Newport. "If we see no growth, which is what we've seen over the last year, it would matter a lot."

Officials at the U.S. central bank already have lowered their expectations for future growth and interest rates. Most policy makers in mid-2012 saw the economy's longer-run growth rate in the 2.3%-to-2.5% range, and their median projection for the long-run level of their benchmark federal-funds rate was 4.25%. Four years later, their median projections were for 2% growth and a fed-funds rate of 3% in the long run.

The economy's potential future growth will be slower than previously expected unless productivity recovers, and their economic projections suggest Fed officials "see current policy as less accommodative, the labor market as less tight and inflationary pressures as more limited," former Fed Chairman Ben Bernanke said Monday on his blog.

The policy implications, Mr. Bernanke said, "are generally dovish, helping to explain the downward shifts in recent years in the Fed's anticipated trajectory of rates."

Sluggish productivity growth isn't limited to the U.S., and a similar pattern has played out across other advanced economies. But its underlying cause or causes remain a bit of a mystery.

Some economists have seen the slowdown as reflecting a secular trend of more modest efficiency gains from new technologies compared with past advances. Others have placed the blame on persistent aftereffects of the financial crisis and 2007-09 recession, and predict it will rebound in coming years. And some have argued productivity is being mismeasured and could be higher than commonly thought.

Fed Chairwoman Janet Yellen in June described the outlook for productivity growth as a "key uncertainty for the U.S. economy" and a "very difficult question" that has divided the economics profession.

"Some are relatively optimistic, pointing to the continuing pace of innovations that promise revolutionary technologies, from genetically tailored medical therapies to self-driving cars," she said. "Others believe that the low-hanging fruit of innovation largely has been picked and that there is simply less scope for further gains."

Ms. Yellen described herself as "cautiously optimistic" but said it "would be helpful to adopt public policies designed to boost productivity," such as promoting investment.

Business investment has been a notable sore spot for the economy in recent months. A closely watched measure of business spending, fixed nonresidential investment, has declined for the past three quarters, according to Commerce Department data. A proxy for spending on new equipment—new orders for nondefense capital goods excluding aircraft—has declined on a year-over-year basis almost continuously for the past year and a half.

If wages continue to climb, companies may seek to contain labor costs by ramping up their investments in new equipment to boost efficiency, aided by low interest rates, or by raising prices.

“We remain extremely focused on managing our labor expense through continued efforts and investments to improve our labor productivity, as well as through targeted price increases,” sandwich-shop chain Potbelly Corp. Chief Financial Officer Michael Coyne told analysts last week.

Write to Ben Leubsdorf at ben.leubsdorf@wsj.com

BUSINESS

Electric Utilities Get No Jolt From Gadgets, Improving Economy

Electricity Sales Anemic for Seventh Year in a Row

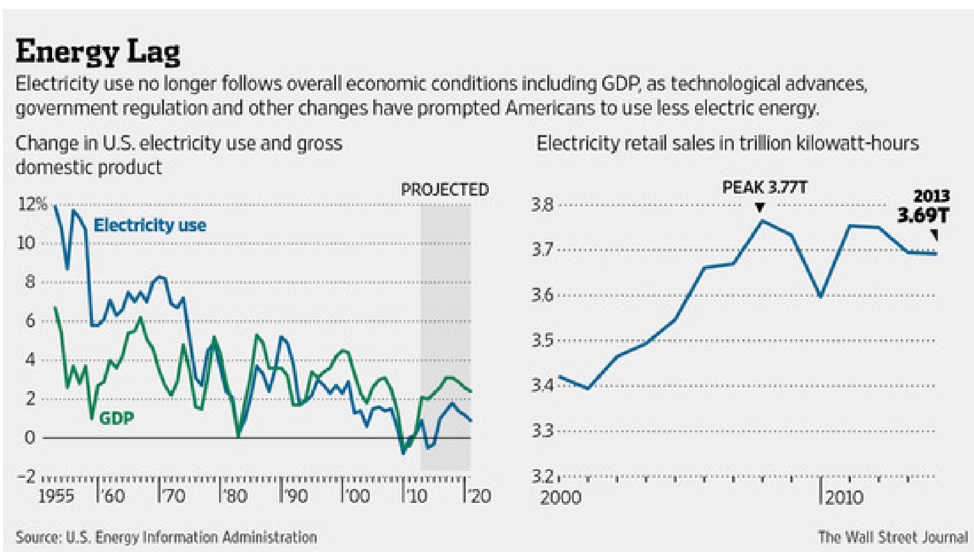
By REBECCA SMITH

July 28, 2014 8:25 p.m. ET

When customers of American Electric Power Co. started dialing back on power consumption in early 2009, company executives figured consumers and businesses were just pinching pennies because of the recession.

Five years and an economic recovery later, electricity sales at the Columbus, Ohio-based power company still haven't rebounded to the peak reached in 2008. As a result, executives have had to abandon their century-old assumption that the use of electricity tracks overall economic conditions.

"It's a new world for us," says Chief Executive Nick Akins.



Utility executives across the country are reaching the same conclusion. Even though Americans are plugging in more gadgets than ever and the unemployment rate had dropped at one point to a level last reported in 2008, electricity sales are looking anemic for the seventh year in a row.

Sluggish electricity demand reflects broad changes in the overall economy, the effects of government regulation and technological changes that have made it easier for Americans to trim their power consumption. But the confluence of these trends presents utilities with an almost unprecedented challenge: how to cope with rising costs when sales of their main product have stopped growing.

Sales volume matters because the power business ranks as the nation's most capital-intensive industry. When utilities are flush with cash, they buy lots of expensive equipment and raise dividends for investors. When they're selling less of their product, they look for ways to cut or defer spending. Regulators typically allow utilities to charge rates that are high enough to cover their basic expenses, but that doesn't guarantee them strong profits.

Utilities typically need to expand sales volume by 1% or more a year just to maintain their expensive, sprawling networks of power plants, transmission lines and substations, says Steven Piper, an energy analyst for SNL Energy, a research company.

"That's where the existential crisis is coming from," he adds.

Historically, economic expansion meant expanding electricity sales. In fact, during the 1950s and 1960s, energy demand outpaced the growth in the gross domestic product. Then, from 1975 to 1995, GDP and electricity sales grew in tandem.

But the connection now appears to be broken. The U.S. Energy Information Administration said recently that it no longer foresees any sustained period in which electricity sales will keep pace with GDP growth.

Some of the trends affecting the electric industry have been building for decades. Among them: Americans have migrated to states with milder weather. And although it may seem counterintuitive, it takes less energy to keep houses cool in warm climates than to warm them in cold climates. According to federal data, less than half of all Americans now live in colder states, down from almost 60% in 1960.

Demand from industry has also changed as manufacturing plants have moved overseas or even within the U.S. Edison International, for example, has lost most of its aerospace and defense customers in Southern California. Ted Craver, chief executive, says industrial customers consumed half of Southern California Edison's electricity in the 1980s but require only 10% today.

Increasingly, both residential and business customers are making their own power rather than buying it from utilities. In Arizona, for example, solar companies are siphoning off utility customers.

Sherry Pfister, a retiree who once worked at the Palo Verde nuclear power plant 45 miles west of Phoenix, says she didn't hesitate to lease solar panels for her home in Waddell, Ariz., and says the panels have cut her utility bill by a third.

"Why isn't everybody doing it?" she wonders.

Sluggish electricity demand reflects broad changes in the overall economy, the effects of government

Her supplier, Sunnova Inc., wooed her with solar panels that cost 70 cents a watt, a fifth of the cost in 2008. Solar energy "is the next shale gas," says Sunnova Chief Executive John Berger, predicting it will upend the utility business.

Energy efficiency blunts the impact of population and economic growth, because upgrades in lighting, appliances and heavy equipment reduce energy needs. In 2005, the average refrigerator consumed 840 kilowatt-hours of electricity a year, according to the U.S. Energy Information regulation and technological changes. *Bloomberg News*

Administration. A typical 2010 replacement needed only 453 kilowatt-hours of electricity.

As their sales have lagged behind, utilities have raised prices, and that, too, is discouraging use. Most U.S. households pay 12 cents a kilowatt-hour today, up one-third from a decade ago, according to EIA data. A 2012 study from the California Public Utilities Commission found that customers have had a "strong response to price changes."

To fight rising costs, Washington, D.C., has hired a consultant to help cut its electricity use 20% by 2015—and to save $10 million a year. FirstFuel Software sniffs out waste at the district's 400 buildings with the help of smart meters and special software.

"We're not going to win the grand innovation prize," says Sam Brooks, head of energy and sustainability for the District of Columbia, but he adds that just turning off the lights and shutting off furnaces when buildings are unoccupied turns out to be an easy way to save money.

Electricity demand is likely to be even more subdued in coming years. The U.S. Environmental Protection Agency wants to slash greenhouse-gas emissions from power plants, in part by trimming electricity use. Its goal is to offset any increases in energy use because of population growth by promoting energy-efficiency measures.

Utilities aren't waiting for better times. They're increasing spending on big solar projects and energy-efficiency programs for which they earn income as investors or managers. And many executives are searching for new services to offer.

"The industry has been pretty resilient the past hundred years," says Bill Johnson, chief executive of the Tennessee Valley Authority, which furnishes electricity to nine million people in seven states. "I wouldn't count us out quite yet."

Electricity demand also isn't bleak everywhere. FirstEnergy Corp. , which is based in Akron, Ohio, says demand is increasing from such industries as steel, auto, oil refining and chemical production.

But that hasn't been enough to make up for losses elsewhere. Anthony Alexander, the company's chief executive, forecasts that it will take until 2016 at the earliest for its electricity sales to recover to prerecession levels.

"It's pretty much a lost decade," he says.

Write to Rebecca Smith at rebecca.smith@wsj.com

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http://www.wsj.com/articles/as-conservation-cuts-electricity-use-utilities-turn-to-fees-1445297729

BUSINESS

As Conservation Cuts Electricity Use, Utilities Turn to Fees

Double-digit percentage increases for distribution, maintenance anger power consumers

Electricity providers in 22 states have proposed increases in the monthly fees charged consumers for maintenance and other services, in many cases by double-digit percentages, as power consumption per square foot of residential space declines. *PHOTO: MICHAEL NAGLE/BLOOMBERG NEWS*

By REBECCA SMITH
October 20, 2015

Electric utilities across the country are trying to change the way they charge customers, shifting more of their fixed costs to monthly fees, raising the hackles of consumer watchdogs and conservation advocates.

Traditionally, charges for generating, transporting and maintaining the grid have been wrapped together into a monthly cost based on the amount of electricity consumers use each month. Some utilities also charge a basic service fee of $5 or so a month to cover the costs of reading meters and sending out bills.

Now, many utility companies are seeking to increase their monthly fees by double-digit percentages, raising them to $25 or more a month regardless of the amount of power consumers use. The utilities argue that the fees should cover a bigger proportion of the fixed costs of the electric grid, including maintenance and repairs.

"The [electricity] grid is becoming a more complex machine, and there needs to be an equitable sharing of its costs," said Lisa Wood, a vice president of the Edison Foundation, the nonprofit arm of the utility industry's trade group Electric Electric Institute. A typical American household pays $110 a month for electricity, she said; more than half goes to cover fixed costs.

Utilities in at least 24 states have requested higher fees, according to the Environmental Law & Policy Center in Chicago, which opposes some of these increases. If regulators allow the fee increases, "the result is that low-use customers pay more than in the past, and high-use customers pay less," said Bradley Klein, a senior attorney for the group.

RELATED

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- Utilities' Profit Recipe: Spend More (http://www.wsj.com/articles/utilities-profit-recipe-spend-more-1429567463) (April 20, 2015)

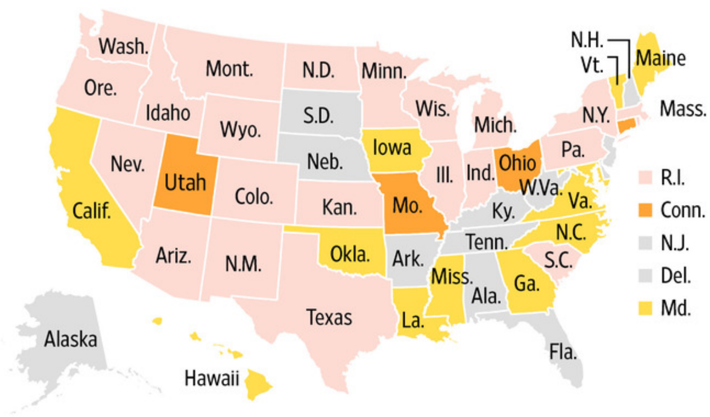
The problem for utilities is that many consumers are using less power these days, in large part because appliances and equipment are getting more energy efficient. Even though U.S. homes are getting bigger, energy consumption per square foot is going down, according to the federal Energy Information Administration. The rise of rooftop solar power in some parts of the country also is chipping away at power sales.

In recent fights in Connecticut, Pennsylvania, Iowa and other states, regulators have said they are sympathetic to the plight of utilities but don't want them to raise fees too aggressively.

Power Shift

Electric utilities in 22 states are proposing to raise their fees and utilities in another four states could seek increases within 24 months.

- **Current fixed charge proposals**
- **New proposal expected within 12 or 24 months**
- **Proposal expected or possible but timing uncertain**
- **No current or near-term expected activity**



Note: As of September
Sources: Natural Resources Defense Council, National Consumer Law Center and Vote Solar
THE WALL STREET JOURNAL.

Eversource Energy 's Connecticut Light & Power asked for permission last year to raise its fee 59% to $25.50 a month from $16. But the state's utility regulator balked, instead granting the company permission to charge residential customers 20% more, or $19.25 a month, starting this year.

The size of the initial request angered customers so much that the Legislature got involved and passed a bill in June that requires the fee to be reviewed—and likely lowered—the next time the utility seeks a general rate increase.

“Fixed fees are unpopular because they disempower the customer and discourage investments in rooftop solar and energy efficiency,” said William Dornbos, Connecticut director for the Maine-based Acadia Center, a public interest group that promotes clean energy.

He says high monthly fees reduce the proportion of the total bill that a customer can lower by conserving energy, reducing the incentive to embrace solar and cut usage.

Eversource said Connecticut Light & Power's cost of providing service, excluding the cost of the electricity itself, is about $35 a month per home. “We proposed what we believed to be a more reasonable charge,” said Mitch Gross, an Eversource spokesman.

In Pennsylvania, PPL Corp. , parent of Pennsylvania Power & Light, wants to raise its customer-service charge by about 42% to $20 from $14.13, as part of an overall 6% rate increase. Under its rate proposal, about 60% of the added revenues would come from a higher monthly charge.

> ‘*The more dollars they collect through a fixed monthly charge, the less their revenue fluctuates*’
>
> —Tanya McCloskey, Penn. Office of Consumer Advocate

PPL spokesman Paul Wirth said the utility figures it costs about $38 a month to provide service to a typical home, including the cost of meter reading and billing, but excluding the cost of electricity. “Since our cost to provide service is mostly fixed, we think our rate design ought to reflect that more accurately,” he said.

Pennsylvania’s Office of Consumer Advocate, which represents electricity customers, has generally opposed fee increases. Tanya McCloskey, the acting head of the agency, said she knows that for utilities, “the more dollars they collect through a fixed monthly charge, the less their revenue fluctuates from weather or recession or other things.” But she says she thinks utilities sometimes exaggerate the proportion of their costs that are truly fixed.

PECO, the Philadelphia utility that is part of Exelon Corp. , agreed earlier this month to charge customers $8.45 a month apiece, up from $7.13, rather than the $12 it proposed in March.

Indianapolis Power & Light is asking state regulators for permission to boost its monthly fees, with the biggest percentage increases falling on customers who use little power. Households consuming less than 325 kilowatt-hours of electricity a month—about 15% of its customers—would pay $11.25 a month, 68% more than the current $6.70.

Residences using more than 325 kilowatt-hours of electricity would pay $17 a month, or 54% more than the current of $11. The utility also wants to increase the price for electricity by anywhere from 3.69% for the biggest consumers to 28% for the smallest users.

Ken Flora, Indiana Power’s director of regulatory affairs, said he thinks the proposal fairly distributes the costs of the electric grid. But the plan has drawn vigorous opposition from a broad coalition of consumer advocates, including those representing the elderly, the poor, and conservation-minded consumers.

Write to Rebecca Smith at rebecca.smith@wsj.com

Corrections & Amplifications

Lisa Wood is a vice president of the nonprofit Edison Foundation. An earlier version of this article incorrectly described her as a vice president of the Edison Electric Institute and the institute as the nonprofit arm of the foundation. (Oct. 20, 2015)

- HEARD ON THE STREET
- April 26, 2010

Wall Street's Missed Expectations

By LIAM DENNING

Wall Street's sell-side analysts are a famously Panglossian tribe. But it turns out that they are actually too pessimistic when it comes to predicting company earnings, particularly in the wake of recession.

With 172 of the S&P 500's members having so far reported quarterly earnings, 143 have beaten their consensus forecast, according to data collated by Thomson Reuters. On average, their numbers came in 21% above the Street's collective wisdom.

