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The disparity between long-term and short-term forecasted earnings growth ☆

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ABSTRACT

We find the disparity between long-term and short-term analyst forecasted earnings growth is a robust predictor of future returns and long-term analyst forecast errors. After adjusting for industry characteristics, stocks whose long-term earnings growth forecasts are far above or far below their implied short-term forecasts for earnings growth have negative and positive subsequent risk-adjusted returns along with downward and upward revisions in long-term forecasted earnings growth, respectively. Additional results indicate that investor inattention toward firm-level changes in long-term earnings growth is responsible for these risk-adjusted returns.

1. Introduction

Long-term earnings expectations are crucial to stock price valuations. For example, according to the Gordon (1962) growth model, a price-to-dividend ratio of 20 implies that a 1% increase in long-term dividend growth translates into a 20% return.[1] Therefore, even small errors in long-term expectations of earnings growth, which are the basis for long-term expectations of dividend growth, can induce economically significant mispricings. Long-term analyst forecasts are an important collection of expectations regarding long-term earnings growth. Jung, Shane, and Yang (2008) show the relevance of these forecasts to stock prices and Copeland, Dolgoff, and Moel (2004) report that revisions in long-term analyst forecasts exert a greater influence on stock prices than revisions in short-term analyst forecasts.

However, the duration of an analyst's career averages four years according to Hong and Kubik (2003), while long-term analyst forecasts pertain to earnings growth over the next three to five years. Consequently, analysts have weak incentives to incorporate information into their long-term forecasts in a timely manner. A growing literature also shows that investors have limited attention and are unable to immediately process all information relevant to future earnings (Sims, 2003; Hong, Torous, and Valkanov, 2007; Cohen and Frazzini, 2008; Hirshleifer, Lim, and Teoh, 2009). In particular, DellaVigna and Pollet (2007) demonstrate that investors have limited attention regarding the long-term earnings implications of information. This paper finds

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

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that analyst incentives and investor inattention exert a significant impact on stock prices as information is slowly incorporated into their long-term forecasts and long-term earnings expectations, respectively.

We propose a novel ex ante proxy to capture the slow incorporation of information into long-term analyst forecasts. At the market level, forecasted earnings growth averages 17.1% per annum for the long-term compared with 15.2% for the current year. Thus, on average, the long-term earnings growth forecasts (*LTG*) of analysts and their implied short-term earnings growth forecasts (*ISTG*) for the current year are similar. *ISTG* is inferred from dollar-denominated annual earnings forecasts for the current year and realized earnings in the previous year. Under the assumption that short-term earnings growth forecasts are more accurate than long-term forecasts, we associate extreme disparities between these forecasts in the cross-section with the slower incorporation of information into long-term analyst forecasts.

Our comparison between *LTG* and *ISTG* is conducted across firms within the same industry because a long-term forecast of 20% could be high for utility companies but low for technology companies. Intuitively, when *LTG* and *ISTG* are simultaneously above and below their respective industry-level counterparts, a firm is forecasted to outperform its industry peers in the long-term but underperform in the short-term. Hence, this firm's long-term earnings growth forecasts could have yet to fully incorporate bad information that has already been incorporated into its short-term earnings forecasts. More generally, the industry-adjusted disparity between *LTG* and *ISTG* provides an ex ante proxy for errors in long-term analyst forecasts. Stale forecasts are excluded from our study as the consensus forecasts that define *LTG* and *ISTG* are required to be issued, revised, or reiterated during the month in which they are compared.

Using double-sorted portfolios formed according to *LTG*, then *ISTG*, we find the high *LTG*/low *ISTG* portfolio has a negative risk-adjusted return of -27 basis points (bp) with a *t*-statistic of -2.73 in the first month after portfolio formation and the most optimistic long-term forecasts. Conversely, the low *LTG*/high *ISTG* portfolio has a positive risk-adjusted return of 21 bp with a *t*-statistic of 2.39 in the first month after portfolio formation and the most pessimistic long-term forecasts. Thus, large disparities between *LTG* and *ISTG* predict returns and provide an ex ante proxy for long-term analyst forecast errors. Furthermore, the 48 bp (*t*-statistic of 5.08) risk-adjusted return from buying low *LTG*/high *ISTG* stocks and selling high *LTG*/low *ISTG* stocks persists for six months. The annualized 4% return-adjusted return from our trading strategy exceeds transaction costs and is robust across different subperiods as well as several alternative methods for inferring *ISTG* that account for realized earnings near zero and negative earnings.

The disparity between *LTG* and *ISTG* identifies return variation across stocks with nearly identical long-term analyst forecasts. Although La Porta (1996) shows that stocks with high long-term analyst forecasts earn low returns, buying low *LTG* stocks and selling high *LTG* stocks does not generate a risk-adjusted return in our sample. Dechow and Sloan (1997) demonstrate that *LTG* portfolios are closely related to market-to-book portfolios. The value premium explains a significant portion of the return variation across *LTG* portfolios. Despite *ISTG*'s importance to the identification of errors in *LTG*, our trading strategy's risk-adjusted return is not driven by earnings momentum (Chan, Jegadeesh, and Lakonishok, 1996). Specifically, eliminating stocks from our trading strategy with large prior revisions in their annual earnings forecasts or large prior earnings surprises does not diminish its risk-adjusted return.

After sorting stocks into *LTG* and *ISTG* deciles within their industry, we construct a firm-level disparity variable as the rank (in descending order) of a firm's *ISTG* decile minus the rank of its *LTG* decile. This nonparametric statistic is not sensitive to *ISTG* outliers that can arise from realized earnings growth near zero. A positive disparity variable indicates that a firm's *LTG* is ranked higher than its *ISTG*. Our disparity variable predicts returns after controlling for size, book-to-market, price-to-earnings, and past return characteristics as well as analyst forecast dispersion (Diether, Malloy, and Scherbina, 2002), analyst coverage (Hou and Moskowitz, 2005), idiosyncratic return volatility (Ang, Hodrick, Xing, and Zhang, 2006), institutional ownership (Nagel, 2005), and revisions in analyst buy and sell recommendations (Barber, Lehavy, McNichols, and Trueman, 2001). Prior revisions in annual earnings forecasts and earnings surprises during the past quarter (Chan, Jegadeesh, and Lakonishok, 1996) also cannot explain the disparity variable's return predictability. Moreover, neither *LTG* nor *ISTG* predict returns. Instead, return predictability is limited to the industry-adjusted disparity between these earnings growth forecasts.

Consistent with prior empirical evidence, revisions in long-term analyst forecasts induce strong stock price reactions in our sample. Moreover, the return predictability of our disparity variable appears to originate from its ability to predict revisions in long-term forecasted earnings growth. Specifically, the short portfolio has large downward post-formation revisions in long-term forecasted earnings growth and the long portfolio has large upward post-formation revisions in long-term forecasted earnings growth, after accounting for mean-reversion in long-term earnings growth. Within these two portfolios, post-formation return variation is also consistent with contemporaneous revisions in long-term analyst forecasted earnings growth.

To summarize, our empirical evidence indicates that the disparity between *LTG* and *ISTG* predicts long-term analyst forecast revisions that influence returns. The predictability in long-term analyst forecast revisions is consistent with analysts having weak incentives to incorporate information into these forecasts. In contrast, while short-term forecast revisions induce significant contemporaneous price fluctuations, they cannot explain the returns from our trading strategy. This finding suggests that investors and analysts incorporate information into their short-term earnings growth expectations more rapidly than their long-term expectations.

For predictability in long-term analyst forecast revisions to generate risk-adjusted returns, the market must not fully account for the predictability in these revisions. Limited attention in DellaVigna and Pollet (2007) has investors adopting simplifying heuristics to form their long-term earnings expectations. Category learning in Peng and Xiong (2006) has investors focusing on prior firm classifications instead of processing firm-level information due to limited attention. The firm-level information in Peng and Xiong (2006) can pertain to long-term earnings growth, which provides a link to the limited attention hypothesized by DellaVigna and Pollet (2007). The theory of style investing in Barberis and Shleifer (2003) also has investors categorizing stocks to reduce the processing of firm-specific information.

We provide direct evidence that investor inattention is responsible for the return predictability associated with the disparity between *LTG* and *ISTG*. Order flow imbalances indicate that future revisions in long-term forecasted earnings growth, despite their predictability, initiate trading activity and consequently surprise investors. This finding suggests that investors pay insufficient attention to the long-term earnings implications of information. Additional evidence supports the predictions of category learning based on limited attention in Peng and Xiong (2006) and limited attention toward long-term earnings growth in DellaVigna and Pollet (2007). Specifically, our disparity variable predicts future book-to-market migrations (migration between growth and value stocks). This predictability is consistent with investors underestimating the heterogeneity within value stocks and growth stocks by underreacting to firm-specific information on long-term earnings growth. Therefore, investors appear to initially underreact to firm-level information regarding long-term earnings growth and focus instead on the prior classification of stocks as high *LTG* (growth) or low *LTG* (value). The migrations in book-to-market characteristics reported in Fama and French (2007) are consistent with the risk-adjusted returns of our long portfolio and short portfolio. However, in contrast to their study, we are able to predict migrations in book-to-market characteristics using the disparity between *LTG* and *ISTG*.

Our paper contributes to an expanding literature on limited attention. While traditional asset pricing assumes that information is instantaneously incorporated into prices, this assumption requires investors to constantly allocate sufficient attention to all relevant information. However, when attention is a scare cognitive resource (Kahneman, 1973), investors have limited attention. Recent theoretical frameworks in which limited attention affects asset pricing include Sims (2003), Peng and Xiong (2006), and DellaVigna and Pollet (2007). Empirically, Hirshleifer, Lim, and Teoh (2009) find that investors are less attentive on days with more earnings announcements. DellaVigna and Pollet (2009) reach a similar conclusion for Friday announcements. Cohen and Frazzini (2008) report that the economic links between customers and suppliers yield return predictability. Similarly, Hong, Torous, and Valkanov (2007) find that market level returns are predictable using prior industry-level returns, especially for industries that are sensitive to economic activity. Our results extend this stream of research by providing new evidence of investor inattention toward long-term earnings growth.

