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Long-Term Earnings Growth Forecasts, Limited Attention, and Return Predictability

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Abstract

Long-term earnings expectations are critically important to stock price valuations. We identify relative optimism and relative pessimism in long-term analyst forecasts by comparing these forecasts with implied short-term earnings growth forecasts across firms within the same industry. Stocks with relatively optimistic and relatively pessimistic long-term analyst forecasts have negative and positive risk-adjusted returns, respectively. This return predictability depends critically on short-term forecasts since relative optimism and relative pessimism originate from the slow diffusion of information from short-term to long-term analyst forecasts. Our results indicate that market participants have limited attention regarding the long-term earnings implications of information.

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I Introduction

Long-term earnings expectations are crucial to stock prices. For example, according to the Gordon growth model (1962), a price-to-dividend ratio of 20 implies that a 1% increase in long-term dividend growth translates into a 20% return.[1] The long-term earnings growth forecasts issued by analysts are an important collection of expectations regarding future earnings growth, hence dividend growth. Empirically, Copeland, Dolgoff, and Moel (2004) find that revisions in these long-term forecasts exert a greater influence on stock returns than revisions in forecasts over shorter horizons.

Given their importance to stock valuations, even small errors in long-term earnings expectations can induce large mispricings. Errors in long-term earnings expectations can arise from their slow incorporation of information. Recently, DellaVigna and Pollet (2007) demonstrate that market participants have limited attention regarding the long-term implications of information. Anecdotal evidence suggests that long-term analyst forecasts, which pertain to earnings over the next three to five years, are slow to react to information since they are revised less frequently than annual earnings forecasts. The slow diffusion of information from short-term to long-term analyst forecasts can result in relatively optimistic and relatively pessimistic expectations of long-term earnings growth. This paper provides ex-ante proxies for these forecast errors and documents the ability of relative optimism and relative pessimism to predict returns. Therefore, using analyst forecasts over different horizons, we provide direct evidence that limited attention regarding the long-term earnings implications of information exerts a significant economic impact on stock prices.

To identify relative optimism and relative pessimism in long-term earnings growth expectations, we propose a novel yet simple "difference-in-difference" procedure that compares long-term analyst forecasts (LTG) with implied short-term earnings growth forecasts for the current year ($ISTG$). $ISTG$ is inferred from dollar-denominated annual earnings forecasts for the current year and realized earnings in the previous year. The ex-ante comparison between LTG and $ISTG$ is conducted across firms within the same industry. This industry-

[1] Starting with $P = \frac{D}{r-g}$ where P, D, r and g denote the price, current dividend, discount rate, and long-term dividend growth respectively, the derivative of P respect to g yields $dP = \frac{P}{r-g}dg$. It then follows that $\frac{dP}{P} = \frac{P}{D}dg$ since $\frac{1}{r-g}$ is equivalent to $\frac{P}{D}$.

level comparison is necessary as a long-term forecast of 20% may simultaneously be optimistic for utility companies and pessimistic for technology companies.

The slow incorporation of information into long-term analyst forecasts induces a disparity between LTG and $ISTG$ that captures relative optimism and relative pessimism towards long-term earnings growth. For example, the slow incorporation of good information into long-term forecasts results in these forecasts being pessimistic relative to short-term forecasts that already manifest the good information. Therefore, the low LTG / high $ISTG$ combination is associated with relatively pessimistic long-term forecasts following the arrival of good information. Conversely, the opposite high LTG / low $ISTG$ combination is associated with relatively optimistic long-term forecasts following the arrival of bad information. Throughout our paper, optimism and pessimism refer to these relative definitions.[2]

Empirically, optimism leads to negative risk-adjusted returns (-27bp with a t-statistic of -2.73), while pessimism leads to positive risk-adjusted returns (21bp with a t-statistic of 2.39) in the first month after portfolio formation. The resulting cross-sectional risk-adjusted return from buying low LTG / high $ISTG$ stocks and selling high LTG / low $ISTG$ stocks equals 48bp (t-statistic of 5.08). This risk-adjusted return persists for six months and reaches an annualized risk-adjusted return of almost 4%. This return predictability is not attributable to earnings momentum and is robust across different sample periods as well as different methods for inferring $ISTG$. Furthermore, our double-sorted LTG / $ISTG$ portfolios identify return variation across stocks with similar long-term analyst forecasts. Moreover, LaPorta (1996)'s trading strategy of buying low LTG firms and selling high LTG firms does not generate a risk-adjusted return. Dechow and Sloan (1997) demonstrate that LTG portfolios are closely related to market-to-book portfolios, with the Fama-French HML factor capturing a significant portion of the return variation reported in LaPorta.

We construct a firm-specific slope variable to summarize the disparity between LTG and $ISTG$ within industries. This slope variable predicts returns even after controlling for size, book-to-market, and past return characteristics as well as analyst forecast dispersion (Diether, Malloy, and Scherbina, 2002), analyst coverage (Hou and Moskowitz, 2005), prior

[2]Realized earnings growth computed after portfolio formation verifies that these definitions also capture optimism and pessimism according to their traditional ex-post definitions.

forecast revisions and prior earnings surprises (Chan, Jegadeesh, and Lakonishok, 1996), idiosyncratic return volatility (Ang et. al., 2006), institutional ownership (Nagel, 2005), and revisions in analyst buy/sell recommendations (Barber et. al., 2001). In particular, common limits to arbitrage proxies such as analyst forecast dispersion and idiosyncratic volatility cannot explain the return predictability of our slope variable. Interestingly, while the disparity between LTG and $ISTG$ predicts returns, neither LTG nor $ISTG$ have marginal return predictability.

Revisions in long-term analyst forecasts after portfolio formation support the view that the disparity between LTG and $ISTG$, hence our slope variable, originates from the slow diffusion of information from short-term to long-term analyst forecasts. For example, consistent with the slow incorporation of bad information into LTG, our short portfolio (high LTG / low $ISTG$) has the most frequent and the largest post-formation downward revisions in long-term forecasted earnings growth, along with the fewest upward revisions in these forecasts. Conversely, consistent with the slow incorporation of good information into LTG, our long portfolio (low LTG / high $ISTG$) has the most frequent and the largest upward post-formation revisions in long-term forecasted earnings growth, along with the fewest downward revisions in these forecasts. These properties are not attributable to mean-reverting expectations of long-term earnings growth.

Post-formation revisions in long-term analyst forecasts also confirm that upward (downward) revisions in $ISTG$ during the month of portfolio formation signify the arrival of good (bad) information regarding LTG. We directly estimate the rate at which information is diffused from short-term to long-term analyst forecasts by regressing long-term forecast revisions on prior revisions in short-term forecasted earnings growth. The return predictability of our slope variable is limited to firms whose long-term forecasts exhibit the slowest response to prior revisions in short-term forecasted earnings growth. We confirm this finding by modifying our trading strategy to condition on the arrival of information, which is captured by upward and downward revisions in $ISTG$ denoted $dISTG$. The modified trading strategy produces a risk-adjusted return of almost 6% over a twelve-month holding period through buying low LTG / high $dISTG$ stocks and selling high LTG / low $dISTG$ stocks. Once again, long-term analyst forecasts within the short portfolio and long portfolio are slow to incorporate information. This evidence suggests that earnings momentum is partially induced by long-term expectations of earnings growth underreacting to information since conditioning on $dISTG$ parallels the sorting procedures underlying earnings momentum strategies.

DellaVigna and Pollet (2007) demonstrate that limited attention is more acute for the long-term implications of information. Our findings contribute to a growing literature on limited attention by applying their insight to analyst earnings forecasts over different horizons. Limited attention has been used to understand different accounting disclosure policies (Hirshleifer and Teoh, 2003), the processing of market-level information at the expense of firm-level information (Peng and Xiong, 2006), the slow reaction of investors to economic links between customers and their respective suppliers (Cohen and Frazzini, 2008), as well as the distinction between earnings momentum and price momentum (Hou, Peng, and Xiong, 2008). Hirshleifer, Lim, and Teoh (2007) and DellaVigna and Pollet (2008) find that investors are less attentive on days with more earnings announcements and on Friday, respectively.

We also contribute to the analyst forecast literature by constructing ex-ante proxies for relative optimism as well as relative pessimism using multiple analyst forecasts. The prior literature has been unable to link pessimism, which is incompatible with analyst conflicts-of-interest, with positive risk-adjusted returns. Instead, by relying on ex-post errors in short-term forecasts, Easterwood and Nutt (1999) and Scherbina (2005) conclude that analysts are optimistic. Although Jagannathan, Ma, and da Silva (2005) evaluate a combination of short-term and long-term analyst forecasts, their study does not examine the disparity between these forecasts. Furthermore, high price-to-value ratios from a residual income model, as in Frankel and Lee (1998), can arise from low short-term and high long-term expected earnings growth or the opposite combination of high short-term and low long-term expected earnings growth. Our methodology differentiates between these two scenarios by assigning them a positive slope and negative slope, respectively.

The remainder of the paper is organized as follows. Section II describes the data and defines the variables utilized in our empirical study. The return predictability associated with relative optimism and relative pessimism regarding long-term earnings growth is described in Section III. Section IV documents the slow incorporation of information into long-term analyst forecasts, while Section V concludes.

II Data and Definitions

Our sample of analyst earnings forecasts is obtained from the Institutional Brokers Estimate System (IBES) Summary unadjusted file. Unadjusted IBES forecasts are not adjusted by share splits after their issuance date.[3]

Starting with all unadjusted consensus earnings forecasts from 1983 through 2006, we retain 722,034 firm-month observations for firms whose earnings in the previous year ($A0_t$), consensus earnings forecasts for the current fiscal year ($A1_t$), and long-term growth forecasts (LTG_t) are available in month t. Quarterly forecasts are not studied due to their seasonality and heightened susceptibility to smoothing by management. Mean consensus earnings forecasts in IBES are produced on the third Thursday of every month. Although the analysts issuing annual forecasts may differ from those issuing long-term forecasts, we use consensus forecasts for both maturities as they are the easiest earnings expectations for investors to access and interpret.