Less than 40% of the index's members have reported, so the current score of 83% having beaten forecasts—easily the highest for any quarter since at least 1999—may not stand. But having a high percentage of companies beat the Street isn't unusual. Thomson's data show that, on average, 64% of companies have done so in any given quarter since the start of 1999, compared with 18% that miss. The average earnings "surprise" is 2%, although these data swing erratically.

This is less surprising than it appears. Corporate management, for better or worse, go to great lengths to guide analysts toward the right numbers. After all, the last thing you want to do is deliver a nasty surprise. Just ask Ingersoll Rand, IR -0.78%which missed the consensus forecast by 11% on Friday and saw its shares plunge 8.5% at one point.

Analysts are also prone to the same greed and fear that fuel the financial markets' gyrations. The most optimistic quarter since 1999, in which only 52% of S&P 500 companies beat the consensus forecast, was the last three months of 2000, just as the tech bubble was turning to bust.

With that in mind, it is little wonder that pessimism has really taken hold recently, with the percentage of companies beating earnings forecasts well above average since the second quarter of 2009. But there could be more to this than mere psychology. So far this quarter, for example, 69% of S&P 500 companies that have reported have beaten revenue estimates, according to Thomson. The implication is that final demand is stronger than anticipated.

Tobias Levkovich of Citigroup points to the importance of labor. Corporate America cut costs rapidly as recession took hold. That helped offset some of the damage inflicted on earnings by falling sales. But the ranks of the unemployed weigh heavily on expectations for a recovery in sales. That leaves scope for surprisingly good revenue numbers, relative to estimates, which in turn provides great operating leverage at the profit line, given earlier cost cutting.

So there is reason to suspect analysts' expectations will continue to be trumped by better results as the current reporting season progresses. But at some point, that unemployment rate has to fall if optimism is to be restored on a sustainable basis.

—Liam Denning

- RETIREMENT PLANNING
- OCTOBER 10, 2011

Pensions Wrestle With Return Rates

By MICHAEL CORKERY

Turmoil in Europe, the sluggish economy and low interest rates are intensifying pressure on public pension-fund systems to reduce the annual-performance assumptions they use to determine contributions from taxpayers and employees.

Some lawmakers and pension officials are pushing to abandon the roughly 8% annual-return assumption set by many public-employee funds, saying the rate is unrealistically high given upheaval in markets around the world and the preceding financial crisis.

"After 10 years of listening to the experts be wrong on the downside more than half the time, I would like to be more cautious," said James Dalton, chairman of the Oregon Public Employees Retirement System.

Enlarge Image

Close

The pension system, which covers about 325,000 members, affirmed its 8% assumption this summer despite a dissenting vote from Mr. Dalton. Oregon exceeded its 8% assumed rate over the most recent 20-year period but fell short over five years and 10 years.

In Minnesota, lawmakers are considering whether to lower the large state pension funds' 8.5% return assumptions, among the highest in the nation. Pension officials at the Teachers' Retirement System of the State of Illinois are mulling a change to the system's 8.5% return target.

The nation's largest public pension, the California Public Employees' Retirement System, could face pressure to trim its assumptions if the $220 billion fund's monthly returns are disappointing. Calpers is set to release those results this week.

The assumed rate of return is critical because it determines how much a city or state and its workers must contribute to a pension system. As with many other investors, optimism prevails among many pension-fund managers. "We are in a low-return environment with a lot of downside risk," said Joseph Dear, Calpers chief investment officer. Nevertheless, Mr. Dear sees little reason to change the fund's 7.75% assumption, because that target is achievable over the long term, he said.

Since the financial crisis, at least 19 state and local pension plans have cut their return targets, while more than 100 others have held rates steady, according to a survey of large funds by the National Association of State Retirement Administrators.

But to keep meeting these assumptions, pension funds might be tempted to take on more risk, some officials and analysts warn.

"To target 8% means some aggressive trading," said Jeffrey Friedman, a senior market strategist at MF Global. "Ten-year Treasurys are yielding around 2%, economists say we are headed for a double-dip, and house prices aren't getting back to 2007 levels for the next decade, maybe."

"Good luck to them," Mr. Friedman said of pension managers still striving to hit longstanding targets.

The Teacher Retirement System of Texas reaffirmed its 8% annual return target after its consultant said the pension system, with about $100 billion in assets, should expect a median rate of return slightly greater than 8% over the next decade.

The consultant, Hewitt Ennis–Knupp, also noted that, during the past 20 years, the Texas pension fund earned a rate of return of 8.9% on invested assets. Brian Guthrie, executive director of the Teacher Retirement System of Texas, said he hasn't "looked under the hood" of the analysis, though pension officials checked with their actuary to make sure the target is in line with most other pension funds'. A spokeswoman for EnnisKnupp declined to comment.

"It doesn't matter what your assumptions are," said Laurie Hacking, executive director of the Teachers Retirement Association of Minnesota, which supports sticking with its 8.5% target return assumption. "It is what that market delivers that matters and how you react to that."

Ms. Hacking said Minnesota reacted to big investment losses after the financial crisis by cutting back on pension benefits and increasing contributions to the fund from employees and school districts. Those moves had a greater impact on the funding level of the teachers' system, now a relatively healthy 78%, than lowering return assumptions, she said.

But tweaking the number could have immediate, real-life consequences. Many public pension funds use their assumed rates of return to calculate the present value of benefits they owe retired workers in the future. So the lower the rate, the greater the obligations appear.

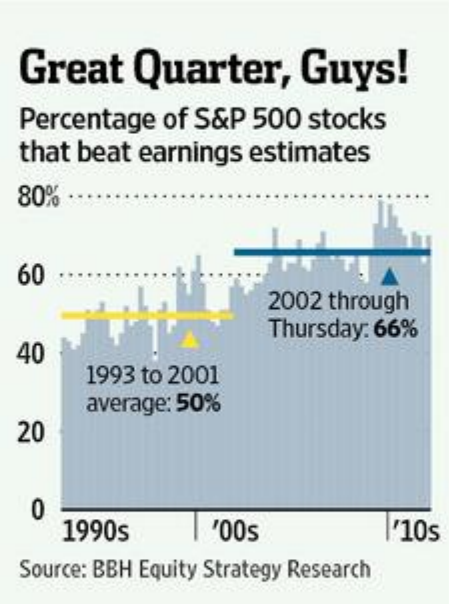
This spring, the New Hampshire legislature put off implementing a decision by the retirement board to lower the rate to 7.75% from 8.5% this year. The move by lawmakers was meant to spare New Hampshire cities and towns from having to make additional contributions to the fund without much warning, even if it means keeping return assumptions few people expect the fund to meet.

"It's a tough decision," said Jeb Bradley, Republican majority leader in the New Hampshire State Senate. "We knew we had to lower it, but we were trying to give ample warning" to cities and towns, he said. Many unions representing New Hampshire public workers objected to the delay in reducing the assumed rate.

In Minnesota, legislators last year reduced cost-of-living adjustments for retired public workers until the funding level of the pension system improves. Lowering the rate of return could lower the pension system's funding level and potentially delay when the cost-of-living adjustments are restored. Some state lawmakers say lowering the rate will benefit the system over the long haul. "A new day has dawned," said Morrie Lanning, chairman of the Legislative Commission on Pensions and Retirement in Minnesota, who wants to lower the return target. "It may have made sense in the past, but it's not realistic anymore."

Earnings Surprises Lose Punch

Surprise, surprise, surprise!



Gomer Pyle might have been about as competent an equity strategist as he was a marine. While the knee-jerk reaction to a positive earnings surprise is often, well, positive, gains can be fleeting. The reason is that companies and the analysts who cover them typically set the bar low enough that a "beat" has to be substantial, and not marred by unpleasant news about the outlook, to really have an impact.

Take the current earnings season. Now that a little over four-fifths of S&P 500 companies by market value have reported, Brown Brothers Harriman says 70% of those have beaten estimates. But since Alcoa Inc. AA -2.24%informally kicked off the current reporting season April 10, the S&P 500 is down slightly.

While this "positive surprise ratio" of 70% is above the 20 year average of 58% and also higher than last quarter's tally, it is just middling since the current bull market began in 2009. In the past decade, the ratio only dipped below 60% during the financial crisis. Look before 2002, though, and 70% would have been literally off the chart. From 1993 through 2001, about half of companies had positive surprises, which seems natural.

What changed? One potential reason is the tightening of rules governing analyst contacts with management. Analysts now must rely on publicly available guidance or, gasp, figure things out by themselves. That puts companies, with an incentive to set the bar low so that earnings are received positively, in the driver's seat. While that makes managers look good short-term, there is no lasting benefit for buy-and-hold investors. In fact, an October study by CXO Advisory Group found that the average weekly index return during earnings season has been slightly negative since 2000, while it has been positive for the rest of the year.

Enlarge Image


Close

Reuters

Since Alcoa informally kicked off the current reporting season April 10, the S&P 500 is down slightly.

The important statistic is actual corporate profits. BBH estimates the S&P 500 recorded operating earnings of $25.31 a share last quarter. That is about $1.50 higher than analyst consensus estimates a month ago but around $1.00 below last July's estimate. That is a typical pattern as expectations start out too optimistic and, by the time actual earnings approach, are too low. When the ink is dry, though, actual profits rarely make it to where expectations first began.

As Gomer would exclaim: "Well gaw-lee."

Write to Spencer Jakab at spencer.jakab@wsj.com

THE WALL STREET JOURNAL.

http://www.wsj.com/articles/the-new-era-of-low-stock-returns-1427499210

MARKETS

The New Era of Low Stock Returns

By JASON ZWEIG

March 27, 2015 7:33 p.m. ET

After more than six years of a bull market, investors should stare a cold, hard truth straight in the face: Future returns on stocks are likely to be far slimmer than the fat gains of the past few years.

Leading investment analysts think you will be lucky to squeeze out an average return of 2% annually, after inflation and fees, from a typical portfolio of stocks and bonds over the coming decade or so.

Investment expenses will loom much larger in a world of smaller expected returns. So will avoiding big mistakes.

The Dow Jones Industrial Average fell 2.7% from its Monday high to its close on Friday as economic growth seemed to falter. But that wasn't nearly enough to make stocks cheap.

One measure of valuation, based on data compiled by Yale University economist Robert Shiller, shows that the market price of the S&P 500 is about 27 times its average earnings over the past 10 years, adjusted for inflation. The long-term average, based on data going back to 1871, is about 16 times adjusted earnings.

So how have U.S. stocks performed in the past when valued around 27 times average earnings? Over the following 10 years, they generated total returns, counting dividends and adjusting for inflation, averaging about 2.5% annually, Prof. Shiller told me earlier this month.

Another method of estimating future stock returns yields a higher expectation—by a hair.

Over time, the return on stocks after inflation has tended to come very close to the sum of two numbers: dividend yield—total dividends over the past year divided by the current share price—plus the inflation-adjusted growth rate in dividends. The yield on the S&P 500 is 2%. For more than a century, the growth rate has averaged about 1.5% after inflation. Add those two numbers and you get 3.5%.

Now consider that the yield—interest income divided by price—on 10-year U.S. Treasury notes is 2% and that the government's core measure of inflation is running at about 1.7% annually.

If you have half your portfolio in stocks that return 3.5% and half in bonds that return 0.3%, you will earn about 1.9% after inflation. If stocks average the 2.5% return from Prof. Shiller's data, then a balanced portfolio will return only 1.4% after inflation. (These numbers assume no fees, taxes or trading costs.)

Either way, "it's pretty awful by historical standards," says William Bernstein, an investment manager at Efficient Frontier Advisors in Eastford, Conn.

Before you despair, bear in mind that the 2.5% expected return that Prof. Shiller derives from his historical data is an average of many 10-year periods in which stock returns ranged from losses of nearly 5% to gains of about 7%. All these results are averaged annually including dividends and after inflation. So 2.5% is a general expectation, not an exact certainty.

Still, keeping your expectations low is a good idea. “The problem isn’t that you might be not able to get better than a 2% return,” Mr. Bernstein says, “but that even getting 2% isn’t going to be psychologically easy.” With stocks and bonds alike still near record prices, they remain vulnerable to the sort of shocking decline that can shake many investors out of their conviction.

A few clear guidelines can help you stay the course.

First, you aren’t entitled to higher returns just because you feel you need (or deserve) them. If traditional investments deliver paltry returns, that doesn’t ensure that “alternatives” like hedge funds, complex trading techniques or esoteric bond funds will do any better.

Take extra risk in a low-return world and you are likely to reap the risk without earning the reward.

“The things that feel most uncomfortable in the short run are generally the most rewarding in the long run,” Mr. Bernstein says, “and right now one of the most uncomfortable things is holding cash and fixed income.” By hanging onto your cash even at today’s invisible yields, you will be able to buy stock in the next downturn when shares finally become cheap again.

You can also look overseas now. “The expected returns on foreign stocks are higher,” Mr. Bernstein says, “plus you’re buying the currencies cheap relative to the dollar.”

Stocks in Europe and selected other international markets are one-half to one-third as costly as U.S. shares by Prof. Shiller’s measure.

Inching up your exposure to non-U.S. stocks through portfolios like the iShares Core MSCI Total International Stock exchange-traded fund or the Vanguard Total International Stock Index Fund makes good sense. The funds each charge annual expenses of 0.14%, or $14 per $10,000 invested.

Next, treat every nickel like a manhole cover.

Purge any expensive mutual funds, replacing them with well-diversified, low-cost index funds or ETFs. Against a backdrop of 2% returns, a half-percentage-point reduction in management fees will give a bigger boost to your returns than almost anything else you can do.

Finally, most financial advisers, when pressed, will concede that their fees are negotiable. Now, when a 1% annual fee eats half your expected rate of return, is an excellent time to haggle.

—intelligentinvestor@wsj.com; twitter.com/jasonzweigwsj

The New Era of Low Stock Returns

hristophe Vorlet

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Investment expenses will loom much larger in a world of smaller expected returns. So will avoiding big mistakes.

U.S. stocks fell about 3% between Monday and Thursday this past week as economic growth seemed to falter. But that wasn't nearly enough to make stocks cheap. One measure of valuation, based on data compiled by Yale University economist Robert Shiller , shows that the market price of the S&P 500 is about 27 times its average earnings over the past 10 years, adjusted for inflation. The long-term average, based on data going back to 1871, is about 16 times adjusted earnings.

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FEATURE ARTICLE

The effect of the SEC's regulation fair disclosure on analyst forecast attributes

Rong Yang
Department of Business Administration, SUNY-College at Brockport, Brockport, New York, USA, and
Yaw M. Mensah
Rutgers Business School, Rutgers University, Piscataway, New Jersey, USA

Abstract

Purpose – This study aims to examine the effect of the Securities and Exchange Commission's regulation fair disclosure (Reg. FD) on analyst forecast performance for pre-Reg. FD closed-call (CLC) and open-call (OPC) firms compared with the non-conference-call (NCC) firms in the post-Reg. FD period.

Design/methodology/approach – Specifically, it examines whether Reg. FD influenced the earnings forecast accuracy and forecast dispersion of financial analysts for the previous-CLC firms in the post-Reg. FD period compared with the previous-OPC firms, and both sets of conference call firms relative to the NCC firms in the same period.

Findings – The main findings indicate that forecast accuracy improved for both OPC and CLC firms compared with the NCC firms in the post-Reg. FD period. More importantly, the differences in earnings forecast performance between the pre-Reg. FD OPC and CLC firms had disappeared in the post-Reg. FD period.

Originality/value – These results offer further confirmation of previous findings that Reg. FD has contributed to leveling the playing field for financial analysts and investors.

Keywords Financial institutions, Earnings, Forecasting, Disclosure, Conferencing

Paper type Viewpoint

1. Introduction

On October 23, 2000, the US Securities and Exchange Commission (SEC) issued regulation fair disclosure (hereafter Reg. FD) which prohibits selective disclosure of material nonpublic information to certain financial analysts, institutional investors and others prior to making it available to the general public. Information is considered material if it is important enough to persuade an investor to buy or sell a stock. Before the implementation of Reg. FD, most conference calls were accessible only to certain analysts and institutional investors. It has been argued that conference calls, because they were predominantly closed, may have contributed to an information gap between analysts privy to the call and analysts and other investors excluded from the call. The intent of Reg. FD was to prevent this selective disclosure of information.

A number of published studies have already examined the impact of Reg. FD on various aspects of the capital markets and investment climate, including the effect on

Journal of Financial Regulation and Compliance
Vol. 14 No. 2, 2006
pp. 192-209
© Emerald Group Publishing Limited
1358-1988
DOI 10.1108/13581980610659503

analyst forecast accuracy and dispersion, although the findings have been contradictory. Using data from the first three quarters after the release of Reg. FD, Agarwal and Chadha (2003) report that sell-side analysts' forecasts were less accurate and more dispersed than before its adoption, where Heflin *et al.* (2003) report no change in analysts' earnings forecast bias, accuracy or dispersion compared to the pre-Reg. FD period. Furthermore, Shane *et al.* (2001), also using data from the same period, find that analysts gathered more information between earnings announcements so that their forecasts are ultimately as accurate as those made in the period before Reg. FD was adopted.

