Do analysts incorporate inflation in their earnings forecasts?

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We examine whether financial analysts fully incorporate expected inflation in their earnings forecasts for individual stocks. We find that expected inflation proxies such as lagged inflation and forecasts from the Michigan Survey of Consumers predict future earnings growth of a portfolio long in high earnings growth firms and short in low earnings growth firms, but analysts do not fully adjust for this relation. Analysts' earnings forecast errors can be predicted using these expected inflation proxies. We conclude that analysts' earnings forecasts do not completely incorporate the earnings information in inflation.

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1. Introduction

Several recent studies emphasize the importance of systematic sources of mispricing in stock returns. For instance, Daniel, Hirshleifer and Subrahmanyam (2001) present a model where mispricing of systematic factors causes misvaluation of the aggregate stock market. Shiller (2000) argues that over-optimism about economic prospects can lead investors to value stocks irrationally. Evidence consistent with such misvaluation of systematic and macroeconomic components has been presented in Baker and Wurgler (2005) and Campbell and Vuolteenaho (2004) among others. We extend this literature to study analysts' behavior with regards to their use of macroeconomic information.

Studying how sell-side analysts use systematic information in forming their earnings expectations can yield several new insights on mispricing of systematic information and on how investors' expectations are formed. Firstly, sell-side analysts are important information intermediaries in the capital markets, whose earnings forecasts are often used by researchers and practitioners to form earnings expectations, value firms and estimate implied cost of capital from asset pricing models. Researchers also often use these forecasts as a surrogate for markets' unobservable earnings expectations. To optimally use analysts' forecasts, users need to know whether these summary measures incorporate all publicly available information. Secondly, market-efficiency tests using stock returns can almost never rule out risk-based explanations. This is particularly worrying for evidence on systematic sources of mispricing, as most asset pricing theories suggest that discount rates are determined by systematic factors. Finally, stock-returns based tests also cannot identify the source of mispricing, i.e., whether the mispricing is due to errors in cash flow expectations or errors in discount rates.

Given the importance of analysts' forecasts, a substantial literature in accounting and finance examines the properties of analysts' earnings forecasts. However, these studies address only the issue of how analysts process firm-specific information, such as past earnings surprises. Surprisingly, little is known about how analysts use systematic macroeconomic information in their forecasts, even though these variables account for about half the variation in firms' earnings (e.g., Brown and Ball, 1967; Chordia and Shivakumar, 2005).

We study the extent to which analysts incorporate publicly available macroeconomic information and, in particular, inflation in their forecasts of firms' earnings. We have two reasons for focusing specifically on inflation. First, several economics and finance papers show that agents ignore the effects of expected inflation in their decision-making. For example, Modigliani and Cohn (1979) posit that equity investors suffer from "inflation illusion" and do not incorporate the effect of expected inflation in forecasting nominal earnings, which causes equity mispricing. Using stock returns, Ritter & Warr (2002), Campbell and Vuolteenaho (2004) and others provide evidence consistent with the inflation illusion hypothesis. Given that analysts produce and sell earnings forecasts, it is interesting to examine whether analysts, like stock market investors, also fail to fully incorporate inflation in their forecasts.

Second, analysts often issue industry reports with the sole purpose of analyzing and forecasting input and output market prices in specific industries. The importance attached to inflation in the industry reports motivates us to assess the extent to which analysts' earnings forecasts for individual firms incorporate inflation information.

Incorporating inflation in earnings forecasts would be a trivial task for analysts if all firms had the same earnings exposure to inflation. However, cross-sectional differences in how firms hedge against price increases, contract on fixed or variable prices, account for inventory

costs, etc., will cause earnings exposure to inflation to vary across firms. In fact, Chordia and Shivakumar (2005) show that earnings exposure to inflation varies in the cross-section across decile portfolios sorted on earnings growth. If analysts do not fully consider the cross-sectional variation in earnings exposure to inflation, then their forecasts of future earnings will be biased, with the bias varying as a function of firms' earnings exposure to inflation. We test this prediction by examining whether biases in analysts' forecasts are related to inflation, and whether this relation varies systematically across portfolios with different earnings exposures to inflation. Chordia and Shivakumar (2005) show that firms in the lowest earnings growth portfolio have negative earnings exposure to inflation, and that the firms in the highest earnings growth portfolio have positive earnings exposure.[1] This finding implies that a failure to fully utilize the earnings information in inflation would induce an upward (downward) bias in forecasts of the lowest (highest) earnings growth firms.

To maximize the power of tests, which is critical for our study as our sample period (July 1984 through September 2003) is characterized by low and relatively stable inflation, our empirical analysis examines forecast error of a portfolio of stocks that is intended to maximize the earnings exposure to inflation. As inflation exposure is negative for low earnings growth firms, but positive for high earnings growth firms, a hedge portfolio that is long on the highest earnings growth portfolio and short on the lowest earnings growth portfolio will have maximum earnings exposure to inflation. Hence our tests are based primarily on this hedge portfolio, which we refer to as PMN (for "positive minus negative").

Our empirical analyses reveal that common proxies for expected inflation, such as lagged inflation and forecasts from the Michigan Survey of Consumers, predict the future earnings growth of the PMN portfolio. However, analysts do not fully use this earnings-predictive ability

[1] We do not estimate earnings exposure to inflation from time-series regressions of a firm's earnings changes on inflation, as Chordia and Shivakumar (2005) show that time variation in a firm's earnings inflation exposure causes these estimates to be attenuated.

of inflation when forecasting future earnings. The proxies for expected inflation can predict analysts' earnings forecast errors of the PMN portfolio for up to two quarters ahead. These results hold after controlling for the ability of current and lagged earnings growth to predict future earnings growth or future forecast errors, as shown by Abarbanell and Bernard (1992). The results are also robust across sub-periods and to either firm-level or portfolio-level data analyses. Finally, these results are observed only for inflation and not for other macroeconomic variables, such as real output growth.

Overall, our results show that analysts do not fully incorporate the effects of inflation in their earnings forecasts. But why do analysts make inflation-related forecasting errors? One simple answer is that they suffer from inflation illusion. Alternatively, they may frame the forecasting problem too narrowly, ignoring information that does not relate directly to the firm. Another explanation, which is consistent with analysts behaving rationally, is that the cost of incorporating expected inflation information exceeds the monetary benefits from improved accuracy. Without knowing both the cost and the benefit of incorporating expected inflation information, we cannot discriminate between the behavioral and rational explanations for our findings.

The finding that analysts do not fully incorporate inflation in their forecasts has significant implications. First, the results provide confirmatory evidence to those obtained from analysis of stock returns on misvaluation of systematic information. Secondly, to the extent that one views analysts' forecasts as surrogates for the unobserved investors' earnings expectations, the results indicate that inflation-related pricing errors arises partly though errors in cash flow expectations. Finally, to the best of our knowledge, this is the first study to show a common source of bias in analysts' forecasts. The common source of bias increases the likelihood that earnings forecast errors and forecast accuracy are correlated across analysts and firms, posing problems for researchers whose statistical tests assume they are independent.

The rest of the paper is organized as follows. The next section provides the background and motivation. Section 3 discusses institutional evidence on how analysts use information about inflation in their earnings forecasts. Section 4 presents the data and the main results and section 5 concludes.

2. Background and motivation

2.1. Rationality of analysts' earnings forecasts

Several prior studies have examined whether analysts fully utilize information in their forecasts. As financial analysts compete with each other in providing information to market participants, they are expected to fully utilize all publicly available information in their forecasts. However, most prior studies investigating the optimality of analysts' earnings forecasts examine whether analysts fully use firm-specific information, such as prior period earnings surprises and prior stock returns, in forecasting future earnings (Abarbanell, 1991; Abarbanell and Bernard, 1992). These studies find that analysts do not fully use the information in lagged earnings and lagged stock returns when predicting future earnings.

Brown and Ball (1967) and Chordia and Shivakumar (2005), among others, have shown that macroeconomic and systematic variables account for nearly half the variation in firms' earnings changes. O'Brien (1994) shows that macroeconomic news that arrives during a year explains a significant portion of the time variation in that year's corporate earnings. Hence, an important question is whether analysts fully utilize the macroeconomic information in their earnings forecasts. Relative to firm-specific information, one could argue that incorporating macroeconomic information in earnings forecasts is much simpler, because macroeconomic forecasts are widely available and so, unlike firm-specific information, need not be forecast separately for each firm. On the other hand, to incorporate macroeconomic information in forecasts, analysts need to estimate a firm's exposure to macroeconomic variables, which will

vary across firms as well as over time for a given firm. Moreover, relative to the functioning of a firm, the macroeconomy is much more complex. The heavily intertwined actions of economic agents and of the governmental and monetary authorities are arguably more difficult to forecast than the actions of managers in a firm. Thus, a priori, it is unclear whether analysts would be more or less efficient in utilization of firm-specific information relative to macroeconomic information.

Our paper examines whether analysts fully utilize inflation information in forming earnings forecasts. The only other paper that examines this issue is Ackert and Hunter (1995), who find that inflation does not predict future forecast errors of individual firms and, consequently, conclude that analysts rationally incorporate inflation in their forecasts. However, low power of tests is a concern in their study, as their tests allow neither for cross-sectional differences in earnings exposure to inflation, nor for time-series variation in this exposure. Consistent with this concern, we find little relation between the market's earnings growth and inflation, in spite of using a larger sample than Ackert and Hunter (1995). As some firms have positive earnings exposure to inflation, whereas others have negative exposure (Chordia and Shivakumar, 2005), the earnings exposure for the aggregate market portfolio is attenuated, leading to low power of the tests. If the market's earnings growth is unrelated to inflation as we find, it is not logical to expect analyst forecasts to reflect inflation on average. By exploiting cross-sectional differences in earnings exposure to inflation, we increase the relative power of our tests.

2.2. Inflation and earnings

As inflation is a key driver of earnings, one can decompose earnings changes for an individual firm as follows:

$$\Delta E_{it} = \beta_{it}\, INF_t + \varepsilon_{it} \tag{1}$$

where β_{it} is the *objective* earnings exposure to inflation for firm i in period t, INF_t is inflation in period t, and ε_{it} captures the change in earnings caused by sources other than inflation. The above equation states that changes in a firm's earnings are proportional to inflation. Thus, for example, if inflation in a given period is 2.5%, a firm with earnings exposure to inflation of 2.0 will see its earnings increase by 5%, whereas a firm with earnings exposure of −2.0 will see its earnings decline by 5%, everything else held constant. If analysts do not fully consider the cross-sectional differences in earnings exposure to inflation, then their *subjective* estimate for earnings exposure to inflation, β_{it}^*, will be lower in magnitude than the *objective* earnings exposure, i.e., $|\beta_{it}| > |\beta_{it}^*|$. In such a case, their forecasts would be biased downwards (upwards) for firms with positive (negative) *objective* earnings exposure.