The IBES dataset is merged with COMPUSTAT and CRSP. Negative book values are eliminated from COMPUSTAT. Stock returns are obtained from CRSP after adjusting for delistings. Shares splits are also accounted for using the split factor in CRSP. Our analysis is conducted entirely on an earnings-per-share (EPS) basis.

The distribution of stocks with annual and long-term forecasts across the eleven IBES industries is reported in Table 1. The number of firms in our sample increases over time according to Panel A.[4] On average, there are about 2,500 firms in our sample every month. According to Panel B, their average size increases over time while their average book-to-market ratio (BM) declines. Panel B also reports that long-term forecasted earnings growth is increasing over the sample period, although its dispersion is stable. In contrast, annual earnings forecasts (normalized by realized earnings) become less uncertain.

For emphasis, annual earnings forecasts are denominated in dollars per share over a fixed horizon while long-term forecasts are annualized percentage growth rates. For compara-

[3]As detailed in Diether, Malloy, and Scherbina (2002), the EPS after a share split is often a small number that I/B/E/S rounds to the nearest cent. This rounding procedure can distort certain properties of dollar-denominated analyst forecasts, such as their revisions and forecast errors.

[4]Analyst coverage is defined as the number of analysts issuing at least one forecast.

tive purposes, $A1_t$ forecasts are converted into annualized percentage growth rates denoted $ISTG_t$ (implied short-term growth) as follows

$$ISTG_t = \left[\frac{A1_t - A0_t}{|A0_t|}\right] \times 100\,. \tag{1}$$

Recall that $A0_t$ denotes the firm's most recent realized annual earnings. The difference $LTG_t - ISTG_t$ is appropriate to measure the relative optimism or relative pessimism of analysts at the portfolio-level. However, for individual firms, $ISTG_t$ has outliers that arise from $A0_t$ being near zero. Therefore, we construct a Slope_t^R variable as the difference between the *rankings* of LTG_t and $ISTG_t$. Within each industry sector, $ISTG_t$ and LTG_t are sorted into deciles from 1 to 10 in descending order. The $ISTG_t$ ranking minus the LTG_t ranking defines $\text{Slope}_{i,t}^R$ for firm i in month t. This intuitive non-parametric statistic is less sensitive to $ISTG_t$ outliers and ranges from -9 to 9 for the lowest LTG_t / highest $ISTG_t$ stocks (1 minus 10) to the highest LTG_t / lowest $ISTG_t$ stocks (10 minus 1).

III Cross-Sectional Return Variation

To determine whether relative optimism and relative pessimism towards long-term earnings growth can predict returns, we first examine double-sorted LTG_t / $ISTG_t$ portfolios. The Slope_t^R variable is then examined in several cross-sectional regressions.

Within the eleven IBES industries, we conduct a three-by-three sequential double-sort each month from 1983 to 2006, first according to LTG_t and then $ISTG_t$. This procedure results in nine double-sorted portfolios that aggregate across the eleven industry sectors. Our trading strategy buys low LTG_t / high $ISTG_t$ stocks and sells high LTG_t / low $ISTG_t$ stocks. Initially, stocks with $A0_t < 0$ are removed (approximately 10% of the sample), which eliminates the need for the absolute value in equation (1). The removal of these firms does not alter our conclusions and is relaxed in a subsequent robustness test. Following common practice in the empirical asset pricing literature, we exclude stocks with share prices below five dollars to ensure our results are not unduly influenced by bid-ask bounce.

A. Empirical Results

The long-term forecast errors (Error) in Panel A of Table 2 are defined as LTG_t minus realized earnings growth over the subsequent three-to-five-year forecasting horizon. Thus, optimistic long-term forecasts yield positive forecast errors while pessimistic long-term forecasts yield negative forecast errors. The forecast errors reported in Panel A confirm that the high LTG_t / low $ISTG_t$ and low LTG_t / high $ISTG_t$ combinations capture optimism and pessimism, respectively, according to their traditional ex-post definitions.

Table 2 also presents the equally-weighted risk-adjusted returns from conditioning on a combination of LTG_t and $ISTG_t$ within different industry sectors. These returns are risk-adjusted using the three Fama and French (1996) factors along with Carhart (1997)'s momentum factor. As recorded in Panel A, the risk-adjusted return of the low LTG_t / high $ISTG_t$ portfolio equals 21bp (t-statistic of 2.39), while the high LTG_t / low $ISTG_t$ portfolio's risk-adjusted return equals -27bp (t-statistic of -2.73) one month after formation. Thus, analyst optimism leads to negative risk-adjusted returns while analyst pessimism leads to positive risk-adjusted returns. The characteristic-based procedure in Daniel, Grinblatt, Titman, and Wermers (1997) confirms these risk-adjusted returns. Interestingly, while ex-post forecast errors indicate that the magnitude of analyst optimism exceeds analyst pessimism (in absolute value), the returns from our short portfolio and long portfolio are similar. Intuitively, the market appears to be better at mitigating analyst optimism than analyst pessimism.

Panel B reports that buying low LTG_t / high $ISTG_t$ stocks and selling high LTG_t / low $ISTG_t$ stocks generates a risk-adjusted return of 48bp in the first month after portfolio formation (t-statistic of 5.08). This return predictability persists for six months, declining to 22bp (t-statistic of 2.11) by the sixth month after portfolio formation. Over this six-month holding period, our trading strategy produces a cumulative risk-adjusted return of 190bp. The cumulative risk-adjusted returns from our trading strategy are plotted in Figure 1 along with a two standard deviation confidence interval.

The risk-adjusted returns from our trading strategy decrease monotonically over the six-month holding period. The temporary nature of this return predictability is difficult to reconcile with risk. Lettau and Wachter (2007) and Da (2008) argue that firms with higher cashflow durations, whose expected cashflows are concentrated in the more distant future, have lower stock returns. The high LTG_t / low $ISTG_t$ combination underlying our short portfolio is consistent with a high cashflow duration, while the opposite low LTG_t / high $ISTG_t$ combination underlying our long portfolio is consistent with a low cashflow duration. However, as cashflow duration is not expected to change drastically within a six-month horizon, explaining the short-term return predictability of our trading strategy is a challenge using cashflow duration.

The cumulative risk-adjusted returns from our trading strategy exceed the quoted bid-ask spreads (in percentage terms) of the long portfolio and short portfolio, which are 39bp and 46bp, respectively. Furthermore, if transaction costs were preventing investors from immediately incorporating information into prices, then risk-adjusted returns and transaction costs would decline in tandem. However, unreported transaction costs within the long portfolio and short portfolio are stable over the six month holding period. Indeed, they increase slightly by 1bp and 3bp over this horizon, respectively. Therefore, the decline in return predictability is not attributable to arbitrageurs taking advantage of lower transaction costs.

In addition, Figure 2 provides preliminary evidence that analysts become less pessimistic and less optimistic about long-term earnings growth during our trading strategy's holding period. To minimize the influence of outliers arising from $A0_t$ being near zero, $ISTG_t$ in this figure is computed according to equation (1) using the aggregate $A1_t$ and aggregate $A0_t$ of the long portfolio and short portfolio. The portfolio-level disparity between LTG_t and $ISTG_t$ narrows after the formation of both these portfolios. Section IV investigates the post-formation dynamics of analyst forecasts in greater detail.

Finally, we find considerable post-formation return variation across stocks with similar long-term analyst forecasts. Indeed, across the three high LTG_t portfolios and across the three low LTG_t portfolios, $ISTG_t$ is responsible for identifying stocks with positive and negative returns. Despite the importance of $ISTG_t$, the low $ISTG_t$ portfolios have lower subsequent returns than the high $ISTG_t$ portfolios. Thus, low $ISTG_t$ and high $ISTG_t$ do not induce mispricings consistent with pessimism and optimism, respectively. Instead, unreported results document that the high $ISTG_t$ and low $ISTG_t$ portfolios experience upward revisions and downward revisions in short-term forecasted earnings growth during the month of portfolio formation, respectively. Although these revisions are consistent with earnings momentum (Chan, Jegadeesh, and Lakonishok, 1996), robustness tests in the next subsection demonstrate that the returns from our trading strategy are not subsumed by earnings momentum.

B. Robustness Tests

This subsection confirms that the risk-adjusted returns from our trading strategy cannot be replicated by conditioning exclusively on long-term analyst forecasts. However, despite the importance of short-term forecasts, we demonstrate that the returns from our trading strategy are distinct from earnings momentum.

After sorting stocks into portfolios according to their LTG_t, LaPorta (1996) documents that high LTG_t stocks earn low subsequent returns. To ensure that this previous finding cannot explain the returns from our trading strategy, our first robustness test implements LaPorta's trading strategy within our sample. As reported in Table 3, although low LTG_t stocks have higher unadjusted returns than high LTG_t stocks, the four-factor intercept from LaPorta's trading strategy is insignificant (t-statistic of 1.44). Consistent with the findings in Dechow and Sloan (1997), the Fama-French HML factor explains a significant portion of the return from LaPorta's strategy, with an unreported loading of 1.583 that is highly significant (t-statistic of 22.00). Intuitively, high LTG_t and low LTG_t are close proxies for growth and value characteristics, respectively.

