Earnings Momentum Strategies and the Macroeconomy*

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Abstract

This paper documents that earnings momentum strategies are systematically related to the macroeconomy. The returns to these strategies are predictable by standard macroeconomic and aggregate financial market variables. What's more, a significant fraction of the variation in the profits to these strategies appears to be *negatively* associated with news about macroeconomic aggregates such as industrial production growth and consumption growth. Existing explanations for the earnings momentum phenomenon, whether rational *or* behavioral, have difficulty explaining all of these facts.

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1 Introduction

In recent years, there has been much discussion in the literature of puzzling patterns in the cross-section of equity returns. These patterns include the size and book-to-market effects,[1] the price momentum effect[2] and the post-earnings announcement drift or earnings momentum effect[3]. Earnings momentum is among the most puzzling of these phenomena. While price momentum refers to the tendency of stocks with high recent realized returns to outperform stocks with low recent realized returns, earnings momentum refers to the tendency of stocks with high recent earnings growth to outperform stocks with low recent earnings growth[4]. Hereafter, I refer to a portfolio long in stocks with high recent earnings growth and short in stocks with low recent earnings growth as an earnings momentum portfolio. As with price momentum, the average return to an earnings momentum portfolio is typically large, positive, and persists after adjusting for risk with the CAPM and the Fama-French (FF) three factor model.

[1] See, among others, Banz (1981), Fama and French (1992, 1993, 1996).

[2] See, for instance, Jegadeesh and Titman (1993), Rouwenhorst (1998), Lewellen (1999) and Chordia and Shivakumar (2000).

[3] See Ball and Brown (1968), Bernard and Thomas (1990), Foster, Ohlsen and Shevlin (1983), Chan, Jegadeesh and Lakonishok (1995).

[4] What I describe as price momentum strategies are typically known in the literature simply as momentum strategies. I use the terms price momentum and earnings momentum to distinguish between the two methods of selecting long/(short) positions. This terminology is consistent with that used in Chan, Jegadeesh and Lakonishok (1995).

Of all of the anomalies, price and earnings momentum pose perhaps the most serious challenge to the Efficient Markets Hypothesis. This is because it is hard to understand how, for instance, earnings momentum of the magnitude observed in the data could obtain in a rational world. That is, even if we accept, for instance, that the CAPM is an imperfect description of the risk-return relationship, why would we expect that earnings growth would be so highly and positively correlated with levels and/or changes of the factor loadings on some missing systematic risk factor as to justify the large profits to earnings momentum strategies? Furthermore, it is not clear what the additional source of systematic risk could be to justify such large earnings momentum profits. What's more, in light of the results in MacKinlay (1995), it is not clear that *any* missing fundamental risk factor could explain the large deviations from the CAPM that we observe with the price and earnings momentum anomalies. These kinds of observations have led some to claim that the evidence is so contrary to our intuition about the risk-return relationship in a rational expectations economy that behavioral explanations are necessary to explain the data.

This paper examines how earnings momentum relates to the macroeconomy. This evidence is important to our understanding of the earnings momentum anomaly. As Cochrane (2000) points out in the context of the size and book-to-market anomalies:

> "[W]e would like to understand the real, macroeconomic, systematic, non-diversifiable risk that is proxied by the returns to the HML and the SMB. Why are investors so concerned about holding stocks that do badly at the times that the HML and SMB portfolios do badly, even though the market does not fall?"

The same question can be asked of earnings momentum. A better understanding of the relationships, if any, between the macroeconomy and an anomaly as large and puzzling as earnings momentum is clearly important to understanding the nature of equilibrium in the capital markets.

To date, there has been little investigation into the relationship between earnings momentum and the macroeconomy[5]. Bernard and Thomas (1990) briefly consider the matter by regressing returns from a portfolio similar to an earnings momentum portfolio on the Chen, Roll and Ross (1986) factors. They conclude that there is no evidence of a relation between earnings momentum and the macroeconomy. The results documented here suggest

[5] I have recently become aware of contemporaneous work, Chordia and Shivakumar (2001), that examines similar issues.

otherwise. What's more, the two lines of evidence presented here represent a challenge for both rational and behavioral models.