One reason why analysts' subjective estimate of the earnings exposure to inflation would be lower than the objective earnings exposure is the inflation illusion hypothesis of Modigliani and Cohn (1979). Modigliani and Cohn (1979) conjecture that stock market investors ignore the effects of inflation on nominal earnings growth (i.e., set the subjective earning exposure to inflation, $\beta_{it}^* = 0$ for all firms), causing aggregate price-dividends ratios to be negatively correlated with inflation. To see this argument more clearly, consider the Gordon growth model for the market portfolio

$$P_t = \frac{D_{t+1}}{r-g} = \frac{(1-b)E_{t+1}}{r-g} \tag{2}$$

where r is the long-term nominal discount rate, g is the long-term growth rate of dividends or earnings, b is the plowback ratio, and P is the price. Modigliani and Cohn (1979) argue that, if investors do not suffer from inflation illusion, then the effect of inflation on discount rates, r, would exactly offset the effect of inflation on earnings growth, g, leaving the price–dividend

ratio for the aggregate market portfolio to be unrelated to inflation. They interpret the empirical evidence contradicting this expectation as evidence of stock-market investors suffering from inflation illusion. More specifically, they argue that investors use nominal discount rates to value stocks, but fail to recognize the effect of inflation in earnings growth. Based on analyses of stock returns, several recent studies (Ritter and Warr, 2002; Campbell and Vuolteenaho, 2004; Chordia and Shivakumar, 2005; Cohen *et al.*, 2005) report evidence consistent with the inflation illusion hypothesis.[2] For instance, Campbell and Vuolteenaho (2004) report that inflation illusion explains almost 80% of the time variation in mispricing of the S&P 500. If analysts, like stock market investors, suffer from inflation illusion, then their forecasts will be systematically biased.

Another reason why analysts might not fully incorporate inflation information in their forecasts is that analysts fail to fully utilize information on lagged earnings surprises and returns (Abarbanell, 1991; Abarbanell and Bernard, 1992). Although these studies focus on firm-specific information, there is no reason to think that biases in information processing are confined purely to idiosyncratic variables. It is possible that the same reason that causes analysts to inefficiently use firm-specific information also causes biases in the use of systematic variables, such as inflation. In fact, as Hirshleifer (2001) notes in the context of general investor irrationality, if misinterpretations of information are conveyed through social processes, mistakes arising from the misinterpretations could be greatest for systematic information.

3. Anecdotal evidence from research reports

The previous sections suggest that inflation is an important driver of earnings, and that analysts may not fully incorporate cross-sectional differences in earnings exposure to

[2] Fehr & Tyran (2001) report experimental evidence that individuals behave differently when the same objective payoffs are expressed in nominal terms rather than in real terms. Fehr and Tyran (2005) argue that these individual level money illusion effects will be reflected in aggregate level money illusion effects in the presence of strategic complementarity but not in the presence of strategic substitutability.

inflation. We initially test these arguments by examining institutional evidence on whether and, if so, how analysts use information about inflation in their earnings forecasts. We examine a small sample of archival analysts reports in the Investext Plus database provided by Thomson Financial, with particular focus on how the analysts generally deal with inflation in their reports.

Analysts often issue research reports with the sole purpose of projecting future industry prices, and their effects on companies' profitability. For example, a JP Morgan research report on three major pharmaceutical distributors, titled *Healthcare Distribution: Drug Price Inflation Still Matters*, identifies drug price inflation as a key near-term earnings driver.[3] The report analyzes historical price data, acquired by the analysts for a fee from a commercial vendor, on the top 50 drugs by sales. The analysts project price increases in 15 drugs and a subsequent decline in distributors' operating margin of 40 basis points on a year-to-year basis.

A Credit Suisse First Boston research report, titled *Food Retailers: Inflation Revisited*, jointly analyzes the inflation dynamics of input and output prices.[4] "Shelf prices and wholesale prices do not move in lockstep… The negative spread between growth in the CPI Food-At-Home and PPI Finished Consumer Foods widened to approximately 390 basis points in the fourth quarter 2003 and was 70 basis points in the first quarter 2004." The inflation data used in the report are freely available from the US Department of Labor.

Finally, a Citigroup Smith Barney report on the restaurant industry analyzes the wage inflation expectations of 95 respondents to their regular Monthly Restaurant Industry Survey.[5] Based on the survey results, the analysts conclude that inflation will be more of a concern in 2005 than in 2004, but do not change their Buy ratings on 4 of their 11 covered stocks.

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[3] The report was written by Lisa Gil, Atif Rahim, and Michael Minchak, and dated December 6, 2004.
[4] The report was written by Jack Murphy and Teresa Ging, and dated April 27, 2004.
[5] The report was written by Mark Kalinowski, Jeffrey Carnevale, and Kwame Aryeh, and dated November 9, 2004.

When we examined reports for individual firms, we found several instances where inflation was mentioned in the report, but could not identify any report where analysts discussed firms' earnings exposure to inflation or explicitly discussed how information about economy-wide prices was incorporated in their earnings forecasts. Although the lack of such discussions suggests the possibility that analysts ignore cross-sectional variation in earnings exposure to inflation, it is possible that their forecasts fully incorporate such information and that the reports merely do not discuss all information used in arriving at a forecast. Based on analysis of reports and a survey of individual analysts, Horngren (1955) found that analysts *never* explicitly adjusted financial statements for general price level changes in their reports, but nevertheless survey evidence indicated that the analysts made such adjustments either mentally or indirectly (e.g., by comparing depreciation adequacy against cost of asset replacements.)

4. Empirical analysis

4.1. Research design

Tests of whether analysts fully use the earnings information in inflation require initial identification of the earnings exposure of firms to inflation. Although at first sight it might seem that nominal earnings growth will have a one-to-one relation with inflation, i.e., the earnings exposure to inflation will be 1.0, this is unlikely to be the case for most firms or even for the aggregate market. This is because firms hedge their exposure to inflation risk, some of their contracts are on fixed prices, firms have international operations, accounting earnings as well as taxes are based on historical costs of goods sold and depreciation that is based on historical costs of assets, and so on.[6] These factors cause cross-sectional variation in earnings exposure to

[6] It is worth pointing out that the use of historical costs for inventory and assets in measurement of accounting earnings can by itself cause earnings exposure of firms to be negative in periods of declining inflation. This is because, while sales grow at current inflation levels, cost of goods sold and depreciation expenses grow at lagged inflation rates, which, if higher than current rates, can cause earnings to decline.

inflation, the effects of which may not cancel out in the aggregate, particularly those due to income taxes. Hence we empirically estimate the earnings exposure of firms to inflation.

One could measure earnings exposure to inflation by regressing earnings growth of individual firms on contemporaneous inflation. However, obtaining a meaningful number of quarterly earnings observations for the firm-specific regressions requires assuming parameter stationarity for relatively long periods of time. This assumption is unlikely to be valid, for several reasons. First, earnings exposure of firms to inflation changes as firms continuously react to the changing environment by investing in new projects, mergers, acquisitions, divestitures, restructurings, and plant closings (Ball *et al.*, 1993). Second, a firm's inflation exposure depends on the nature of its contracts (e.g., nominal or real) with suppliers, customers and employees, which vary as contracts mature and new contracts are signed. Third, earnings exposure will also vary with changes in firms' production (e.g., input mix and suppliers), marketing (e.g., pricing), and financial strategies (e.g., holdings of cash and trading securities and hedge contracts) through their effects on product prices, factor costs, and returns on financial investments. Finally, as reported earnings are based on historical cost of inventory and historical depreciation, earnings exposure to inflation will also change with replacement of inventory and property, plant, and equipment. Thus firm-specific regressions are likely to yield imprecise estimates of earnings-inflation sensitivity, with high standard errors.

We do not estimate firm-specific measures of inflation exposure, but instead rely on the finding of Chordia and Shivakumar (2005) that sorting stocks on a proxy for earnings growth yields portfolios that vary monotonically in their earnings exposure to inflation. In particular, they show that portfolios of stocks with the lowest (highest) recent earnings growth have significantly negative (positive) exposure to expected inflation. This approach assumes that inflation exposure is more stable at the earnings growth portfolio level than at the individual firm level. As Chordia and Shivakumar (2005) note, if this assumption were not valid, then the tests

would have lower power in detecting cross-sectional differences in inflation exposure, as firms frequently jump from one portfolio to another. They report that the probability of a firm continuing in the same portfolio for more than a year is no different from that expected under a random walk. The approach of using earnings growth portfolios to estimate inflation exposure allows time variation in individual firm's earnings exposure to inflation as well as allowing this exposure to vary cross-sectionally.

We closely follow the approach of Chordia and Shivakumar (2005) in forming the earnings growth portfolios and use standardized unexpected earnings (SUE) as the measure of earnings growth. SUE_{iq} for firm i is computed in each month t as

$$\text{SUE}_{iq} = \frac{E_{iq} - E_{iq-4}}{\sigma_{iq}} \tag{3}$$

where E_{iq} is the most recently announced earnings for firm i corresponding to earnings for quarter q, E_{iq-4} represents the earnings four quarters ago, and σ_{iq} is the standard deviation of ($E_{iq} - E_{iq-4}$) over the prior eight quarters.[7] To avoid using stale earnings, we use only earnings announced within four months of the portfolio formation month, i.e. month t. In each month, sample firms are sorted into deciles based on SUE_{iq} using the distribution of earnings growth from the prior three months to determine the decile cut-offs. To avoid biases that might be introduced from limiting the earnings growth distribution to firms with analyst following, the decile cut-offs are based on all firms in the merged CRSP and COMPUSTAT database irrespective of whether IBES has data available on analysts' forecasts. The decile portfolios are denoted P_1 through P_{10}, with P_1 (P_{10}) being the lowest (highest) earnings growth portfolio. As in Chordia and Shivakumar (2005), we expect portfolio P_{10} to have positive exposure to inflation and portfolio P_1 to have negative exposure to inflation.