Our paper also contributes to the analyst forecast literature. While Chan, Karceski, and Lakonishok (2003) conclude that long-term analyst forecasts are a poor predictor of realized earnings growth, our study finds that errors in these forecasts are partially attributable to their slow incorporation of information. In particular, we extend the existing analyst forecast literature by demonstrating that the disparity between *LTG* and *ISTG* provides an ex ante proxy for analyst forecast errors. Thus, our disparity variable enables researchers and practitioners involved in equity valuation to interpret long-term analyst forecasts more accurately.

Our ex ante comparison of analyst forecasts over different horizons also extends prior research on the return implications of analyst forecast biases because the disparity between *LTG* and *ISTG* yields economically as well as statistically significant risk-adjusted returns. This return predictability cannot be replicated by conditioning on *LTG* alone, as in La Porta (1996), and is not a manifestation of earnings momentum. Scherbina (2005) relies on ex post forecast errors to conclude that short-term analyst optimism influences returns. Furthermore, a high price-to-value ratio from a residual income model (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. We differentiate between these respective scenarios by assigning them a positive and negative disparity. Although Jagannathan, Ma, and Baldaque da Silva (2005) evaluate a combination of short-term and long-term analyst forecasts, they do not examine the disparity between forecasted earnings growth over different horizons.

The remainder of the paper is organized as follows. Section 2 describes our data. The return predictability and errors in long-term expectations of earnings growth associated with the disparity between *LTG* and *ISTG* are reported in Section 3 and Section 4, respectively. Section 5 provides a theoretical explanation for the risk-adjusted returns of our trading strategy and Section 6 demonstrates their robustness. Section 7 then concludes.

2. Data and definitions

Our sample of analyst earnings forecasts is obtained from the Institutional Brokers' Estimate System (I/B/E/S) Summary unadjusted file. Unadjusted I/B/E/S forecasts are not adjusted by share splits after their issuance date. As detailed in Diether, Malloy, and Scherbina (2002), the earnings per share (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.

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 I/B/E/S are produced on the third Thursday of every month. Although the analysts issuing annual forecasts could 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. Following Diether, Malloy, and Scherbina (2002), we define forecast dispersion (DISP) as the standard deviation of analyst forecasts divided by the absolute value of their average forecast.

The I/B/E/S data set is merged with Compustat and returns from the Center for Research into Security Prices (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 11 I/B/E/S industries is reported in Table 1. The number of firms in our sample increases over time according to Panel A. 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. By requiring firms to have long-term analyst forecasts, our sample is orientated toward large stocks with relatively high analyst coverage. Analyst coverage is defined as the number of analysts issuing at least one forecast. 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 and long-term forecasts are annualized percentage growth rates. For comparative purposes, the $A1_t$ forecasts are converted into annualized percentage growth rates denoted $ISTG_t$ (implied short-term growth):

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

based on the firm's realized earnings from the prior year. The difference $LTG_t - ISTG_t$ measures the disparity between long-term and short-term forecasts of earnings growth at the portfolio level. However, for individual firms, $ISTG_t$ has outliers that arise from $A0_t$ being near zero. Therefore, we construct a Disparity^R_t 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 $\text{Disparity}^R_{i,t}$ for firm i in month t. This nonparametric statistic is not 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). In particular, a positive (negative) disparity variable indicates that a firm's LTG is ranked higher (lower) than its $ISTG$.

3. Disparity in forecasted earnings growth

To determine whether the disparity between long-term and short-term forecasted earnings growth predicts returns, we construct double-sorted $LTG_t/ISTG_t$ portfolios and utilize our firm-level disparity variable in cross-sectional regressions.

Within the 11 I/B/E/S industries, we first 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

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 analyst forecasts (LTG), as well as their distribution across the 11 industry sectors in the Institutional Brokers' Estimate System (I/B/E/S). The $A1$ forecasts are dollar-denominated earnings per share figures normalized by realized earnings from the previous year and LTG represents an annualized percentage forecast for earnings growth. In Panel B, analyst coverage (COVER) as well as $A1$ and LTG and their respective dispersions (DISP) are recorded. In addition, 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

		Industry sector breakdown										
Years	Number of stocks	Consumer services	Non durables	Durables	Finance	Technology	Energy	Capital goods	Health care	Basic industrials	Utilities	Transport
1983 to 1989	1,879	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	2,764	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	2,768	16.6%	10.0%	4.7%	18.8%	3.6%	4.7%	2.2%	22.3%	5.3%	6.5%	5.1%
All	2,507	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

Years	COVER	A1	LTG	DISP A1	DISP LTG	Size	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

aggregate across the 11 industry sectors. Within each of the 11 industry sectors, stocks are equally weighted. By construction, these double-sorted portfolios are not concentrated in specific industries. Panel A of Table 2 reports the average size, book-to-market, past return (RET12), and price-to-earnings (PE) characteristics of the firms in these double-sorted portfolios. Past returns are defined over the past 12 months with a one-month lag. The PE ratios are defined using the methodology in Jegadeesh, Kim, Krische, and Lee (2004) that divides a firm's prior four quarterly earnings per share realizations by its stock price. Overall, firms with low (high) $ISTG_t$ typically have lower (higher) past returns and lower (higher) PE ratios.

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 Eq. (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 also exclude stocks with share prices below five dollars to ensure our results are not unduly influenced by bid–ask bounce.

Panel A of Table 2 presents the risk-adjusted returns from the nine double-sorted LTG_t/$ISTG_t$ portfolios. These returns are risk-adjusted using the three Fama and French (1996) factors along with the Carhart (1997) momentum factor. The

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 Eq. (1). Within the 11 Institutional Brokers' Estimate System (I/B/E/S) industries, a three-by-three sequential double-sort is conducted 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 11 industry sectors. Difference is computed by subtracting each portfolio's $ISTG_t$ characteristic from its LTG_t characteristic. The Error column equals LTG_t minus realized long-term earnings growth. 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, with *t*-statistics in italics. 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), past return (RET12), and price-to-earnings (PE) 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. In Panel B, the risk-adjusted returns and factor loadings from our 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. MKT, HML, SMB, and UMD refer to market, book-to-market, size, and momentum factors, respectively.

Panel A: Portfolio characteristics and returns

		Stock characteristics at portfolio formation								First-month returns				
	Number	LTG_t	$ISTG_t$	Difference	Error	Size	BM	RET12	PE	Raw	Four-factor		Characteristics	
$LTG_t/ISTG_t$	of stocks	percent	percent	percent	percent	millions	ratio	percent	ratio	return	alpha	*t*-statistic	alpha	*t*-statistic
High/High	213	25.78	189.30	−163.52	6.97	1,322.7	0.58	0.520	27.34	1.32	0.16	*1.53*	0.20	*1.98*
High/Med	221	22.26	22.58	−0.31	9.60	2,410.4	0.50	0.340	18.00	1.13	−0.04	*−0.39*	0.09	*0.95*
High/Low	217	22.37	−37.26	59.63	20.35	1,705.8	0.55	0.122	8.11	0.84	−0.27	*−2.73*	−0.22	*−2.05*
Med/High	216	14.83	140.99	−126.16	−1.12	2,195.4	0.71	0.332	19.39	1.45	0.22	*2.39*	0.07	*0.99*
Med/Med	223	14.62	11.73	2.89	5.66	3,959.1	0.60	0.224	14.03	1.21	0.07	*0.70*	0.01	*0.10*
Med/Low	220	14.56	−32.95	47.51	16.16	2,408.4	0.68	0.060	8.00	1.06	−0.05	*−0.55*	−0.04	*−0.51*
Low/High	215	10.20	141.52	−131.32	−1.26	2,654.1	0.86	0.262	17.92	1.44	0.21	*2.39*	0.21	*2.75*
Low/Med	222	10.23	7.82	2.41	5.27	5,169.3	0.72	0.176	12.80	1.33	0.18	*2.08*	0.02	*0.26*
Low/Low	219	9.79	−43.64	53.42	13.00	3,367.7	0.83	0.050	7.33	1.14	0.00	*0.04*	−0.14	*−1.84*

Panel B: Risk-adjusted returns after portfolio formation

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

risk-adjusted return of the low LTG_t/high $ISTG_t$ portfolio equals 21 bp (t-statistic of 2.39), and the high LTG_t/low $ISTG_t$ portfolio's risk-adjusted return equals −27 bp (t-statistic of −2.73) one month after formation. The characteristic-based procedure in Daniel, Grinblatt, Titman, and Wermers (DGTW, 1997) confirms these risk-adjusted returns. The low LTG_t/high $ISTG_t$ portfolio and the high LTG_t/low $ISTG_t$ portfolio are the only portfolios that have significant risk-adjusted returns using the four-factor model and the procedure in Daniel, Grinblatt, Titman, and Wermers (1997).

The high LTG_t/high $ISTG_t$ portfolio and low LTG_t/low $ISTG_t$ portfolio have large differences between LTG_t and $ISTG_t$, given the variability in $ISTG_t$. The positive DGTW-adjusted return of 20 bp from the high LTG_t/high $ISTG_t$ portfolio and the negative DGTW-adjusted return of −14 bp from the low LTG_t/low $ISTG_t$ portfolio are consistent with their negative disparity and positive disparity, respectively. Specifically, Panel A of Table 2 reports the high LTG_t/high $ISTG_t$ portfolio has an LTG_t of 25.78% and an $ISTG_t$ of 189.30%, yielding a negative difference of −163.52% that corresponds to a positive DGTW risk-adjusted return. Furthermore, the low LTG_t/low $ISTG_t$ portfolio has an LTG_t of 9.79% and an $ISTG_t$ of −43.64%, yielding a positive difference of 53.42% that corresponds to a negative DGTW-adjusted return.