We also demonstrate that the risk-adjusted returns from our trading strategy are not a manifestation of earnings momentum by sorting stocks every month according to their earnings surprises in the prior quarter (SUE) or the revisions in their annual forecasts over the prior six months (FREV). Stocks in the top and bottom quintiles of these cross-sectional sorts are then excluded before implementing our trading strategy on the remaining stocks. Table 3 confirms that our trading strategy's performance is not driven by earnings momentum. Indeed, the risk-adjusted returns from our trading strategy are higher after removing the stocks underlying earnings momentum strategies. The next section provides further evidence that revisions in long-term rather than short-term forecasted earnings growth are responsible for our trading strategy's return predictability.

Table 3 also confirms that our trading strategy's performance is similar across two non-overlapping subperiods; from 1983 to 1994 and from 1995 to 2006. Figure 3 plots the risk-adjusted returns from our trading strategy over the entire sample period and reinforces its consistency. In unreported results, our trading strategy is robust to the enactment of the SEC's fair disclosure regulation (Reg FD) in late 2000 as it produces a risk-adjusted return of 47bp (t-statistic of 2.37) during the 2001 to 2006 subperiod.

Given the importance of short-term forecasted earnings growth, $ISTG_t$ in equation (1) is replaced with two alternatives. The first alternative relaxes the assumption that $A0_t$ is positive in equation (1). As reported in Table 3, this assumption does not exert a large influence on our trading strategy's risk-adjusted return. The second alternative definition of short-term forecasted earnings growth replaces $ISTG_t$ with the firm's forecasted return on book-equity

$$ROE_t = \frac{A1_t \cdot (\#\text{ of shares})}{B_{t-1}}, \quad (2)$$

where B_{t-1} denotes its book value from the prior year. Once again, this modification does not have a material impact on our trading strategy's performance.

C. Firm Characteristics

To complement the above robustness tests, we also examine the marginal return predictability of our Slope^R variable after controlling for firm characteristics in the existing empirical asset pricing literature.

Gleason and Lee (2003) find more rapid price adjustments to forecast revisions in stocks with higher analyst coverage. Hou and Moskowitz (2005) also find that investor recognition characteristics such as institutional ownership can explain price delays.[5] However, Panel A of Table 4 indicates that the stocks in the long portfolio and short portfolio have similar analyst coverage (COVER) and institutional ownership (IO) as the other double-sorted portfolios.

[5] Nagel (2005) concludes that low institutional ownership increases the difficulty associated with short-selling. D'Avolio (2002) reports that institutional investors are the primary lenders of securities in short-sale transactions, while Dechow, Hutton, Meulbroek, and Sloan (2001) find that short-sellers target stocks with high institutional ownership to minimize the cost of borrowing shares.

Miller (1977) argues that short-sell constraints, in conjunction with differences of opinion, lead to overvaluation by preventing the opinions of pessimistic investors from being incorporated into stock prices. Using analyst forecast dispersion as a proxy for differences of opinion, Diether, Malloy, and Scherbina (2002) find that stocks with high forecast dispersion have poor subsequent risk-adjusted returns. However, Panel A of Table 4 reports that the underperforming stocks in the short portfolio have lower forecast dispersions (DISP) than the overperforming stocks in the long portfolio. In particular, the average $A1_t$ forecast dispersion equals 0.198 for the long portfolio, which exceeds 0.147 for the short portfolio.[6] Similarly, LTG_t's forecast dispersion of 0.327 for the long portfolio is larger than 0.234 for the short portfolio. Besides forecast dispersion, idiosyncratic volatility (Ang, Hodrick, Xing, and Zhang, 2006) is a common proxy for limits to arbitrage. However, the idiosyncratic volatility (IVOL) of the long portfolio and short portfolio are not unusually high. Nonetheless, the cross-sectional regression below controls for idiosyncratic volatility as well as forecast dispersion.

Barber, Lehavy, McNichols, and Trueman (2001) examine the consensus buy/sell recommendations of analysts. These recommendations are limited to five values, with 1 denoting a "strong buy" and 5 a "sell" recommendation. Consequently, lower numerical values for the consensus recommendation and negative revisions represent more favorable analyst recommendations and upgrades in these recommendations, respectively. Beginning in 1994, the REC variable in Panel A denotes the consensus buy/sell recommendation of analysts while REC-REV signifies its revision. The results in Panel A indicate that the stocks in our long portfolio have relatively more pessimistic consensus recommendations (REC) than those in our short portfolio. Stocks in the long portfolio also experience recent upgrades during the prior month while those in the short portfolio experience downgrades. However, our long portfolio and short portfolio are not associated with extreme analyst buy/sell recommendations nor extreme revisions in these recommendations. This finding is also confirmed by a later cross-sectional regression.

We also examine the characteristics in Jegadeesh, Kim, Krische, and Lee (2004), which include past returns over consecutive non-overlapping six-month horizons (RETP and RET2P

[6] The standard deviation of $A1_t$ forecasts is proportional to the standard deviation of $ISTG_t$.

respectively) as well as the combined twelve-month horizon (RET12) and turnover (TURN). RET denotes the prior one-month return that is skipped during the construction of RETP, RET2P, and RET12. These authors also consider analyst-related variables that include revisions in annual consensus forecasts over the past six months normalized by price (FREV) and standardized unexpected earnings (SUE) in the prior quarter. In addition, they account for a firm's earnings-to-price ratio (EP), total accruals to total assets (TA), capital expenditures to total assets (CAPEX), and previous sales growth (SG). Appendix A of Jegadeesh, Kim, Krische, and Lee (2004) defines each of these characteristics in detail. Using these characteristics, we estimate the following cross-sectional regression

$$\begin{aligned} r_{i,t+1} &= \beta_1 \,\mathrm{Slope}^R_{i,t} + \beta_2 \,\mathrm{BM}_{i,t} + \beta_3 \,\mathrm{Size}_{i,t} + \beta_4 \,\mathrm{RET12}_{i,t} + \beta_5 \,\mathrm{RET}_{i,t} \\ &\quad + \beta_6 \,\mathrm{DISP\text{-}}A1_{i,t} + \beta_7 \,\mathrm{DISP\text{-}}LTG_{i,t} + \beta_8 \,\mathrm{REC}_{i,t} + \beta_9 \,\mathrm{REC\text{-}REV}_{i,t} \\ &\quad + \beta_{10} \,\mathrm{FREV}_{i,t} + \beta_{11} \,\mathrm{SUE}_{i,t} + \beta_{12} \,\mathrm{LTG}_{i,t} + \beta_{13} \,\mathrm{ISTG}_{i,t} + \gamma \cdot X_{i,t} + \epsilon_{i,t+1} \,, \end{aligned} \tag{3}$$

using monthly unadjusted returns for individual stocks. The firm and analyst characteristics in Panel A that are not reported separately as independent variables in equation (3) are contained in the X vector. Every independent variable is cross-sectionally demeaned and standardized.

The significant estimates for β_1 in Panel B of Table 4 indicate that our slope variable predicts returns in every specification. In particular, consistent with its ability to capture optimism and pessimism in long-term analyst forecasts, future returns are inversely related to Slope^R. In contrast, the β_2 coefficient for book-to-market is insignificant in several specifications, but consistent with the value premium, while the β_3 coefficient for size is uniformly insignificant. The positive β_4 coefficient for RET12 indicates the presence of price momentum, while the negative β_5 coefficient can be explained by monthly return reversals that Avramov, Chordia, and Goyal (2006) conclude are caused by temporary liquidity shocks.

The β_7 coefficient for LTG_t's dispersion is uniformly insignificant, while the β_6 coefficient for $A1_t$'s dispersion is generally insignificant. Thus, analyst forecast dispersion cannot explain the return predictability of our slope variable. The negative β_9 coefficient for REC-REV implies that analyst downgrades (upgrades) yield negative (positive) subsequent returns, although the recommendations themselves fail to predict returns since β_8 is insignificant.

The insignificant β_{10} coefficient indicates that past forecast revisions cannot predict returns. Despite β_{11}'s significance, Panel A indicates that earnings surprises in the prior quarter are similar for the long portfolio and short portfolio. Consequently, as indicated by the robustness tests in Table 3, the past forecast revisions and prior earnings surprises that define earnings momentum cannot explain the return predictability of our slope variable.

Interestingly, neither LTG_t nor $ISTG_t$ predict returns as the β_{12} and β_{13} coefficients are both insignificant. Thus, the disparity between LTG_t and $ISTG_t$ has marginal return predictability but not the individual forecasts that comprise our slope variable.

IV Forecast Revisions and Limited Attention

This section documents that post-formation revisions in long-term analyst forecasts are crucial to understanding the risk-adjusted returns from our trading strategy as well as the return predictability of our slope variable. We also examine revisions in short-term analyst forecasts. In unreported results, the long portfolio experiences an average upward revision in $ISTG_t$ of 0.88%, while the short portfolio experiences an average downward revision in $ISTG_t$ of -1.42%. These revisions signify the arrival of good and bad information in month t, respectively. However, post-formation revisions in short-term forecasted earnings growth cannot explain the risk-adjusted returns from our trading strategy as they exhibit no discernible cross-sectional patterns across the double-sorted portfolios.