[7] Standardizing earnings change ($E_{iq} - E_{iq-4}$) by price at end of month t, instead of σ_{iq}, leaves our results qualitatively unchanged.

4.2. Sample

Our sample consists of all NYSE, AMEX, and NASDAQ firms with data on the monthly CRSP, quarterly COMPUSTAT, and detailed IBES databases. We restrict our sample to firms with individual analysts' forecast errors available between July 1984 and September 2003. For each firm and each quarter, we compute analysts' consensus forecasts from IBES as the mean of individual analysts' earnings forecasts.[8] To avoid using stale forecasts, only forecasts issued in the same month as the earnings announcement or in the immediately previous month are considered. Forecast errors ($FERR_{iq}$) are then calculated as the actual earnings announced, as reported in IBES, less the mean consensus forecast, divided by the stock price at the end of the portfolio formation month. To obtain portfolio-level data, we average the relevant variable across individual firms constituting the portfolio. For instance, $FERR_{P1,q+j}$ for earnings growth portfolio P_1 is obtained by averaging $FERR_{i,q+j}$ across all stocks in the portfolio P_1.

Our analyses use earnings growth for the four quarters prior to portfolio formation (i.e., SUE_{iq-3} to SUE_{iq}) and both earnings growth and forecast errors for the four quarters subsequent to the portfolio formation month t (i.e., SUE_{iq+1} to SUE_{iq+4} and $FERR_{iq+1}$ to $FERR_{iq+4}$). We delete the extreme 1% of observations on either side for $SUE_{i,q+j}$ ($j = -3$ to $+4$) and $FERR_{i,q+j}$ ($j = +1$ to $+4$) in each portfolio formation month to reduce the impact of outliers on the regression parameters.[9]

Our analyses focus on the predictability of earnings growth and forecast errors for quarters $q + 1$ to $q + 4$, where quarter q corresponds to the quarter whose earnings are used to

[8] IBES-provided consensus forecasts often include stale forecasts. O'Brien (1988) shows that a consensus forecast constructed from recent individual forecasts is more accurate than the IBES consensus forecast. Brown (1991) shows that timely composite earnings forecasts are more accurate than both the mean of all outstanding forecasts and the most recent forecast. Our results are robust to using IBES-provided consensus forecasts. Also, we have replicated our results using split unadjusted data from IBES.

[9] Our conclusions are unaffected by this exclusion criterion.

sort stocks into earnings growth portfolios. For analysis of forward-looking earnings growth (SUE_{iq+j}, j = 1 to 4), we include only firm-quarters that also have data on $FERR_{i,q+j}$ for the same quarter. Similarly for analysis of forward-looking forecast errors, we include only firm-quarters that have data on earnings growth for the corresponding quarter. These restrictions are imposed to have comparability in results across analyses of earnings growth and forecast errors, although the results are robust to not imposing the restrictions. In addition, we also require our sample firms to have earnings growth data for quarters $q - 3$ to q (i.e., SUE_{iq-3} to SUE_{iq}), as these are included in the analyses as control variables. After the above exclusions, each earnings growth decile portfolio consists of 84 stocks on average.

Table 1 reports descriptive statistics for the current earnings growth and analysts' forecast errors for different forecast intervals across the earnings growth decile portfolios. By construction, the average earnings growth in quarter q is monotonically increasing across earnings growth deciles. The forecast errors in this quarter are also monotonically increasing, which is due partly to SUE_{iq} and $FERR_{iq}$ being correlated through the use of the same actual earnings, E_{it}, in their computations. More interestingly, we find that the forecast errors in the quarter subsequent to portfolio formation are also monotonically increasing. $FERR_{i,q+1}$ is −0.72 for the lowest earnings growth decile P_1, and increases to 0.33 for the highest earnings growth decile P_{10}. $FERR_{i,q+2}$ increases from −0.43 for P_1 to 0.02 for $P_{10,}$ but this increase is non-monotonic. These findings are consistent with those of Abarbanell and Bernard (1992), who show that lagged earnings growth predicts future forecast errors. However, if earnings exposure to inflation systematically increases across the earnings growth deciles (Chordia and Shivakumar, 2005), then underutilization of inflation information would cause a similar systematic increase in forecast errors. For firms with negative earnings exposure to inflation, analysts would overestimate the future earnings, resulting in negative forecast errors, whereas for firms with positive earnings

exposure to inflation, they would underestimate future earnings, resulting in positive forecast errors. The remainder of the paper tests this alternative causal explanation.

We use two different proxies for expected inflation in our analyses, one based on time-series estimates and the other based on survey data. Our time-series estimate for future inflation is lagged annual inflation, $INF_{q-3,q}$, chosen in view of the high persistence of inflation.[10] The survey-based proxy for inflation expectations is the one-year-ahead inflation forecasts reported by the Michigan Survey of Consumers, $EINF_q$.[11] The choice of Michigan Survey of Consumers relative to other surveys (such as the Livingstone survey) for inflation forecasts was dictated largely by its monthly availability. Throughout the paper, expected inflation is measured in the month prior to the portfolio formation month to ensure that these data would have been publicly available before portfolio formation.

During our sample period, the average forecast of inflation from the Michigan Survey was 3.02%, which corresponds well with the actual annual inflation of 3.06% for the period. The standard deviation of annual inflation was 1.09. The low and relatively stable inflation is a well-known characteristic of the late 1980s and the 1990s.

The rest of the analysis proceeds as follows. In the next section, we examine whether earnings exposure to inflation increases across the earnings growth deciles. We then investigate whether proxies for expected inflation can predict future earnings growth of the earnings growth deciles. Finally, we study whether the same proxies for expected inflation also predict future forecast errors. If analysts underutilize inflation information,

[10] A more sophisticated time-series model would require parameter estimation, which would introduce an unknown amount of noise into the expected inflation proxy. In any case, the loss of power from using lagged inflation as a proxy for expected inflation is not a concern, because we find significant results even with this proxy.
[11] The survey data are available monthly from 1978, and are based on a random sample of at least 500 households. The Survey Research Centre at the University of Michigan conducted the telephone interviews.

then we expect that proxies for inflation expectations that predict future earnings growth would also predict future forecast errors.

4.3 Earnings exposure to inflation in earnings growth deciles

To estimate the earnings exposure to inflation of each earnings growth decile, we estimate a pooled regression of SUE_{iq+1}, our earnings growth measure, on actual inflation in quarter $q + 1$ ($INF_{q+1,q+1}$), where q corresponds to the quarter whose earnings growth is used in forming portfolios. In this regression, the dependent and independent variables are not measured in quarter q (i.e., SUE_{iq} and $INF_{q,q}$), as such a regression would involve estimating regressions separately for portfolios sorted on the dependent variable, and be thereby misspecified.

The results are presented in Table 2. Earnings growth is significantly related to contemporaneous inflation for the lowest three deciles and the largest two deciles. The lack of significance for the middle five earnings growth portfolios is likely due to the low power of the regressions. Given that inflation was low and relatively stable during our sample period, its effects on future earnings growth would be difficult to identify empirically for portfolios with relatively small exposures to inflation.[12] Compared with our results, Chordia and Shivakumar (2005) find significant earnings exposure for eight of the ten earnings growth portfolios using a sample from 1972 to 2001, which not only covers a longer period than this study but also includes the more volatile and high-inflation period of the 1970s.

More importantly for the current study, significant differences in the earnings exposure are observed across the earnings growth deciles. The F-test that the earnings exposure to inflation is the same across all earnings growth deciles is rejected at less than 1% level. The earnings exposure of the lowest earnings growth decile portfolio is a significantly negative −0.30, whereas the corresponding figure for the highest earnings growth decile portfolio is

[12] We did not find a significant coefficient on inflation in unreported regressions at the aggregate market level.

+0.15. These coefficients imply that a one standard deviation increase in quarter $q + 1$'s inflation (0.47) decreases SUE_{iq+1} for portfolio P_1 by −0.14, while increasing the SUE_{iq+1} for portfolio P_{10} by 0.07, which represent 12% and 10% respectively of the average SUE_{iq+1} for portfolios P_1 and P_{10}.

In order to maximize the power of our tests, subsequent analyses focus primarily on a zero-investment portfolio that is long on the highest earnings growth portfolio and short on the lowest earnings growth portfolio. The power of tests is a critical issue for our study, because our analyses are predictive in nature and our sample period is characterized by relatively low and stable inflation. Thus, unless the earnings exposure to inflation is sufficiently large, it would be difficult to empirically identify any relation between inflation and future earnings growth or future forecast errors. The findings in Table 2 suggest that the zero-investment portfolio, PMN, maximizes the earnings exposure to inflation, and that it has a significantly positive exposure to inflation. Apart from maximizing earnings exposure, the use of a zero investment portfolio also controls for spurious correlations that might arise from inflation being related to potential biases in earnings growth or forecast errors that equally affect all stocks.[13] Moreover, our focus on a zero-investment portfolio accommodates time variation in earnings exposure even at the earnings growth portfolio level, which might happen if managers of all firms systematically adjust their earnings exposure to inflation across business cycles. Analyses of the PMN portfolio, however, assume any time variation in the earnings exposures to be similar across extreme deciles, so that the relationship between inflation and earnings is stationary for the hedge portfolio, PMN.

We next examine whether the cross-sectional differences in earnings exposure observed in Table 2 help predict future earnings growth for these portfolios based on current expectations of inflation. Table 3 reports results from predictive regressions for the earnings growth in the four quarters subsequent to portfolio formation quarter, i.e., SUE_{iq+1} to SUE_{iq+4}. The regressions

[13] Chopra (1998) shows that, at the aggregate market level, analysts' optimism varies across business cycles.

use pooled time-series cross-sectional data for individual stocks in portfolios P_1 and P_{10}, with variables' signs being reversed for stocks in P_1 to account for their short position in portfolio PMN. Consistent with prior studies (e.g., Bernard and Thomas, 1990), the coefficients on lagged earnings growth in the regression of quarter-ahead earnings growth are significantly positive for the first three lags and significantly negative for the fourth lag. The adjusted R^2 is 4.34% for this predictive regression. Including expected inflation as an additional explanatory variable marginally increases the adjusted R^2s. The coefficient on expected inflation is significantly positive for regressions of earnings growth in all four quarters $q + 1$ to $q + 4$, irrespective of whether we measure this variable using lagged inflation or the forecast from the Michigan Survey. This indicates that expected inflation has significant predictive power for future earnings growth, even after controlling for the information in lagged earnings growth.