Overall, the double-sorted LTG_t/$ISTG_t$ portfolios capture differences between long-term and short-term forecasted earnings growth, with risk-adjusted returns being inversely related to large differences. However, the double-sorted portfolios offer a less refined firm-level proxy for the disparity between LTG_t and $ISTG_t$ than our Disparity_t^R variable. Specifically, Disparity_t^R is constructed after sorting stocks into deciles instead of terciles according to their forecasted earnings growth.

For emphasis, long-term analyst forecasts are similar within the three high LTG_t portfolios, approximately 22%, and within the three low LTG_t portfolios, approximately 10%. Thus, after controlling for LTG_t, the disparity between LTG_t and $ISTG_t$ identifies positive as well as negative risk-adjusted returns. In particular, the disparity between LTG_t and $ISTG_t$ identifies cross-sectional return variation across portfolios with similar levels of long-term forecasted earnings growth. The considerable post-formation return variation across stocks with similar long-term analyst forecasts reinforces the importance of conditioning on the disparity between LTG_t and $ISTG_t$ instead of LTG_t itself. However, despite $ISTG_t$'s ability to identify return variation across stocks with similar long-term analyst forecasts, its level does not induce mispricings. Specifically, the low $ISTG_t$ portfolios have lower subsequent returns than the high $ISTG_t$ portfolio. This return variation is inconsistent with high $ISTG_t$ and low $ISTG_t$ proxying for optimism and pessimism, respectively.

The long-term forecast errors in Panel A of Table 2 are defined as LTG_t minus realized earnings growth over the subsequent three-to-five-year horizon. Thus, positive forecast errors correspond to optimistic long-term forecasts and negative forecast errors correspond to pessimistic long-term forecasts. The ex post forecast errors reported in Panel A suggest that the high LTG_t/low $ISTG_t$ and low LTG_t/high $ISTG_t$ combinations are valid ex ante proxies for analyst optimism and analyst pessimism regarding long-term earnings growth, respectively. These ex post errors confirm that these respective portfolios have more severe analyst optimism and analyst pessimism regarding long-term earnings growth than the other double-sorted portfolios. In general, after accounting for the pervasive optimism in high LTG_t forecasts, large differences between LTG_t and $ISTG_t$ lead to ex post forecast errors of the same sign. As the returns from our short portfolio and long portfolio are similar, the market appears to be better at mitigating analyst optimism regarding long-term earnings growth 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 48 bp in the first month after portfolio formation (t-statistic of 5.08). This return predictability persists for six months, declining to 22 bp (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 190 bp. The cumulative risk-adjusted returns from our trading strategy are plotted in Fig. 1 along with a two standard deviation confidence interval.

The cumulative six-month risk-adjusted returns from our trading strategy exceed the quoted bid-ask spreads (in percentage terms) of 39 and 46 bp for the long portfolio and short portfolio, respectively. Bid–ask spreads are calculated using quotes from the Trades and Quote (TAQ) data set. The median bid–ask spread, defined as the ask minus the bid normalized by the midpoint, is computed daily. Within each month, daily median spreads are then averaged to produce a monthly bid–ask spread. If transaction costs were preventing investors from immediately incorporating information into prices, then risk-adjusted returns and transaction costs would decline in tandem. Instead, the respective bid–ask spreads for the long portfolio and short portfolio increase by 1 and 3 bp over the six-month holding period. Therefore, the decline in return predictability is unlikely to be caused by arbitrageurs taking advantage of lower transaction costs.

Turnover within the long portfolio and short portfolio is moderate as 75% and 74% of the stocks in the long portfolio and short portfolio remain in their respective portfolio across consecutive months. This persistence indicates that salient information is not necessarily arriving in the month of portfolio formation because large disparities between long-term and short-term forecasted earnings growth continue for several months. Fig. 2 illustrates a gradual decline in the disparity between LTG and $ISTG$ during the holding period. To minimize the influence of outliers arising from $A0_t$ being near zero, $ISTG_t$ in this figure is computed according to Eq. (1) using the aggregate $A1_t$ and aggregate $A0_t$ of each portfolio.

The temporary nature of our trading strategy's return predictability is difficult to reconcile with risk. Lettau and Wachter (2007) and Da (2009) argue that firms with higher cash flow durations, whose expected cash flows are concentrated in the more distant future, should have lower stock returns. The high LTG_t/low $ISTG_t$ combination underlying our short portfolio is consistent with a high cash flow duration, while the opposite low LTG_t/high $ISTG_t$ combination

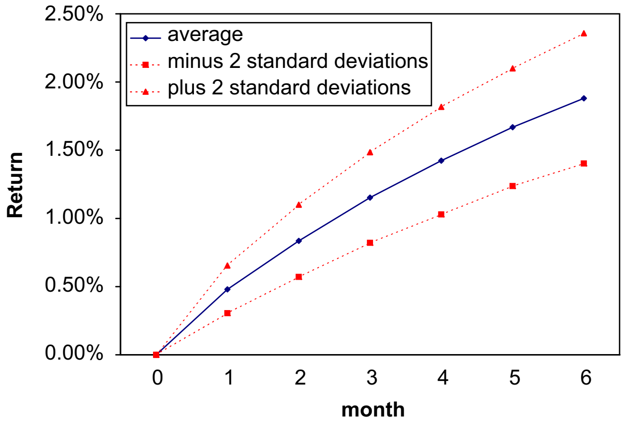

Fig. 1. This figure plots the cumulative risk-adjusted returns from our trading strategy that buys low LTG_t/high $ISTG_t$ stocks and sells high LTG_t/low $ISTG_t$ stocks. Within the 11 I/B/E/S industries, a three-by-three sequential double-sort is conducted each month from 1983 to 2006, first according to long-term forecasted earnings growth (LTG_t) and then implied short-term forecasted earnings growth ($ISTG_t$). This procedure results in nine double-sorted portfolios that aggregate across the 11 industry sectors. $ISTG_t$ is computed according to Eq. (1) using annual consensus earnings forecasts and realized earnings. 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 190 basis points, are graphed along with a confidence interval defined by (plus and minus) 2 standard deviations.

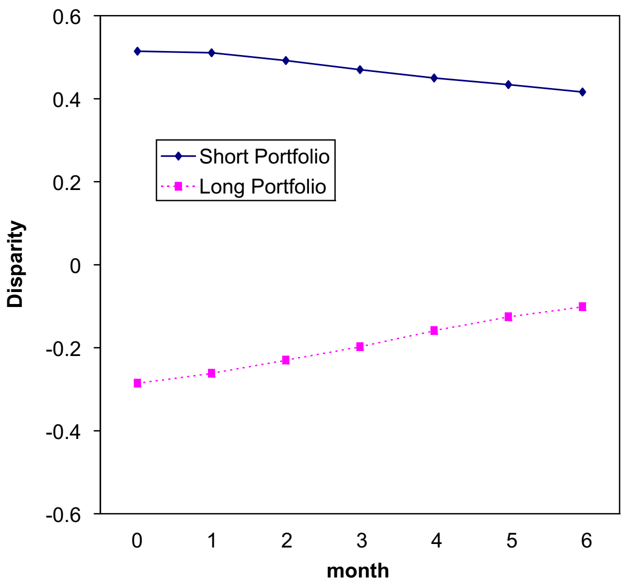

Fig. 2. This figure plots the difference, $LTG_t - ISTG_t$, for the long portfolio and short portfolio underlying our trading strategy, starting in the month of portfolio formation until six months afterwards. Within the 11 I/B/E/S industries, a three-by-three sequential double-sort is conducted according to long-term forecasted earnings growth (LTG_t) and then short-term forecasted earnings growth ($ISTG_t$). This procedure results in nine double-sorted portfolios that aggregate across the 11 industry sectors. The long portfolio contains low LTG_t/high $ISTG_t$ stocks and the short portfolio contains high LTG_t/low $ISTG_t$ stocks. $ISTG_t$ is computed at the portfolio level according to Eq. (1) using a portfolio's aggregate annual earnings forecast and its aggregate realized earnings.

underlying our long portfolio is consistent with a low cash flow duration. However, as cash flow 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 cash flow duration.

Our firm-level disparity variable Disparity_t^R facilitates a further examination of the marginal return predictability associated with disparities between LTG_t and $ISTG_t$. This disparity variable enables us to control for firm characteristics that have been found to predict returns in the existing 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. Nagel (2005) also 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, and Dechow, Hutton, Meulbroek, and Sloan (2001) find that short-sellers target stocks with high institutional ownership to minimize the cost of borrowing shares. Quarterly data on institutional ownership are obtained from the portfolio holdings reported in 13f filings with the Securities and Exchange Commission (SEC). These holdings are then normalized by the total number of shares outstanding to compute the percentage of shares held by institutions. However, Panel A of Table 3 indicates that stocks in the long portfolio and short portfolio have similar analyst coverage (COVER) and institutional ownership (IO) as the other double-sorted portfolios.

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 3 reports that the under-performing stocks in the short portfolio have lower forecast dispersions (DISP) than the over-performing stocks in the long portfolio. In particular, the average $A1_t$ forecast dispersion of 0.198 for the long portfolio exceeds 0.147 for the short portfolio. The standard deviation of $A1_t$ forecasts is proportional to the standard deviation of $ISTG_t$. Similarly, LTG_t's forecast dispersion of 0.327 for the long portfolio exceeds 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. As in Fu (2009), we compute idiosyncratic volatility on a monthly basis using the residuals from a three-factor model involving daily returns. 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 and 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 and sell recommendation of analysts and 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 and sell recommendations or 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 nonoverlapping six-month horizons (RETP and RET2P, respectively) as well as the combined 12-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. SUE is computed by comparing a firm's realized earnings in the most recent quarter with its realized earnings in the same quarter of the prior year, with this difference then normalized by the standard deviation of its earnings over the prior eight quarters. These revisions and earnings surprises are the conditional information in standard earnings momentum strategies.