In contrast, there is strong evidence that long-term earnings growth forecasts for stocks within our long portfolio and short portfolio are slow to incorporate information. Revisions in long-term forecasted earnings growth during the month of portfolio formation as well as cumulative post-formation revisions are reported in Table 5.[7] Six months after the long portfolio and short portfolio are formed, they have experienced cumulative upward and downward revisions in long-term forecasted earnings growth of 0.44% and -1.60%, respectively. These post-formation revisions are the largest upward and largest downward revisions across the nine double-sorted portfolios, respectively, and consistent with the slow incorporation of good and bad information into long-term analyst forecasts. These revisions do not simply

[7] The cumulative post-formation revisions are based on the prevailing LTG_t forecasts in month t.

reflect mean-reversion in long-term forecasted earnings growth. Indeed, after six months, the difference between the cumulative revisions in long-term forecasted earnings growth for the short portfolio and the high LTG_t / high $ISTG_t$ portfolio, -1.60% versus -0.75%, is significant (t-statistic of -9.04) despite both portfolios having high LTG_t at the time of their formation. The comparable difference between our long portfolio and the low LTG_t / low $ISTG_t$ portfolio, 0.44% versus 0.19%, is also significant (t-statistic of 6.14) after six months despite both portfolios having low LTG_t at the time of their formation.

Consistent with analysts underreacting to the long-term implications of good information, the long portfolio has the highest percentage of upward post-formation revisions and the lowest percentage of downward post-formation revisions, 28.52% versus 17.64%, respectively. In contrast, consistent with analysts underreacting to the long-term implications of bad information, the short portfolio has the highest percentage of downward post-formation revisions and the lowest percentage of upward post-formation revisions, 38.84% versus 12.62%, respectively.[8]

Finally, for the long portfolio and short portfolio, post-formation revisions in long-term forecasted earnings growth are of the same sign as $ISTG_t$ revisions during the month of portfolio formation. This pattern confirms that upward revisions in $ISTG_t$ signify the arrival of good information regarding long-term as well as short-term earnings growth while downward revisions in $ISTG_t$ signify the arrival of bad information regarding long-term as well as short-term earnings growth. The next subsection estimates the speed at which information is diffused from short-term to long-term analyst forecasts.

A. Delayed Response Measure

Our previous analysis indicates that the slow incorporation of information into long-term analyst forecasts is responsible for our slope variable's return predictability. We verify this conclusion by estimating a firm-level proxy for the speed at which information diffuses from short-term to long-term forecasts. This proxy is estimated as the γ_1 coefficient in the fol-

[8]The percentage of upward revisions and downward revisions does not sum to 100% since many revisions reiterate previous forecasts.

lowing regression

$$\text{RevLTG}_{t+6,t} = \gamma_0 + \gamma_1 \,\text{RevISTG}_{t,t-1} + \gamma_2 \,\text{LTG}_t + \gamma_3 \,\text{RET12}_t + \epsilon_t \,, \tag{4}$$

where RevLTG and RevISTG denote revisions in long-term and short-term forecasted earnings growth. Once again, RET12 refers to returns over the past twelve months (after a one-month delay). The γ_1 coefficient captures the sensitivity of future revisions in long-term forecasted earnings growth over a six-month horizon to revisions in short-term forecasted earnings growth during the prior month, while γ_2 captures mean-reversion in long-term earnings growth forecasts. For emphasis, equation (4) is estimated for individual firms, with the i subscript omitted for notational simplicity.

The firm-level time series regression in equation (4) is performed over rolling three-year windows for stocks that have a minimum of two years of available data. Every month, stocks are sorted into terciles according to their γ_1 coefficient. The average γ_1 coefficient equals 0.0032, while the median is also positive.

Within each γ_1 tercile, we estimate the following cross-sectional regression

$$r_{t+1} = \beta_1 \,\text{Slope}^R_t + \beta_2 \,\text{BM}_t + \beta_3 \,\text{Size}_t + \beta_4 \,\text{RET12}_t + \beta_5 \,\text{RET}_t + \epsilon_{t+1} \tag{5}$$

which is a simplified version of equation (3).[9] This regression conditions on γ_1 coefficients that are estimated in month t.

If the slow diffusion of information from short-term to long-term analyst forecasts is responsible for the return predictability of Slope^R, then firms with a positive γ_1 coefficient are expected to have a negative β_1 coefficient. Consistent with this hypothesis, Table 6 indicates that the return predictability of our slope variable is concentrated in firms with the highest γ_1 coefficients. Indeed, the β_1 coefficient of -0.0017 for Slope^R in the high γ_1 subset is significant (t-statistic of -3.05). Conversely, the smaller -0.0005 β_1 coefficient for Slope^R in the low γ_1 subset is insignificant. As a consequence, the slow diffusion of information from short-term to long-term forecasts appears to be the origin of our slope variable's return predictability. To verify this finding, the next subsection examines a modified trading strategy that conditions on the arrival of information.

[9] Our trading strategy is not implemented within each tercile since too few firms are available within these terciles to conduct industry-level comparisons of forecasted earnings growth.

B. Modified Trading Strategy

A modified trading strategy that conditions on revisions in $ISTG_t$, denoted $dISTG_t$, enables us to further examine the return predictability that surrounds the slow incorporation of information into long-term analyst forecasts. This modification focuses on double-sorted LTG_t / $dISTG_t$ portfolios. As documented earlier, $dISTG_t$ proxies for the arrival of information that is relevant to short-term as well as long-term earnings growth. While our original LTG_t / $ISTG_t$ trading strategy focused on relative optimism and relative pessimism in long-term forecasts, its modification focuses on the arrival of information.

According to Panel A of Table 7, the high LTG_t / low $dISTG_t$ portfolio earns a negative risk-adjusted return while the low LTG_t / high $dISTG_t$ portfolio earns a positive risk-adjusted return. These risk-adjusted returns are consistent with investors underestimating the long-term implications of bad information and good information, respectively. For brevity, we report the cross-sectional risk-adjusted returns from the modified trading strategy for one, three, six, nine, and twelve months after portfolio formation in Panel B. Under the standard four-factor model, the risk-adjusted returns from the LTG_t / $dISTG_t$ trading strategy persist for one year and reach a cumulative risk-adjusted return of almost 6% over this horizon. In unreported results, the risk-adjusted returns from the LTG_t / $dISTG_t$ trading strategy persist for 13 months.[10]

Panel C indicates that six months after their formation, the long portfolio contains stocks with the largest cumulative upward revisions while the short portfolio contains stocks with the largest downward cumulative revisions. Furthermore, the long portfolio has the highest percentage of upward post-formation revisions and lowest percentage of downward post-formation revisions in long-term forecasted earnings growth. In contrast, the short portfolio has the lowest percentage of upward post-formation revisions and highest percentage of downward post-formation revisions in long-term forecasted earnings growth. These post-formation revisions in long-term forecasted earnings growth are consistent with an underreaction to good and bad information, respectively.

[10]Risk-adjusted returns computed using the characteristic-based approach of Daniel, Grinblatt, Titman, and Wermers (1997) persist for eight months after portfolio formation, and reach a cumulative risk-adjusted return of 315bp over this horizon.

Conditioning on $dISTG_t$ is similar to the sorting mechanism underlying the earnings momentum strategies in Chan, Jegadeesh, and Lakonishok (1996). Therefore, Table 7 suggests that a portion of earnings momentum is attributable to an underreaction in long-term expectations of earnings growth. However, the high $dISTG_t$ portfolios have positive risk-adjusted returns, which is consistent with a general underreaction to good information. Thus, earnings momentum cannot be entirely explained by the slow incorporation of information into long-term analyst forecasts.

C. Discussion and Interpretation

The accuracy of annual earnings forecasts is easier to monitor than the accuracy of long-term forecasts, which implies that short-term forecast accuracy is more important to analyst careers. Consequently, analysts have an incentive to revise their annual earnings forecasts before revising their long-term forecasts. Indeed, on average, firm-level revisions in long-term consensus forecasts occur at five month intervals in our sample while revisions in annual forecasts occur at two month intervals. Moreover, the average duration of an analyst's career is four years according to Hong and Kubik (2003). Thus, analysts are less accountable for their long-term forecasts.

However, analyst incentives cannot explain the underreaction exhibited by investors. In contrast, the theory of limited attention in DellaVigna and Pollet (2007) applies to investor expectations, hence returns, as well as analyst forecasts. Less frequent long-term forecast revisions by analysts are also compatible with their theory of limited attention. Thus, limited attention provides a more complete description of our results than analyst incentives.

The overconfident investor in Daniel, Hirshleifer, and Subrahmanyam (1998) overweights private information at the expense of public information. Overconfidence requires a disparity between analyst forecasts (public information) and the private information of investors. However, our results suggest that investors are overly reliant on long-term analyst forecasts. Moreover, overconfidence posits an overreaction to private information, while the return predictability we document is more consistent with the slow reaction of long-term analyst forecasts to information that was previously incorporated into their short-term forecasts. Indeed, our empirical results are more consistent with the slow diffusion of public information into long-term forecasts than the slow diffusion of private information hypothesized by Hong and Stein (1999).

In their single-asset model, Brav and Heaton (2002) demonstrate that the influence of behavioral biases on stock returns is difficult to disentangle from Bayesian learning. Learning allows market participants to initially overestimate or underestimate the long-term earnings growth of individual firms. Thus, errors in the initial expectations of long-term earnings growth should be diversifiable. However, our evidence also indicates that analysts consistently underestimate the long-term earnings implications of information. Indeed, while greater uncertainty regarding the long-term earnings implications of information can cause investors to assign more weight to their priors, return predictability at the portfolio-level implies that these priors *systematically* underestimate the long-term earnings implications of such information. Thus, our findings are incompatible with unbiased investor expectations of long-term earnings growth.

V Conclusions

Long-term earnings expectations are crucial to stock price valuations. This paper provides a novel procedure for identifying relative pessimism and relative optimism in long-term analyst forecasts using a combination of short-term and long-term analyst forecasts. Both these errors in long-term expectations predict returns and appear to originate from the slow incorporation of information into long-term analyst forecasts.