The coefficient on expected inflation measured as lagged inflation, reported in Panel A, is 0.06 for the quarter-ahead earnings growth. It decreases to 0.03 as the prediction horizon is extended to quarter $q + 4$. The coefficients for expected inflation measured using the Michigan Survey in Panel B are generally higher in magnitude, with values around 0.09, and remain fairly constant as the prediction horizon is extended. The difference in magnitudes is consistent with lagged inflation being a noisier proxy for expected inflation than the forecasts from the Michigan Survey. However, these coefficients on lagged expected inflation are much smaller than the earnings exposure to contemporaneous actual inflation of +0.45 (0.15 for P_{10} – 0.30 for P_1) that is implied by the results in Table 2, which is not surprising given that the current regressions are predictive, whereas the regressions in Table 2 are contemporaneous.

4.4 Forecast errors and expected inflation

The results in Table 3 indicate that expected inflation data are useful for predicting earnings four quarters ahead. If analysts use all publicly available information, including inflation expectations, and unbiasedly forecast future earnings, then their future forecast errors should be orthogonal to expected inflation. However, if analysts underutilize inflation information, or fail to consider the impact of expected inflation on future earnings, then expected inflation will predict future forecast errors. More specifically, as prior tables show that expected inflation is significantly positively related to future earnings growth of PMN, ignoring these inflation data will induce future earnings forecast errors for PMN to be positively correlated with expected inflation.

We first plot the relationship between forecast errors for PMN and actual monthly inflation in Figure 1. This figure indicates a positive relationship between monthly inflation and forecast errors for PMN in the future months. In general, periods with higher inflation are followed by periods with higher forecast errors for PMN. We more formally test the relationship between analysts' forecasts errors and inflation by estimating a predictive regression as in Table 3, but after replacing future earnings growth with future forecast errors ($FERR_{PMN}$) as the dependent variable. Table 4 reports the results from this analysis. Panel A reports results when annual inflation serves as the measure for inflation expectations, and Panel B reports results when the Michigan Survey inflation forecast serves the same role. Because of our sample selection procedures, which require firm-quarters to have data on both earnings growth and forecast error before they are included in the sample, our analyses in Tables 3 and 4 are based on identical observations, with only the dependent variable differing between the two tables.

Regressing one-quarter-ahead earnings forecast errors ($FERR_{i,q+1}$) on earnings growth in the prior three quarters, i.e., SUE_{iq-3} to SUE_{iq}, we find that the coefficients on the first three lags are significantly positive. This result is consistent with the findings of Abarbanell and Bernard

(1992), who show that analysts do not fully use the information in lagged earnings growth. When we extend the regression to include expected inflation as an additional explanatory variable, we find that the coefficient on expected inflation is significantly positive for forecast errors in the subsequent three quarters.[14] As in Table 3, the coefficient on Michigan Survey inflation forecasts is larger in magnitude than for lagged inflation, consistent with lagged inflation being a noisier measure of expected inflation. More interestingly, for both measures, the coefficient on expected inflation monotonically decreases as one moves from one-quarter-ahead forecast errors to four-quarter-ahead forecast errors. This is consistent with analysts slowly incorporating the effects of inflation in their forecasts.[15] By the end of the third quarter subsequent to portfolio formation, analysts seem to have fully incorporated all the information on inflation that was available at portfolio formation.

Comparing coefficients on expected inflation across Tables 3 and 4 also provides interesting insights into the delayed response of analysts to earnings information in inflation expectations. In the first two quarters subsequent to portfolio formation, the coefficients from regressions of earnings growth (Table 3) are very similar in size to those from regressions of forecast errors (Table 4). However, for the third and fourth quarters subsequent to portfolio formation, the coefficients for forecast errors are much smaller than the coefficients for earnings growth, which is consistent with analysts' incorporating inflation information in their earnings forecasts over time.

The adjusted R^2s in these predictive regressions are generally small, suggesting that the variation in forecast errors due to analysts ignoring inflation is small. This is not surprising,

[14] This result is robust to including lagged forecast errors (i.e., FERR_{iq-3} to FERR_{iq}) as additional explanatory variables because prior research reports that analysts' lagged forecasts errors predict future forecast errors (e.g. Mendenhall, 1991; Abarbanell & Bernard, 1992). The coefficients on lagged forecast errors are generally insignificant.

[15] An alternative interpretation is that inflation in quarter q is a better proxy for expected inflation in quarter q+1 than for each subsequent quarter, q+2 through q+4. Note however that our benchmark regression in Table 3 Panel B indicates that the effect of inflation on earnings growth is relatively constant across quarters q+1 through q+4.

given the relatively stable inflation in our sample period and also the fact that unexpected shocks to a firm's earnings are likely to cause most of the variation in forecast errors for individual firms. In a later section, we show that aggregating forecast errors to portfolios significantly reduces firm-specific noise, causing substantial improvement in the adjusted R^2s.

4.5. Robustness checks

4.5.1 Other macroeconomic variables

Our analyses thus far examine analysts' rationality with regard to inflation, but not to other macroeconomic variables. This choice was dictated by prior evidence on the predictive power of economy-wide inflation for firm-specific earnings. However, it is possible that our results are spuriously induced by inflation being correlated with other macroeconomic variables and analysts' inefficiently using information on these other macroeconomic variables, but not inflation. Since, apart from inflation, real output growth is the macroeconomic variable most likely to affect earnings growth, we check whether our results for inflation are affected by controls for expected real output growth. In econometric terms, we examine whether measures of real economic activity are important correlated omitted variables in our previous analyses.

Table 5 examines the sensitivity of our previous results to the inclusion of two proxies for real output growth: industrial production growth ($IPG_{q-3,q}$) over the prior four quarters, and the real interest rate ($REALINT_q$) in month t, measured as the yield on the 12-month T-bill minus the proxy for expected inflation. We re-run the regressions for both earnings growth and forecast errors for the next two quarters, using the same observations used in Tables 3 and 4. Table 5 Panel A reports results using lagged inflation to measure expected inflation. Neither the real interest rate nor industrial production growth explains much variation in either earnings growth or forecast errors, as reflected in slope coefficients that are near zero, insignificant t-statistics,

and virtually unchanged adjusted R^2s relative to the regressions in Panel A of Tables 3 and 4. In addition, all the other included variables and their associated *t*-statistics are virtually unchanged. Table 5 Panel B reports similar results using the Michigan Consumer Survey measure as the expected inflation proxy. The only exception is that the real interest rate, REALINT_q, has a marginally significant *t*-statistic in the regression predicting one-period-ahead earnings growth. However, coefficients on both expected inflation proxies continue to be statistically significant in every regression in Table 5. We infer that the explanatory power of expected inflation for analysts' earnings forecast errors is not due to correlated omitted variables measuring real activity.

4.5.2 Sub-period analyses

The previous analyses pool data for the last 20 years, which assumes that the relations we examine have been stationary over time. However, Fama (1998) emphasizes that many apparent stock-market anomalies were significantly reduced after they were first documented, suggesting either that the original phenomena were sample period specific, or that rational investors arbitraged them away once they had been pointed out. This viewpoint suggests the possibility that the effects of inflation illusion have abated over time, and that our pooled analyses could overstate the extent to which any anomaly persists in the most recent data. To explore whether the effect of inflation illusion is sample period specific, we split our time period into equal halves and re-run the main regressions in each sub-period. As in Table 5, we report results for both earnings growth and forecast error for the next two quarters for each expected inflation proxy.

Table 6 Panel A, which reports results from analyses using lagged inflation, indicates that in both sub-periods the coefficient on lagged inflation is significantly positive. These results hold in both regressions of earnings growth as well as in regressions of forecast error. The coefficients

on expected inflation in the earnings growth regressions are larger in the latter half of our sample period. Interestingly, the opposite is observed for coefficients from regressions of forecast errors. In regressions of the one- and two-quarter-ahead earnings growth, the coefficients on lagged earnings growth are statistically significant in both sub-periods. Similarly, in regressions of future forecast errors, the coefficients are statistically significant except for the two-quarter-ahead forecast error in the later sub-period. Similar inferences can be drawn from the results in Panel B of Table 6, which are based on inflation forecasts from the Michigan Survey. Overall our conclusion that analysts underutilize inflation information is robust across sub-periods, although analysts' forecast errors are markedly less sensitive to expected inflation in the more recent sub-period, possibly as a result of to analyst learning.

4.5.2 Portfolio-level analyses

Consistent with most prior studies on analysts' rationality and on the post-earnings-announcement drift (e.g., Bernard and Thomas, 1990; Abarbanell and Bernard, 1992; Ball and Bartov, 1996; Easterwood and Nutt, 1999), our analysis thus far is based on pooled firm-level data. However, these regressions may suffer from cross-correlation problems. Hence, to test the sensitivity of our results to this issue, we repeat our regressions using portfolio-level data.[16] Apart from addressing this issue, the portfolio-level analysis will also reduce firm-specific noise in the regressions, and thereby likely improve the explanatory power of the models relative to firm-level analysis.

We construct portfolio-level earnings growth ($SUE_{PMN,q+j}$, $j = -3$ to $+4$) and forecast errors ($FERR_{PMN,q+j}$, $j = -3$ to $+4$) for PMN by averaging the variables of interest within each earnings growth decile and then differencing these averages across the extreme deciles, P_{10} and

[16] We cannot control for cross-sectional dependence using the Fama–Macbeth approach, as values for inflation would be identical across portfolio observations in the monthly cross-sectional regressions.

P_1. We compute these averages every month, as the composition of the PMN portfolio changes every month. But this procedure is likely to induce serial correlation in the variables, as earnings growth and forecast errors are available only on a quarterly frequency. To account for the serial correlation, we use Newey–West standard errors. We have alternatively computed the portfolio-level variables at a quarterly rather than monthly frequency and obtained qualitatively similar results.