Price-to-earnings characteristics are also included to supplement book-to-market characteristics. Piotroski (2000) and Mohanram (2005) find considerable return variation within value stocks and growth stocks, respectively, by conditioning on additional proxies for firm-level fundamentals while Panel A of Table 2 indicates that PE ratios are proportional to short-term forecasted earnings growth. In addition, total accruals to total assets (TA), capital expenditures to total assets (CAPEX), and previous sales growth (SG) are included as control variables in our analysis. Appendix A of Jegadeesh, Kim, Krische, and Lee (2004) defines each of these characteristics in detail. TA is defined using a firm's current assets. Depreciation along with changes in cash, current liabilities, current long-term debt, and deferred taxes are then subtracted from current assets. CAPEX sums a firm's capital expenditures over the prior four quarters, on a rolling basis. Both TA and CAPEX are quarterly variables normalized by a firm's total assets. Sales growth is a ratio whose numerator equals quarterly sales over the prior four quarters and whose denominator equals quarterly sales over a nonoverlapping horizon consisting of the prior eight to four quarters.

Using the above firm-level characteristics, we estimate the cross-sectional regression

$$\begin{aligned} r_{i,t+1} = {} & \beta_1 \text{ Disparity}^R_{i,t} + \beta_2 \text{ BM}_{i,t} + \beta_3 \text{ Size}_{i,t} + \beta_4 \text{ RET12}_{i,t} + \beta_5 \text{ RET}_{i,t} \\ & + \beta_6 \text{ DISP-}A1_{i,t} + \beta_7 \text{ DISP-}LTG_{i,t} + \beta_8 \text{ REC}_{i,t} + \beta_9 \text{ REC-REV}_{i,t} \\ & + \beta_{10} \text{ FREV}_{i,t} + \beta_{11} \text{ SUE}_{i,t} + \beta_{12} \text{ LTG}_{i,t} + \beta_{13} \text{ ISTG}_{i,t} + \beta_{14} \text{ PE}_{i,t} \\ & + \gamma \cdot X_{i,t} + \varepsilon_{i,t+1}, \end{aligned} \quad (2)$$

using monthly unadjusted returns for individual stocks. The firm and analyst characteristics in Panel A that are not reported separately as independent variables in Eq. (2) 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 3 indicate that our disparity variable predicts returns. In particular, future returns are inversely related to Disparity^R in every specification. In contrast, the β_2 coefficient for book-to-market is consistent with the value premium but insignificant in several specifications, and the β_3 coefficient for size is uniformly insignificant. The positive β_4 coefficient for RET12 indicates the presence of price momentum, and 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.

Table 3

The double-sorted portfolios below 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 Eq. (1). Within the 11 Institutional Brokers' Estimate System (I/B/E/S) industries, a three-by-three sequential double-sort is conducted 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 11 industry sectors. Panel A reports on the firm characteristics of each double-sorted portfolio. RETP and RET2P denote the prior returns from nonoverlapping six-month horizons, respectively, and RET denotes the return from the prior month. Turnover (TURN) supplements these return characteristics. Other characteristics are analyst coverage (COVER), analyst forecast dispersion (DISP) for annual (*A*1) 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 and sell recommendation of analysts (REC), and revisions in these recommendations (REC REV). Accounting variables such as a firm's price-to-earnings ratio (PE), 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 results from the regression specifications in Eq. (2), $r_{t+1} = \beta_1 \text{ Disparity}_t^R + \beta_2 \text{ BM}_t + \beta_3 \text{ Size}_t + \beta_4 \text{ RET12}_t + \beta_5 \text{ RET}_t + \beta_6 \text{ DISP-}A1_t + \beta_7 \text{ DISP-}LTG_t + \beta_8 \text{ REC}_t + \beta_9 \text{ REC-REV}_t + \beta_{10} \text{ FREV}_t + \beta_{11} \text{ SUE}_t + \beta_{12} \text{ LTG}_t + \beta_{13} \text{ ISTG}_t + \beta_{14} \text{ PE}_t + \gamma \cdot X_t + \varepsilon_{t+1}$, involving individual stocks returns. After sorting stocks into *ISTG* and *LTG* deciles, from 1 to 10 in descending order within each of the 11 I/B/E/S industries, Disparity_t^R is defined a firm's $ISTG_t$ ranking minus its LTG_t ranking. The other independent variables in this cross-sectional regression are the firm characteristics 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 and 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

	Returns and turnover				Analyst-related variables							Accounting variables				Others	
$LTG_t/ISTG_t$	RET	RETP	RET2P	TURN	COVER	DISP A1	DISP LTG	FREV	SUE	REC 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

	Disparity^R	BM	Size	RET12	RET	DISP A1	DISP LTG	REC	REC REV	FREV	SUE	LTG	ISTG	PE	X	Adj. R^2	Number of stocks
Coefficient		0.0018	0.0000	0.0032	−0.0036							−0.0010	0.0003		No	0.058	1,671
t-statistic		*3.04*	*−0.06*	*3.92*	*−6.43*							*−1.04*	*1.46*				
Coefficient	−0.0009	0.0018	0.0000	0.0030	−0.0037							−0.0006			No	0.058	1,671
t-statistic	*−3.03*	*3.03*	*−0.06*	*3.66*	*−6.48*							*−0.57*					
Coefficient	−0.0010	0.0021	0.0001	0.0030	−0.0035								0.0001		No	0.051	1,671
t-statistic	*−2.83*	*2.37*	*0.10*	*3.28*	*−6.05*								*0.65*				
Coefficient	−0.0011	0.0020	0.0000	0.0030	−0.0035									0.0000	No	0.051	1,671
t-statistic	*−3.03*	*2.33*	*0.06*	*3.28*	*−6.05*									*−0.16*			
Coefficient	−0.0010	0.0020	−0.0003	0.0024	−0.0037	−0.0014	−0.0002								No	0.062	1,300
t-statistic	*−2.81*	*2.02*	*−0.39*	*2.33*	*−6.16*	*−2.81*	*−0.47*										
Coefficient	−0.0012	0.0017	−0.0008	0.0017	−0.0039	−0.0008	−0.0004	0.0004	−0.0021						No	0.067	1,533
t-statistic	*−2.48*	*1.44*	*−0.71*	*1.30*	*−3.83*	*−1.27*	*−0.86*	*0.66*	*−6.00*								
Coefficient	−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	678
t-statistic	*−2.72*	*1.57*	*−0.84*	*2.20*	*−5.95*	*−1.40*	*0.63*			*−1.16*	*3.33*	*0.60*	*−0.81*				

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 disparity 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 because β_8 is insignificant.

The insignificant β_{10} coefficient indicates that past forecast revisions cannot predict returns. Despite β_{11}'s significance, earnings surprises in the prior quarter are similar for the long portfolio and short portfolio according to Panel A. Overall, the past forecast revisions and prior earnings surprises that define earnings momentum cannot explain the return predictability of our disparity variable. This finding is confirmed by later robustness tests that exclude stocks with extreme values for FREV and SUE from our trading strategy.

Neither LTG_t nor $ISTG_t$ predicts returns as the β_{12} and β_{13} coefficients are insignificant. The insignificant β_{12} coefficient is consistent with the results in Panel A that suggest the level of long-term analyst forecasts is insufficient to induce mispricings. Even after removing Disparity_t^R from the cross-sectional regression, the coefficients for LTG_t and $ISTG_t$ are insignificant. Thus, return predictability is limited to the disparity between LTG_t and $ISTG_t$ relative to a firm's industry peers. Finally, the insignificant β_{14} coefficient for PE, which is low (high) when a firm's *ISTG* is also low (high), is consistent with the insignificant β_{13} coefficient for $ISTG_t$.

The next section investigates the source of our disparity variable's return predictability by investigating post-formation revisions in long-term forecasted earnings growth, not their level.

4. Long-term forecast revisions

Copeland, Dolgoff, and Moel (2004) report that stock returns are sensitive to revisions in long-term analyst forecasts, even after controlling for revisions in short-term earning forecasts. Revisions in long-term forecasted earnings growth during the month of portfolio formation as well as cumulative post-formation revisions are reported in Panel A of Table 4. The cumulative post-formation revisions are based on the prevailing LTG_t forecasts in month *t*. These revisions account for mean-reversion in long-term earnings growth because high long-term earnings growth is difficult to maintain over a long horizon due to competition while poor long-term earnings growth alleviate competition as firms exit an industry. We account for this mean-reversion by sorting stocks into LTG_t terciles (high, medium, and low), with the average revision in long-term earnings growth over the subsequent one to six-month horizon then computed. This characteristic-adjusted average revision is then subtracted from a firm's respective post-formation revision in long-term forecasted earnings growth.

According to Panel A of Table 4 the long portfolio and short portfolio experience the largest upward and largest downward cumulative revisions in long-term forecasted earnings growth, respectively. These revisions are not simply a manifestation of mean-reversion in long-term forecasted earnings growth. 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.

Moreover, Panel A also presents adjusted cumulative revisions that account for mean-reversion in long-term forecasted earnings growth. After six months, the difference between the cumulative adjusted revisions in long-term forecasted earnings growth for the short portfolio and the high LTG_t/high $ISTG_t$ portfolio is significant, despite both portfolios having high LTG_t at the time of their formation. The difference between their cumulative adjusted revisions is monotonically increasing. The comparable difference between our long portfolio and the low LTG_t/low $ISTG_t$ portfolio is also significant, despite both portfolios having low LTG_t at the time of their formation. The difference in the cumulative adjusted revisions of these portfolios is also monotonically increasing. Overall, across stocks with high LTG_t, our short portfolio contains stocks with the largest downward adjusted revisions in long-term forecasted earnings growth. Conversely, across stocks with low LTG_t, our long portfolio contains stocks with the largest upward adjusted revisions in long-term forecasted earnings growth.