This study has two main objectives. The first is to examine if there were changes in analyst earnings forecast errors (FE) and forecast dispersion (FD) in the pre- and post-Reg. FD period between the "closed-call" (henceforth referred to as CLC) firms and "open-call" (OPC) firms. The second objective is to determine if there were any changes in analyst earnings forecast attributes between the CLC and OPC firms as a group (labeled CC – conference call firms), and the non-conference-call (NCC) firms in the post-Reg. FD environment.

Thus, this study contributes to the existing literature by differentiating between firms in the pre-Reg. FD period that held closed conference calls, firms that held open conference calls, and other firms which held NCCs. By limiting the study only to OPC and NCC firms in the post-Reg. FD period, we are able to control for extraneous factors such as changing group membership in our analyses. Second, because the study covers the period from October 1998 to September 2002, more quarterly observations are available to conduct the tests than in previous research.

The remainder of this study is organized as follows. Section 2 presents a brief summary of previous studies focused on only the main sources, and an outline of the hypotheses examined in the paper. Section 3 describes the sample selection and a brief outline of our research methodology. Section 4 presents the major results of the study. Section 5 presents the conclusions and suggestions for future research. In the Appendix, we provide details on the research methodology and the regression equations used to analyze the data.

2. Literature review and hypothesis development

2.1 Brief review

Economic theory suggests that expanded disclosures can reduce information asymmetry arising between the firm and its shareholders or among potential buyers and sellers of firm shares and benefit firms by correcting any firm mis-valuation and increasing institutional interest and liquidity for the firm's stock. For example, Diamond and Verrecchia (1991) find that credible commitments by managers to improve disclosure increasing the precision of public information about firm value results in higher current stock prices due to reduced information asymmetry and increased liquidity. Frankel *et al.* (1999) provide evidence that firms holding conference calls as a voluntary disclosure medium tend to be relatively larger, more profitable, more heavily followed by analysts, and access the capital markets more often than other firms.

In other related findings, Bowen *et al.* (2002) provide evidence that regular use of earnings-related conference calls could present a selective disclosure problem if the public is not privy to these calls, even if conference calls tend to reduce both FE and FD. Bushee and Noe (2000) find that firms with greater analyst following and greater institutional ownership are less likely to have conference calls that provide open access to all investors. Core (2001) presents evidence consistent with the intuition that informed investors prefer less disclosure, and that analysts and institutions produce information that reduces information asymmetry and the need for conference calls.

As cited previously, some of the research focused on the effect of Reg. FD on financial analyst behavior have yielded mixed results. In general, however, the majority of these studies conclude that Reg. FD has had the intended benefit of diminishing the information advantage of analysts with previously exclusive access to management, although some anecdotal stories in the press still hint at the continued exclusive disclosure of material non-public information (*Wall Street Journal*, 2004). Interested readers can contact the lead author for a more detailed reference list.

2.2 Expected effects of Reg. FD on analysts forecast performance and related stock market

The arguments surrounding Reg. FD revolve around two major themes:

(1) its potential to level the playing field for all investors; and

(2) its potential to increase the cost of capital by restricting the availability of information to investors.

The first of these themes relies on the rationale that, by providing equal access to firm information, Reg. FD can reduce the level of information asymmetry, leading stock prices to be less dependent on private information. This logic implies that any loss of accuracy in earnings forecasts by analysts would be offset by the wider dissemination of information and hence, a more informed general investor population. In addition, Reg. FD may enhance the accuracy and precision of analysts' earnings forecasts, if it succeeded in opening up new sources of information to analysts, or if analysts could substitute the information obtained directly from companies with the information gathered from customers, suppliers, competitor's industry observers, and other sources of information. That is consistent with Mohanram and Sunder's (2006) finding, analysts may substitute privately acquired information for public-disclosed information for firms after the enactment of Reg. FD.

The counter-argument relies on the possibility that Reg. FD could have an adverse effect on certain analysts' forecast accuracy through denying them the sometimes-exclusive access to management that they previously enjoyed. Given the important role of financial analysts as intermediaries who provide professional investment to the capital markets, the decreased accuracy may have deleterious capital market consequences. In addition, it has been argued that Reg. FD induce firms to reduce the level of information and guidance that they may have provided originally in the closed conference calls, but which they may be unwilling to impart in open conference calls.

Recently, Bushee *et al.* (2004) find that Reg. FD had a significantly negative impact on managers' decisions to continue hosting conference calls even though this impact was not large. Hence, the level of specialty guidance may have decreased in the post-Reg. FD period. At the same time, Gintschel and Markov (2004) report that the informativeness of analysts output has dropped in the post-FD environment.

Specifically, they found that the absolute price impact of information disseminated by financial analysts dropped by 28 percent in this period. Eleswarapu *et al.* (2004) also report that the return volatility around mandatory announcements had decreased, and the impact was more pronounced for smaller and less liquid stocks. Taken together, these results suggest a strong impact of Reg. FD on the functioning of capital markets.

2.3 Hypothesis development

Extant studies assume that public information is common across all analysts and private information is idiosyncratic and uncorrelated across analysts. They have used FE and FD as proxies for analyst forecast attributes. Both FE and FD capture the extent to which private information differs across analysts, which also represents the level of actual past selective disclosure. For instance, Barron *et al.* (1998) present a model that expresses two properties of their forecasts, proxied by both dispersion in individual forecasts and the squared error in the mean forecast, as functions of the amount or "precision" of analysts' public and private information in forecasting firms' earnings. Sunder (2001) further find that "restricted-call" firms faced higher information asymmetry compared to "open-call" firms in the pre-Reg. FD period, while in the post-Reg. FD period, the differences in information asymmetry between two groups do not persist.

In summary, analysts should make more FE for OPC firms than for CLC firms if open conference calls do not provide as much information as closed conference calls. The first objective of Reg. FD was to level the playing field among all investors and analysts with respect to access to corporate information. If this objective were achieved with the implementation of Reg. FD, then one observable effect should be no difference in analysts' earnings forecast attributes between the previous-OPC and previous-CLC firms. This line of reasoning leads to the following set of hypotheses (stated in null form):

$H_0$1.1. Analysts' quarterly earnings FE for the previous-CLC firms are not significantly different from those for the previous-OPC firms in the post-Reg. FD period (i.e. $FE^{CLC}_{POST} \approx FE^{OPC}_{POST}$).

$H_0$1.2. Analysts' quarterly earnings FD for the previous-CLC firms is not significantly different from that for the previous-OPC firms in the post-Reg. FD period (i.e. $FD^{CLC}_{POST} \approx FD^{OPC}_{POST}$).

Using the same line of reasoning, it can be argued that the earnings FE and FD of NCC firms should be greater than those of both CLC and OPC firms (if they remained conference call firms) in the post-Reg. FD period. In other words, Reg. FD's exclusive effect should be on closing the information gap between the OPC and CLC firms, but should have no effect on the greater informativeness of conference calls as a means of communicating more information to investors (as demonstrated by prior research). This leads to the following set of hypotheses (in alternative form):

H_a1.3. Analysts' quarterly earnings FE for NCC firms are significantly greater than those for both previous-CLC and OPC firms in the post-Reg. FD period (i.e. $FE^{NCC}_{POST} > (FE^{CLC}_{POST}, FE^{OPC}_{POST})$).

H_a 1.4. Analysts' quarterly earnings FD for NCC firms is significantly greater than that for both previous-CLC and OPC firms in the post-Reg. FD period (i.e. $FD^{NCC}_{POST} > (FD^{CLC}_{POST}, FD^{OPC}_{POST})$).

In addition to the effects hypothesized above, the effectiveness of Reg. FD can be further evaluated by its effect on changes in the forecast attributes. That is, if the equality of the earnings forecast attributes between the CLC and OPC firms in the post-Reg. FD period is to be attributed to the adoption of Reg. FD, then the change in the forecast attributes from the pre- to the post-FD period should reflect this. So the absolute change in both FE and FD for the previous-CLC firms should be bigger than those for the OPC firms. These hypotheses can be stated in alternative form as follows:

H_a2.1. The absolute change in analysts' quarterly earnings FE for the previous-CLC firms is significantly higher than that for the previous-OPC firms in the post-Reg. FD period (i.e. $|\Delta FE^{CLC}| > |\Delta FE^{OPC}|$).

H_a 2.2. The absolute change in analysts' quarterly earnings FD for the previous-CLC firms is significantly higher than that for the previous-OPC firms in the post-Reg. FD period (i.e. $|\Delta FD^{CLC}| > |\Delta FD^{OPC}|$).

3. Brief description of research methodology

3.1 Sample selection

Following the Bushee *et al.* (2003) approach, firms on the Bestcalls.com list are considered to be "open-call" firms (i.e. calls that allow unlimited real time access), while the firms provided by First Call Corporation but not included on the Bestcalls.com list are considered to be "closed-call" firms (i.e. calls that restrict access to invited professionals) in the pre-Reg. FD period. According to Bowen *et al.* (2002, p. 286, footnote 1), Bestcalls.com launched a web site in March 1999 publicizing the dates and times of conference calls open to individual investors. However, some firms did not allow individuals access to their calls. Meanwhile, other firms began live broadcasts of their conference calls using internet web casts. So it is reasonable to assume that after March 1999, all firms on the Bestcalls.com list had OPCs. Therefore, we divide the samples into three groups, OPC, CLC and NCC (where no disclosures are made via conference calls) firms in the pre-Reg. FD period. More specifically, the firms listed by the Bestcalls.com are regarded as OPC firms, while the firms listed by First Call Corporation but not included in the Bestcalls.com list are regarded as CLC firms. Firms listed in CRSP and the I/B/E/S databases but not included in either Bestcalls.com or First Call Corporation lists are regarded as pre-NCC firms.

To obtain better control of extraneous factors, the sample is restricted to firms which retained their status in both pre- and post-Reg. FD environments. We exclude firms that Bestcalls.com lists as NCC firms, as well as NCC firms now listed as CC firms. The analyst forecast data used are obtained from I/B/E/S database, and earnings announcement dates and other control variables from quarterly Compustat data sets. To ensure the meaningful computation of dispersion, the minimum number of analysts following a firm is set to four. All firms are required to have non-missing quarterly I/B/E/S forecast data during the period of October 1998 through September 2002 and non-missing quarterly Compustat data. After applying this screening process, the surviving sample consists of 1,697 firms (521 OPC, 990 CLC, and 186 NCC firms).

The total final sample consists of 12,806 firm-quarter observations in the pre-Reg. FD period, and 13,104 firm-quarter observations in the post-Reg. FD period.

3.2 Research methodology

Empirical accounting research frequently utilizes the properties of analyst forecasts, such as accuracy, dispersion, bias, etc. to construct proxies for variables of interest. For instance, FD and errors in the mean forecast are used to proxy for the uncertainty or the degree of consensus among analysts or market expectations. Based on prior research, we estimated the effect of Reg. FD on analysts' forecast attributes by running a series of regression equations. Technical details on the regressions estimated are provided in Appendix. The description below is a brief summary of the approach used in the paper.

To control for factors that have been shown in prior research to be highly related to the levels of analyst FE and FD, we include in our regressions proxies measures for firm size, industry effect, earnings predictability, earnings surprise, and age of the forecast. Firm size and the level of FE or the level of FD are proxies for the richness of the firm's information environment. The ability of analysts to forecast the current quarter's earnings depends on both earnings surprise in the prior quarter and any information disclosed during the conference call. Forecast age is also an important determinant of forecast accuracy.

We estimate two regression equations, with the dependent variable in the first equation the absolute FE, and in the second equation, the FD. The independent variables in both equations include the dummy variables to represent the CLC and OPC firms, interaction terms to control for the presence of high-technology firms in the sample, forecast age (AGE), the number of analysts which follow a given firm (ANA), the size of earnings surprise in the previously released quarterly earnings (SURP), and firm size (SIZE).

The interaction terms for high-technology firms are designed to evaluate whether forecast attributes are consistently different for firms in the high technology sector. Barron *et al.* (2002) find that lower levels of analyst consensus are associated with high-tech firms because of their relatively high R&D expenditures. Therefore, a significantly positive coefficient on HighTech is consistent with the belief that analysts make more FE and dispersion for high-technology firms due to a higher information asymmetry as compared to non-high-technology firms.

4. Empirical results

4.1 Descriptive statistics

Tables I-III present some descriptive statistics on the post-Reg. FD period variables. Panel A reveals that both the mean and the median of analyst FE for NCC firms are greater than those for CLC and OPC firms in the post-Reg. FD period. Also the median of FD for NCC firms is greater than the median for both OPC and CLC firms in the post-Reg. FD period. Panel B presents the significant difference in means of FE and FD using statistical tests for the differences (specifically, Scheffe's tests and *t*-tests) in the post-Reg. FD period.

The first part of panel B shows that the means of OPC and CLC firms are not statistically different (at the 0.05 probability level), whereas the means for the other two groups, NCC and OPC, NCC and CLC are significantly different in the post-Reg. FD period. On the other hand, the second part of panel B shows the means between

	CLC firms	OPC firms	NCC firms
Descriptive statistics [a]			
FE			
Mean	0.0109	0.0202	0.0254
Median	0.0019	0.0021	0.0024
Std. deviation	0.0561	0.3335	0.1513
FD			
Mean	0.0032	0.0085	0.0065
Median	0.0008	0.0008	0.0009
Std. deviation	0.0183	0.2166	0.0412
AGE			
Mean	60.8104	61.9091	59.6318
Median	61.0000	63.0000	59.0000
Std. deviation	32.2772	31.7771	32.3843
ANA			
Mean	8.1587	9.7380	8.2127
Median	7.0000	8.0000	7.0000
Std. deviation	4.7847	6.1128	4.3793
SURP			
Mean	−0.0029	−0.0055	−0.0041
Median	−0.0007	−0.0016	−0.0009
Std. deviation	0.0396	0.0454	0.1156
SIZE			
Mean	7.3864	7.6700	7.2287
Median	7.2105	7.5224	7.3333
Std. deviation	1.6543	1.6927	1.5248

Notes: [a]Variables definitions: FE_{it} = absolute difference between actual earnings per share for quarter *t* less the mean forecast as provided by IBES summary file at the end of the quarter *t* deflated by the stock price at the beginning of quarter t. FD_{it} = standard deviation of all analyst forecasts made at the end of the quarter *t* from the "consensus" (mean) of analysts' forecasts deflated by the stock price at the beginning of quarter *t*. $AGE_{i,t}$ = the number of calendar days between the analyst's forecast date and the date of the actual earnings announcement at quarter t. $ANA_{i,t}$ = the total number of analysts releasing an earnings forecast for the firm i at quarter t. $SURP_{it} = \{EPS_t - EPS_{t-4}\}/P_{t-4}$, where EPS_t is the primary earnings share (excluding extraordinary items) for quarter *t* and P_{t-4} is the ending price per share at quarter $t-4$. $SIZE_{it}$ = the log of market value of equity at the beginning of quarter t.
[b]All correlations are significant at the 0.001 level or better except for the correlation between SURP and ANA, and ANA and AGE, which are not significant at conventional levels.
[c]Above of the table is the Pearson correlation coefficients and the below is the Spearman correlation coefficients.
[1]NCC – non-conference call firms; [2] CLC – closed-call firms; [3] OPC – open-call firms.
& = Statistically significant at a probability of less than 0.10;
* = Statistically significant at a probability of less than 0.05;
** = Statistically significant at a probability of less than 0.01;
*** = Statistically significant at a probability of less than 0.001

Table I.
Univariate tests on analysts forecast attributes and other variables after Reg. FD: Panel A

NCC and CC, and between CLC and OPC in the post-Reg. FD period are statistically different. All the *t*-values are significant for each comparison except for the comparison of FD between NCC and CC in the post-Reg. FD period. These preliminary results are generally consistent with *H1.1-H1.4*.

Panel C presents correlation coefficients (both the Pearson product-moment and Spearman rank-order correlations) between analyst forecast attributes and their determinants in the post-Reg. FD period. All the correlation coefficients have signs consistent with those expected for the regression coefficients and all are significant except for the correlation coefficient between the number of analysts following (ANA) and forecast age (AGE), and between ANA and earnings surprise (SURP). The correlation coefficients between the number of analysts following (ANA) and the firm size (SIZE) is the highest among all coefficients, which is consistent with the previous research findings that large firms usually have a large group of analysts following regardless of the implementation of Reg. FD.

4.2 Regression results

Table IV presents the results of regressing analyst FE and FD in the pre- and post-Reg. FD periods by using equations (1) and (2). As expected, the coefficients of two dummy variables, CLC and OPC, are significantly negative. Moreover, the coefficients of CLC are greater than the coefficients of OPC for both regressions of FE and FD in both pre- and post-Reg. FD periods. Also as expected, forecast age (AGE), the number of forecasts (ANA) and high-tech firms (HighTech) are positively associated with FE and FD, while earnings surprise (SURP) and firm size (SIZE) are negatively associated with FE and FD.