Table 7 reports results from a time-series regression of $SUE_{PMN,q+j}$ and $FERR_{PMN,q+j}$ (j = +1 to +4) on the two measures for expected inflation. Panel A reports results for $SUE_{PMN,q+j}$ (j = +1 to +4), and Panel B reports results for $FERR_{PMN,q+j}$ (j = +1 to +4). In regressions of $SUE_{PMN,q+j}$ (j = +1 to +4), the coefficient on expected inflation is almost always significantly positive. The only exception is regressions of SUE_{iq+3}, where this coefficient is significant only in the univariate regressions based on Michigan Survey forecasts of inflation. The coefficients on lagged earnings growth no longer have the pattern observed in firm-level analyses. This is consistent with Lewellen *et al.*'s (2003) finding that the return predictive ability of earnings growth varies considerably across portfolio-level and firm-level analyses. The coefficients on lagged earnings growth are significantly negative for the first lag, significantly positive for the second lag, and generally insignificant for the other two lags. The average adjusted R^2s in the regressions of one-quarter-ahead earnings growth vary between 7.5% and 27%, which is a substantial improvement from the adjusted R^2s of about 4% observed from firm-level analysis in Table 3.

Focusing on regressions of $FERR_{PMN,q+j}$ (j = +1 to +4), we find that the coefficient on expected inflation is significantly positive for the two quarters subsequent to portfolio formation. This result holds both for lagged inflation and for the Michigan Survey forecasts of inflation. The coefficient of 0.17 on the Michigan inflation forecasts in regression of $FERR_{PMN,q+1}$ suggests that a one standard deviation increase in inflation forecasts of 0.55% increases the quarter-ahead

forecast errors (expressed as a percentage of lagged stock price) for PMN by 0.09, which corresponds to an economically significant 2.5 cents for the average firm. For comparison purposes, the average of actual earnings per share reported by firms in our sample is 24 cents. The coefficients on lagged earnings growth are no longer significant in these portfolio-level regressions, suggesting that the results reported in prior studies on the predictive ability of earnings growth for future forecast errors are not robust to using portfolio-level data.[17] The average adjusted R^2s in the regressions of one-quarter-ahead FERR vary between 10% and 18%, which is substantially higher than the adjusted R^2s of less than 1% observed in firm-level analysis in Table 4. Overall, the portfolio-level regressions confirm our earlier findings that analysts fail to fully incorporate inflation expectations in their earnings forecasts up to two quarters ahead. Our results are thus consistent with the argument that analysts underutilize inflation information.

5. Conclusions

We examine whether analysts fully account for earnings exposures to inflation of individual stocks in forecasting future earnings. We find that commonly used proxies for expected inflation predict future earnings growth as well as analysts' earnings forecast errors of a earnings growth-based hedge portfolio. Our findings of forecast error predictability are robust to sub-period analyses and to controlling for other macroeconomic variables such as real interest rate and industrial production growth. In addition, we find similar results using portfolio-level and firm-level data.

[17] Keane and Runkle (1998) also report that predictability of forecast errors based on lagged earnings is not robust to controls for cross-correlation. We also note that our results are not directly comparable to those of Abarbanell and Bernard (1992) who study average effects whereas our tests examine cross-sectional variation in the predictive ability of earnings growth for forecast errors.

Our study makes several contributions. First, we extend the Modigliani and Cohn (1979) inflation illusion hypothesis from investors' earnings expectations to analysts' earnings expectations. The extension to financial analysts is only natural given the prominent role of financial analysts as information intermediaries, and given that supplying information about future earnings to investors is central to analysts' activities. As investors' unobservable earnings expectations are likely correlated with analysts' observable expectations, our evidence that analysts' earnings forecasts underutilize inflation data suggests that perhaps equity investors also underutilize inflation data.

Second, in contrast to prior studies that examine the effect of inflation on aggregate market portfolios, we examine use of inflation information at the individual stock level. This is consistent with the institutional setting in which financial analysts conduct their activities. Financial analysts follow and issue earnings forecasts for a wide cross-section of stocks, which allows additional insights into how inflation illusion impacts on future earnings expectations. A fundamental feature of our approach is that it exploits the variation in inflation exposures of firms ranked in extreme earnings growth deciles to both design a more powerful test of the inflation illusion hypothesis, and document systematic variation in analysts' earnings forecast errors.

Our study also suggests several promising avenues for future research. In general, prices faced by a firm in input and output markets are more relevant for forecasting its earnings than prices from markets in which a firm does not participate. Possible extensions of our paper include alternative specifications of the relation between expected inflation and future nominal earnings growth, or the use of industry- or commodity-specific price indexes that track prices more directly relevant to individual firms. It would also be interesting to replicate our tests in a high-inflation economy where the effect of expected inflation on future nominal earnings is likely to be greater.

Contrasting the extent to which analysts ignore expected inflation in different environments would shed light on Akerlof's (2002) claim that ignoring expected inflation is a sensible rule of thumb if it is not too costly. It would be interesting to study whether top-down analysts are less prone to inflation illusion than bottom-up analysts, because inflation information should be more salient and relevant to macroeconomic strategists.

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Figure 1: Plot of forecast errors for PMN and actual monthly inflation

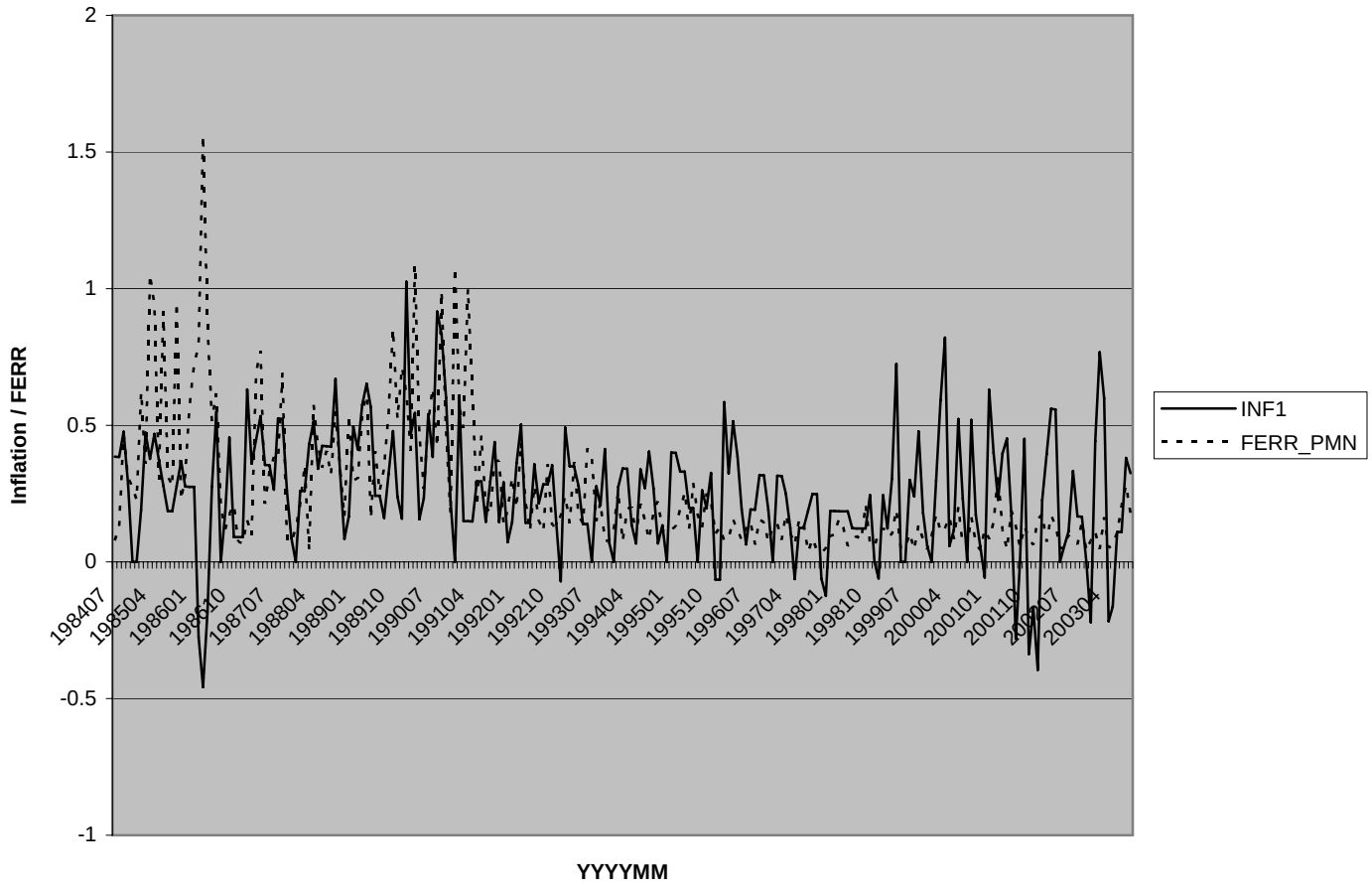

Table 1: Descriptive statistics for earnings growth and forecast errors by earnings growth deciles

In each month t, all NYSE, AMEX, and NASDAQ firms are sorted into deciles based on their earnings growth (SUE_{it}), which is defined as $SUE_{it} = (E_{it} - E_{it-4})/\sigma_{it}$, where E_{it} is the most recently announced earnings for firm i, E_{it-4} represents the earnings four quarters ago, and σ_{it} is the standard deviation of $(E_{it} - E_{it-4})$ over the prior eight quarters. The decile cut-offs for forming portfolios are based on all COMPUSTAT firms (i.e., including firms that are not in the IBES database) that announced earnings in the three months prior to the formation month. Forecast errors ($FERR_{it}$) are obtained from IBES as the difference between the mean consensus forecast using forecasts made either in the earnings announcement month or in the prior month and the actual earnings announced, divided by the stock price at the end of the formation month. Forecast errors are also measured for the four quarters, $q + 1$ to $q + 4$, subsequent to the portfolio formation month. The earnings growth (forecast error) for each decile portfolio (i.e., portfolio earnings growth or portfolio forecast error) is then obtained by averaging the SUE_{it} ($FERR_{it}$) of individual firms constituting the portfolio. The table presents the time-series mean and standard deviation for the portfolio earnings growths and forecast errors. The extreme 1% of $SUE_{i,q+j}$ ($j = -3$ to 4) and $FERR_{i,q+j}$ ($j = -3$ to 4) are deleted in each portfolio formation month. The sample period comprises 231 months from July 1984 through September 2003, and the sample consists of stocks that have data available for both SUE and FERR and four lags of SUE. These criteria are used to ensure a constant sample across the subsequent earnings growth and forecast error analyses. The criterion on lags of earnings growth is included as four lags of earnings growth are included as control variables in the regressions. On average, each decile portfolio consists of 84 stocks.