Panel A of Table 4 confirms that, in addition to having the most dramatic revisions in long-term forecasted earnings growth, our long portfolio and short portfolio have the largest positive and largest negative cumulative risk-adjusted returns. Moreover, across stocks with similar levels of LTG_t, the disparity between LTG_t and $ISTG_t$ explains future cross-sectional return variation. Large upward and large downward post-formation cumulative adjusted revisions in long-term forecasted earnings growth generally coincide with positive and negative risk-adjusted returns, respectively.

Furthermore, Panel B of Table 4 reports that the long portfolio has the highest percentage of upward post-formation revisions and the lowest percentage of downward post-formation revisions, 28.52% and 17.64%, respectively. In contrast, the short portfolio has the highest percentage of downward post-formation revisions and the lowest percentage of upward post-formation revisions, 38.84% and 12.62%, respectively. The percentage of upward revisions and downward revisions does not sum to 100% because many revisions reiterate previous forecasts.

For completeness, 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%, and the short portfolio experiences an average downward revision in $ISTG_t$ of -1.42%. However, post-formation revisions in short-term forecasted earnings growth exhibit no discernible cross-sectional pattern across the double-sorted portfolios.

Table 4

Panel A and Panel B of this table report on the magnitude and direction of revisions in long-term forecasted earnings growth (LTG_t) across the double-sorted $LTG_t/ISTG_t$ portfolios. $ISTG_t$ denotes implied short-term forecasted earnings growth. Within the 11 I/B/E/S industries, a three-by-three sequential double-sort is conducted 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 11 industry sectors. Revisions in long-term analyst forecasts during the month of portfolio formation as well as the subsequent six months after their formation are reported for each double-sorted portfolio. Post-formation revisions are cumulative as they are computed based on prevailing forecasts during the month of portfolio formation (month *t*). These cumulative revisions are adjusted by removing a mean-reversion component computed as the average revision in long-term forecasted earnings growth for each respective LTG_t tercile. Panel A also reports the cumulative risk-adjusted returns of each double-sorted portfolio for comparison with their cumulative revisions in long-term forecasted earnings growth. "High Diff." refers to the high LTG_t/low $ISTG_t$ (short) portfolio minus the high LTG_t/high $ISTG_t$ benchmark portfolio, and "Low Diff." refers to the low LTG_t/high $ISTG_t$ (long) portfolio minus the low LTG_t/low $ISTG_t$ benchmark portfolio. The *t*-statistics (in italics) are Newey-West adjusted with the lag length being one less than the cumulative number of months (for example, the lag length is five for cumulative revisions and cumulative returns over a six-month horizon). The last column of Panel A refers to the *t*-statistic for the cumulative risk-adjusted return six months after portfolio formation. Panel B reports the percentage of upward and downward revisions in long-term analyst forecasts, and Panel C reports on the post-formation returns across three different subportfolios within the long portfolio and short portfolio of our trading strategy. These subportfolios are defined by post-formation revisions in long-term forecasts that are upward, downward, and unchanged. Both raw and risk-adjusted returns under the characteristics-based approach in Daniel, Grinblatt, Titman, and Wermers (1997) are reported in Panel C.

Panel A: Cumulative revisions in long-term forecasted earnings growth and cumulative risk-adjusted returns

	Unadjusted revisions							Mean-reversion adjusted revisions							Cumulative risk-adjusted returns						
		Months after portfolio formation							Months after portfolio formation						Months after portfolio formation						
$LTG_t/ISTG_t$	*t*	1	2	3	4	5	6	*t*	1	2	3	4	5	6	1	2	3	4	5	6	*t*-statistic
High/High	−0.07	−0.13	−0.27	−0.37	−0.44	−0.66	−0.75	−0.07	0.01	0.09	0.19	0.29	0.26	0.36	0.16	0.24	0.24	0.27	0.32	0.35	*0.61*
High/Med	−0.01	−0.11	−0.30	−0.50	−0.66	−0.79	−0.99	−0.01	0.02	0.06	0.06	0.06	0.14	0.13	−0.04	−0.03	−0.16	−0.21	−0.22	−0.31	*−0.54*
High/Low	0.07	−0.17	−0.52	−0.82	−1.07	−1.32	−1.60	0.07	−0.03	−0.16	−0.26	−0.35	−0.40	−0.48	−0.27	−0.47	−0.68	−0.75	−0.76	−0.81	*−1.93*
Med/High	−0.08	0.09	0.04	−0.01	0.08	0.03	0.03	0.02	0.06	0.06	0.05	0.15	0.13	0.17	0.22	0.40	0.47	0.51	0.61	0.66	*1.31*
Med/Med	−0.10	0.00	−0.03	−0.08	−0.14	−0.15	−0.17	0.01	−0.04	−0.01	−0.02	−0.07	−0.05	−0.04	0.07	0.22	0.28	0.33	0.43	0.54	*1.10*
Med/Low	−0.13	0.02	−0.06	−0.08	−0.14	−0.18	−0.26	−0.03	−0.02	−0.04	−0.02	−0.08	−0.08	−0.13	−0.05	−0.11	−0.12	−0.15	−0.16	−0.22	*−0.48*
Low/High	−0.07	0.14	0.18	0.31	0.37	0.36	0.44	0.05	0.03	0.02	0.08	0.11	0.09	0.12	0.21	0.37	0.47	0.67	0.91	1.07	*2.37*
Low/Med	−0.11	0.10	0.22	0.24	0.22	0.29	0.33	0.02	−0.01	0.06	0.01	−0.04	0.02	0.01	0.18	0.30	0.40	0.57	0.67	0.72	*1.60*
Low/Low	−0.20	0.10	0.08	0.14	0.17	0.16	0.19	−0.07	−0.02	−0.08	−0.09	−0.08	−0.11	−0.13	0.00	−0.06	−0.09	−0.11	−0.06	−0.11	*−0.28*
High Diff.	0.14	−0.04	−0.25	−0.45	−0.64	−0.66	−0.84	0.14	−0.04	−0.25	−0.45	−0.64	−0.66	−0.84	−0.42	−0.70	−0.92	−1.02	−1.07	−1.14	
t-statistic	*1.51*	*−0.74*	*−3.20*	*−5.45*	*−6.84*	*−6.92*	*−9.04*	*1.51*	*−0.74*	*−3.20*	*−5.45*	*−6.84*	*−6.92*	*−9.04*	*−4.69*	*−4.16*	*−3.70*	*−3.10*	*−2.60*	*−2.37*	
Low Diff.	0.12	0.04	0.10	0.18	0.19	0.20	0.25	0.12	0.04	0.10	0.18	0.19	0.20	0.25	0.21	0.42	0.56	0.77	0.96	1.16	
t-statistic	*3.55*	*1.66*	*3.27*	*5.58*	*5.48*	*5.45*	*6.14*	*3.55*	*1.66*	*3.27*	*5.58*	*5.48*	*5.45*	*6.14*	*2.86*	*3.01*	*2.73*	*3.06*	*3.18*	*3.38*	

Panel B: Direction of long-term analyst forecast revisions

	Upward revisions						Downward revisions					
	Months after portfolio formation						Months after portfolio formation					
$LTG_t/ISTG_t$	1	2	3	4	5	6	1	2	3	4	5	6
High/High	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	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	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	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	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	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	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	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	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.	−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-statistic	*−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.	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-statistic	*6.91*	*11.51*	*13.83*	*14.17*	*14.15*	*13.55*	*−9.83*	*−12.02*	*−13.60*	*−14.10*	*−13.89*	*−13.64*

Panel C: Post-formation returns and long-term forecast revisions

		Number	Raw returns			Characteristic-adjusted returns		
Portfolio	Revisions	of stocks	One month	Three months	Six months	One month	Three months	Six months
Long	Downward	45	0.42	1.45	4.11	−0.75	−2.03	−2.87
	Unchanged	101	1.28	3.70	7.39	0.01	−0.13	−0.25
	Upward	70	2.27	6.43	11.87	1.00	2.45	4.07
Short	Downward	98	0.02	0.45	2.01	−0.93	−2.25	−3.15
	Unchanged	87	1.20	3.52	6.63	0.31	0.51	0.72
	Upward	33	2.48	6.68	11.45	1.50	3.65	5.51

Panel C of Table 4 reports on the post-formation returns across three different subportfolios within the long portfolio and short portfolio of our trading strategy. These subportfolios are defined by post-formation long-term forecasts that are revised upward, downward, or unchanged. These subportfolios confirm that post-formation returns are driven by post-formation revisions in long-term forecasts. Upward revisions and downward revisions in long-term forecasted earnings growth coincide with positive returns and negative returns, respectively.

The importance of long-term analyst forecasts to stock returns is confirmed by the following cross-sectional regression of individual firm-level stock returns on changes in long-term and short-term forecasted earnings growth from the prior month:

$$r_t = \beta_0 + \beta_1 \text{ ISTG Revision}_t + \beta_2 \text{ LTG Revision}_t + \varepsilon_t, \qquad (3)$$

where the i subscripts are omitted for notational simplicity. The independent variables in Eq. (3) are computed by subtracting forecasts in month $t-1$ from forecasts in month t, and then normalizing these differences by the absolute value of the corresponding month $t-1$ forecasts.

Panel A of Table 5 indicates that the β_2 coefficient is significant (t-statistic of 3.14) and more than three times larger than β_1. Thus, long-term analyst forecast revisions exert a significant impact on stock prices. The significance of the β_1 and β_2 coefficients indicates that long-term analyst forecasts are not redundant. Instead, horizon-specific forecasts convey distinct information regarding an individual firm's earnings growth.