Focusing on the tests of *H1-H4*, the results in Table IV (PRE period) indicate that conference calls did provide additional information to financial analysts, with both OPC and CLC firms having fewer earnings FE than NCC firms prior to the

Table II. Univariate tests on analysts forecast attributes and other variables after Reg. FD: Panel B

Tests	Group/Variables[a]	FE	FD
Scheffe's tests and Satterthwaite unequal variance t-tests for OPC[3], CLC[2] and NCC[1] firms			
Scheffe's test – Difference in means	NCC[1] – CLC[2]	0.0224*	0.0057*
	NCC[1] – OPC[3]	0.0224*	0.0062*
	CLC[2] – OPC[3]	−0.0001	0.0005
T-test among 3 groups: *t* value	NCC[1] – (CLC[2] + OPC[3])	4.43***	1.47
	CLC[2] – OPC[3]	4.18***	3.71***

Note: See Table I for key

Table III. Univariate tests on analysts forecast attributes and other variables after Reg. FD: Panel C

Variables[a]	FE	FD	AGE	ANA	SURP	SIZE
Correlations between forecast attributes and other variables[bc]						
FE	1	0.7646	0.0620	−0.0329	−0.1510	−0.1749
FD	0.6123	1	0.0253	−0.0405	0.0415	−0.1706
Age	0.1422	0.0151	1	0.0108	−0.0191	0.0228
ANA	−0.1604	−0.1827	0.0526	1	−0.0196	0.5160
SURP	−0.3063	−0.1450	−0.0170	−0.0012	1	−0.0020
Size	−0.3806	−0.4391	0.0233	0.5003	0.0381	1

Note: See Table I for key

Table IV.
Regression of analyst FE and dispersion on both pre- and post-Reg. FD variables

Regression of FE and FD		Among NCC, CLC and OPC firms							
		Before Reg. FD (PRE)				After Reg. FD (POST)			
		FE		FD		FE		FD	
Variables[a]	Expected sign	Coefficient	*t*-value	Coefficient	*t*-value	Coefficient	*t*-value	Coefficient	*t*-value
Intercept		0.0169	56.49***	0.0049	59.16***	0.0877	31.26***	0.0203	30.08***
CLC	–	*−0.0006*	*−2.34* *	*−0.0004*	−6.05***	−0.0225	−12.09***	−0.0045	−10.09***
OPC	–	*−0.0011*	*−4.09* ***	*−0.0005*	*−7.02* ***	*−0.0232*	*−11.72* ***	*−0.0046*	*−9.67* ***
HighTech × CLC	+	−0.0004	−2.71**	−0.0004	−9.1***	0.0121	6.43***	0.0025	5.54***
HighTech × OPC	+	0.0016	11.9***	0.0002	5.32***	0.0127	7***	0.0016	3.66***
HighTech × NCC	+	0.0019	3.31***	−0.0003	−1.72&	−0.0077	−2.39*	0.0029	3.81***
AGE	+	0.0001	29.38***	0.0001	6.56***	0.0001	9.89***	0.0000	4.37***
ANA	+	0.0001	5.82***	0.0001	7.34***	0.0010	8.95***	0.0002	7.82***
SURP	–	−0.0366	−35.5***	−0.0022	−7.71***	−0.2127	−24.14***	0.0145	6.83***
SIZE	–	−0.0018	−74.74***	−0.0005	−66.51***	−0.0097	−28.82***	−0.0022	−26.81***
Adjusted R^2		0.1294		0.0847		0.0697		0.0434	
F-statistic		1,038.41***		647.11***		213.36***		129.65***	
F-test ($\alpha_1 = \alpha_2, \beta_1 = \beta_2$)		*31.73* ***		*11.28* ***		*0.37*		*0.11*	

Notes: [a]Variables definitions: FE_{it}, absolute difference between actual earnings per share for quarter t less the mean forecast as provided by IBES summary file at the end of the quarter t deflated by the stock price at the beginning of quarter t; FD_{it}, standard deviation of all analyst forecasts made at the end of the quarter t from the "consensus" (mean) of analysts' forecasts deflated by the stock price at the beginning of quarter t; $AGE_{i,t}$, the number of calendar days between the analyst's forecast date and the date of the actual earnings announcement at quarter t; $ANA_{i,t}$, the total number of analysts releasing an earnings forecast for the firm i at quarter t; $SURP_{it} = \{EPS_t - EPS_{t-4}\}/P_{t-4}$, where EPS_t is the primary earnings share (excluding extraordinary items) for quarter t and P_{t-4} is the ending price per share at quarter $t-4$; $SIZE_{it}$, the log of market value of equity at the beginning of quarter t; [b]all correlations are significant at the 0.001 level or better except for the correlation between SURP and ANA which is not significant at conventional levels; [c]above of the table is the Pearson correlation coefficients and the below is the Spearman correlation coefficients; [1]NCC – non-conference call firms; [2]CLC – closed-call firms; [3]OPC – open-call firms; [&]statistically significant at a probability of <0.10; [*]statistically significant at a probability of <0.05; [**]statistically significant at a probability of <0.01; [***]statistically significant at a probability of <0.001

implementation of Reg. FD. This conclusion can be drawn from the differences in the values of the intercepts terms for the NCC and CLC dummy variables. The intercept of the regression of FE in the pre-Reg. FD period is 0.0169 for NCC firms, 0.0163 (i.e. 0.0169 − 0.0006) for CLC firms, and 0.0158 (i.e. 0.0169 − 0.0011) for OPC firms. The intercept of the regression of FD in the pre-Reg. FD period is 0.0049 for NCC firms, 0.0045 (i.e. 0.0049 − 0.0004) for CLC firms, and 0.0044 (i.e. 0.0049 − 0.0005) for OPC firms.

Further examination of the regressions results in Table IV (POST period) supports the inference that analysts still made more FE and had higher FD for the NCC firms as compared to the OPC and CLC firms after the release of Reg. FD. In the post-Reg. FD period, the intercept of the regression of FE is 0.0877 for NCC firms, 0.0652 (i.e. 0.0877 − 0.0225) for CLC firms, and 0.0645 (i.e. 0.0877 − 0.0232) for OPC firms. The intercept of the regression of FD in the post-Reg. FD period is 0.0203 for NCC firms, 0.0158 (i.e. 0.0203 − 0.0045) for CLC firms, and 0.0157 (i.e. 0.0203 − 0.0046) for OPC firms.

To determine if Reg. FD has any impact on analysts FE, it is necessary to compare the coefficients across CLC and OPC firms within each period which can be done using the standard *F*-test. The *F*-tests performed show that the observed differences between the coefficients of interest (α_1 and α_2 in equation (1) and β_1 and β_2 in equation (2) in the Appendix) support the hypotheses presented earlier. In the pre-Reg. FD period, the *F*-value for FE (FD) is 31.73 (11.28), and the *p*-value is significant at the 0.001 level. Thus, these two null hypotheses that $\alpha_1 = \alpha_2$, and $\beta_1 = \beta_2$ can both be rejected. However, in the post-Reg. FD period, the *F*-value for FE (FD) is 0.37 (0.11) with an insignificant probability level. Thus, the null hypotheses that $\alpha_1 = \alpha_2$ in equation (1) and $\beta_1 = \beta_2$ in equation (2) cannot be rejected.

In summary, there are observable differences in the regression coefficients between CLC and OPC firms in the PRE period, and these statistically significant differences in coefficients disappear in the POST period. These results thus support both *H1.1* and *H1.2*, and provide evidence that differences in analyst forecast performance between the previous-CLC and previous-OPC firms do not persist after Reg. FD went into effect[1].

4.3 Univariate analyses of change in analyst forecast attributes

Tables V-VII present some descriptive statistics on the absolute change in analyst FE ($|\Delta FE|$) and FD ($|\Delta FD|$). From panel A, it can be observed that the means of $|\Delta FE|$ and $|\Delta FD|$ for CLC firms are smaller than those for OPC firms. Panel B presents the significant difference in means of the absolute change in FE and FD using both Scheffe's tests and the pairwise *t*-tests.

The results from Scheffe's tests show the comparisons in means are significantly different at the 0.05 level among three groups except for one comparison, $|\Delta FE|$ between CLC and OPC firms. At the same time, the results from the *t*-tests show that there is no significant difference in mean levels of $|\Delta FE|$ or $|\Delta FD|$ for the comparison between NCC and CC (including CLC and OPC firms) firms and the comparison between CLC and OPC firms. Panel C presents the Pearson and Spearman correlation coefficients between the absolute change in analyst forecast attributes and their determinants.

Statistics	CLC firms	OPC firms	NCC firms
Descriptive statistics[a]			
$\|\Delta FE\|$			
Mean	0.0113	0.0199	0.0318
Median	0.0021	0.0023	0.0024
Std. deviation	0.0477	0.4281	0.2186
$\|\Delta FD\|$			
Mean	0.0027	0.0069	0.0087
Median	0.0005	0.0005	0.0007
Std. deviation	0.0129	0.2061	0.0744
ΔAGE			
Mean	1.1795	1.3668	8.0495
Median	−1.0000	−1.0000	−1.0000
Std. deviation	46.5676	45.8835	53.9615
ΔANA			
Mean	1.5168	2.0406	1.1011
Median	1.0000	1.0000	0.0000
Std. deviation	4.8651	5.4807	4.6420
$\Delta SURP$			
Mean	−0.0062	−0.0134	−0.0048
Median	−0.0031	−0.0029	−0.0018
Std. deviation	0.0596	0.0909	0.1276
lagSIZE			
Mean	7.3170	7.6682	7.1224
Median	7.1327	7.5000	7.1416
Std. deviation	1.6198	1.7113	1.4797
lagFE			
Mean	0.0086	0.0083	0.0132
Median	0.0016	0.0017	0.0020
Std. deviation	0.0451	0.0349	0.0474
lagFD			
Mean	0.0021	0.0020	0.0035
Median	0.0007	0.0006	0.0009
Std. deviation	0.0093	0.0098	0.0167

Notes: [a]Variable definition: CLC = a dummy variable equal to 1 if the firm is a CLC firm and 0 if the firm is a NCC or OPC firm. $|\Delta FE_t|$=the absolute value of the difference between forecast errors in the post- and the pre-Reg. FD period deflated by the price at the beginning of the pre-Reg. FD period. $|\Delta FD_t|$ = the absolute value of the difference between forecast dispersion in the post- and the pre-Reg. FD period deflated by the price at the beginning of the pre-Reg. FD period. ΔAGE_t = the difference in forecast age between the post- and pre-Reg. FD period. ΔANA_t = the difference in the number of followed analysts between the post- and pre-Reg. FD period. $\Delta SURP_t$ = the difference in earnings surprise between the post- and pre-Reg. FD period. lagSIZE = the log of market value of equity in the pre-Reg. FD period. lagFE, lagFD = the level of forecast error or forecast dispersion in the pre-Reg. FD period.

[b]Above the table is the Pearson correlation coefficients and the below is the Spearman correlation coefficients. All correlations are significant at the 0.001 level or better except for the correlations between ΔSURP and ΔANA, ΔSURP and ΔAGE, ΔAGE and lagFE, and ΔSURP and lagSIZE, which are not significant at conventional levels.

[1]NCC – non-conference call firms;

[2]CLC – closed-call firms;

[3] OPC – open-call firms.

& = Statistically significant at a probability of less than 0.10;

* = Statistically significant at a probability of less than 0.05;

** = Statistically significant at a probability of less than 0.01;

*** = Statistically significant at a probability of less than 0.001

Table V.
Univariate tests on the change in analysts forecast attributes: Panel A

4.4 Regression results for change in analyst forecast attributes

Table VIII presents the regression results obtained when the absolute changes in analyst quarterly FE (|ΔFE|) and FD (|ΔFD|) are regressed on the hypothesized independent variables (as presented in equations (3) and (4) in Appendix). The sign of coefficients on the dummy variable, OPC, for both regressions of |ΔFE| and |ΔFD| is not significant, a result which contradicts *H2.1* and *H2.2*. In addition, the sign of coefficients on the dummy variable, NCC, is significantly positive for both regressions of |ΔFE| and |ΔFD|.

Because we adopt October 23, 2000 as the boundary between the pre-Reg. FD period and the post-period, it is possible that the failure to support *H2.1* and *H2.2* may be due to the choice of the cut-off date. Previous research by Mac (2003) finds that firms had already changed their voluntary disclosure policy in the pre-enactment period (December 20, 1999-October 22, 2000), before Reg. FD became effective on October 23, 2000. Thus, if some firms in the sample have already changed their voluntary disclosure policy prior to the release of Reg. FD because they anticipate the passage of Reg. FD, the tests may not be sufficiently powerful.

Figures 1 and 2 show the graph of the means of FE and FD among three groups, CLC, OPC and NCC firms, from the third quarter of 1998 to the third quarter of 2002. Both Figures 1 and 2 show that FE and FD for NCC firms are higher than those for both OPC and CLC firms in both pre- and post-Reg. FD periods. However, the means of FE (FD) for CLC firms are greater than those for OPC firms in the pre-Reg. FD period

Table VI. Univariate tests on the change in analysts forecast attributes: Panel B

Tests[a]	Group/Variables[a]	$\|\Delta FE^a\|$	$\|\Delta FD^b\|$
Test of difference in means of ΔFE and ΔFD − Scheffe's tests and Satterthwaite unequal variance T-tests			
1. Scheffe's Tests − Difference between Means	NCC[1] − CLC[2]	0.158*	0.0046*
	NCC[1] − OPC[3]	0.0163*	0.005*
	CLC[2] − OPC[3]	0.0005	0.0004
2. *T* tests − *t* value	NCC[1] − (CLC[2] + OPC[3])	1.62	1.18
	CLC[2] − OPC[3]	1.02	1.03

Note: See Table V for key

Table VII. Univariate tests on the change in analysts forecast attributes: Panel C

	|ΔFE|	|ΔFD|	ΔAge	ΔANA	ΔSURP	lagSIZE	lagFE	lagFD
Correlations[ab]								
|ΔFE|	1	0.5810	0.1128	−0.0467	−0.1486	−0.1476	0.6277	0.5205
|ΔFD|	0.5004	1	0.0806	−0.0322	0.0634	−0.1171	0.4934	0.5922
ΔAge	0.0741	0.0556	1	−0.0493	−0.0375	−0.1274	0.0402	0.0073
ΔANA	−0.0649	−0.0663	−0.0121	1	−0.0090	0.1034	−0.0306	−0.0211
ΔSURP	−0.1501	−0.0723	0.0035	0.0023	1	0.0060	0.0006	−0.0746
lagSIZE	−0.2966	−0.3287	−0.0728	0.1086	−0.0038	1	−0.1846	−0.1692
lagFE	0.5398	0.4751	0.0465	−0.0540	0.0159	−0.3826	1	0.7908
lagFD	0.4242	0.5425	0.0352	−0.0858	−0.0189	−0.3673	0.5494	1

Note: See Table V for key

Variables[a]	Expected sign	|ΔFE| Coefficient	|ΔFE| t-value	|ΔFD| Coefficient	|ΔFD| t-value
Intercept		0.0075	2.61**	0.0005	0.68
OPC	−	−0.0013	−0.88	−0.0003	−0.87
NCC	−	0.0188	7.26***	0.0029	4.11***
HighTech × CLC	+	0.0018	0.71	0.0014	2.05*
HighTech × OPC	+	0.0069	2.98**	0.0012	1.93&
HighTech × NCC	+	−0.0175	−3.27**	−0.0021	−1.42
ΔAGE	+	0.0001	4.13***	0.0000	3.57***
ΔANA	+	−0.0004	−1.7&	−0.0001	−1.29
ΔSURP	−	−0.0900	−11.69***	0.0039	1.84&
lagSIZE	−	−0.0005	−1.25	0.0000	−0.11
lagFE	−	0.8006	42.55***		
lagFD	−			0.8514	40.01***
Adjusted R^2		0.4435		0.3831	
F-statistic		222.35***		173.53***	

Notes: [a]Variable definition: CLC, a dummy variable equal to 1 if the firm is a CLC firm and 0 if the firm is a NCC or OPC firm; OPC, a dummy variable equal to 1 if the firm is a OPC firm and 0 if the firm is a NCC or CLC firm; HighTech, a dummy variable equal to 1 if the firm is a high-technology firm and 0 if the firm is not a high-technology firm; $|\Delta FE_t|$, the absolute value of the difference between FE in the post- and the pre-Reg. FD period deflated by the price at the beginning of the pre-Reg. FD period; $|\Delta FD_t|$, the absolute value of the difference between FD in the post- and the pre-Reg. FD period deflated by the price at the beginning of the pre-Reg. FD period; ΔAGE_t, the difference in forecast age between the post- and pre-Reg. FD period; ΔANA_t, the difference in the number of followed analysts between the post- and pre-Reg. FD period; $\Delta SURP_t$, the difference in earnings surprise between the post- and pre-Reg. FD period; lagSIZE, the log of market value of equity in the pre-Reg. FD period; lagFE, lagFD, the level of FE or FD in the pre-Reg. FD period; [1]NCC – non-conference call firms; [2]CLC – closed-call firms; [3]OPC – open-call firms; [&]statistically significant at a probability of less than 0.10; *statistically significant at a probability of <0.05; **statistically significant at a probability of <0.01; ***statistically significant at a probability of <0.001

Table VIII.
Regression of the change in analyst forecast attributes

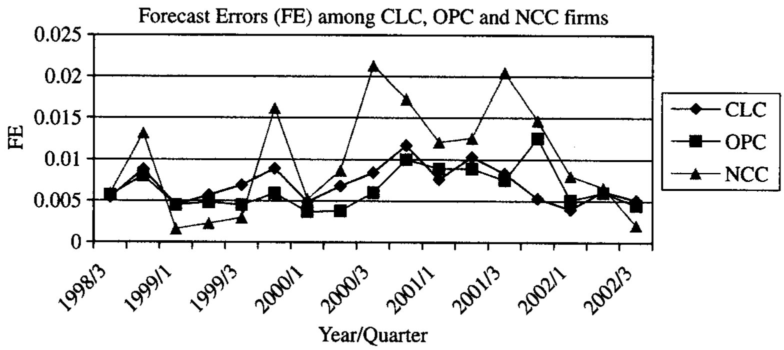

Figure 1.