Intuitively, the slow speed at which information diffuses from short-term to long-term analyst forecasts creates disparities between these forecasts that capture relative pessimism as well as relative optimism towards long-term earnings growth. For example, the slow incorporation of good information into long-term forecasts causes these forecasts to be pessimistic relative to short-term forecasts that already reflect the good information. Consequently, a combination of low long-term and high short-term forecasted earnings growth is associated with relatively pessimistic long-term forecasts that slowly incorporate good information. Conversely, the opposite combination of high long-term and low short-term forecasted earnings growth is associated with relatively optimistic long-term analyst forecasts that slowly incorporate bad information. Double-sorted portfolios, as well as a firm-specific slope variable defined as long-term minus short-term forecasted earnings growth, provide ex-ante proxies for relative pessimism and relative optimism that enable us to evaluate the return predictability of these errors in long-term expectations.

Analyst pessimism and analyst optimism lead to positive and negative risk-adjusted returns respectively. This return predictability persists for six months. Our slope variable also predicts returns after controlling for a multitude of firm characteristics such as analyst forecast dispersion, idiosyncratic volatility, institutional ownership, and analyst coverage, as well as prior earnings surprises and prior forecast revisions in the earnings momentum literature. Moreover, while our slope variable predicts returns, neither of the individual forecasts that comprise this disparity has marginal return predictability.

Conditioning on short-term forecasted earnings growth is crucial to identifying errors in long-term analyst forecasts that predict returns. Indeed, conditioning on long-term analyst forecasts alone, as in LaPorta (1996), does not produce a risk-adjusted return. Despite the importance of short-term forecasts, the return predictability arising from relative optimism and relative pessimism is not attributable to earnings momentum.

Post-formation revisions in long-term analyst forecasts explain the return-adjusted returns from our trading strategy as well as our slope variable's return predictability. In particular, the portfolio with high long-term and low short-term forecasted earnings growth, which is associated with relative optimism due to the slow incorporation of bad information into long-term analyst forecasts, has the largest and most frequent downward post-formation revisions in long-term forecasted earnings growth. Conversely, the opposite combination of low long-term and high short-term forecasted earnings growth, which is associated with relative pessimism and the slow incorporation of good information into long-term analyst forecasts, has the largest and most frequent upward post-formation revisions in long-term forecasted earnings growth. Additional tests confirm that the return predictability underlying our trading strategy and slope variable originate from the slow diffusion of information from short-term to long-term analyst forecasts. The limited attention towards information with long-term implications hypothesized by DellaVigna and Pollet (2007) offers an explanation for this return predictability as well as the underreaction exhibited by long-term analyst forecasts.

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Table 1: This table summarizes the analyst forecasts and firm characteristics in our sample over three separate subperiods. Panel A reports on the number of firms with annual ($A1$) and long-term (LTG) analyst forecasts, as well as their distribution across eleven IBES industry sectors. The $A1$ forecasts are dollar-denominated earnings per share figures normalized by realized earnings from the previous year, while LTG represents an annualized percentage. In Panel B, analyst coverage (COVER) as well as $A1$ and LTG and their respective dispersions (DISP) are recorded. In addition, the size (in millions of dollars), book-to-market (BM), and past return characteristics of the firms in our sample are reported. RET12 denotes past returns over the prior year with a one month lag.

Panel A: Sample Size and Industry Sector Distribution

Year	Number of Stocks	Industry Sector Breakdown										
		Consumer Services	Non Durables	Durables	Finance	Technology	Energy	Capital Goods	Health Care	Basic Industrials	Utilities	Transport
1983 to 1989	1879	14.4%	6.3%	7.8%	14.8%	5.5%	5.5%	3.5%	15.1%	8.9%	10.8%	7.6%
1990 to 1999	2764	14.9%	9.5%	5.7%	17.4%	4.7%	4.7%	2.5%	17.2%	7.7%	9.0%	6.6%
2000 to 2006	2768	16.6%	10.0%	4.7%	18.8%	3.6%	4.7%	2.2%	22.3%	5.3%	6.5%	5.1%
All	2507	15.3%	8.7%	6.0%	17.1%	4.6%	5.0%	2.7%	18.1%	7.3%	8.8%	6.5%

Panel B: Sample Characteristics

Year	COVER	A1	LTG	DISP A1	DISP LTG	Size ($MM)	BM	RET12
1983 to 1989	8.9	0.70	15.6	0.277	0.322	952.2	0.84	0.209
1990 to 1999	8.1	1.12	17.4	0.197	0.253	1,939.5	0.67	0.181
2000 to 2006	7.8	1.15	18.2	0.167	0.279	5,007.0	0.65	0.198
All	8.3	1.00	17.1	0.212	0.281	2,546.2	0.71	0.194

Table 2: This table reports on the returns from double-sorting stocks each month according to their long-term forecasted earnings growth (LTG_t) and then their implied short-term forecasted earnings growth ($ISTG_t$) in equation (1). For each of the nine double-sorted portfolios, raw and risk-adjusted returns are recorded in Panel A as monthly percentages for the first month after portfolio formation. Risk-adjusted returns are defined relative to the four-factor model and the characteristics-based approach in Daniel, Grinblatt, Titman, and Wermers (1997). The size (in millions of dollars), book-to-market (BM), and past return characteristics of the double-sorted portfolios are summarized in the formation month. RET12 denotes past returns over the prior year with a one month lag, while ERROR equals LTG_t minus realized earnings growth over the three-to-five-year forecasting horizon. In Panel B, the post-formation risk-adjusted returns from a trading strategy that buys low LTG_t / high $ISTG_t$ stocks and sells high LTG_t/ low $ISTG_t$ stocks are reported over a six-month holding period. The t-statistics (in italics) are Newey-West adjusted with 12 lags.

Panel A: Portfolio Characteristics and Returns

LTG_t /		Stock Characteristics at Portfolio Formation						First-Month Returns (%)				
$ISTG_t$	N	LTG_t (%)	$ISTG_t$ (%)	Error (%)	Size ($MM)	BM	RET12	Raw	Four-Factor		Characteristics	
								Return	alpha	t-stat.	alpha	t-stat.
High/High	213	25.78	189.30	6.97	1,322.7	0.58	0.520	1.32	0.16	*1.53*	0.20	*1.98*
High/Med	221	22.26	22.58	9.60	2,410.4	0.50	0.340	1.13	-0.04	*-0.39*	0.09	*0.95*
High/Low	217	22.37	-37.26	20.35	1,705.8	0.55	0.122	0.84	-0.27	*-2.73*	-0.22	*-2.05*
Med/High	216	14.83	140.99	-1.12	2,195.4	0.71	0.332	1.45	0.22	*2.39*	0.07	*0.99*
Med/Med	223	14.62	11.73	5.66	3,959.1	0.60	0.224	1.21	0.07	*0.70*	0.01	*0.10*
Med/Low	220	14.56	-32.95	16.16	2,408.4	0.68	0.060	1.06	-0.05	*-0.55*	-0.04	*-0.51*
Low/High	215	10.20	141.52	-1.26	2,654.1	0.86	0.262	1.44	0.21	*2.39*	0.21	*2.75*
Low/Med	222	10.23	7.82	5.27	5,169.3	0.72	0.176	1.33	0.18	*2.08*	0.02	*0.26*
Low/Low	219	9.79	-43.64	13.00	3,367.7	0.83	0.050	1.14	0.00	*0.04*	-0.14	*-1.84*

Panel B: Risk-Adjusted Returns after Portfolio Formation

Post-Formation Month		Four-Factor Model					Characteristics
		alpha (%)	MKT	HML	SMB	UMD	alpha (%)
One	coeff.	0.48	-0.166	0.319	-0.318	0.135	0.43
	t-stat.	*5.08*	*-6.89*	*9.02*	*-10.82*	*6.42*	*4.08*
Two	coeff.	0.36	-0.167	0.336	-0.295	0.142	0.28
	t-stat.	*3.51*	*-6.45*	*8.81*	*-9.30*	*6.27*	*2.71*
Three	coeff.	0.32	-0.164	0.324	-0.299	0.160	0.19
	t-stat.	*3.17*	*-6.36*	*8.55*	*-9.49*	*7.13*	*2.00*
Four	coeff.	0.27	-0.179	0.328	-0.280	0.155	0.08
	t-stat.	*2.60*	*-6.64*	*8.30*	*-8.54*	*6.63*	*0.78*
Five	coeff.	0.25	-0.172	0.324	-0.284	0.182	0.10
	t-stat.	*2.44*	*-6.59*	*8.48*	*-8.91*	*8.04*	*1.01*
Six	coeff.	0.22	-0.151	0.321	-0.310	0.167	0.05
	t-stat.	*2.11*	*-5.82*	*8.37*	*-9.71*	*7.39*	*0.56*

Table 3: This table first reports on the returns from LaPorta (1996)'s trading strategy that focuses exclusively on long-term analyst forecasts. Each month from January 1983 to December 2006, stocks are sorted into nine portfolios according to their long-term forecasted earnings growth (LTG_t). Raw and risk-adjusted returns from the four-factor model are reported for the corresponding trading strategy that buys low LTG_t stocks and sells high LTG_t stocks. The t-statistics (in italics) are Newey-West adjusted with 12 lags. Several robustness tests are also performed on our trading strategy that buys low LTG_t / high $ISTG_t$ stocks and sells high LTG_t / low $ISTG_t$ stocks. The first robustness test examines a subsample of stocks that excludes those with the highest and lowest earnings surprises in the prior quarter (SUE). The highest and lowest thresholds are defined as the top and bottom quintiles from a monthly cross-sectional sort, respectively. A similar procedure excludes stocks with the highest and lowest revisions in annual forecasts over the prior six months (FREV). Three additional robustness tests are also implemented; the first divides the sample period into two subperiods: from 1983 to 1994 and from 1995 to 2006, the second does not impose the $A0_t > 0$ filter when inferring $ISTG_t$ in equation (1), and the third replaces $ISTG_t$ with the current year's return on book-equity (ROE_t) in equation (2).