The ability of our disparity variable to predict revisions in long-term forecasted earnings growth is investigated by the regression

$$\text{LTG Revision}_{t+6,t} = \gamma_0 + \gamma_1 \text{ Disparity}_t^R + \gamma_2 \text{ LTG}_t + \gamma_3 \text{ RET12}_t + \gamma_4 \text{ FREV}_t + \gamma_5 \text{ SUE}_t + \varepsilon_t, \qquad (4)$$

where the dependent variable is defined over a six-month horizon for individual firms. A negative γ_1 coefficient indicates that revisions in long-term forecasted earnings growth are inversely related to our disparity variable. A negative γ_2 coefficient captures mean-reversion in long-term earnings growth forecasts. Once again, RET12 refers to returns over the past 12 months (after a one-month delay), and FREV and SUE refer to past revisions in annual earnings forecasts and past earnings surprises, respectively. These variable are included in Eq. (4) to account for price momentum and earnings momentum.

The negative γ_1 coefficient (t-statistic of -5.74) for Disparity^R in Panel B of Table 5 indicates that a positive disparity predicts a decline in long-term forecasted earnings growth and a negative disparity predicts an increase in long-term forecasted earnings growth. This inverse relation holds after accounting for mean-reversion in long-term analyst forecasts, as γ_2 is negative, and the predictability in long-term forecasts attributable to past returns. The positive γ_3 coefficient indicates that positive (negative) prior returns induce upward (downward) revisions in long-term forecasted earnings growth. The earnings momentum proxies FREV and SUE also cannot explain the ability of our disparity variable to predict revisions in long-term analyst forecasts, although positive (negative) prior earnings surprises lead to upward (downward) revisions in long-term forecasted earnings growth.

In summary, the disparity between long-term and short-term analyst forecasted earnings growth appears to reflect the slow incorporation of information into long-term analyst forecasts. The next section provides a mechanism in which this slow incorporation of information influences investor expectations of long-term earnings. To clarify, while LTG_t pertains to earnings growth over the subsequent three to five-year horizon, this long horizon is not inconsistent with our trading strategy's six-month holding period. Investors could require six months to incorporate information, including forecast revisions, into their long-term

Table 5

This table reports on the sensitivity of monthly returns to contemporaneous changes in long-term forecasted earnings growth (LTG_t) and implied short-term analyst forecasted earnings growth ($ISTG_t$). The results in Panel A correspond to the coefficients ($\times 100$) of the regression, $r_t = \beta_0 + \beta_1$ ISTG Revision$_t + \beta_2$ LTG Revision$_t + \varepsilon_t$, in Eq. (3). The independent variables correspond to changes in $ISTG_t$ and LTG_t relative to these values in month $t-1$, with these differences then normalized by their absolute value in month $t-1$, respectively. Panel B contains the results from regressing cumulative revisions in long-term forecasted earnings growth over a six-month horizon on our disparity variable, LTG Revision$_{t+6,t} = \gamma_0 + \gamma_1$ Disparity$_t^R + \gamma_2$ LTG$_t + \gamma_3$ RET12$_t + \gamma_4$ FREV$_t + \gamma_5$ SUE$_t + \varepsilon_t$. After sorting stocks into $ISTG_t$ and LTG_t deciles, from 1 to 10 in descending order within each of the 11 I/B/E/S industries, Disparity$_t^R$ is defined as a firm's $ISTG_t$ ranking minus its LTG_t ranking in month t. RET12 refers to stock returns over the past 12 months (after a one-month delay), and FREV and SUE refer to past revisions in annual earnings forecasts and past earnings surprises, respectively. The t-statistics in italics below each regression coefficient are Newey-West adjusted with 12 lags.

Panel A: Return sensitivity to revisions

	Intercept	*ISTG* revision	*LTG* revision	Adj. R^2	Number of stocks
Coefficient	1.1911	0.1770	0.6427	0.103	1,671
t-statistic	*4.74*	*4.41*	*3.14*		

Panel B: Predictability in long-term forecast revisions

	Intercept	Disparity^R	LTG	RET12	FREV	SUE	Adj. R^2	Number of stocks
Coefficient	0.0159	−0.0004	−0.1402	0.0083	−0.0083	0.0004	0.133	1,054
t-statistic	*11.49*	*−5.74*	*−13.16*	*13.15*	*−1.59*	*3.80*		

expectations of earnings growth. Hence, mispricings attributable to the slow incorporation of information into LTG_t can disappear in less than three to five years.

5. Limited attention

Our results suggest that the market does not fully account for the predictability in long-term analyst forecast revisions. In particular, investors and analysts both appear to slowly incorporate information into their long-term earnings growth expectations and forecasts, respectively. The DellaVigna and Pollet (2007) theory of limited attention provides an explanation for the slow incorporation of information into long-term investor expectations. However, unlike their empirical study, which links industry-level returns and demographics, our comparison of analyst forecasts over different horizons does not require investors to understand demographics and barriers-to-entry when forecasting demand.

The theory of category learning in Peng and Xiong (2006) has investors focusing on prior stock classifications due to limited attention toward firm-specific information. In the context of our study, category learning predicts that investors react slowly to firm-specific revisions in long-term analyst forecasts that cause migrations in book-to-market characteristics away from their original classifications. Therefore, we examine whether the risk-adjusted returns of our trading strategy correspond to firm-level heterogeneity within growth and value stocks. Intuitively, stocks with a large positive disparity between LTG_t and $ISTG_t$ are likely to be "disappointing growth" stocks and stocks with a large negative disparity are likely to be "recovering value" stocks. Bali, Scherbina, and Tang (2009) identify several unusual firm-specific news events that potentially alter long-term earnings growth.

According to Panel A of Table 6, which reports book-to-market ratios until 24 months after portfolio formation, our short portfolio consists of disappointing growth stocks that are migrating toward value and our long portfolio consists of recovering value stocks that are migrating toward growth. Therefore, the risk-adjusted returns of these portfolios are consistent with the Fama and French (2007) finding that migrations in book-to-market characteristics explain a large portion of the value premium. However, in contrast to their study, our disparity variable is capable of predicting book-to-market migrations. This predictability could be attributed to our disparity variable's ability to predict returns and revisions in long-term forecasted earnings growth because the market valuations that define book-to-market ratios are positively correlated with these returns and revisions. To clarify, our ability to predict migrations over a 24-month horizon is due to raw returns, hence market valuations, being more predictable than risk-adjusted returns whose predictability diminishes after six months. Overall, the results in Panel A of Table 6 provide additional evidence that errors in investor expectations are captured by the disparity between long-term and short-term forecasted earnings growth.

We also examine the relation between post-formation order flow imbalances, denoted OIMB, and post-formation revisions in long-term forecasts to gauge the appropriateness of limited attention as an explanation for the risk-adjusted returns from our trading strategy. Specifically, the following regression is conducted on stocks in the long portfolio and short portfolio of our trading strategy

$$\mathrm{OIMB}_{t+6,t} = \gamma_0 + \gamma_1\ \mathrm{LTG\ Revision}_{t+6,t} + \gamma_2\ \mathrm{BM}_t + \gamma_3\ \mathrm{Size}_t + \gamma_4\ \mathrm{RET12}_t + \gamma_5\ \mathrm{FREV}_t + \gamma_6\ \mathrm{SUE}_t + \varepsilon_t, \quad (5)$$

where order flow imbalances are defined as

$$\mathrm{OIMB} = \frac{\sharp \text{ of buyer-initiated shares traded } - \sharp \text{ of seller-initiated shares traded}}{\sharp \text{ of buyer-initiated shares traded } + \sharp \text{ of seller-initiated shares traded}}. \quad (6)$$

Buyer-initiated and sell-initiated trades are determined by the Lee and Ready (1991) algorithm. This algorithm classifies a trade as a buy (sell) if it is executed above (below) the midpoint of the bid–ask spread, where prices are matched with the bid and ask quotes from the prior five seconds. For trades executed at the midpoint, the algorithm classifies a trade as a buy (sell) if it is executed at a higher (lower) price than the previous trade. Once trades are classified as either buys or sells, positive and negative signs are assigned to the volume of buys and sells, respectively. Order flow imbalances are then constructed as the sum of signed volume.

RET12 controls for the possibility that order flow imbalances are driven by investors conditioning on past returns (trend-chasing). Once again, FREV and SUE account for earnings momentum. For emphasis, Eq. (5) is estimated using firms in the long portfolio (low LTG_t/high $ISTG_t$) and short portfolio (high LTG_t/low $ISTG_t$) to better understand the return predictability of our trading strategy. Along with the need for order flow imbalance data, this focus accounts for the smaller number of stocks reported in Panel B of Table 6.

A positive γ_1 coefficient in Eq. (5) suggests that upward revisions in long-term forecasted earnings growth lead to a disproportionate amount of buy trades, and downward revisions lead to a disproportionate amount of sell trades during the trading strategy's six-month holding period. As reported in Panel B in Table 6, the γ_1 coefficient is highly significant, even after controlling for book-to-market, size, and past return characteristics as well as prior revisions in short-term analyst forecasts and prior earnings surprises. The positive γ_2 and γ_3 coefficients indicate that buyer-initiated trades are more likely for value stocks and large stocks, respectively. The positive γ_4 coefficient provides evidence of trend-chasing as high (low) past returns lead to a disproportionate amount of buy (sell) trades. These properties hold after controlling for earnings momentum.

Overall, trading activity appears to be initiated by revisions in long-term forecasted earnings growth, despite the predictability of these revisions. Investors appear to be surprised by predictable revisions in long-term analyst forecasts. This finding supports limited attention as an explanation for the risk-adjusted returns of our trading strategy.