(before the third quarter of 2000), but generally indistinguishable in the post-Reg. FD period.

The statistical tests performed earlier show that the difference in OPC and CLC means for FE and FD are not statistically significant (when the control variables are

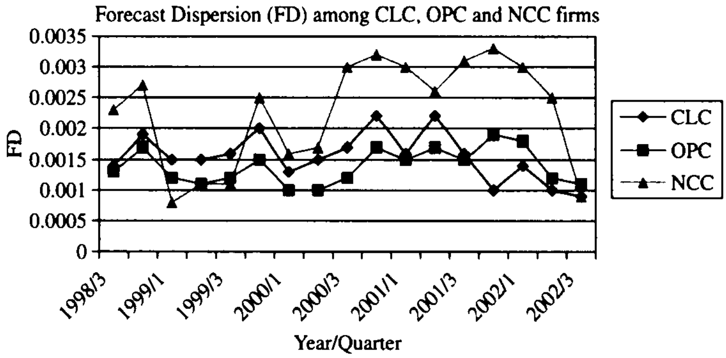

Figure 2.

accounted for) in the post-Reg. FD period. However, CLC firms have statistically significant (and positive) intercepts compared to NCC firms in both pre- and post-Reg. FD periods. This finding indicates that both FE and FD for NCC firms increase relative to those of OPC and CLC firms (both of which held conference calls). Thus, the overall view conveyed is that conference calls continue to be useful in helping analysts to produce accurate forecasts during a period when NCC firms experience a huge jump in earnings FE and FD.

4.5 Additional analysis and robustness tests

It can be argued that FE is another factor which affects FD. To evaluate this possibility, we use a recursive two-stage regression approach by allowing FE to be included as an explanatory variable for the FD equation. The regression results of FE and FD are qualitatively consistent with the previous results without adding FE in the regression of FD.

To evaluate the robustness of these results to possible outliers, we apply four diagnostic tests recommended by Belsley *et al.* (1980):

(1) the diagonal of the projection matrix (Hat matrix);

(2) the studentized residuals (RSYUDENT);

(3) the change in the determinants of the covariance matrix of the estimates (CovRatio); and

(4) the change in the predicted value (DFFITS).

The filters are applied by setting observations exceeding the cutoffs recommended by Belsley *et al.* (1980) to missing values. Qualitatively, the results are the same regardless of whether the outliers are eliminated or not.

5. Conclusion

Prior to the release of Reg. FD, CLC firms were accustomed to disclosing material nonpublic information to certain analysts and institutional investors while not concurrently releasing the information to the general public. There is considerable anecdotal evidence indicating that managers penalize analysts based on the content of their forecasts by limiting or cutting off analysts' future contact with management. Since, voluntary disclosures (e.g. conference calls) put individual investors at a larger informational disadvantage, it has been of concern to the SEC that the effect of selective disclosure is similar to insider trading. The primary purpose of Reg. FD is to curtail analysts' private channels to companies that they had previously enjoyed.

The results of this study are somewhat mixed. On one hand, there is support for the inference that, at least with respect to closing the information gap between analysts privy to the closed conference calls and those not privy to these calls, Reg. FD succeeded in that no statistical difference in earnings FE and FD between the previous-CLC and previous-OPC firms remained in the post-Reg. FD period. Moreover, in the post-Reg. FD period, conference calls continue to lead to lower FE and FD for both previous-OPC and previous-CLC firms, despite a huge jump in the earnings forecast attributes for firms which do not hold conference calls.

Against these favorable findings may be offset the contrary finding that no change in the earnings forecast attributes centered on the actual date of adoption of Reg. FD could be detected. Moreover, the findings reported by Gintschel and Markov (2004) that the informativeness of analysts' information output have declined in the post-Reg. FD period suggests that analysts' forecast attributes may no longer play as vital a role in the capital markets as in the pre-Reg. FD period. To the extent that this was the intent of the SEC in adopting Reg. FD, then the policy may be deemed to be a success[2].

Notes

1. These results are consistent with the findings reported by Shane *et al.* (2001). They provide evidence that analysts gather relatively more uncertainty-relieving information between earnings announcements and by the end of the quarter, their forecasts are as accurate as they were in the prior year. That is to say, the previous-CLC firms may have changed their selective disclosure policy, and Reg. FD may have contributed to the leveling of such information asymmetry.
2. It is not clear what the implication of the findings of Clement and Tse (2003) that investors respond more strongly to the earlier forecasts than to the later forecasts (despite the greater accuracy of the later forecasts) are to the findings reported by Gintschel and Markov (2004). Presumably, analysts forecasts may be more useful when released early that later. The effect of Reg. FD on analyst behavior in terms of earlier or later revisions of forecasts have yet to be examined.

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Appendix. Description of regression equations estimated

Test of first set of hypotheses (H1.1-H1.4)

We use the following two regression models in the cross-sectional tests to test *H1.1-H1.4*, using data for the pre- and the post-Reg. FD period, respectively:

$$\begin{aligned}\mathrm{FE}_{it} = {} & \alpha_0 + \alpha_1\mathrm{CLC}_{it} + \alpha_2\mathrm{OPC}_{it} + \alpha_3(\mathrm{HighTech}\times\mathrm{CLC}) + \alpha_4(\mathrm{HighTech}\times\mathrm{OPC}) \\ & + \alpha_5(\mathrm{HighTech}\times\mathrm{NCC}) + \alpha_6\mathrm{AGE}_{i,t} + \alpha_7\mathrm{ANA}_{i,t} + \alpha_8\mathrm{SURP}_{i,t} + \alpha_9\mathrm{SIZE}_{it} + \varepsilon_{it}\end{aligned} \tag{1}$$

$$\begin{aligned}\mathrm{FD}_{it} = {} & \beta_0 + \beta_1\mathrm{CLC}_{it} + \beta_2\mathrm{OPC}_{it} + \beta_3(\mathrm{HighTech}\times\mathrm{CLC}) + \beta_4(\mathrm{HighTech}\times\mathrm{OPC}) \\ & + \beta_5(\mathrm{HighTech}\times\mathrm{NCC}) + \beta_6\mathrm{AGE}_{i,t} + \beta_7\mathrm{ANA}_{i,t} + \beta_8\mathrm{SURP}_{i,t} + \beta_9\mathrm{SIZE}_{it} + \varepsilon_{it}\end{aligned} \tag{2}$$

where, CLC, a dummy variable equal to 1 if the firm is a CLC firm and 0 if the firm is a NCC or OPC firm; OPC, a dummy variable equal to 1 if the firm is an OPC firm and 0 if the firm is a NCC or CLC firm; NCC, a dummy variable equal to 1 if the firm is a NCC firm and 0 if the firm is an OPC or CLC firm; HighTech, a dummy variable equal to 1 if the firm is a high-technology firm and 0 if the firm is not a high-technology firm; FE_{it}, the absolute difference between actual earnings per share for quarter t less the mean forecast as provided by IBES summary file at the end of the quarter t deflated by the stock price at the beginning of quarter t; FD_{it}, the standard deviation of all analyst forecasts made at the end of the quarter t from the "consensus" (mean) of analysts' forecasts deflated by the stock price at the beginning of quarter t. The consensus forecast used is the last one on the IBES summary tape prior to earnings being reported; AGE_{it}, the number of calendar days between the analyst's forecast date and the date of the actual earnings announcement at quarter t; ANA_{it}, total number of analysts releasing an earnings forecast for the firm i at quarter t; $SURP_{it} = \{EPS_t - EPS_{t-4}\}/P_{t-4}$, a proxy for the difficulty in forecasting earnings, where EPS_t is the primary earnings share (excluding extraordinary items) for quarter t and P_{t-4} is the ending price per share at quarter $t - 4$.; $SIZE_{it}$, the log of market value of equity at the beginning of quarter t.

To evaluate *H1.1*, an F-test of whether $\alpha_1 = \alpha_2$ in equation (1) is performed. Similarly, to evaluate *H1.2*, an F-test of whether $\beta_1 = \beta_2$ in equation (2) is performed. Rejection of the equalities and the relative magnitude of the two parameters would permit us to infer that analyst earnings forecast attributes are different for the previous-CLC firms versus the previous-OPC firms in the post-Reg. FD period. The test of *H1.3* is an F-test of whether $\alpha_1 + \alpha_2 = 0$. Rejection of that equality would provide support for *H1.3*. Similarly, a test of *H1.4* is whether $\beta_1 + \beta_2 = 0$, with its rejection an indication that *H1.4* is supported by the data.

Test of second set of hypotheses (H2.1-H2.4)

To test *H2.1* and *H2.4*, the dependent variables for testing the attributes of analyst earnings forecast are the change in FE and the change in FD. Using changes rather than levels of FE and dispersion mitigates the effect of cross-sectional differences in information environments. The general form of each dependent variable is:

$$\frac{\text{Post-Reg. FD event measure} - \text{Pre-Reg. FD event measure}}{\text{Stock price at Pre-Reg. FD event date}}$$

The pre-Reg. FD event measure component of the dependent variable is the quarterly FE or quarterly FD measured at quarter t before Reg. FD, and the post-Reg. FD event measure component of the dependent variable is the quarterly FE or quarterly FD measured at quarter t after Reg. FD:

$$|\Delta FE| = \left|\frac{FE_{post,it} - FE_{pre,it}}{P_{pre,it}}\right|$$

$$|\Delta FD| = \left|\frac{FD_{post,it} - FD_{pre,it}}{P_{pre,it}}\right|$$

The regressions estimated to evaluate *H2.1* and *H2.4* can be written as follows:

$$\begin{aligned}|\Delta FE_{it}| = {} & \lambda_0 + \lambda_1 OPC_{it} + \lambda_2 NCC_{it} + \lambda_3(\text{HighTech} \times \text{CLC}) \\ & + \lambda_4(\text{HighTech} \times \text{OPC}) + \lambda_5(\text{HighTech} \times \text{NCC}) + \lambda_6 \Delta AGE_{it} + \lambda_7 \Delta ANA_{it} \\ & + \lambda_8 \Delta SURP_{it} + \lambda_9 lagSIZE_{i,pre} + \lambda_{10} lagFE_{i,pre} + \delta_{it}\end{aligned} \quad (3)$$

$$\begin{aligned}|\Delta FD_{it}| = {} & \gamma_0 + \gamma_1 OPC_{it} + \gamma_2 NCC_{it} + \gamma_3(\text{HighTech} \times \text{CLC}) \\ & + \gamma_4(\text{HighTech} \times \text{OPC}) + \gamma_5(\text{HighTech} \times \text{NCC}) + \gamma_6 \Delta AGE_{it} + \gamma_7 \Delta ANA_{it} \\ & + \gamma_8 \Delta SURP_{it} + \gamma_9 lagSIZE_{i,pre} + \gamma_{10} lagFD_{i,pre} + \delta_{it}\end{aligned} \quad (4)$$

where lagSIZE$_{i,\mathrm{pe}}$, the log of market value of equity in the pre-Reg. FD period; lagFE$_{i,\mathrm{pre}}$, the level of FE in the pre-Reg. FD period; lagFD$_{i,\mathrm{pre}}$, the level of FD in the pre-Reg. FD period, and all terms are as defined earlier.

As presented in equations (3) and (4), the CLC effect is captured in the intercept. Thus, to evaluate *H2.1*, the test is whether $\lambda_1 < 0$ in equation (3). This essentially examines whether the change in FE is higher for the firms classified as CLC in the pre-Reg. FD period than that for the OPC firms. If so, then Reg. FD had a more pronounced effect on the firms which previously held closed conference calls. This is exactly the effect that should be expected if Reg. FD had the desired effect.

Similarly, to evaluate *H2.2*, the test is whether $\gamma_1 < 0$ in equation (4). Rejection of the equality with positive coefficients would permit an inference that the absolute change in analyst earnings forecast attributes for the previous-CLC firms was greater than the absolute change for the previous-OPC firms.

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FEATURE ARTICLE

The effect of the SEC's regulation fair disclosure on analyst forecast attributes

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Abstract

Purpose – This study aims to examine the effect of the Securities and Exchange Commission's regulation fair disclosure (Reg. FD) on analyst forecast performance for pre-Reg. FD closed-call (CLC) and open-call (OPC) firms compared with the non-conference-call (NCC) firms in the post-Reg. FD period.

Design/methodology/approach – Specifically, it examines whether Reg. FD influenced the earnings forecast accuracy and forecast dispersion of financial analysts for the previous-CLC firms in the post-Reg. FD period compared with the previous-OPC firms, and both sets of conference call firms relative to the NCC firms in the same period.

Findings – The main findings indicate that forecast accuracy improved for both OPC and CLC firms compared with the NCC firms in the post-Reg. FD period. More importantly, the differences in earnings forecast performance between the pre-Reg. FD OPC and CLC firms had disappeared in the post-Reg. FD period.

Originality/value – These results offer further confirmation of previous findings that Reg. FD has contributed to leveling the playing field for financial analysts and investors.

Keywords Financial institutions, Earnings, Forecasting, Disclosure, Conferencing

Paper type Viewpoint

1. Introduction

On October 23, 2000, the US Securities and Exchange Commission (SEC) issued regulation fair disclosure (hereafter Reg. FD) which prohibits selective disclosure of material nonpublic information to certain financial analysts, institutional investors and others prior to making it available to the general public. Information is considered material if it is important enough to persuade an investor to buy or sell a stock. Before the implementation of Reg. FD, most conference calls were accessible only to certain analysts and institutional investors. It has been argued that conference calls, because they were predominantly closed, may have contributed to an information gap between analysts privy to the call and analysts and other investors excluded from the call. The intent of Reg. FD was to prevent this selective disclosure of information.

A number of published studies have already examined the impact of Reg. FD on various aspects of the capital markets and investment climate, including the effect on

Journal of Financial Regulation and Compliance
Vol. 14 No. 2, 2006
pp. 192-209
© Emerald Group Publishing Limited
1358-1988
DOI 10.1108/13581980610659503

analyst forecast accuracy and dispersion, although the findings have been contradictory. Using data from the first three quarters after the release of Reg. FD, Agarwal and Chadha (2003) report that sell-side analysts' forecasts were less accurate and more dispersed than before its adoption, where Heflin *et al.* (2003) report no change in analysts' earnings forecast bias, accuracy or dispersion compared to the pre-Reg. FD period. Furthermore, Shane *et al.* (2001), also using data from the same period, find that analysts gathered more information between earnings announcements so that their forecasts are ultimately as accurate as those made in the period before Reg. FD was adopted.

This study has two main objectives. The first is to examine if there were changes in analyst earnings forecast errors (FE) and forecast dispersion (FD) in the pre- and post-Reg. FD period between the "closed-call" (henceforth referred to as CLC) firms and "open-call" (OPC) firms. The second objective is to determine if there were any changes in analyst earnings forecast attributes between the CLC and OPC firms as a group (labeled CC – conference call firms), and the non-conference-call (NCC) firms in the post-Reg. FD environment.

Thus, this study contributes to the existing literature by differentiating between firms in the pre-Reg. FD period that held closed conference calls, firms that held open conference calls, and other firms which held NCCs. By limiting the study only to OPC and NCC firms in the post-Reg. FD period, we are able to control for extraneous factors such as changing group membership in our analyses. Second, because the study covers the period from October 1998 to September 2002, more quarterly observations are available to conduct the tests than in previous research.

The remainder of this study is organized as follows. Section 2 presents a brief summary of previous studies focused on only the main sources, and an outline of the hypotheses examined in the paper. Section 3 describes the sample selection and a brief outline of our research methodology. Section 4 presents the major results of the study. Section 5 presents the conclusions and suggestions for future research. In the Appendix, we provide details on the research methodology and the regression equations used to analyze the data.

2. Literature review and hypothesis development

2.1 Brief review

Economic theory suggests that expanded disclosures can reduce information asymmetry arising between the firm and its shareholders or among potential buyers and sellers of firm shares and benefit firms by correcting any firm mis-valuation and increasing institutional interest and liquidity for the firm's stock. For example, Diamond and Verrecchia (1991) find that credible commitments by managers to improve disclosure increasing the precision of public information about firm value results in higher current stock prices due to reduced information asymmetry and increased liquidity. Frankel *et al.* (1999) provide evidence that firms holding conference calls as a voluntary disclosure medium tend to be relatively larger, more profitable, more heavily followed by analysts, and access the capital markets more often than other firms.