		P_1	P_2	P_3	P_4	P_5	P_6	P_7	P_8	P_9	P_{10}
SUE_q	**Mean**	−3.16	−1.23	−0.62	−0.25	−0.03	0.13	0.33	0.62	1.16	2.48
	Std. dev.	0.62	0.23	0.18	0.13	0.09	0.08	0.10	0.13	0.18	0.25
$FERR_q$	**Mean**	−1.16	−0.86	−0.57	−0.30	−0.12	0.03	0.16	0.33	0.51	0.74
	Std. dev.	0.40	0.45	0.34	0.25	0.25	0.25	0.23	0.24	0.39	0.34
$FERR_{q+1}$	**Mean**	−0.72	−0.59	−0.38	−0.20	−0.10	−0.01	0.09	0.13	0.24	0.33
	Std. dev.	0.36	1.47	0.34	0.32	0.27	0.27	0.25	0.30	0.32	0.35
$FERR_{q+2}$	**Mean**	−0.43	−0.27	−0.22	−0.16	−0.04	−0.04	0.08	0.00	−0.03	0.02
	Std. dev.	0.34	0.43	0.34	0.28	0.29	0.31	0.72	0.35	0.36	0.39
$FERR_{q+3}$	**Mean**	0.53	0.09	−0.01	−0.08	−0.10	−0.14	−0.11	−0.23	−0.37	−0.41
	Std. dev.	0.35	0.22	0.27	0.24	0.26	0.30	0.71	0.33	0.43	0.43
$FERR_{q+4}$	**Mean**	−0.22	−0.12	−0.08	−0.08	−0.05	0.01	0.01	0.04	0.03	0.04
	Std. dev.	0.26	0.18	0.11	0.27	0.32	0.08	0.20	0.07	0.06	0.06

Table 2: Regression of earnings growth on contemporaneous inflation

The table presents results from the pooled regression of SUE_{iq+1} on inflation ($INF_{q+1,q+1}$) in the contemporaneous quarter. Earnings growth for quarter q ($SUE_{i,q+1}$) is defined as $SUE_{i,q+1} = (E_{iq+1} - E_{iq-3})/\sigma_{iq+1}$, where E_{iq+1} is the most recently announced earnings and corresponds to quarter $q + 1$; E_{iq-3} represents the earnings from four quarters ago; and σ_{iq+1} is the standard deviation of $(E_{iq+1} - E_{ia-3})$ over the prior eight quarters. The regression is estimated separately for each earnings growth portfolio using quarterly observations of the firms constituting the portfolio. The earnings growth portfolios are formed by sorting stocks into deciles based on $SUE_{i,q.}$ Each earnings growth portfolio excludes the extreme 1% of $SUE_{i,q+1}$ on either side. The column titled "*F*-test" gives the *p*-value for the *F*-test that the coefficient is the same across all earnings growth portfolios. The sample covers earnings announced from July 1984 through September 2003.

Independent variable:		P_1	P_2	P_3	P_4	P_5	P_6	P_7	P_8	P_9	P_{10}	*F*-test (*p*-value)
$INF_{q+1,q+1}$	Coeff	−0.30	−0.13	−0.08	0.03	−0.02	−0.02	0.04	0.03	0.08	0.15	0.00
	t-stat	(−8.00)	(−4.07)	(−2.65)	(0.87)	(−0.70)	(−0.67)	(1.49)	(1.16)	(2.69)	(3.30)	

Table 3: Regression of future earnings growth on proxies for inflation expectation
This table presents results from the regression of one- to four-quarter-ahead earnings growth (i.e., SUE_{iq+1} to $SUE_{i,q+4}$) on lagged proxies for expected inflation. The lagged proxies for expected inflation are annual inflation ending in month t, i.e., the month prior to announcement month for quarter q's earnings ($INF_{q-3,q}$), and expected annual inflation ($EINF_q$) obtained from the Michigan Survey of Consumers taken in month t. The expected inflation proxies are measured as of the month prior to the earnings-release month to ensure that these figures are publicly available prior to SUE_{iq}, which is used to sort firms into earnings growth deciles. The portfolio PMN is formed by being long on the highest earnings growth portfolio (P_{10}) and shorting stocks in the lowest earnings growth portfolio (P_1). The regression is estimated for the PMN portfolio using quarterly observations of the firms constituting the portfolio. The regressions include four lags of earnings growth to control for the predictability shown in Abarbanell and Bernard (1992). In each quarter, the extreme 1% of $SUE_{i,q+j}$ ($j = -3$ to $+4$) on either side is excluded. The sample period is July 1984 through September 2003.

Panel A: Proxy for expected inflation is $INF_{q-3,q}$

	$SUE_{PMN,q+1}$		$SUE_{PMN,q+2}$		$SUE_{PMN,q+3}$		$SUE_{PMN,q+4}$	
Intercept	0.70	0.53	0.39	0.27	0.20	0.08	0.01	−0.10
	(19.92)	(9.46)	(11.32)	(4.91)	(5.76)	(1.56)	(0.14)	(−1.73)
$INF_{q-3,q}$		0.06		0.04		0.04		0.03
		(4.07)		(2.99)		(2.72)		(2.34)
SUE_{iq}	0.03	0.03	0.04	0.04	0.05	0.05	−0.20	−0.19
	(2.58)	(2.75)	(3.62)	(3.75)	(4.60)	(4.74)	(−17.52)	(−17.33)
SUE_{iq-1}	0.18	0.18	0.13	0.13	-0.13	-0.13	0.07	0.07
	(17.04)	(16.96)	(12.68)	(12.63)	(-12.61)	(-12.65)	(6.56)	(6.53)
SUE_{iq-2}	0.06	0.06	−0.21	−0.21	0.00	0.00	−0.01	−0.01
	(5.05)	(5.05)	(−17.97)	(−18.01)	(−0.31)	(−0.34)	(−0.47)	(−0.48)
SUE_{iq-3}	−0.21	−0.21	0.01	0.01	−0.01	−0.01	−0.05	−0.05
	(−17.45)	(−17.46)	(0.45)	(0.46)	(−0.79)	(−0.78)	(−3.72)	(−3.72)
Adj R^2 (%)	4.34	4.46	3.27	3.33	1.87	1.92	3.14	3.18
No. of obs.	12764	12764	12234	12234	11776	11776	11271	11271

Panel B: Proxy for expected inflation is $EINF_q$

	$SUE_{PMN,q+1}$		$SUE_{PMN,q+2}$		$SUE_{PMN,q+3}$		$SUE_{PMN,q+4}$	
Intercept	0.70	0.44	0.39	0.14	0.20	−0.04	0.01	−0.28
	(19.92)	(4.79)	(11.32)	(1.57)	(5.76)	(−0.50)	(0.14)	(−2.84)
$EINF_q$		0.09		0.08		0.08		0.09
		(3.09)		(3.00)		(2.94)		(3.14)
SUE_{iq}	0.03	0.03	0.04	0.04	0.05	0.05	−0.20	−0.19
	(2.58)	(2.73)	(3.62)	(3.78)	(4.60)	(4.78)	(−17.52)	(−17.25)
SUE_{iq-1}	0.18	0.18	0.13	0.13	−0.13	−0.13	0.07	0.07
	(17.04)	(16.99)	(12.68)	(12.67)	(−12.61)	(−12.63)	(6.56)	(6.56)
SUE_{iq-2}	0.06	0.06	−0.21	−0.21	0.00	0.00	−0.01	−0.01
	(5.05)	(5.07)	(−17.97)	(−17.98)	(−0.31)	(−0.32)	(−0.47)	(−0.46)
SUE_{iq-3}	−0.21	−0.21	0.01	0.01	−0.01	−0.01	−0.05	−0.05
	(−17.45)	(−17.46)	(0.45)	(0.44)	(−0.79)	(−0.78)	(−3.72)	(−3.74)
Adj R^2 (%)	4.34	4.41	3.27	3.33	1.87	1.93	3.14	3.22
No. of obs.	12764	12764	12234	12234	11776	11776	11271	11271

Table 4: Regression of future forecast errors on proxies for inflation expectation

This table presents results from the regression of one- to four-quarter-ahead forecast errors (i.e., $FERR_{iq+1}$ to $FERR_{i,q+4}$) on lagged proxies for expected inflation. Forecast errors are expressed as a percentage of the stock price at the end of the earnings growth portfolio formation month. The regression is estimated for the PMN portfolio using quarterly observations of the firms constituting the portfolio. The earnings growth portfolios are formed by sorting stocks on SUE_{iq}, which is computed from the most recently announced quarterly earnings. The lagged proxies for expected inflation are annual inflation ending in month t, i.e., the month prior to announcement month for quarter q's earnings (INF_q), and expected annual inflation ($EINF_q$) obtained from the Michigan Survey of Consumers taken in month t. The expected inflation proxies are measured as of the month prior to the earnings-release month to ensure that these figures are publicly available prior to SUE_{iq}, which is used to sort firms into earnings growth deciles. The portfolio PMN is formed by being long on the highest earnings growth portfolio (P_{10}) and shorting stocks in the lowest earnings growth portfolio (P_1). The regressions include four lags of earnings growth to control for the predictability shown in Abarbanell and Bernard (1992). In each earnings growth portfolio, the extreme 1% on either side of forecast errors and of lagged earnings growth are excluded. The sample period is July 1984 through September 2003.