In contrast, our empirical results are less consistent the slow diffusion of private information hypothesized by Hong

Table 6

This table first reports on the post-formation book-to-market characteristics of the firms in the low LTG_t/high $ISTG_t$ portfolio and high LTG_t/low $ISTG_t$ portfolio. Double-sorted portfolios are formed each month according to long-term forecasted earnings growth (LTG_t) and then implied short-term forecasted earnings growth ($ISTG_t$), as defined in Eq. (1) where month t denotes the time of portfolio formation. Within the 11 I/B/E/S industries, a three-by-three sequential double-sort is conducted 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 11 industry sectors. Book-to-market ratios are then computed six, 12, 18, and 24 months after each portfolio's formation and reported in Panel A. Book-to-market ratios are reported for the short portfolio and long portfolio underlying our trading strategy as well as control portfolios with similar analyst forecasts for long-term earnings growth but different forecasts for short-term earnings growth. "High Diff." refers to the high LTG_t/low $ISTG_t$ (short) portfolio minus the high LTG_t/high $ISTG_t$ control portfolio, and "Low Diff." refers to the low LTG_t/high $ISTG_t$ (long) portfolio minus the low LTG_t/low $ISTG_t$ control portfolio. The "Change" column denotes the difference between a portfolio's book-to-market ratio in month $t+24$ minus this ratio in month t. Panel B contains the results from the regression specifications in Eq. (5) that examine the relation between average order flow imbalances (OIMB) and contemporaneous revisions in long-term analyst forecasts over a six-month horizon $\text{OIMB}_{t+6,t}=\gamma_0+\gamma_1\,\text{LTGRevision}_{t+6,t}+\gamma_2\,\text{BM}_t+\gamma_3\,\text{Size}_t+\gamma_4\,\text{RET12}_t+\gamma_5\,\text{FREV}_t+\gamma_6\,\text{SUE}_t+\varepsilon_t$. This regression is conducted on stocks in the long portfolio and short portfolio of our trading strategy that have the largest cross-sectional disparities between LTG_t and $ISTG_t$. OIMB is defined in Eq. (6) as (# of buyer-initiated shares traded − # of seller-initiated shares traded)/(# of buyer-initiated shares traded + # of seller-initiated shares traded). RET12 refers to stock returns over the past 12 months after a one-month delay, and FREV and SUE refer to past revisions in annual earnings forecasts and past earnings surprises, respectively. The t-statistics in italics are Newey-West adjusted with 12 lags.

Panel A: Post-formation migrations

	Book-to-market characteristics						
$LTG_t/ISTG_t$	t	t+6	t+12	t+18	t+24	Change	t-statistic
High/High	0.579	0.534	0.519	0.544	0.596	0.005	*0.49*
High/Low	0.550	0.567	0.613	0.645	0.679	0.117	*12.13*
High Diff.	−0.029	0.033	0.094	0.102	0.083		
t-statistic	*−5.12*	*5.69*	*15.95*	*16.55*	*13.99*		
Low/High	0.862	0.833	0.811	0.813	0.816	−0.069	*−6.42*
Low/Low	0.827	0.868	0.911	0.909	0.914	0.068	*5.78*
Low Diff.	0.035	−0.035	−0.099	−0.095	−0.098		
t-statistic	*5.00*	*−4.98*	*−13.55*	*−12.41*	*−13.48*		

Panel B: Sensitivity of order flow imbalances to revisions in long-term forecasts

	Intercept	LTG revision	BM	Size	RET12	FREV	SUE	Adj. R^2	Number of stocks
Coefficient	−0.1940	0.1089	0.0122	0.0298	0.0290			0.146	353
t-statistic	*−16.84*	*6.07*	*6.77*	*22.90*	*9.65*				
Coefficient	−0.1817	0.1295	0.0135	0.0285	0.0295	0.0379	−0.0013	0.158	273
t-statistic	*−15.68*	*7.01*	*7.85*	*21.93*	*8.06*	*1.84*	*−2.22*		

and Stein (1999) and the overconfidence bias assumed by Daniel, Hirshleifer, and Subrahmanyam (1998). In contrast to these theories, the return predictability we identify is based on public information in the form of analyst forecasts. In particular, our findings suggest that investors are overly reliant on long-term analyst forecasts.

6. Robustness tests

Our first robustness test confirms that the risk-adjusted returns from our trading strategy are not a manifestation of earnings momentum. After 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), we exclude stocks in the top and bottom quintiles of these cross-sectional sorts before implementing our trading strategy. According to Panel A of Table 7, the risk-adjusted returns from our trading strategy increase slightly after removing these stocks. Thus, the risk-adjusted returns from our trading strategy are not attributable to earnings momentum. Instead, revisions in long-term instead of short-term forecasted earnings growth appear to be responsible for the return predictability associated with the disparity between LTG_t and $ISTG_t$.

Panel A of Table 7 also confirms that our trading strategy's performance is similar in two nonoverlapping subperiods: from 1983 to 1994 and from 1995 to 2006. Fig. 3 plots the risk-adjusted returns from our trading strategy over the entire sample period and reinforces its consistency. Our trading strategy's performance is also robust to the enactment of the SEC's fair disclosure regulation (Reg FD) in August 2000. During the most recent subperiod starting in September 2000, its risk-adjusted return equals 52 bp (t-statistic of 2.55) in the first month after portfolio formation.

Given the importance of short-term forecasted earnings growth, $ISTG_t$ in Eq. (1) is replaced with two alternatives. The first alternative relaxes the assumption that $A0_t$ is positive in Eq. (1). As reported in Table 7, this assumption does not exert a large influence on our trading strategy's risk-adjusted return. The second alternative definition of

Table 7

Several robustness tests are conducted on our trading strategy that buys low LTG_t/high $ISTG_t$ stocks and sells high LTG_t/low $ISTG_t$ stocks. Raw and risk-adjusted returns from the four-factor model are reported after double-sorting stocks each month according to their long-term forecasted earnings growth (LTG_t) and implied short-term forecasted earnings growth ($ISTG_t$) in Eq. (1). Within the 11 I/B/E/S industries, this three-by-three sequential double-sort results in nine double-sorted portfolios that aggregate across the 11 industry sectors. The first robustness test examines a subsample that excludes stocks 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 robustness test excludes stocks with the highest and lowest revisions in annual forecasts over the prior six months (FREV). Another robustness test divides the sample period into three subperiods: 1983 to 1994, 1995 to 2006, and September 2001 to 2006, with the most recent subperiod coinciding with SEC's fair disclosure regulation (Reg FD). An additional set of robustness tests removes the $A0_t > 0$ filter when inferring $ISTG_t$, replaces $ISTG_t$ with the current year's return on book-equity (ROE_t) in Eq. (7), and infers $ISTG_t$ using the average forecasted earnings for the current year as well as next year, as in Eq. (8). The raw returns and four-factor alphas associated with our trading strategy are reported for each robustness test, with t-statistics in italics. Panel B reports on the risk-adjusted returns and factor loading of La Porta's (1996) 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). This trading strategy then buys stocks with the lowest long-term analyst forecasts and sells stocks with the highest long-term analyst forecasts. In Panel C, risk-adjusted returns and factor loadings arising from an application of our trading strategy to double-sorted portfolios formed according to book-to-market (BM) and price-to-earnings (PE) characteristics are reported. The short portfolio in Panel C consists of low BM/low PE stocks and the long portfolio consists of high BM/high PE stocks.

Panel A: Alternative filters, subperiods, and definitions for $ISTG_t$

	After removing extreme		Subperiods			$ISTG_t$ alternatives		
Portfolio	Prior SUE	Prior FREV	1983–1994	1995–2006	2001–2006	Without $A0_t > 0$	ROE_t	$A1$ and $A2$
Long								
Raw return	1.69	1.54	1.41	1.47	1.43	1.40	1.38	1.42
alpha	0.92	0.76	0.34	0.22	0.33	0.15	0.24	0.18
t-statistic	*8.47*	*7.46*	*4.01*	*1.80*	*2.61*	*1.90*	*2.57*	*1.99*
Short								
Raw return	0.70	0.74	0.80	0.89	0.08	0.69	0.85	0.91
alpha	0.10	0.12	−0.09	−0.40	−0.19	−0.32	−0.20	−0.02
t-statistic	*0.88*	*1.06*	*−0.85*	*−2.77*	*−0.94*	*−3.62*	*−2.18*	*−1.88*
Long–short								
Raw return	0.99	0.80	0.60	0.58	0.63	0.70	0.53	0.51
alpha	0.81	0.63	0.43	0.62	0.52	0.47	0.44	0.37
t-statistic	*6.21*	*5.04*	*3.68*	*4.26*	*2.55*	*3.96*	*3.52*	*3.64*

Panel B. Returns from La Porta (1996)'s trading strategy

	Four-factor model				
Month	alpha	MKT	HML	SMB	UMD
One					
Coefficient	0.26	−0.521	1.575	−0.817	0.054
t-statistic	*1.44*	*−11.32*	*23.26*	*−14.50*	*1.33*
Two					
Coefficient	0.26	−0.551	1.554	−0.726	0.129
t-statistic	*1.44*	*−11.97*	*22.94*	*−12.88*	*3.19*
Three					
Coefficient	0.35	−0.531	1.583	−0.729	0.188
t-statistic	*1.97*	*−11.54*	*23.36*	*−12.94*	*4.68*
Four					
Coefficient	0.33	−0.526	1.561	−0.750	0.242
t-statistic	*1.82*	*−11.30*	*22.85*	*−13.23*	*5.99*
Five					
Coefficient	0.22	−0.535	1.562	−0.701	0.340
t-statistic	*1.12*	*−10.80*	*21.49*	*−11.56*	*7.88*
Six					
Coefficient	−0.03	−0.523	1.529	−0.757	0.385
t-statistic	*−0.15*	*−10.95*	*21.75*	*−12.93*	*9.26*