In other related findings, Bowen *et al.* (2002) provide evidence that regular use of earnings-related conference calls could present a selective disclosure problem if the public is not privy to these calls, even if conference calls tend to reduce both FE and FD. Bushee and Noe (2000) find that firms with greater analyst following and greater institutional ownership are less likely to have conference calls that provide open access to all investors. Core (2001) presents evidence consistent with the intuition that informed investors prefer less disclosure, and that analysts and institutions produce information that reduces information asymmetry and the need for conference calls.

As cited previously, some of the research focused on the effect of Reg. FD on financial analyst behavior have yielded mixed results. In general, however, the majority of these studies conclude that Reg. FD has had the intended benefit of diminishing the information advantage of analysts with previously exclusive access to management, although some anecdotal stories in the press still hint at the continued exclusive disclosure of material non-public information (*Wall Street Journal*, 2004). Interested readers can contact the lead author for a more detailed reference list.

2.2 Expected effects of Reg. FD on analysts forecast performance and related stock market

The arguments surrounding Reg. FD revolve around two major themes:

(1) its potential to level the playing field for all investors; and
(2) its potential to increase the cost of capital by restricting the availability of information to investors.

The first of these themes relies on the rationale that, by providing equal access to firm information, Reg. FD can reduce the level of information asymmetry, leading stock prices to be less dependent on private information. This logic implies that any loss of accuracy in earnings forecasts by analysts would be offset by the wider dissemination of information and hence, a more informed general investor population. In addition, Reg. FD may enhance the accuracy and precision of analysts' earnings forecasts, if it succeeded in opening up new sources of information to analysts, or if analysts could substitute the information obtained directly from companies with the information gathered from customers, suppliers, competitor's industry observers, and other sources of information. That is consistent with Mohanram and Sunder's (2006) finding, analysts may substitute privately acquired information for public-disclosed information for firms after the enactment of Reg. FD.

The counter-argument relies on the possibility that Reg. FD could have an adverse effect on certain analysts' forecast accuracy through denying them the sometimes-exclusive access to management that they previously enjoyed. Given the important role of financial analysts as intermediaries who provide professional investment to the capital markets, the decreased accuracy may have deleterious capital market consequences. In addition, it has been argued that Reg. FD induce firms to reduce the level of information and guidance that they may have provided originally in the closed conference calls, but which they may be unwilling to impart in open conference calls.

Recently, Bushee *et al.* (2004) find that Reg. FD had a significantly negative impact on managers' decisions to continue hosting conference calls even though this impact was not large. Hence, the level of specialty guidance may have decreased in the post-Reg. FD period. At the same time, Gintschel and Markov (2004) report that the informativeness of analysts output has dropped in the post-FD environment.

Specifically, they found that the absolute price impact of information disseminated by financial analysts dropped by 28 percent in this period. Eleswarapu *et al.* (2004) also report that the return volatility around mandatory announcements had decreased, and the impact was more pronounced for smaller and less liquid stocks. Taken together, these results suggest a strong impact of Reg. FD on the functioning of capital markets.

2.3 Hypothesis development

Extant studies assume that public information is common across all analysts and private information is idiosyncratic and uncorrelated across analysts. They have used FE and FD as proxies for analyst forecast attributes. Both FE and FD capture the extent to which private information differs across analysts, which also represents the level of actual past selective disclosure. For instance, Barron *et al.* (1998) present a model that expresses two properties of their forecasts, proxied by both dispersion in individual forecasts and the squared error in the mean forecast, as functions of the amount or "precision" of analysts' public and private information in forecasting firms' earnings. Sunder (2001) further find that "restricted-call" firms faced higher information asymmetry compared to "open-call" firms in the pre-Reg. FD period, while in the post-Reg. FD period, the differences in information asymmetry between two groups do not persist.

In summary, analysts should make more FE for OPC firms than for CLC firms if open conference calls do not provide as much information as closed conference calls. The first objective of Reg. FD was to level the playing field among all investors and analysts with respect to access to corporate information. If this objective were achieved with the implementation of Reg. FD, then one observable effect should be no difference in analysts' earnings forecast attributes between the previous-OPC and previous-CLC firms. This line of reasoning leads to the following set of hypotheses (stated in null form):

$H_01.1$. Analysts' quarterly earnings FE for the previous-CLC firms are not significantly different from those for the previous-OPC firms in the post-Reg. FD period (i.e. $FE^{CLC}_{POST} \approx FE^{OPC}_{POST}$).

$H_01.2$. Analysts' quarterly earnings FD for the previous-CLC firms is not significantly different from that for the previous-OPC firms in the post-Reg. FD period (i.e. $FD^{CLC}_{POST} \approx FD^{OPC}_{POST}$).

Using the same line of reasoning, it can be argued that the earnings FE and FD of NCC firms should be greater than those of both CLC and OPC firms (if they remained conference call firms) in the post-Reg. FD period. In other words, Reg. FD's exclusive effect should be on closing the information gap between the OPC and CLC firms, but should have no effect on the greater informativeness of conference calls as a means of communicating more information to investors (as demonstrated by prior research). This leads to the following set of hypotheses (in alternative form):

$H_a1.3$. Analysts' quarterly earnings FE for NCC firms are significantly greater than those for both previous-CLC and OPC firms in the post-Reg. FD period (i.e. $FE^{NCC}_{POST} > (FE^{CLC}_{POST}, FE^{OPC}_{POST})$).

H_a 1.4. Analysts' quarterly earnings FD for NCC firms is significantly greater than that for both previous-CLC and OPC firms in the post-Reg. FD period (i.e. $FD_{POST}^{NCC} > (FD_{POST}^{CLC}, FD_{POST}^{OPC})$).

In addition to the effects hypothesized above, the effectiveness of Reg. FD can be further evaluated by its effect on changes in the forecast attributes. That is, if the equality of the earnings forecast attributes between the CLC and OPC firms in the post-Reg. FD period is to be attributed to the adoption of Reg. FD, then the change in the forecast attributes from the pre- to the post-FD period should reflect this. So the absolute change in both FE and FD for the previous-CLC firms should be bigger than those for the OPC firms. These hypotheses can be stated in alternative form as follows:

H_a2.1. The absolute change in analysts' quarterly earnings FE for the previous-CLC firms is significantly higher than that for the previous-OPC firms in the post-Reg. FD period (i.e. $|\Delta FE^{CLC}| > |\Delta FE^{OPC}|$).

H_a 2.2. The absolute change in analysts' quarterly earnings FD for the previous-CLC firms is significantly higher than that for the previous-OPC firms in the post-Reg. FD period (i.e. $|\Delta FD^{CLC}| > |\Delta FD^{OPC}|$).

3. Brief description of research methodology

3.1 Sample selection

Following the Bushee *et al.* (2003) approach, firms on the Bestcalls.com list are considered to be "open-call" firms (i.e. calls that allow unlimited real time access), while the firms provided by First Call Corporation but not included on the Bestcalls.com list are considered to be "closed-call" firms (i.e. calls that restrict access to invited professionals) in the pre-Reg. FD period. According to Bowen *et al.* (2002, p. 286, footnote 1), Bestcalls.com launched a web site in March 1999 publicizing the dates and times of conference calls open to individual investors. However, some firms did not allow individuals access to their calls. Meanwhile, other firms began live broadcasts of their conference calls using internet web casts. So it is reasonable to assume that after March 1999, all firms on the Bestcalls.com list had OPCs. Therefore, we divide the samples into three groups, OPC, CLC and NCC (where no disclosures are made via conference calls) firms in the pre-Reg. FD period. More specifically, the firms listed by the Bestcalls.com are regarded as OPC firms, while the firms listed by First Call Corporation but not included in the Bestcalls.com list are regarded as CLC firms. Firms listed in CRSP and the I/B/E/S databases but not included in either Bestcalls.com or First Call Corporation lists are regarded as pre-NCC firms.

To obtain better control of extraneous factors, the sample is restricted to firms which retained their status in both pre- and post-Reg. FD environments. We exclude firms that Bestcalls.com lists as NCC firms, as well as NCC firms now listed as CC firms. The analyst forecast data used are obtained from I/B/E/S database, and earnings announcement dates and other control variables from quarterly Compustat data sets. To ensure the meaningful computation of dispersion, the minimum number of analysts following a firm is set to four. All firms are required to have non-missing quarterly I/B/E/S forecast data during the period of October 1998 through September 2002 and non-missing quarterly Compustat data. After applying this screening process, the surviving sample consists of 1,697 firms (521 OPC, 990 CLC, and 186 NCC firms).

The total final sample consists of 12,806 firm-quarter observations in the pre-Reg. FD period, and 13,104 firm-quarter observations in the post-Reg. FD period.

3.2 Research methodology
Empirical accounting research frequently utilizes the properties of analyst forecasts, such as accuracy, dispersion, bias, etc. to construct proxies for variables of interest. For instance, FD and errors in the mean forecast are used to proxy for the uncertainty or the degree of consensus among analysts or market expectations. Based on prior research, we estimated the effect of Reg. FD on analysts' forecast attributes by running a series of regression equations. Technical details on the regressions estimated are provided in Appendix. The description below is a brief summary of the approach used in the paper.

To control for factors that have been shown in prior research to be highly related to the levels of analyst FE and FD, we include in our regressions proxies measures for firm size, industry effect, earnings predictability, earnings surprise, and age of the forecast. Firm size and the level of FE or the level of FD are proxies for the richness of the firm's information environment. The ability of analysts to forecast the current quarter's earnings depends on both earnings surprise in the prior quarter and any information disclosed during the conference call. Forecast age is also an important determinant of forecast accuracy.

We estimate two regression equations, with the dependent variable in the first equation the absolute FE, and in the second equation, the FD. The independent variables in both equations include the dummy variables to represent the CLC and OPC firms, interaction terms to control for the presence of high-technology firms in the sample, forecast age (AGE), the number of analysts which follow a given firm (ANA), the size of earnings surprise in the previously released quarterly earnings (SURP), and firm size (SIZE).

The interaction terms for high-technology firms are designed to evaluate whether forecast attributes are consistently different for firms in the high technology sector. Barron *et al.* (2002) find that lower levels of analyst consensus are associated with high-tech firms because of their relatively high R&D expenditures. Therefore, a significantly positive coefficient on HighTech is consistent with the belief that analysts make more FE and dispersion for high-technology firms due to a higher information asymmetry as compared to non-high-technology firms.

4. Empirical results

4.1 Descriptive statistics
Tables I-III present some descriptive statistics on the post-Reg. FD period variables. Panel A reveals that both the mean and the median of analyst FE for NCC firms are greater than those for CLC and OPC firms in the post-Reg. FD period. Also the median of FD for NCC firms is greater than the median for both OPC and CLC firms in the post-Reg. FD period. Panel B presents the significant difference in means of FE and FD using statistical tests for the differences (specifically, Scheffe's tests and *t*-tests) in the post-Reg. FD period.

The first part of panel B shows that the means of OPC and CLC firms are not statistically different (at the 0.05 probability level), whereas the means for the other two groups, NCC and OPC, NCC and CLC are significantly different in the post-Reg. FD period. On the other hand, the second part of panel B shows the means between

	CLC firms	OPC firms	NCC firms
Descriptive statistics [a]			
FE			
Mean	0.0109	0.0202	0.0254
Median	0.0019	0.0021	0.0024
Std. deviation	0.0561	0.3335	0.1513
FD			
Mean	0.0032	0.0085	0.0065
Median	0.0008	0.0008	0.0009
Std. deviation	0.0183	0.2166	0.0412
AGE			
Mean	60.8104	61.9091	59.6318
Median	61.0000	63.0000	59.0000
Std. deviation	32.2772	31.7771	32.3843
ANA			
Mean	8.1587	9.7380	8.2127
Median	7.0000	8.0000	7.0000
Std. deviation	4.7847	6.1128	4.3793
SURP			
Mean	−0.0029	−0.0055	−0.0041
Median	−0.0007	−0.0016	−0.0009
Std. deviation	0.0396	0.0454	0.1156
SIZE			
Mean	7.3864	7.6700	7.2287
Median	7.2105	7.5224	7.3333
Std. deviation	1.6543	1.6927	1.5248

Notes: [a]Variables definitions: FE_{it} = absolute difference between actual earnings per share for quarter t less the mean forecast as provided by IBES summary file at the end of the quarter t deflated by the stock price at the beginning of quarter t. FD_{it} = standard deviation of all analyst forecasts made at the end of the quarter t from the "consensus" (mean) of analysts' forecasts deflated by the stock price at the beginning of quarter t. $AGE_{i,t}$ = the number of calendar days between the analyst's forecast date and the date of the actual earnings announcement at quarter t. $ANA_{i,t}$ = the total number of analysts releasing an earnings forecast for the firm i at quarter t. $SURP_{it} = \{EPS_t - EPS_{t-4}\}/P_{t-4}$, where EPS_t is the primary earnings share (excluding extraordinary items) for quarter t and P_{t-4} is the ending price per share at quarter $t-4$. $SIZE_{it}$ = the log of market value of equity at the beginning of quarter t.
[b]All correlations are significant at the 0.001 level or better except for the correlation between SURP and ANA, and ANA and AGE, which are not significant at conventional levels.
[c]Above of the table is the Pearson correlation coefficients and the below is the Spearman correlation coefficients.
[1]NCC – non-conference call firms; [2] CLC – closed-call firms; [3] OPC – open-call firms.
& = Statistically significant at a probability of less than 0.10;
* = Statistically significant at a probability of less than 0.05;
** = Statistically significant at a probability of less than 0.01;
*** = Statistically significant at a probability of less than 0.001

Table I. Univariate tests on analysts forecast attributes and other variables after Reg. FD: Panel A

NCC and CC, and between CLC and OPC in the post-Reg. FD period are statistically different. All the t-values are significant for each comparison except for the comparison of FD between NCC and CC in the post-Reg. FD period. These preliminary results are generally consistent with *H1.1-H1.4*.

Panel C presents correlation coefficients (both the Pearson product-moment and Spearman rank-order correlations) between analyst forecast attributes and their determinants in the post-Reg. FD period. All the correlation coefficients have signs consistent with those expected for the regression coefficients and all are significant except for the correlation coefficient between the number of analysts following (ANA) and forecast age (AGE), and between ANA and earnings surprise (SURP). The correlation coefficients between the number of analysts following (ANA) and the firm size (SIZE) is the highest among all coefficients, which is consistent with the previous research findings that large firms usually have a large group of analysts following regardless of the implementation of Reg. FD.

4.2 Regression results

Table IV presents the results of regressing analyst FE and FD in the pre- and post-Reg. FD periods by using equations (1) and (2). As expected, the coefficients of two dummy variables, CLC and OPC, are significantly negative. Moreover, the coefficients of CLC are greater than the coefficients of OPC for both regressions of FE and FD in both pre- and post-Reg. FD periods. Also as expected, forecast age (AGE), the number of forecasts (ANA) and high-tech firms (HighTech) are positively associated with FE and FD, while earnings surprise (SURP) and firm size (SIZE) are negatively associated with FE and FD.