Panel A: Proxy for expected inflation is $INF_{q-3,q}$

	$FERR_{PMN,q+1}$		$FERR_{PMN,q+2}$		$FERR_{PMN,q+3}$		$FERR_{PMN,q+4}$	
Intercept	−0.01	−0.18	−0.05	−0.17	−0.01	−0.09	−0.03	−0.05
	(−0.51)	(−5.84)	(−2.55)	(−6.10)	(−0.86)	(−3.42)	(−2.00)	(−1.84)
$INF_{q-3,q}$		0.06		0.04		0.02		0.00
		(7.12)		(5.80)		(3.73)		(0.75)
SUE_{iq}	0.02	0.02	0.03	0.03	0.02	0.02	0.01	0.01
	(3.73)	(4.03)	(5.60)	(5.85)	(3.20)	(3.40)	(2.30)	(2.34)
SUE_{iq-1}	0.02	0.02	0.01	0.01	0.00	0.00	0.01	0.01
	(2.70)	(2.56)	(2.25)	(2.15)	(0.80)	(0.75)	(2.98)	(2.97)
SUE_{iq-2}	0.02	0.02	0.00	0.00	−0.01	−0.01	0.00	0.00
	(3.23)	(3.23)	(0.34)	(0.27)	(−1.06)	(−1.10)	(0.09)	(0.09)
SUE_{iq-3}	0.00	0.00	−0.01	−0.01	−0.01	−0.01	0.00	0.00
	(−0.61)	(−0.60)	(−1.75)	(−1.72)	(−1.04)	(−1.03)	(0.13)	(0.13)
Adj R^2 (%)	0.29	0.68	0.28	0.54	0.08	0.19	0.10	0.10
No. of obs.	12764	12764	12234	12234	11776	11776	11271	11271

Panel B: Proxy for expected inflation is $EINF_q$

	$FERR_{PMN,q+1}$		$FERR_{PMN,q+2}$		$FERR_{PMN,q+3}$		$FERR_{PMN,q+4}$	
Intercept	−0.01	−0.31	−0.05	−0.29	−0.01	−0.12	−0.03	−0.07
	(−0.51)	(−6.12)	(−2.55)	(−6.12)	(−0.86)	(−2.86)	(−2.00)	(−1.67)
$EINF_q$		0.10		0.08		0.03		0.01
		(6.41)		(5.57)		(2.74)		(0.97)
SUE_{iq}	0.02	0.02	0.03	0.03	0.02	0.02	0.01	0.01
	(3.73)	(4.04)	(5.60)	(5.91)	(3.20)	(3.37)	(2.30)	(2.36)
SUE_{iq-1}	0.02	0.02	0.01	0.01	0.00	0.00	0.01	0.01
	(2.70)	(2.60)	(2.25)	(2.23)	(0.80)	(0.79)	(2.98)	(2.98)
SUE_{iq-2}	0.02	0.02	0.00	0.00	−0.01	−0.01	0.00	0.00
	(3.23)	(3.28)	(0.34)	(0.34)	(−1.06)	(−1.06)	(0.09)	(0.10)
SUE_{iq-3}	0.00	0.00	−0.01	−0.01	−0.01	−0.01	0.00	0.00
	(−0.61)	(−0.61)	(−1.75)	(−1.76)	(−1.04)	(−1.03)	(0.13)	(0.12)
Adj R^2 (%)	0.29	0.60	0.28	0.52	0.08	0.14	0.10	0.10
No. of obs.	12764	12764	12234	12234	11776	11776	11271	11271

Table 5: Regression of future earnings growth and forecast errors on proxies for inflation expectation and proxies for expectations of real output growth

This table presents results from the regression of one- and two-quarter-ahead earnings growth (i.e., SUE_{iq+1} to $SUE_{i,q+4}$) or forecast errors (i.e., $FERR_{iq+1}$ to $FERR_{i,q+4}$) on lagged proxies for expected inflation and expected real output growth. Forecast errors are expressed as a percentage of the stock price at the end of the earnings growth portfolio formation month. The lagged proxies for expected inflation are annual inflation ending in month *t*, i.e., the month prior to announcement month for quarter *q*'s earnings ($INF_{q-3,q}$), and expected annual inflation ($EINF_q$) obtained from the Michigan Survey of Consumers taken in month *t*. The expected inflation proxies are measured as of the month prior to the earnings-release month to ensure that these figures are publicly available prior to SUE_{iq}, which is used to sort firms into earnings growth deciles. The proxies for expected real output growth are either the industrial production growth ($IPG_{q-3,q}$) over the prior four quarters or the real interest rate ($REALINT_q$) in month *t*, measured as the yield on the 12-month T-bill minus the proxy for expected inflation. The portfolio PMN is formed by being long on the highest earnings growth portfolio (P_{10}) and shorting stocks in the lowest earnings growth portfolio (P_1). The regression is estimated for the PMN portfolio using quarterly observations of the firms constituting the portfolio. The regressions include four lags of earnings growth to control for the predictability shown in Abarbanell and Bernard (1992). In each quarter, the extreme 1% of $SUE_{i,q+j}$ ($j = -3$ to $+4$) on either side is excluded. The sample period is July 1984 through September 2003.

Panel A: Proxy for expected inflation is $INF_{q-3,q}$

	$SUE_{PMN,q+1}$		$SUE_{PMN,q+2}$		$FERR_{PMN,q+1}$		$FERR_{PMN,q+2}$	
Intercept	0.49	0.52	0.26	0.24	−0.20	−0.17	−0.19	−0.19
	(8.05)	(8.45)	(4.37)	(4.01)	(−5.97)	(−5.08)	(−6.14)	(−6.01)
$INF_{q-3,q}$	0.06	0.06	0.04	0.04	0.06	0.06	0.04	0.04
	(4.04)	(4.06)	(2.98)	(3.16)	(7.08)	(6.84)	(5.73)	(5.90)
$REALINT_q$	0.01		0.00		0.01		0.01	
	(1.38)		(0.11)		(1.58)		(1.49)	
$IPG_{q-3,q}$		0.00		0.01		0.00		0.00
		(0.40)		(1.24)		(−0.55)		(1.04)
SUE_{iq}	0.03	0.03	0.04	0.04	0.02	0.02	0.03	0.03
	(2.75)	(2.76)	(3.75)	(3.80)	(4.03)	(4.01)	(5.88)	(5.89)
SUE_{iq-1}	0.18	0.18	0.13	0.13	0.02	0.02	0.01	0.01
	(16.94)	(16.96)	(12.63)	(12.62)	(2.54)	(2.56)	(2.14)	(2.15)
SUE_{iq-2}	0.06	0.06	−0.21	−0.21	0.02	0.02	0.00	0.00
	(5.05)	(5.05)	(−18.00)	(−18.00)	(3.24)	(3.23)	(0.29)	(0.28)
SUE_{iq-3}	−0.21	−0.21	0.01	0.01	0.00	0.00	−0.01	−0.01
	(−17.46)	(−17.46)	(0.46)	(0.45)	(−0.60)	(−0.59)	(−1.74)	(−1.73)
Adj R^2 (%)	4.47	4.46	3.33	3.32	0.69	0.67	0.55	0.57
No. of obs.	12764	12764	12234	12234	12764	12764	12234	12234

TABLE 5 (contd)

Panel B: Proxy for expected inflation is $EINF_q$

	$SUE_{PMN,q+1}$		$SUE_{PMN,q+2}$		$FERR_{PMN,q+1}$		$FERR_{PMN,q+2}$	
Intercept	0.46	0.45	0.14	0.14	−0.30	−0.30	−0.28	−0.29
	(4.99)	(4.82)	(1.57)	(1.48)	(−5.87)	(−5.74)	(−5.93)	(−6.03)
$EINF_q$	0.08	0.09	0.08	0.08	0.09	0.10	0.07	0.08
	(2.15)	(3.10)	(2.72)	(2.98)	(5.10)	(6.47)	(4.41)	(5.57)
$REALINT_q$	0.02		0.00		0.01		0.01	
	(2.06)		(0.03)		(1.33)		(1.59)	
$IPG_{q-3,q}$		−0.00		0.00		−0.01		−0.00
		(−0.56)		(0.56)		(−1.73)		(−0.25)
SUE_{iq}	0.03	0.03	0.04	0.04	0.02	0.02	0.03	0.03
	(2.72)	(2.72)	(3.78)	(3.80)	(4.03)	(4.01)	(5.92)	(5.89)
SUE_{iq-1}	0.18	0.18	0.13	0.13	0.02	0.02	0.01	0.01
	(16.95)	(16.98)	(12.66)	(12.67)	(2.56)	(2.58)	(2.20)	(2.23)
SUE_{iq-2}	0.06	0.06	−0.21	−0.21	0.02	0.02	0.00	0.00
	(5.07)	(5.07)	(−17.98)	(−17.97)	(3.28)	(3.27)	(0.34)	(0.33)
SUE_{iq-3}	−0.21	−0.21	0.01	0.01	0.00	0.00	−0.01	−0.01
	(−17.46)	(−17.45)	(0.44)	(0.44)	(−0.61)	(−0.58)	(−1.77)	(−1.76)
Adj R^2 (%)	4.58	4.48	3.33	3.31	0.67	0.67	0.52	0.53
No. of obs.	12764	12764	12234	12234	12764	12764	12234	12234

Table 6: Regression of future earnings growth and forecast errors on proxies for inflation expectation in sub-periods

This table presents results from the sub-period regressions of one- and two-quarter-ahead earnings growth (i.e., SUE_{iq+1} to $SUE_{i,q+2}$) or forecast errors (i.e., $FERR_{iq+1}$ to $FERR_{i,q+2}$) on lagged proxies for expected inflation and expected real output growth. Forecast errors are expressed as a percentage of the stock price at the end of the earnings growth portfolio formation month. The lagged proxies for expected inflation are annual inflation ending in month t, i.e., the month prior to announcement month for quarter q's earnings ($INF_{q-3,q}$), and expected annual inflation ($EINF_q$) obtained from the Michigan Survey of Consumers taken in month t. The expected inflation proxies are measured as of the month prior to the earnings-release month to ensure that these figures are publicly available prior to SUE_{iq}, which is used to sort firms into earnings growth deciles. The proxies for expected real output growth are either the industrial production growth ($IPG_{q-3,q}$) over the prior four quarters or the real interest rate ($REALINT_q$) in month t, measured as the yield on the 12-month T-bill minus the proxy for expected inflation. The portfolio PMN is formed by being long on the highest earnings growth portfolio (P_{10}) and shorting stocks in the lowest earnings growth portfolio (P_1). The regression is estimated for the PMN portfolio using quarterly observations of the firms constituting the portfolio. The regressions include four lags of earnings growth to control for the predictability shown in Abarbanell and Bernard (1992). In each quarter, the extreme 1% of $SUE_{i,q+j}$ (j = −3 to +4) on either side is excluded. The sample period is July 1984 through September 2003.