Panel C: Returns from the BM/PE trading strategy

	Four-factor model				
Month	alpha	MKT	HML	SMB	UMD
One					
Coefficient	0.44	−0.192	1.202	−0.136	−0.135
t-statistic	*2.43*	*−4.16*	*17.72*	*−2.42*	*−3.35*
Two					
Coefficient	0.25	−0.171	1.208	−0.093	−0.073

Table 7 (*continued*)

Panel C: Returns from the BM/PE trading strategy

	Four-factor model				
Month	alpha	MKT	HML	SMB	UMD
t-statistic	*1.46*	*−3.96*	*18.96*	*−1.75*	*−1.92*
Three					
Coefficient	0.23	−0.182	1.211	−0.025	−0.004
t-statistic	*1.35*	*−4.22*	*19.00*	*−0.48*	*−0.10*
Four					
Coefficient	0.31	−0.178	1.203	−0.012	0.024
t-statistic	*1.88*	*−4.20*	*19.37*	*−0.23*	*0.64*
Five					
Coefficient	0.15	−0.149	1.261	0.001	0.110
t-statistic	*0.93*	*−3.48*	*20.11*	*0.01*	*2.97*
Six					
Coefficient	0.16	−0.180	1.243	0.029	0.147
t-statistic	*1.01*	*−4.48*	*21.01*	*0.59*	*4.22*

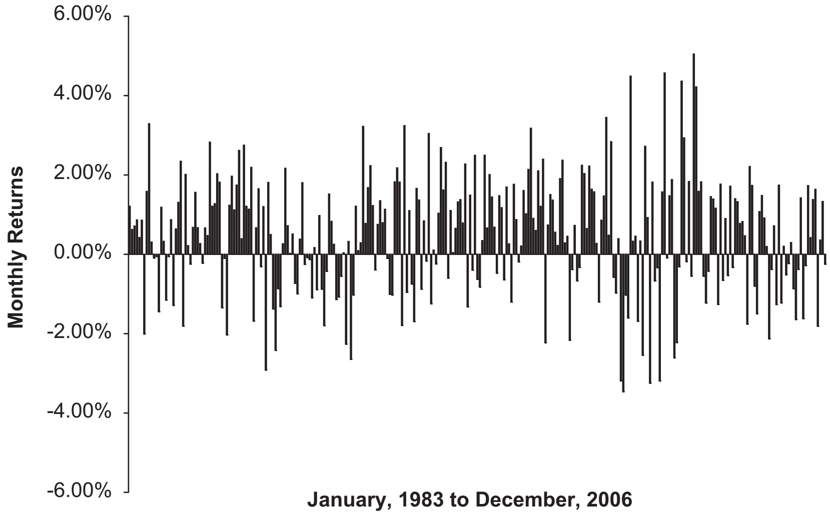

Fig. 3. This figure plots the risk-adjusted returns from our trading strategy, which buys stocks with low LTG_t/high $ISTG_t$ and sells stocks with high LTG_t/low $ISTG_t$ over the 1983 to 2006 period. The risk-adjusted returns are computed in the first month after the long portfolio and short portfolio are formed. Within the 11 I/B/E/S industries, a three-by-three sequential double-sort is conducted each month according to long-term analyst forecasted earnings growth (LTG_t) and then implied analyst short-term forecasted earnings growth ($ISTG_t$). This procedure results in nine double-sorted portfolios that aggregate across the 11 industry sectors. $ISTG_t$ is computed according to Eq. (1) using annual earnings forecasts and realized earnings.

short-term forecasted earnings growth replaces $ISTG_t$ with the firm's forecasted return on book-equity:

$$ROE_t = \frac{A1_t \cdot (\sharp \text{ of shares})}{B_{t-1}}, \tag{7}$$

where B_{t-1} denotes its book value from the prior year. This alternative definition for $ISTG_t$ does not alter our trading strategy's performance. The third alternative definition for $ISTG_t$ uses the average earnings forecast for the current year ($A1_t$) and next year ($A2_t$):

$$\left[\frac{\left(\frac{A1_t + A2_t}{2}\right) - A0_t}{|A0_t|}\right] \times 100. \tag{8}$$

The slightly weaker risk-adjusted return from this definition is likely attributable to the smaller sample of stocks as $A2_t$ forecasts are required. Overall, the results in Table 7 demonstrate that the risk-adjusted returns underlying our trading strategy are similar using several definitions for $ISTG_t$.

Moreover, Panel B of Table 7 verifies that the risk-adjusted returns of our strategy cannot be replicated by conditioning exclusively on LTG_t. After sorting stocks into LTG_t portfolios, La Porta (1996) shows that high LTG_t stocks earn low subsequent returns. To ensure that this earlier finding is not driving the returns from our trading strategy, we implement La Porta's trading strategy within our sample. As reported in Panel B of Table 7, low LTG_t stocks have higher unadjusted returns than high LTG_t stocks, which is consistent with the result in La Porta. However, the four-factor alpha of 26 bp from La Porta's trading strategy is insignificant in the first two months after portfolio formation (*t*-statistic of 1.44). Furthermore, while significant, the risk-adjusted return of 19 bp from the long portfolio in La Porta's trading strategy after the first month is economically small relative to transaction costs and declining in subsequent months. Overall, our results support the findings in Dechow and Sloan (1997) as the Fama-French HML factor derived from book-to-market characteristics explains a significant portion of the return from La Porta's strategy given the highly significant HML loadings. Intuitively, high LTG_t and low LTG_t are close proxies for growth and value characteristics, respectively.

Besides the inverse relation between long-term analyst forecasts and book-to-market characteristics, Panel A of Table 2 indicates that a low (high) PE ratio coincides with a low (high) $ISTG_t$. Piotroski (2000) and Mohanram (2005) find considerable return variation within value stocks and growth stocks, respectively, by conditioning on additional proxies for firm-level fundamentals. Therefore, we repeat our double-sort procedure by assigning stocks to BM and PE terciles to approximate our earlier LTG_t and $ISTG_t$ terciles. This robustness test investigates the importance of using analyst forecasts instead of alternative valuation ratios. Panel C of Table 7 reports that applying our trading strategy to double-sorted BM/PE portfolios produces far weaker risk-adjusted returns. As with the trading strategy in La Porta (1996), the returns from the BM/PE portfolios have high HML loadings. Furthermore, the risk-adjusted return from the BM/PE trading strategy is insignificant by the second month. In unreported results, the short portfolio consisting of low BM/low PE stocks, which approximates our high LTG_t/low $ISTG_t$ portfolio, has an insignificant four-factor alpha of −11 bp (t-statistic of −1.11) while the long portfolio consisting of high BM/high PE stocks, which approximates our low LTG_t/high $ISTG_t$ portfolio, has an insignificant four-factor alpha of 12 bp (t-statistic of 0.98).

Finally, in unreported results, our trading strategy produces a risk-adjusted return of 33 bp (t-statistic of 2.27) after value-weighting stocks within each industry sector. The continued profitability of our trading strategy is consistent with our sample being orientated toward relatively large stocks given the long-term analyst forecast requirement. The minimum price filter of five dollars also mitigates the influence of extremely small stocks.

7. Conclusions

Long-term earnings expectations are crucial to stock price valuations. We find the disparity between long-term and short-term analyst forecasted earnings growth predicts returns and revisions in long-term analyst forecasts. Intuitively, after adjustments for industry characteristics, a larger disparity reflects the slower incorporation of information into long-term analyst forecasts than short-term analyst forecasts. This slow incorporation of information is responsible for errors in long-term analyst forecasts that yield risk-adjusted returns.

The cross-sectional risk-adjusted return from buying stocks with negative disparities, low long-term and high short-term forecasted earnings growth, and selling stocks with positive disparities, high long-term and low short-term forecasted earnings growth, persists for six months and reaches an annualized risk-adjusted return of almost 4%. This return-adjusted return exceeds transaction costs and is robust across different subperiods. Short-term earnings growth forecasts are crucial to the identification of return variation across stocks with nearly identical long-term analyst forecasts. However, our trading strategy's risk-adjusted return is not attributable to earnings momentum. Moreover, our trading strategy's risk-adjusted return cannot be replicated by conditioning on long-term analyst forecasts alone, as in La Porta (1996).

The disparity between long-term and short-term forecasted earnings growth predicts returns after controlling for a multitude of firm characteristics such as analyst forecast dispersion, idiosyncratic volatility, institutional ownership, analyst coverage, as well as prior earnings surprises and prior forecast revisions in the earnings momentum literature. Instead, post-formation revisions in long-term forecasts are consistent with the return predictability of our trading strategy. In particular, high long-term and low short-term forecasted earnings growth (positive disparity) corresponds with the largest and most frequent downward revisions in long-term forecasted earnings growth. Conversely, low long-term and high short-term forecasted earnings growth (negative disparity) corresponds with the largest and most frequent upward post-formation revisions in long-term forecasted earnings growth.

Therefore, stock prices do not appear to fully reflect the predictability in long-term analyst forecast revisions available from conditioning on the disparity between long-term and short-term forecasted earnings growth. This evidence suggests that investors have limited attention regarding long-term earnings growth. Moreover, the disparity between long-term and short-term forecasted earnings growth predicts migrations in book-to-market characteristics. In particular, the stocks in our long portfolio are migrating from value to growth and the stocks in our short portfolio are migrating from growth to value. Thus, our long portfolio consists of recovering value stocks and our short portfolio consists of disappointing growth stocks. This evidence suggests that investors focus on prior stock categories (value versus growth) and underestimate the firm-level heterogeneity regarding long-term earnings growth within these categories. Consequently, our results provide empirical support for the limited attention hypothesized by DellaVigna and Pollet (2007) and Peng and Xiong (2006). Furthermore, consistent with investors having limited attention, order flow imbalances indicate that investors are surprised by predictable revisions in long-term forecasted earnings growth.

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