Focusing on the tests of *H1-H4*, the results in Table IV (PRE period) indicate that conference calls did provide additional information to financial analysts, with both OPC and CLC firms having fewer earnings FE than NCC firms prior to the

Table II. Univariate tests on analysts forecast attributes and other variables after Reg. FD: Panel B

Tests	Group/Variables[a]	FE	FD
Scheffe's tests and Satterthwaite unequal variance t-tests for OPC[3], CLC[2] and NCC[1] firms			
Scheffe's test – Difference in means	NCC[1] – CLC[2]	0.0224*	0.0057*
	NCC[1] – OPC[3]	0.0224*	0.0062*
	CLC[2] – OPC[3]	−0.0001	0.0005
T-test among 3 groups: *t* value	NCC[1] – (CLC[2] + OPC[3])	4.43***	1.47
	CLC[2] – OPC[3]	4.18***	3.71***

Note: See Table I for key

Table III. Univariate tests on analysts forecast attributes and other variables after Reg. FD: Panel C

Variables[a]	FE	FD	AGE	ANA	SURP	SIZE
Correlations between forecast attributes and other variables[bc]						
FE	1	0.7646	0.0620	−0.0329	−0.1510	−0.1749
FD	0.6123	1	0.0253	−0.0405	0.0415	−0.1706
Age	0.1422	0.0151	1	0.0108	−0.0191	0.0228
ANA	−0.1604	−0.1827	0.0526	1	−0.0196	0.5160
SURP	−0.3063	−0.1450	−0.0170	−0.0012	1	−0.0020
Size	−0.3806	−0.4391	0.0233	0.5003	0.0381	1

Note: See Table I for key

Table IV.
Regression of analyst FE and dispersion on both pre- and post-Reg. FD variables

Regression of FE and FD		Among NCC, CLC and OPC firms							
		Before Reg. FD (PRE)				After Reg. FD (POST)			
		FE		FD		FE		FD	
Variables[a]	Expected sign	Coefficient	*t*-value	Coefficient	*t*-value	Coefficient	*t*-value	Coefficient	*t*-value
Intercept		0.0169	56.49***	0.0049	59.16***	0.0877	31.26***	0.0203	30.08***
CLC	–	*– 0.0006*	*– 2.34* *	*– 0.0004*	– 6.05***	– 0.0225	– 12.09***	– 0.0045	– 10.09***
OPC	–	*– 0.0011*	*– 4.09* ***	*– 0.0005*	*– 7.02* ***	*– 0.0232*	*– 11.72* ***	*– 0.0046*	*– 9.67* ***
HighTech × CLC	+	– 0.0004	– 2.71**	– 0.0004	– 9.1***	0.0121	6.43***	0.0025	5.54***
HighTech × OPC	+	0.0016	11.9***	0.0002	5.32***	0.0127	7***	0.0016	3.66***
HighTech × NCC	+	0.0019	3.31***	– 0.0003	– 1.72&	– 0.0077	– 2.39*	0.0029	3.81***
AGE	+	0.0001	29.38***	0.0001	6.56***	0.0001	9.89***	0.0000	4.37***
ANA	+	0.0001	5.82***	0.0001	7.34***	0.0010	8.95***	0.0002	7.82***
SURP	–	– 0.0366	– 35.5***	– 0.0022	– 7.71***	– 0.2127	– 24.14***	0.0145	6.83***
SIZE	–	– 0.0018	– 74.74***	– 0.0005	– 66.51***	– 0.0097	– 28.82***	– 0.0022	– 26.81***
Adjusted R^2		0.1294		0.0847		0.0697		0.0434	
F-statistic		1,038.41***		647.11***		213.36***		129.65***	
F-test ($\alpha_1 = \alpha_2, \beta_1 = \beta_2$)		*31.73* ***		*11.28* ***		*0.37*		*0.11*	

Notes: [a]Variables definitions: FE_{it}, absolute difference between actual earnings per share for quarter t less the mean forecast as provided by IBES summary file at the end of the quarter t deflated by the stock price at the beginning of quarter t; FD_{it}, standard deviation of all analyst forecasts made at the end of the quarter t from the "consensus" (mean) of analysts' forecasts deflated by the stock price at the beginning of quarter t; $AGE_{i,t}$, the number of calendar days between the analyst's forecast date and the date of the actual earnings announcement at quarter t; $ANA_{i,t}$, the total number of analysts releasing an earnings forecast for the firm i at quarter t; $SURP_{it} = \{EPS_t - EPS_{t-4}\}/P_{t-4}$, where EPS_t is the primary earnings share (excluding extraordinary items) for quarter t and P_{t-4} is the ending price per share at quarter $t - 4$; $SIZE_{it}$, the log of market value of equity at the beginning of quarter t; [b]all correlations are significant at the 0.001 level or better except for the correlation between SURP and ANA which is not significant at conventional levels; [c]above of the table is the Pearson correlation coefficients and the below is the Spearman correlation coefficients; [1]NCC – non-conference call firms; [2]CLC – closed-call firms; [3]OPC – open-call firms; [&]statistically significant at a probability of < 0.10; [*]statistically significant at a probability of < 0.05; [**]statistically significant at a probability of < 0.01; [***]statistically significant at a probability of < 0.001

implementation of Reg. FD. This conclusion can be drawn from the differences in the values of the intercepts terms for the NCC and CLC dummy variables. The intercept of the regression of FE in the pre-Reg. FD period is 0.0169 for NCC firms, 0.0163 (i.e. 0.0169 − 0.0006) for CLC firms, and 0.0158 (i.e. 0.0169 − 0.0011) for OPC firms. The intercept of the regression of FD in the pre-Reg. FD period is 0.0049 for NCC firms, 0.0045 (i.e. 0.0049 − 0.0004) for CLC firms, and 0.0044 (i.e. 0.0049 − 0.0005) for OPC firms.

Further examination of the regressions results in Table IV (POST period) supports the inference that analysts still made more FE and had higher FD for the NCC firms as compared to the OPC and CLC firms after the release of Reg. FD. In the post-Reg. FD period, the intercept of the regression of FE is 0.0877 for NCC firms, 0.0652 (i.e. 0.0877 − 0.0225) for CLC firms, and 0.0645 (i.e. 0.0877 − 0.0232) for OPC firms. The intercept of the regression of FD in the post-Reg. FD period is 0.0203 for NCC firms, 0.0158 (i.e. 0.0203 − 0.0045) for CLC firms, and 0.0157 (i.e. 0.0203 − 0.0046) for OPC firms.

To determine if Reg. FD has any impact on analysts FE, it is necessary to compare the coefficients across CLC and OPC firms within each period which can be done using the standard *F*-test. The *F*-tests performed show that the observed differences between the coefficients of interest (α_1 and α_2 in equation (1) and β_1 and β_2 in equation (2) in the Appendix) support the hypotheses presented earlier. In the pre-Reg. FD period, the *F*-value for FE (FD) is 31.73 (11.28), and the *p*-value is significant at the 0.001 level. Thus, these two null hypotheses that $\alpha_1 = \alpha_2$, and $\beta_1 = \beta_2$ can both be rejected. However, in the post-Reg. FD period, the *F*-value for FE (FD) is 0.37 (0.11) with an insignificant probability level. Thus, the null hypotheses that $\alpha_1 = \alpha_2$ in equation (1) and $\beta_1 = \beta_2$ in equation (2) cannot be rejected.

In summary, there are observable differences in the regression coefficients between CLC and OPC firms in the PRE period, and these statistically significant differences in coefficients disappear in the POST period. These results thus support both *H1.1* and *H1.2*, and provide evidence that differences in analyst forecast performance between the previous-CLC and previous-OPC firms do not persist after Reg. FD went into effect[1].

4.3 Univariate analyses of change in analyst forecast attributes

Tables V-VII present some descriptive statistics on the absolute change in analyst FE ($|\Delta FE|$) and FD ($|\Delta FD|$). From panel A, it can be observed that the means of $|\Delta FE|$ and $|\Delta FD|$ for CLC firms are smaller than those for OPC firms. Panel B presents the significant difference in means of the absolute change in FE and FD using both Scheffe's tests and the pairwise *t*-tests.

The results from Scheffe's tests show the comparisons in means are significantly different at the 0.05 level among three groups except for one comparison, $|\Delta FE|$ between CLC and OPC firms. At the same time, the results from the *t*-tests show that there is no significant difference in mean levels of $|\Delta FE|$ or $|\Delta FD|$ for the comparison between NCC and CC (including CLC and OPC firms) firms and the comparison between CLC and OPC firms. Panel C presents the Pearson and Spearman correlation coefficients between the absolute change in analyst forecast attributes and their determinants.

Statistics	CLC firms	OPC firms	NCC firms
Descriptive statistics[a]			
|ΔFE|			
Mean	0.0113	0.0199	0.0318
Median	0.0021	0.0023	0.0024
Std. deviation	0.0477	0.4281	0.2186
|ΔFD|			
Mean	0.0027	0.0069	0.0087
Median	0.0005	0.0005	0.0007
Std. deviation	0.0129	0.2061	0.0744
ΔAGE			
Mean	1.1795	1.3668	8.0495
Median	−1.0000	−1.0000	−1.0000
Std. deviation	46.5676	45.8835	53.9615
ΔANA			
Mean	1.5168	2.0406	1.1011
Median	1.0000	1.0000	0.0000
Std. deviation	4.8651	5.4807	4.6420
ΔSURP			
Mean	−0.0062	−0.0134	−0.0048
Median	−0.0031	−0.0029	−0.0018
Std. deviation	0.0596	0.0909	0.1276
lagSIZE			
Mean	7.3170	7.6682	7.1224
Median	7.1327	7.5000	7.1416
Std. deviation	1.6198	1.7113	1.4797
lagFE			
Mean	0.0086	0.0083	0.0132
Median	0.0016	0.0017	0.0020
Std. deviation	0.0451	0.0349	0.0474
lagFD			
Mean	0.0021	0.0020	0.0035
Median	0.0007	0.0006	0.0009
Std. deviation	0.0093	0.0098	0.0167

Notes: [a]Variable definition: CLC = a dummy variable equal to 1 if the firm is a CLC firm and 0 if the firm is a NCC or OPC firm. $|\Delta FE_t|$=the absolute value of the difference between forecast errors in the post- and the pre-Reg. FD period deflated by the price at the beginning of the pre-Reg. FD period. $|\Delta FD_t|$ = the absolute value of the difference between forecast dispersion in the post- and the pre-Reg. FD period deflated by the price at the beginning of the pre-Reg. FD period. ΔAGE_t = the difference in forecast age between the post- and pre-Reg. FD period. ΔANA_t = the difference in the number of followed analysts between the post- and pre-Reg. FD period. $\Delta SURP_t$ = the difference in earnings surprise between the post- and pre-Reg. FD period. lagSIZE = the log of market value of equity in the pre-Reg. FD period. lagFE, lagFD = the level of forecast error or forecast dispersion in the pre-Reg. FD period.

[b]Above the table is the Pearson correlation coefficients and the below is the Spearman correlation coefficients. All correlations are significant at the 0.001 level or better except for the correlations between ΔSURP and ΔANA, ΔSURP and ΔAGE, ΔAGE and lagFE, and ΔSURP and lagSIZE, which are not significant at conventional levels.

[1]NCC – non-conference call firms;

[2]CLC – closed-call firms;

[3] OPC – open-call firms.

& = Statistically significant at a probability of less than 0.10;

* = Statistically significant at a probability of less than 0.05;

** = Statistically significant at a probability of less than 0.01;

*** = Statistically significant at a probability of less than 0.001

Table V.
Univariate tests on the change in analysts forecast attributes: Panel A

4.4 Regression results for change in analyst forecast attributes

Table VIII presents the regression results obtained when the absolute changes in analyst quarterly FE (|ΔFE|) and FD (|ΔFD|) are regressed on the hypothesized independent variables (as presented in equations (3) and (4) in Appendix). The sign of coefficients on the dummy variable, OPC, for both regressions of |ΔFE| and |ΔFD| is not significant, a result which contradicts *H2.1* and *H2.2*. In addition, the sign of coefficients on the dummy variable, NCC, is significantly positive for both regressions of |ΔFE| and |ΔFD|.

Because we adopt October 23, 2000 as the boundary between the pre-Reg. FD period and the post-period, it is possible that the failure to support *H2.1* and *H2.2* may be due to the choice of the cut-off date. Previous research by Mac (2003) finds that firms had already changed their voluntary disclosure policy in the pre-enactment period (December 20, 1999-October 22, 2000), before Reg. FD became effective on October 23, 2000. Thus, if some firms in the sample have already changed their voluntary disclosure policy prior to the release of Reg. FD because they anticipate the passage of Reg. FD, the tests may not be sufficiently powerful.

Figures 1 and 2 show the graph of the means of FE and FD among three groups, CLC, OPC and NCC firms, from the third quarter of 1998 to the third quarter of 2002. Both Figures 1 and 2 show that FE and FD for NCC firms are higher than those for both OPC and CLC firms in both pre- and post-Reg. FD periods. However, the means of FE (FD) for CLC firms are greater than those for OPC firms in the pre-Reg. FD period

Table VI. Univariate tests on the change in analysts forecast attributes: Panel B

Tests[a]	Group/Variables[a]	|ΔFE[a]|	|ΔFD[b]|
Test of difference in means of ΔFE and ΔFD – Scheffe's tests and Satterthwaite unequal variance T-tests			
1. Scheffe's Tests – Difference between Means	NCC[1] – CLC[2]	0.158*	0.0046*
	NCC[1] – OPC[3]	0.0163*	0.005*
	CLC[2] – OPC[3]	0.0005	0.0004
2. *T* tests – *t* value	NCC[1] – (CLC[2] + OPC[3])	1.62	1.18
	CLC[2] – OPC[3]	1.02	1.03

Note: See Table V for key

Table VII. Univariate tests on the change in analysts forecast attributes: Panel C

	|ΔFE|	|ΔFD|	ΔAge	ΔANA	ΔSURP	lagSIZE	lagFE	lagFD
Correlations[ab]								
|ΔFE|	1	0.5810	0.1128	−0.0467	−0.1486	−0.1476	0.6277	0.5205
|ΔFD|	0.5004	1	0.0806	−0.0322	0.0634	−0.1171	0.4934	0.5922
ΔAge	0.0741	0.0556	1	−0.0493	−0.0375	−0.1274	0.0402	0.0073
ΔANA	−0.0649	−0.0663	−0.0121	1	−0.0090	0.1034	−0.0306	−0.0211
ΔSURP	−0.1501	−0.0723	0.0035	0.0023	1	0.0060	0.0006	−0.0746
lagSIZE	−0.2966	−0.3287	−0.0728	0.1086	−0.0038	1	−0.1846	−0.1692
lagFE	0.5398	0.4751	0.0465	−0.0540	0.0159	−0.3826	1	0.7908
lagFD	0.4242	0.5425	0.0352	−0.0858	−0.0189	−0.3673	0.5494	1

Note: See Table V for key

Variables[a]	Expected sign	|ΔFE| Coefficient	|ΔFE| t-value	|ΔFD| Coefficient	|ΔFD| t-value
Intercept		0.0075	2.61**	0.0005	0.68
OPC	−	−0.0013	−0.88	−0.0003	−0.87
NCC	−	0.0188	7.26***	0.0029	4.11***
HighTech × CLC	+	0.0018	0.71	0.0014	2.05*
HighTech × OPC	+	0.0069	2.98**	0.0012	1.93&
HighTech × NCC	+	−0.0175	−3.27**	−0.0021	−1.42
ΔAGE	+	0.0001	4.13***	0.0000	3.57***
ΔANA	+	−0.0004	−1.7&	−0.0001	−1.29
ΔSURP	−	−0.0900	−11.69***	0.0039	1.84&
lagSIZE	−	−0.0005	−1.25	0.0000	−0.11
lagFE	−	0.8006	42.55***		
lagFD	−			0.8514	40.01***
Adjusted R^2		0.4435		0.3831	
F-statistic		222.35***		173.53***	

Notes: [a]Variable definition: CLC, a dummy variable equal to 1 if the firm is a CLC firm and 0 if the firm is a NCC or OPC firm; OPC, a dummy variable equal to 1 if the firm is a OPC firm and 0 if the firm is a NCC or CLC firm; HighTech, a dummy variable equal to 1 if the firm is a high-technology firm and 0 if the firm is not a high-technology firm; $|\Delta FE_t|$, the absolute value of the difference between FE in the post- and the pre-Reg. FD period deflated by the price at the beginning of the pre-Reg. FD period; $|\Delta FD_t|$, the absolute value of the difference between FD in the post- and the pre-Reg. FD period deflated by the price at the beginning of the pre-Reg. FD period; ΔAGE_t, the difference in forecast age between the post- and pre-Reg. FD period; ΔANA_t, the difference in the number of followed analysts between the post- and pre-Reg. FD period; $\Delta SURP_t$, the difference in earnings surprise between the post- and pre-Reg. FD period; lagSIZE, the log of market value of equity in the pre-Reg. FD period; lagFE, lagFD, the level of FE or FD in the pre-Reg. FD period; [1]NCC – non-conference call firms; [2]CLC – closed-call firms; [3]OPC – open-call firms; [&]statistically significant at a probability of less than 0.10; [*]statistically significant at a probability of <0.05; [**]statistically significant at a probability of <0.01; [***]statistically significant at a probability of <0.001

Table VIII. Regression of the change in analyst forecast attributes

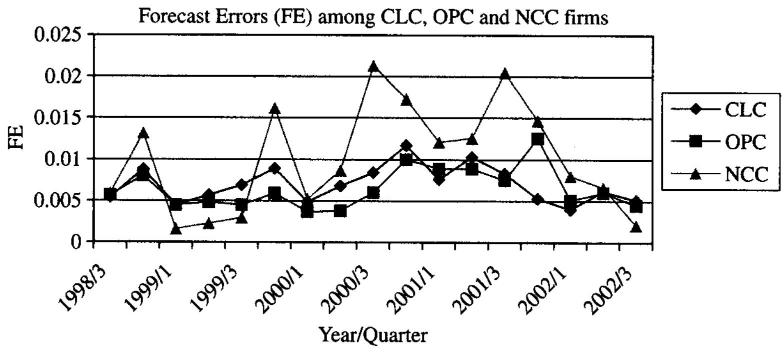

Figure 1.

(before the third quarter of 2000), but generally indistinguishable in the post-Reg. FD period.