Portfolio		LaPorta (1996)	After Removing Extreme		Subperiods		$ISTG_t$ Alternatives	
			Prior SUE	Prior FREV	1983-1994	1995-2006	Without $A0_t > 0$	ROE_t
	raw return (%)	1.36	1.69	1.54	1.41	1.47	1.40	1.38
Long	alpha (%)	0.19	0.92	0.76	0.34	0.22	0.15	0.24
	t-stat.	*2.41*	*8.47*	*7.46*	*4.01*	*1.80*	*1.90*	*2.57*
	raw return (%)	0.74	0.70	0.74	0.80	0.89	0.69	0.85
Short	alpha (%)	-0.07	0.10	0.12	-0.09	-0.40	-0.32	-0.20
	t-stat.	*-0.45*	*0.88*	*1.06*	*-0.85*	*-2.77*	*-3.62*	*-2.18*
	raw return (%)	0.62	0.99	0.80	0.60	0.58	0.70	0.53
Long - Short	alpha (%)	0.26	0.81	0.63	0.43	0.62	0.47	0.44
	t-stat.	*1.44*	*6.21*	*5.04*	*3.68*	*4.26*	*3.96*	*3.52*

Table 4: Double-sorted portfolios are defined by classifying stocks according to their long-term forecasted earnings growth (LTG_t) and then their implied short-term forecasted earnings growth ($ISTG_t$) in equation (1). Panel A reports on the firm characteristics of each double-sorted portfolio. RETP and RET2P denote the prior returns from non-overlapping six-month horizons, respectively, while RET denotes the return from the prior month. Turnover (TURN) supplements these return characteristics. Other characteristics include analyst coverage (COVER), analyst forecast dispersion (DISP) for annual ($A1$) and long-term forecasts (LTG), revisions in annual consensus forecasts over the past six months normalized by price (FREV), standardized unexpected earnings (SUE), the consensus buy/sell recommendation of analysts (REC), and revisions in these recommendations (REC REV). Accounting variables such as a firm's earnings-to-price ratio (EP), total accruals to total assets (TA), capital expenditures to total assets (CAPEX), and sales growth (SG) are also examined as well as idiosyncratic volatility (IVOL) and institutional ownership (IO). Panel B provides the estimated coefficients from different specifications of the cross-sectional regression in equation (3) involving individual stocks returns. These specifications involve the variables in Panel A as well as book-to-market (BM), size, and past return (RET12) characteristics. RET12 equals the return from the prior year with a one month lag. The X vector contains the characteristics in Panel A, except those reported separately. Analyst buy/sell recommendations and their revisions are available from 1994, while the other specifications begin in 1983. The t-statistics (in italics) reported below the regression coefficients are Newey-West adjusted with 12 lags.

Panel A: Characteristics of Double-Sorted Portfolios

LTG_t /	Returns and Turnover				Analyst-Related Variables							Accounting Variables				Others	
$ISTG_t$	RET	RETP	RET2P	TURN	COVER	DISP A1	DISP LTG	FREV	SUE	REC	REC REV	EP	TA	CAPEX	SG	IVOL	IO
High/High	0.020	0.124	0.127	0.681	6.304	0.179	0.268	0.014	0.674	1.856	0.005	0.017	0.011	0.076	1.432	0.263	0.414
High/Med	0.016	0.069	0.109	0.649	8.040	0.070	0.205	0.006	1.142	1.881	0.009	0.045	0.016	0.077	1.346	0.202	0.447
High/Low	0.010	-0.036	0.023	0.651	7.229	0.147	0.234	-0.006	0.288	2.069	0.023	0.039	0.011	0.080	1.311	0.239	0.401
Med/High	0.020	0.087	0.063	0.609	8.538	0.137	0.262	0.011	0.512	2.066	0.003	0.034	-0.003	0.058	1.178	0.191	0.446
Med/Med	0.015	0.037	0.051	0.568	10.379	0.052	0.206	0.005	0.872	2.064	0.007	0.065	0.004	0.062	1.167	0.141	0.462
Med/Low	0.012	-0.049	-0.022	0.596	9.115	0.140	0.242	-0.007	0.075	2.277	0.021	0.061	0.000	0.064	1.144	0.181	0.425
Low/High	0.020	0.068	0.024	0.583	8.339	0.198	0.327	0.012	0.277	2.315	-0.002	0.018	-0.015	0.047	1.093	0.171	0.428
Low/Med	0.015	0.022	0.019	0.523	10.504	0.066	0.262	0.003	0.518	2.322	0.005	0.067	-0.009	0.050	1.095	0.114	0.446
Low/Low	0.013	-0.045	-0.038	0.565	9.099	0.164	0.310	-0.011	-0.157	2.514	0.015	0.062	-0.009	0.051	1.079	0.152	0.413

Panel B: Cross-sectional Regressions

N	$Slope^R$	BM	Size	RET12	RET	DISP A1	DISP LTG	REC	REC REV	FREV	SUE	LTG	ISTG	X	Avg. R^2
1671	-0.0010	0.0021	0.0002	0.0031										No	0.041
	-2.97	*2.38*	*0.32*	*3.42*											
1671	-0.0011	0.0020	0.0000	0.0030	-0.0035									No	0.050
	-3.04	*2.33*	*0.06*	*3.26*	*-6.00*										
1300	-0.0010	0.0020	-0.0003	0.0024	-0.0037	-0.0014	-0.0002							No	0.062
	-2.81	*2.02*	*-0.39*	*2.33*	*-6.16*	*-2.81*	*-0.47*								
1533	-0.0012	0.0017	-0.0008	0.0017	-0.0039	-0.0008	-0.0004	0.0004	-0.0021					No	0.067
(1994-2006)	*-2.48*	*1.44*	*-0.71*	*1.30*	*-3.83*	*-1.27*	*-0.86*	*0.66*	*-6.00*						
678	-0.0015	0.0010	-0.0008	0.0023	-0.0042	-0.0006	0.0003			-0.0005	0.0010	0.0007	-0.0009	Yes	0.106
	-2.72	*1.57*	*-0.84*	*2.20*	*-5.95*	*-1.40*	*0.63*			*-1.16*	*3.33*	*0.60*	*-0.81*		

Table 5: This table reports on the magnitude and direction of revisions in long-term forecasted earnings growth across the double-sorted LTG_t / $ISTG_t$ portfolios. Revisions in long-term analyst forecasts during the month of portfolio formation as well as the subsequent six months after their formation are reported. Post-formation revisions are cumulative as they are computed based on prevailing forecasts during the month of portfolio formation (month t). The percentage of upward and downward revisions in long-term analyst forecasts are also reported. “High Diff.” refers to the high LTG_t / low $ISTG_t$ (short) portfolio minus the high LTG_t / high $ISTG_t$ benchmark portfolio, while “Low Diff.” refers to the low LTG_t / high $ISTG_t$ (long) portfolio minus the low LTG_t / low $ISTG_t$ benchmark portfolio. All t-statistics (in italics) are Newey-West adjusted with 12 lags.

		Revisions in Long-Term Forecasts (%)						Upward Revisions in Long-Term Forecasts (%)						Downward Revisions in Long-Term Forecasts (%)					
LTG_t /	Month	Months After Portfolio Formation						Months After Portfolio Formation						Months After Portfolio Formation					
$ISTG_t$	t	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
High/High	-0.07	-0.13	-0.27	-0.37	-0.44	-0.66	-0.75	7.51	11.18	13.22	14.41	15.13	15.40	11.66	19.23	24.31	28.06	31.45	34.08
High/Med	-0.01	-0.11	-0.30	-0.50	-0.66	-0.79	-0.99	7.03	10.47	12.47	13.55	14.12	14.22	12.78	20.60	25.97	29.97	33.40	35.79
High/Low	0.07	-0.17	-0.52	-0.82	-1.07	-1.32	-1.60	6.02	8.92	10.56	11.64	12.30	12.62	14.32	22.65	28.43	32.84	36.32	38.84
Med/High	-0.08	0.09	0.04	-0.01	0.08	0.03	0.03	9.50	14.86	18.02	20.05	21.52	22.37	9.09	14.30	18.03	20.89	23.14	24.91
Med/Med	-0.10	0.00	-0.03	-0.08	-0.14	-0.15	-0.17	8.42	12.68	15.23	16.84	18.15	18.68	11.09	17.62	22.15	25.44	28.05	29.59
Med/Low	-0.13	0.02	-0.06	-0.08	-0.14	-0.18	-0.26	7.44	11.29	13.56	15.23	16.34	17.03	12.28	19.29	24.03	27.73	30.34	32.24
Low/High	-0.07	0.14	0.18	0.31	0.37	0.36	0.44	11.02	17.69	22.21	25.06	27.19	28.52	6.97	10.78	13.31	15.18	16.70	17.64
Low/Med	-0.11	0.10	0.22	0.24	0.22	0.29	0.33	10.05	15.54	19.26	21.82	23.88	25.05	8.46	13.11	16.23	18.47	20.18	21.36
Low/Low	-0.20	0.10	0.08	0.14	0.17	0.16	0.19	9.47	14.58	18.18	20.69	22.69	24.11	8.95	13.76	17.08	19.35	21.02	22.10
High Diff.	0.14	-0.04	-0.25	-0.45	-0.64	-0.66	-0.84	-1.49	-2.26	-2.66	-2.78	-2.83	-2.78	2.65	3.41	4.12	4.77	4.86	4.76
t-stat.	*1.51*	*-0.74*	*-3.20*	*-5.45*	*-6.84*	*-6.92*	*-9.04*	*-8.63*	*-10.59*	*-11.28*	*-11.15*	*-11.27*	*-11.35*	*11.81*	*12.58*	*13.55*	*14.36*	*14.58*	*13.96*
Low Diff.	0.12	0.04	0.10	0.18	0.19	0.20	0.25	1.55	3.11	4.02	4.37	4.49	4.41	-1.98	-2.98	-3.78	-4.17	-4.32	-4.45
t-stat.	*3.55*	*1.66*	*3.27*	*5.58*	*5.48*	*5.45*	*6.14*	*6.91*	*11.51*	*13.83*	*14.17*	*14.15*	*13.55*	*-9.83*	*-12.02*	*-13.60*	*-14.10*	*-13.89*	*-13.64*