Panel A: Proxy for expected inflation is $INF_{q-3,q}$

	Period: Jul 1984 to Jan 1994				Period: Feb 1994 to Sep 2003			
	$SUE_{PMN,q+1}$	$SUE_{PMN,q+2}$	$FERR_{PMN,q+1}$	$FERR_{PMN,q+2}$	$SUE_{PMN,q+1}$	$SUE_{PMN,q+2}$	$FERR_{PMN,q+1}$	$FERR_{PMN,q+2}$
Intercept	0.60	0.24	−0.34	−0.37	0.35	0.19	0.00	0.05
	(5.80)	(2.19)	(−3.86)	(−4.60)	(3.89)	(2.31)	(−0.15)	(2.03)
$INF_{q-3,q}$	0.04	0.05	0.05	0.04	0.12	0.07	0.02	0.01
	(1.98)	(2.01)	(3.33)	(2.50)	(4.08)	(2.55)	(2.47)	(1.48)
SUE_{iq}	0.02	0.05	0.06	0.10	0.04	0.04	0.00	−0.01
	(1.05)	(2.61)	(4.46)	(7.85)	(2.95)	(2.84)	(−1.18)	(−3.71)
SUE_{iq-1}	0.18	0.11	0.04	0.02	0.18	0.15	0.00	0.01
	(10.24)	(6.06)	(2.53)	(1.66)	(13.39)	(11.23)	(0.38)	(1.51)
SUE_{iq-2}	0.06	−0.22	0.05	0.01	0.06	−0.21	0.00	0.00
	(3.11)	(−11.36)	(3.44)	(0.47)	(3.76)	(−13.81)	(0.36)	(−0.75)
SUE_{iq-3}	−0.20	−0.01	−0.03	−0.02	−0.21	0.01	0.01	0.00
	(−10.38)	(−0.45)	(−1.67)	(−1.54)	(−13.66)	(0.67)	(1.96)	(−1.03)
Adj R^2 (%)	4.27	3.53	1.07	1.47	4.49	3.38	0.12	0.17
No. of obs.	4860	4758	4860	4758	7904	7476	7904	7476

TABLE 6 (contd)

Panel B: Proxy for expected inflation is $EINF_q$

	Period: Jul 1984 to Jan 1994				Period: Feb 1994 to Sep 2003			
	$SUE_{PMN,q+1}$	$SUE_{PMN,q+2}$	$FERR_{PMN,q+1}$	$FERR_{PMN,q+2}$	$SUE_{PMN,q+1}$	$SUE_{PMN,q+2}$	$FERR_{PMN,q+1}$	$FERR_{PMN,q+2}$
Intercept	0.52	0.20	−0.50	−0.45	0.34	−0.03	0.00	−0.03
	(3.41)	(1.22)	(−3.82)	(−3.71)	(2.26)	(−0.21)	(0.07)	(−0.64)
$INF_{q-3,q}$	0.07	0.07	0.08	0.07	0.11	0.14	0.04	0.03
	(2.19)	(1.98)	(3.33)	(2.20)	(2.19)	(2.99)	(2.64)	(2.19)
SUE_{iq}	0.02	0.05	0.06	0.10	0.04	0.04	−0.01	−0.01
	(1.06)	(2.62)	(4.49)	(7.87)	(2.87)	(2.90)	(−1.24)	(−3.62)
SUE_{iq-1}	0.18	0.11	0.04	0.02	0.18	0.15	0.00	0.01
	(10.23)	(6.08)	(2.51)	(1.68)	(13.41)	(11.28)	(0.40)	(1.54)
SUE_{iq-2}	0.06	−0.22	0.06	0.01	0.06	−0.20	0.00	0.00
	(3.13)	(−11.34)	(3.47)	(0.50)	(3.74)	(−13.77)	(0.35)	(−0.73)
SUE_{iq-3}	−0.20	−0.01	−0.03	−0.02	−0.21	0.01	0.01	0.00
	(−10.36)	(−0.45)	(−1.64)	(−1.54)	(−13.65)	(0.63)	(1.95)	(−1.06)
Adj R^2 (%)	4.26	3.49	1.07	1.44	4.35	3.41	0.06	0.23
No. of obs.	4860	4758	4860	4758	7904	7476	7904	7476

Table 7: Portfolio-level regression of future earnings growth and future forecast errors on expected inflation

The table presents the coefficient estimates and associated *t*-statistics from regressing the one- to four-quarter-ahead earnings growth of PMN portfolio (i.e., $SUE_{PMN,q+1}$ to $SUE_{PMN,q+1}$) or forecast errors of PMN (i.e., $FERR_{PMN,q+1}$ to $FERR_{PMN,q+4}$) on expected inflation. In each month *t*, sample firms are sorted into deciles based on their earnings growth in quarter *q*, which is defined as $SUE_{i,q} = (E_{iq} - E_{iq-4})/\sigma_{iq}$, where E_{iq} is the most recently announced earnings, E_{iq-4} represents the earnings from four quarters ago, and σ_{iq} is the standard deviation of $(E_{iq} - E_{ia-4})$ over the prior eight quarters. Forecast error for individual stocks is expressed as a percentage of the stock price at the end of month *t*. Portfolio earnings growth is computed by averaging SUE_{iq} across all firms constituting the portfolio, after excluding the extreme 1% of earnings growth on either side. Earnings growth of portfolio PMN (i.e., SUE_{PMN}) is then computed as the difference in earnings growth of portfolios P_{10} and P_1. Forecast errors for PMN ($FERR_{PMN}$) are similarly computed. The proxies for expected inflation are annual inflation ending in month $t - 1$ (INF_q), and expected annual inflation ($EINF_q$) obtained from the Michigan Survey of Consumers taken in month $t - 1$ or yield on 3-month T-bill (YLD_q) measured at end of month $t - 1$. The expected inflation proxies are measured as of the month prior to the earnings-release month to ensure that these figures are publicly available prior to SUE_{iq}, which is used to sort firms into earnings growth deciles. The *t*-statistics are based on Newey–West standard errors to correct for overlap in SUE_{PMN}. The sample covers the 231 months from July 1984 through September 2003.

Panel A: Dependent variable is one- to four-quarter-ahead SUE_{PMN}

Dep var:	$SUE_{PMN,q+1}$				$SUE_{PMN,q+2}$				$SUE_{PMN,q+3}$				$SUE_{PMN,q+4}$			
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI
INTERCEPT	1.49	1.44	1.18	1.16	0.76	1.34	0.56	1.20	0.32	1.40	0.19	1.31	−1.22	−0.46	−1.64	−0.81
	(12.56)	(3.61)	(5.14)	(2.88)	(7.11)	(3.63)	(3.06)	(3.02)	(3.14)	(2.94)	(1.48)	(2.45)	(−13.01)	(−0.73)	(−10.40)	(−1.20)
INF_q	0.13	0.09			0.09	0.08			0.04	0.04			0.08	0.03		
	(3.70)	(3.00)			(2.91)	(2.03)			(1.61)	(1.27)			(2.89)	(1.20)		
$EINF_q$			0.24	0.17			0.16	0.13			0.09	0.06			0.22	0.12
			(3.14)	(2.74)			(2.78)	(2.15)			(2.21)	(1.20)			(4.37)	(2.75)
SUE_{iq}		−0.14		−0.13		−0.17		−0.17		−0.13		−0.13		−0.23		−0.22
		(−2.40)		(−2.41)		(−2.72)		(−2.76)		(−2.30)		(−2.23)		(−3.34)		(−3.06)
SUE_{iq-1}		0.64		0.66		0.26		0.27		−0.24		−0.23		0.27		0.27
		(5.09)		(5.22)		(2.43)		(2.60)		(−1.86)		(−1.71)		(2.21)		(2.19)
SUE_{iq-2}		−0.33		−0.32		−0.07		−0.06		0.06		0.06		0.22		0.21
		(−1.79)		(−1.76)		(−0.39)		(−0.34)		(0.32)		(0.35)		(1.19)		(1.18)
SUE_{iq-3}		0.20		0.20		0.18		0.18		0.08		0.09		0.02		0.03
		(1.41)		(1.51)		(1.54)		(1.55)		(0.50)		(0.52)		(0.15)		(0.24)
Adj R^2 (%)	9.47	26.75	7.57	25.81	5.74	15.17	4.04	14.05	1.03	6.05	0.91	5.64	3.78	20.33	6.79	21.65

Table 7 (contd.)

Panel B: Dependent variable is one- to four-quarter-ahead $FERR_{PMN}$

Dep var:	$FERR_{PMN,q+1}$				$FERR_{PMN,q+2}$				$FERR_{PMN,q+3}$				$FERR_{PMN,q+4}$			
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI
INTERCEPT	−0.12	−0.32	−0.31	−0.57	−0.15	−0.15	−0.34	−0.41	−0.01	0.18	−0.07	0.16	−0.04	0.14	−0.03	0.14
	(−1.76)	(−1.29)	(−1.97)	(−2.09)	(−2.99)	(−0.60)	(−3.05)	(−1.24)	(−0.22)	(0.54)	(−0.75)	(0.42)	(−0.61)	(0.54)	(−0.25)	(0.44)
INF_q	0.09	0.10			0.08	0.09			0.03	0.02			0.02	0.03		
	(3.45)	(3.72)			(4.20)	(4.18)			(1.59)	(1.11)			(1.19)	(1.17)		
$EINF_q$			0.15	0.17			0.15	0.15			0.05	0.03			0.02	0.03
			(2.76)	(3.20)			(3.71)	(3.69)			(1.39)	(0.70)			(0.55)	(0.56)
SUE_{iq}		0.04		0.04		0.01		0.02		−0.02		−0.02		−0.01		−0.01
		(1.46)		(1.34)		(0.51)		(0.56)		(−0.46)		(−0.48)		(−0.16)		(−0.24)
SUE_{iq-1}		0.06		0.09		−0.06		−0.04		−0.05		−0.04		0.00		0.01
		(0.98)		(1.30)		(−1.09)		(−0.65)		(−0.73)		(−0.60)		(0.00)		(0.15)
SUE_{iq-2}		−0.16		−0.14		0.05		0.06		0.17		0.18		−0.19		−0.18
		(−1.50)		(−1.11)		(0.59)		(0.70)		(1.11)		(1.15)		(−0.92)		(−0.88)
SUE_{iq-3}		−0.07		−0.06		−0.06		−0.05		−0.32		−0.32		0.07		0.08
		(−0.71)		(−0.70)		(−0.93)		(−0.75)		(−1.18)		(−1.18)		(0.57)		(0.57)
Adj R^2 (%)	14.97	18.01	10.13	12.67	17.07	16.72	12.61	11.87	0.63	7.31	0.33	6.89	0.18	0.03	−0.33	−0.64