The statistical tests performed earlier show that the difference in OPC and CLC means for FE and FD are not statistically significant (when the control variables are

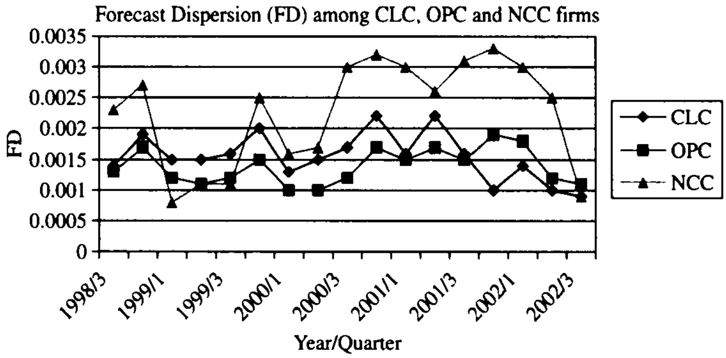

Figure 2.

accounted for) in the post-Reg. FD period. However, CLC firms have statistically significant (and positive) intercepts compared to NCC firms in both pre- and post-Reg. FD periods. This finding indicates that both FE and FD for NCC firms increase relative to those of OPC and CLC firms (both of which held conference calls). Thus, the overall view conveyed is that conference calls continue to be useful in helping analysts to produce accurate forecasts during a period when NCC firms experience a huge jump in earnings FE and FD.

4.5 Additional analysis and robustness tests

It can be argued that FE is another factor which affects FD. To evaluate this possibility, we use a recursive two-stage regression approach by allowing FE to be included as an explanatory variable for the FD equation. The regression results of FE and FD are qualitatively consistent with the previous results without adding FE in the regression of FD.

To evaluate the robustness of these results to possible outliers, we apply four diagnostic tests recommended by Belsley *et al.* (1980):

(1) the diagonal of the projection matrix (Hat matrix);

(2) the studentized residuals (RSYUDENT);

(3) the change in the determinants of the covariance matrix of the estimates (CovRatio); and

(4) the change in the predicted value (DFFITS).

The filters are applied by setting observations exceeding the cutoffs recommended by Belsley *et al.* (1980) to missing values. Qualitatively, the results are the same regardless of whether the outliers are eliminated or not.

5. Conclusion

Prior to the release of Reg. FD, CLC firms were accustomed to disclosing material nonpublic information to certain analysts and institutional investors while not concurrently releasing the information to the general public. There is considerable anecdotal evidence indicating that managers penalize analysts based on the content of their forecasts by limiting or cutting off analysts' future contact with management. Since, voluntary disclosures (e.g. conference calls) put individual investors at a larger informational disadvantage, it has been of concern to the SEC that the effect of selective disclosure is similar to insider trading. The primary purpose of Reg. FD is to curtail analysts' private channels to companies that they had previously enjoyed.

The results of this study are somewhat mixed. On one hand, there is support for the inference that, at least with respect to closing the information gap between analysts privy to the closed conference calls and those not privy to these calls, Reg. FD succeeded in that no statistical difference in earnings FE and FD between the previous-CLC and previous-OPC firms remained in the post-Reg. FD period. Moreover, in the post-Reg. FD period, conference calls continue to lead to lower FE and FD for both previous-OPC and previous-CLC firms, despite a huge jump in the earnings forecast attributes for firms which do not hold conference calls.

Against these favorable findings may be offset the contrary finding that no change in the earnings forecast attributes centered on the actual date of adoption of Reg. FD could be detected. Moreover, the findings reported by Gintschel and Markov (2004) that the informativeness of analysts' information output have declined in the post-Reg. FD period suggests that analysts' forecast attributes may no longer play as vital a role in the capital markets as in the pre-Reg. FD period. To the extent that this was the intent of the SEC in adopting Reg. FD, then the policy may be deemed to be a success[2].

Notes

1. These results are consistent with the findings reported by Shane *et al.* (2001). They provide evidence that analysts gather relatively more uncertainty-relieving information between earnings announcements and by the end of the quarter, their forecasts are as accurate as they were in the prior year. That is to say, the previous-CLC firms may have changed their selective disclosure policy, and Reg. FD may have contributed to the leveling of such information asymmetry.
2. It is not clear what the implication of the findings of Clement and Tse (2003) that investors respond more strongly to the earlier forecasts than to the later forecasts (despite the greater accuracy of the later forecasts) are to the findings reported by Gintschel and Markov (2004). Presumably, analysts forecasts may be more useful when released early that later. The effect of Reg. FD on analyst behavior in terms of earlier or later revisions of forecasts have yet to be examined.

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Appendix. Description of regression equations estimated

Test of first set of hypotheses (H1.1-H1.4)

We use the following two regression models in the cross-sectional tests to test *H1.1-H1.4*, using data for the pre- and the post-Reg. FD period, respectively:

$$\begin{aligned}\mathrm{FE}_{it} = {} & \alpha_0 + \alpha_1\mathrm{CLC}_{it} + \alpha_2\mathrm{OPC}_{it} + \alpha_3(\mathrm{HighTech}\times\mathrm{CLC}) + \alpha_4(\mathrm{HighTech}\times\mathrm{OPC}) \\ & + \alpha_5(\mathrm{HighTech}\times\mathrm{NCC}) + \alpha_6\mathrm{AGE}_{i,t} + \alpha_7\mathrm{ANA}_{i,t} + \alpha_8\mathrm{SURP}_{i,t} + \alpha_9\mathrm{SIZE}_{it} + \varepsilon_{it}\end{aligned} \quad (1)$$

$$\begin{aligned}\mathrm{FD}_{it} = {} & \beta_0 + \beta_1\mathrm{CLC}_{it} + \beta_2\mathrm{OPC}_{it} + \beta_3(\mathrm{HighTech}\times\mathrm{CLC}) + \beta_4(\mathrm{HighTech}\times\mathrm{OPC}) \\ & + \beta_5(\mathrm{HighTech}\times\mathrm{NCC}) + \beta_6\mathrm{AGE}_{i,t} + \beta_7\mathrm{ANA}_{i,t} + \beta_8\mathrm{SURP}_{i,t} + \beta_9\mathrm{SIZE}_{it} + \varepsilon_{it}\end{aligned} \quad (2)$$

where, CLC, a dummy variable equal to 1 if the firm is a CLC firm and 0 if the firm is a NCC or OPC firm; OPC, a dummy variable equal to 1 if the firm is an OPC firm and 0 if the firm is a NCC or CLC firm; NCC, a dummy variable equal to 1 if the firm is a NCC firm and 0 if the firm is an OPC or CLC firm; HighTech, a dummy variable equal to 1 if the firm is a high-technology firm and 0 if the firm is not a high-technology firm; FE_{it}, the absolute difference between actual earnings per share for quarter t less the mean forecast as provided by IBES summary file at the end of the quarter t deflated by the stock price at the beginning of quarter t; FD_{it}, the standard deviation of all analyst forecasts made at the end of the quarter t from the "consensus" (mean) of analysts' forecasts deflated by the stock price at the beginning of quarter t. The consensus forecast used is the last one on the IBES summary tape prior to earnings being reported; AGE_{it}, the number of calendar days between the analyst's forecast date and the date of the actual earnings announcement at quarter t; ANA_{it}, total number of analysts releasing an earnings forecast for the firm i at quarter t; $SURP_{it} = \{EPS_t - EPS_{t-4}\}/P_{t-4}$, a proxy for the difficulty in forecasting earnings, where EPS_t is the primary earnings share (excluding extraordinary items) for quarter t and P_{t-4} is the ending price per share at quarter $t-4$.; $SIZE_{it}$, the log of market value of equity at the beginning of quarter t.

To evaluate *H1.1*, an F-test of whether $\alpha_1 = \alpha_2$ in equation (1) is performed. Similarly, to evaluate *H1.2*, an F-test of whether $\beta_1 = \beta_2$ in equation (2) is performed. Rejection of the equalities and the relative magnitude of the two parameters would permit us to infer that analyst earnings forecast attributes are different for the previous-CLC firms versus the previous-OPC firms in the post-Reg. FD period. The test of *H1.3* is an F-test of whether $\alpha_1 + \alpha_2 = 0$. Rejection of that equality would provide support for *H1.3*. Similarly, a test of *H1.4* is whether $\beta_1 + \beta_2 = 0$, with its rejection an indication that *H1.4* is supported by the data.

Test of second set of hypotheses (H2.1-H2.4)

To test *H2.1* and *H2.4*, the dependent variables for testing the attributes of analyst earnings forecast are the change in FE and the change in FD. Using changes rather than levels of FE and dispersion mitigates the effect of cross-sectional differences in information environments. The general form of each dependent variable is:

$$\frac{\text{Post–Reg. FD event measure} - \text{Pre–Reg. FD event measure}}{\text{Stock price at Pre–Reg. FD event date}}$$

The pre-Reg. FD event measure component of the dependent variable is the quarterly FE or quarterly FD measured at quarter t before Reg. FD, and the post-Reg. FD event measure component of the dependent variable is the quarterly FE or quarterly FD measured at quarter t after Reg. FD:

$$|\Delta FE| = \left|\frac{FE_{post,it} - FE_{pre,it}}{P_{pre,it}}\right|$$

$$|\Delta FD| = \left|\frac{FD_{post,it} - FD_{pre,it}}{P_{pre,it}}\right|$$

The regressions estimated to evaluate *H2.1* and *H2.4* can be written as follows:

$$\begin{aligned}|\Delta FE_{it}| = {} & \lambda_0 + \lambda_1 OPC_{it} + \lambda_2 NCC_{it} + \lambda_3(\text{HighTech} \times \text{CLC}) \\ & + \lambda_4(\text{HighTech} \times \text{OPC}) + \lambda_5(\text{HighTech} \times \text{NCC}) + \lambda_6 \Delta AGE_{it} + \lambda_7 \Delta ANA_{it} \\ & + \lambda_8 \Delta SURP_{it} + \lambda_9 lagSIZE_{i,pre} + \lambda_{10} lagFE_{i,pre} + \delta_{it}\end{aligned} \qquad (3)$$

$$\begin{aligned}|\Delta FD_{it}| = {} & \gamma_0 + \gamma_1 OPC_{it} + \gamma_2 NCC_{it} + \gamma_3(\text{HighTech} \times \text{CLC}) \\ & + \gamma_4(\text{HighTech} \times \text{OPC}) + \gamma_5(\text{HighTech} \times \text{NCC}) + \gamma_6 \Delta AGE_{it} + \gamma_7 \Delta ANA_{it} \\ & + \gamma_8 \Delta SURP_{it} + \gamma_9 lagSIZE_{i,pre} + \gamma_{10} lagFD_{i,pre} + \delta_{it}\end{aligned} \qquad (4)$$

where $lagSIZE_{i,pe}$, the log of market value of equity in the pre-Reg. FD period; $lagFE_{i,pre}$, the level of FE in the pre-Reg. FD period; $lagFD_{i,pre}$, the level of FD in the pre-Reg. FD period, and all terms are as defined earlier.

As presented in equations (3) and (4), the CLC effect is captured in the intercept. Thus, to evaluate *H2.1*, the test is whether $\lambda_1 < 0$ in equation (3). This essentially examines whether the change in FE is higher for the firms classified as CLC in the pre-Reg. FD period than that for the OPC firms. If so, then Reg. FD had a more pronounced effect on the firms which previously held closed conference calls. This is exactly the effect that should be expected if Reg. FD had the desired effect.

Similarly, to evaluate *H2.2*, the test is whether $\gamma_1 < 0$ in equation (4). Rejection of the equality with positive coefficients would permit an inference that the absolute change in analyst earnings forecast attributes for the previous-CLC firms was greater than the absolute change for the previous-OPC firms.

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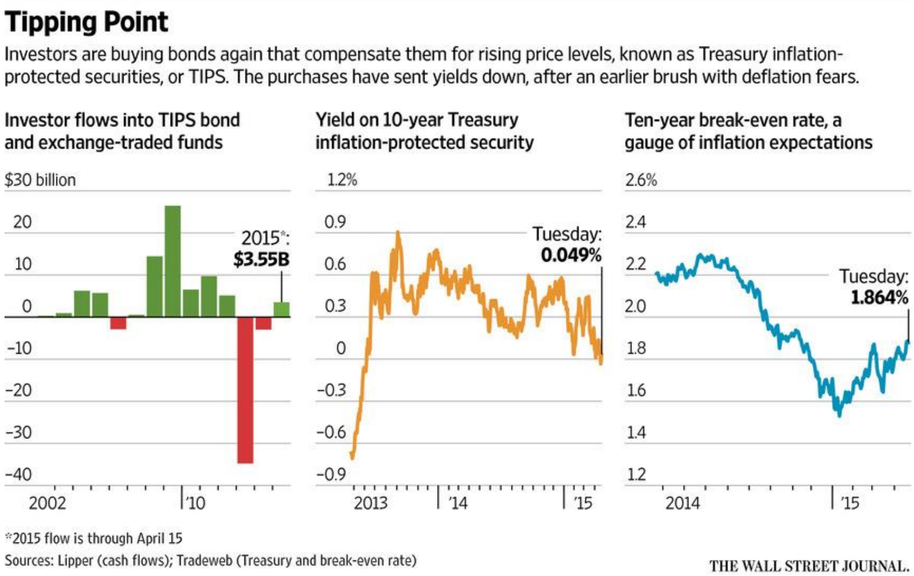
Investors Find TIPS Appealing Once More

Rally by inflation-protected Treasurys signals worries about deflation have been alleviated



By
Min Zeng

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April 21, 2015 7:36 p.m. ET

Investors are piling into U.S. government bonds that protect against inflation at the fastest pace in three years, a sign of diminishing fears over falling consumer prices.

Money managers poured $3.55 billion into U.S. bond mutual funds and exchange-traded funds focusing on Treasury inflation-protected securities, according to fund-tracker Lipper data for 2015 through April 15. That follows two consecutive years of net outflows.

The rush into TIPS suggests that aggressive central-bank stimulus programs, a stabilization in oil prices and a pause in the dollar's rally have alleviated investors' worries about deflation, a cycle of declining consumer prices and deferred consumption that some economists say could lead to economic contraction.

"The big picture is that the deflation scare may be behind us,'' said Gemma Wright-Casparius, senior bond-fund manager at Vanguard Group, which has over $3.26 trillion in global assets under management. "The overall sentiment will be inflation moving higher over the next 12 months."

If the rate of inflation in the U.S. breaches a certain threshold, holders of TIPS are repaid more than the face value of the bonds when the principal comes due. Rising prices can erode the value of regular bonds.

It was the prospect of steadily falling prices that stoked worries about growth earlier in the year, especially in Europe. In the eurozone, consumer prices have fallen every month since November. To battle the threat of deflation, the European Central Bank, led by President Mario Draghi, unleashed a bigger-than-expected bond-buying program last month. The Bank of Japan **8301 4.79 %** expanded its own program in October.

In Europe, ECB President Mario Draghi launched a bond-buying program last month to battle the threat of deflation.
PHOTO: ANDREW HARRER/BLOOMBERG NEWS

In the past month, oil prices have rebounded from six-year lows and the dollar's appreciation against major currencies has stalled. Both factors have lessened the likelihood that the U.S. could tip into deflation.

The consumer-price index rose a seasonally adjusted 0.2% in March from a month earlier, but fell 0.1% on an annualized basis. Core CPI, which excludes volatile food and energy items, rose to 1.8% on an annualized basis last month. Strategists at Credit Suisse **CS -0.08 %** forecast core CPI will accelerate to 2% by the end of September 2016.

At the same time, Federal Reserve officials have played down the possibility of an increase in short-term benchmark interest rates this summer. That has bolstered the buying of TIPS because some investors see rising inflation risks down the road the longer the Fed maintains a loose monetary policy.

On Friday, the yield on 10-year TIPS dipped to negative-0.03%, the lowest level since June 2013. Bond yields fall as prices rise.

Yields have risen since then. On Tuesday, the yield on 10-year TIPS was 0.049%, still down from 0.506% at the end of 2014. The regular 10-year Treasury note yielded 1.913%.

Even as concerns about deflation fade, few investors see consumer prices rising rapidly, which limits TIPS' appeal. The gap between yields on TIPS and regular 10-year Treasurys was 1.864 percentage point Tuesday.

This "break-even rate" is a measure of investors' inflation expectations and suggests they see inflation running at a 1.864% annualized rate on average in a decade. The break-even rate hit 1.53 percentage point in January, the lowest level since 2010.

TIPS had a big selloff in the second half of 2014 as plunging oil prices galvanized deflation fears. TIPS funds saw net outflows of $2.98 billion in 2014 and $34.77 billion in 2013, according to Lipper. The recent rally in TIPS reflects investors' struggle to obtain bonds that offer a good mix of income and safety. The $1.07 trillion TIPS market is part of the broader $12.6 trillion U.S. government-debt market.

More than a quarter of government bonds in Europe are now trading with negative yields, according to analysts. The ECB's bond purchases are forcing money managers to scramble for alternatives outside the eurozone.

"Global demand has elevated valuation in U.S. Treasury markets, including TIPS,'' said James Ong, a portfolio manager at asset-management firm Invesco Ltd. **IVZ 0.82 %** , which has $798.3 billion of assets under management. "We recommended buying TIPS.

TIPS overall have handed investors a total return—including price gains and interest payments—of 2.81% for this year through Monday, beating a 1.8% return on regular Treasury debt, according to Barclays **BCS 0.39 %** PLC.

"We still find TIPS attractive" even after their recent good performance, said Jeremie Banet, a portfolio manager focusing on inflation-bond investments at Pacific Investment Management Co., with $1.59 trillion in assets under management at the end of March. Pimco, one of the largest investors in TIPS, has boosted its exposure this year.

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