Table 6: This table reports on the return implications of the firm-level γ_1 estimates from equation (4). These estimates measure the sensitivity of cumulative revisions in a firm's long-term forecasted earnings growth over a six-month horizon (RevLTG) to revisions in its short-term forecasted earnings growth during the prior month (RevISTG), $\text{RevLTG}_{t+6,t} = \gamma_0 + \gamma_1 \text{RevISTG}_{t,t-1} + \gamma_2 \text{LTG}_t + \gamma_3 \text{RET12}_t + \epsilon_t$. This firm-level regression is performed monthly over rolling three-year windows for stocks that have a minimum of two years data to obtain a monthly cross-section of γ_1 estimates. Every month, stocks are then sorted into terciles according to their γ_1 estimate. A regression of monthly stock returns on our Slope^R variable, as in equation (5), is then conducted for stocks with high γ_1 estimates and low γ_1 estimates where these thresholds are defined as the 33^{rd} and 66^{th} percentiles, respectively. Within the low tercile and high tercile, the time series averages of the regression coefficients for $r_{t+1} = \beta_1 \text{Slope}^R_t + \beta_2 \text{BM}_t + \beta_3 \text{Size}_t + \beta_4 \text{RET12}_t + \beta_5 \text{RET}_t + \epsilon_{t+1}$ are reported. BM represents a firm's book-to-market ratio while Size refers to its market capitalization. RET12 denotes past returns over the prior twelve months after omitting the most recent month (RET). The t-statistics (in italics) below each regression coefficient are Newey-West adjusted with 12 lags.

γ_1	N	Slope^R	BM	Size	RET12	RET	Avg. R^2
High	382	-0.0017	0.0006	-0.0007	0.0019	-0.0033	0.066
		-3.05	*0.65*	*-0.76*	*1.92*	*-4.84*	
Low	382	-0.0005	0.0010	-0.0005	0.0024	-0.0044	0.066
		-0.98	*1.09*	*-0.67*	*2.47*	*-6.28*	

Table 7: This table reports on the returns from double-sorted LTG_t / $dISTG_t$ portfolios along with the post-formation revisions in long-term analyst forecasts within each portfolio. Panel A reports the raw returns and risk-adjusted returns from each of the LTG_t / $dISTG_t$ portfolios, along with their size, book-to-market ratio (BM), and past return (RET12) characteristics. Risk-adjusted returns are computed using the four-factor model and the characteristics-based approach in Daniel, Grinblatt, Titman, and Wermers (1997). Panel B then reports the risk-adjusted returns from a trading strategy that buys low LTG_t / high $dISTG_t$ stocks and sells high LTG_t / low $dISTG_t$ stocks. For brevity, we report these risk-adjusted returns for one, three, six, nine, and twelve months after portfolio formation. The intermediate months have similar risk-adjusted returns. The t-statistics (in italics) are Newey-West adjusted with 12 lags. Panel C contains the revisions in long-term forecasted earnings growth during the month of portfolio formation (month t) as well as cumulative post-formation revisions. Panel C also reports on the percentage of upward and downward post-formation revisions in long-term forecasts. "High Diff." refers to the high LTG_t / low $dISTG_t$ (short) portfolio minus the high LTG_t / high $dISTG_t$ benchmark portfolio, while "Low Diff." refers to the low LTG_t / high $dISTG_t$ (long) portfolio minus the low LTG_t / low $dISTG_t$ benchmark portfolio. The t-statistics corresponding to these post-formation differences in long-term analyst forecasts are reported below each entry.

Panel A: Portfolio Characteristics and Returns

LTG_t /		Stock Characteristics at Portfolio Formation					First-Month Returns (%)				
$dISTG_t$	N	LTG_t (%)	$dISTG_t$ (%)	Size ($MM)	BM	RET12	Raw	Four-Factor		Characteristics	
							Return	alpha	t-stat.	alpha	t-stat.
High/High	153	23.26	25.58	1,756.9	0.55	0.49	1.72	0.51	*4.42*	0.47	*4.50*
High/Med	313	23.15	-0.12	2,021.8	0.53	0.31	1.09	-0.05	*-0.51*	0.19	*2.38*
High/Low	168	23.10	-39.55	1,844.0	0.54	0.17	0.57	-0.51	*-4.24*	-0.26	*-2.67*
Med/High	155	14.71	22.81	2,739.7	0.67	0.32	1.55	0.32	*3.02*	0.43	*5.16*
Med/Med	315	14.46	-0.08	3,226.1	0.65	0.21	1.21	0.08	*0.98*	0.10	*1.62*
Med/Low	174	14.76	-30.84	2,688.3	0.66	0.09	0.93	-0.19	*-1.90*	-0.07	*-0.90*
Low/High	155	10.09	27.13	3,762.2	0.82	0.24	1.67	0.45	*4.96*	0.37	*5.11*
Low/Med	307	9.99	0.01	4,157.1	0.78	0.17	1.26	0.11	*1.39*	0.07	*1.02*
Low/Low	175	10.11	-32.06	3,463.5	0.81	0.07	1.09	-0.06	*-0.71*	-0.07	*-0.91*

Panel B: Risk-Adjusted Returns after Portfolio Formation

Post-Formation Month		Four-Factor Model					Characteristics
		alpha (%)	MKT	HML	SMB	UMD	alpha (%)
One	coeff.	0.96	-0.193	0.355	-0.328	0.148	0.63
	t-stat.	*7.75*	*-6.11*	*7.63*	*-8.46*	*5.37*	*5.13*
Three	coeff.	0.55	-0.175	0.335	-0.420	0.222	0.27
	t-stat.	*4.91*	*-6.07*	*7.92*	*-11.96*	*8.85*	*2.33*
Six	coeff.	0.34	-0.168	0.401	-0.359	0.265	0.24
	t-stat.	*2.80*	*-5.39*	*8.73*	*-9.40*	*9.78*	*2.05*
Nine	coeff.	0.40	-0.158	0.293	-0.365	0.145	0.17
	t-stat.	*3.59*	*-5.60*	*6.99*	*-10.52*	*5.89*	*1.54*
Twelve	coeff.	0.26	-0.167	0.297	-0.269	0.194	0.18
	t-stat.	*2.17*	*-5.45*	*6.49*	*-7.17*	*7.26*	*1.38*

Panel C: Revisions in Long-Term Forecasted Earnings Growth

LTG_t /	Month	Cumulative Long-Term Forecast Revisions (%) Months After Portfolio Formation						Upward Revisions in Long-Term Forecasts (%) Months After Portfolio Formation						Downward Revisions in Long-Term Forecasts (%) Months After Portfolio Formation					
$dISTG_t$	t	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
High/High	0.09	-0.15	-0.36	-0.54	-0.70	-0.89	-1.05	7.92	11.78	14.57	16.09	16.37	16.97	12.22	19.15	24.95	29.08	31.93	34.70
High/Med	0.15	-0.20	-0.44	-0.62	-0.81	-0.90	-1.07	6.70	10.08	11.58	12.64	13.58	13.45	12.52	20.47	25.12	28.96	32.78	35.09
High/Low	0.07	-0.22	-0.58	-0.77	-1.03	-1.27	-1.48	6.49	9.41	11.17	11.91	12.37	12.77	14.84	23.33	29.94	34.47	37.49	40.27
Med/High	-0.06	0.06	0.05	0.06	0.10	0.08	0.03	9.49	14.71	18.16	20.34	21.75	22.88	9.76	15.11	19.54	22.59	24.07	26.26
Med/Med	-0.05	0.09	0.01	0.00	0.00	-0.07	-0.12	8.14	12.59	14.93	16.63	18.10	18.55	10.52	16.74	20.60	23.62	26.86	28.18
Med/Low	-0.14	-0.02	-0.15	-0.23	-0.29	-0.33	-0.38	8.14	12.10	14.42	15.89	16.74	17.39	12.64	19.94	25.06	28.88	30.96	33.00
Low/High	-0.15	0.16	0.30	0.39	0.46	0.51	0.53	11.26	17.89	22.99	26.07	28.18	29.91	7.83	11.89	14.67	16.34	17.70	18.94
Low/Med	-0.09	0.09	0.14	0.21	0.20	0.23	0.25	9.94	15.55	18.83	21.29	23.68	24.66	7.76	12.14	14.73	16.92	18.65	19.63
Low/Low	-0.18	0.07	0.08	0.10	0.12	0.16	0.20	9.89	15.15	18.91	21.34	22.83	24.34	9.27	14.29	18.22	20.75	22.48	23.64
High Diff.	-0.01	-0.07	-0.22	-0.23	-0.33	-0.38	-0.43	-1.43	-2.37	-3.40	-4.17	-4.00	-4.20	2.61	4.18	5.00	5.39	5.56	5.57
t-stat.	*-0.16*	*-0.98*	*-2.54*	*-2.35*	*-3.16*	*-3.64*	*-3.92*	*-7.41*	*-10.08*	*-13.42*	*-14.88*	*-13.59*	*-14.71*	*9.54*	*12.65*	*13.55*	*14.21*	*14.65*	*13.73*
Low Diff.	0.03	0.10	0.22	0.29	0.34	0.35	0.33	1.37	2.74	4.08	4.73	5.34	5.57	-1.43	-2.40	-3.55	-4.40	-4.78	-4.70
t-stat.	*1.25*	*3.53*	*6.89*	*8.20*	*10.01*	*9.39*	*8.92*	*5.67*	*9.51*	*12.78*	*13.79*	*15.02*	*14.63*	*-6.27*	*-8.35*	*-11.70*	*-13.47*	*-14.36*	*-14.19*

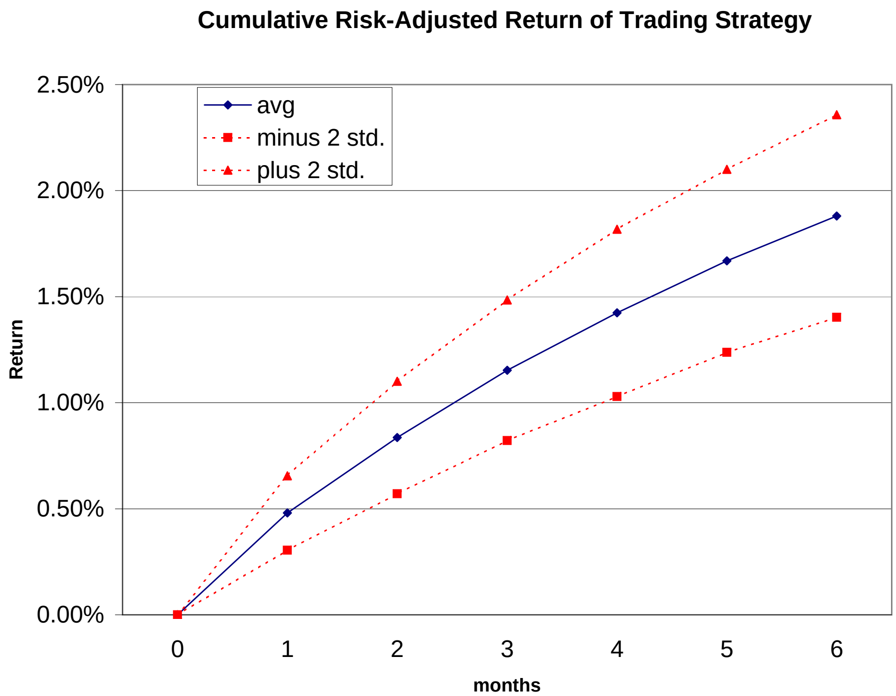

Figure 1: This figure plots the cumulative risk-adjusted returns from our trading strategy that buys low LTG_t / high $ISTG_t$ stocks and sells high LTG_t/ low $ISTG_t$ stocks. Implied short-term forecasted earnings growth, $ISTG_t$, is computed according to equation (1) using annual consensus earnings forecasts and realized earnings, while LTG_t denotes long-term analyst forecasts for earnings growth. A holding period from one to six months after portfolio formation is considered. The cumulative risk-adjusted returns over this six-month horizon, which equals 190bp, are graphed along with a confidence interval defined by (plus and minus) two standard deviations.

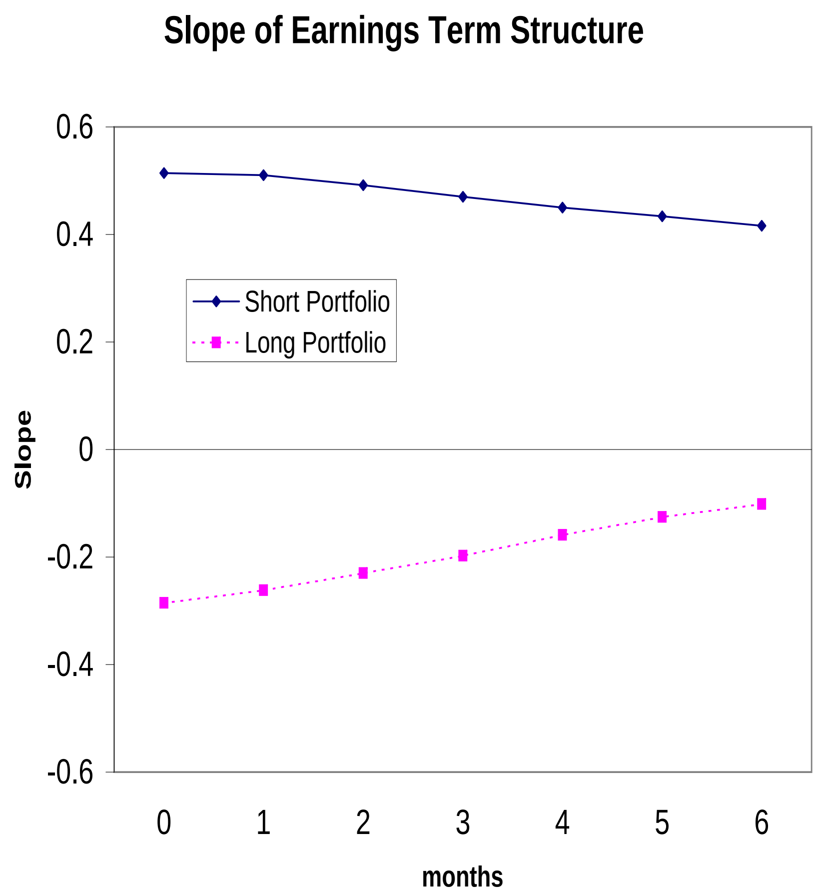

Figure 2: This figure plots the difference, $LTG_t - ISTG_t$, for the long portfolio and short portfolio underlying our trading strategy, starting in the month of portfolio formation until six months afterwards. The long portfolio contains low LTG_t / high $ISTG_t$ stocks while the short portfolio contains high LTG_t / low $ISTG_t$ stocks. Implied short-term forecasted earnings growth, $ISTG_t$, is computed at the portfolio-level according to equation (1) using a portfolio's aggregate annual earnings forecast and its aggregate realized earnings. LTG_t denotes a portfolio's aggregate long-term analyst forecast for earnings growth.

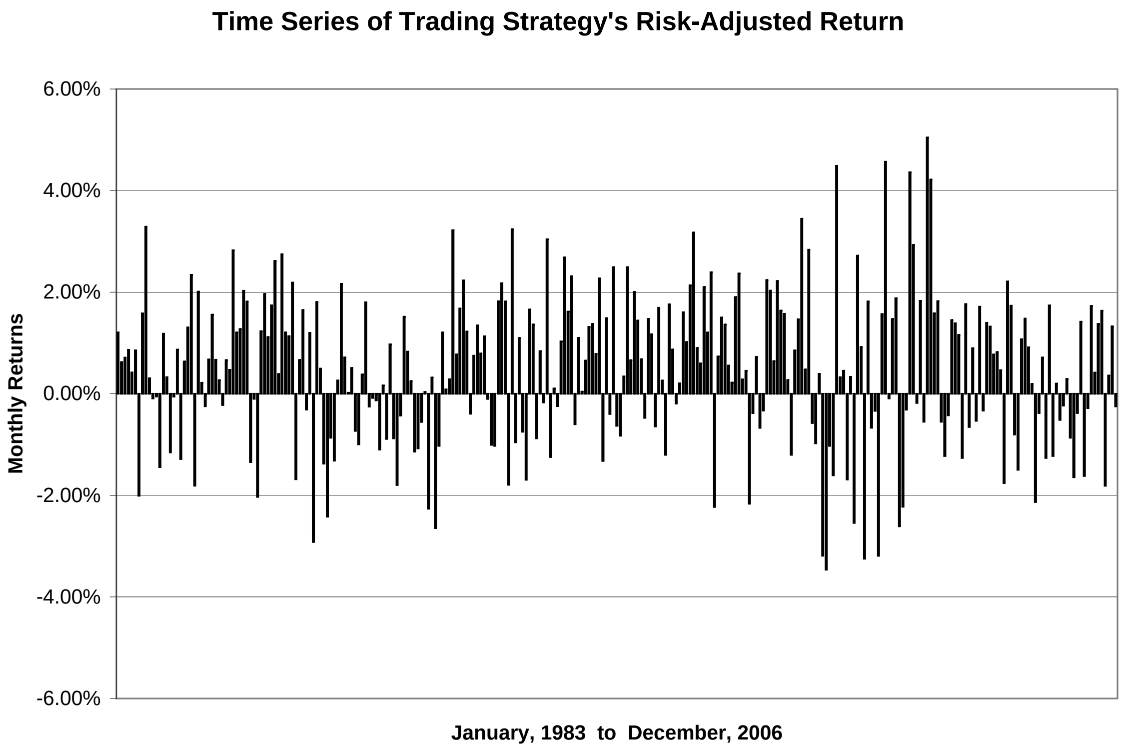

Figure 3: This figure plots the risk-adjusted returns from our trading strategy, which buys stocks with low LTG_t / high $ISTG_t$ and sells stocks with high LTG_t/ low $ISTG_t$ over the 1983 to 2006 period. Implied short-term forecasted earnings growth, $ISTG_t$, is computed according to equation (1) using annual earnings forecasts and realized earnings, while LTG_t denotes long-term analyst forecasts for earnings growth. The risk-adjusted returns are computed in the first month after the long portfolio and short portfolio are formed.