First, the evidence contained herein suggests that, like aggregate market returns, earnings momentum returns are forecastable based on aggregate financial market and macroeconomic variables, such as interest rates and the default premium. I reject that the predictable variation in earnings momentum returns can be explained by a conditional CAPM with time varying factor loadings. This particular class of rational models therefore has difficulty explaining the predictability. As I argue below, the behavioral stories currently favored in the literature also have difficulty explaining this predictability.

Second, I find that earnings momentum returns are *negatively* related to measures of real activity, such as industrial production, even after accounting for the returns to the value-weighted index and the FF factors. Moreover, the association is substantial. Results in this paper suggest that up to forty percent of the variation in earnings momentum returns is related to aggregate financial variables and measures of real activity. As I discuss at length below, this finding is puzzling from the perspective of both rational models *and* behavioral stories.

This paper is part of an emerging literature documenting connections between the macroeconomy and the anomalies. With respect to the book-to-market and size anomalies, Ferson and Harvey (1999) and Cooper, Gulen and Vassalou (2001) present evidence that aggregate financial instruments commonly used for predicting market returns also predict returns to the Fama and French (FF) SMB and HML portfolios. Liew and Vassalou (1999) present evidence that the SMB and HML portfolios predict macroeconomic aggregates such as GDP. With respect to price momentum, Chordia and Shivakumar (2000) show that price momentum returns are predictable by standard financial market instruments.

It is worth noting however that these papers have, by and large, documented connections between the size, book-to-market and price momentum anomalies and the macroeconomy that are broadly consistent with intuition about rational asset pricing models. This paper, on the other hand, documents connections between earnings momentum and the macroeconomy that appear anomalous with respect to rational models as well as connections that are anomalous with respect to some popular behavioral models.

The remainder of the paper is organized as follows. In the next section, I describe the data and portfolio formation methods. Next, I describe the evidence that earnings momentum profits are predictable based on aggregate financial market variables. Following this, I present evidence that earnings momentum returns predict macroeconomic variables, and that the relation between these returns and the macroeconomic variables is negative. Having done so, I examine how much of the earnings momentum portfolios' return variation is related to macroeconomic aggregates. In the final section, I conclude.

2 Data and Portfolio Formation

The stock return data come from the Center for Research in Security Prices (CRSP). Earnings data come from quarterly Compustat. I form two types of earnings momentum strategies. First, I form portfolios based on standardized, seasonal earnings growth, otherwise known in the post-earnings announcement drift literature as standardized unexpected earnings, or SUE's. The SUE is computed as the seasonal earnings growth in quarter t, divided by the time series standard deviation of seasonal earnings growth, estimated over the previous eight quarters. Firms cannot enter the sample without at least eight quarters of data. Hereafter, I will refer to the earnings momentum strategy based on SUE's as the ES portfolio. Second, I form portfolios based on announcement day returns. I refer to the strategy based on announcement day returns as the EA portfolio. These measures of earnings momentum are chosen to be consistent with the methods used in Chan, Jegadeesh and Lakonishok (1995).

I then form portfolios of "winners"/("losers") from the highest/(lowest) decile of SUE or announcement day return using the method developed by Jegadeesh and Titman (1993)[6]. Specifically, at the beginning of each month t, I divide all stocks who released earnings in months $t-1$ to $t-3$ into deciles based on their SUE's or their announcement day returns. Based on these rankings, I form portfolios of winners and losers. These portfolios are known as sub-portfolios and are indexed by the month t. I then form an equal-weighted compound portfolio consisting of several of the sub-portfolios as follows. At month $t+1$, I hold the k sub-portfolios from month $t-k$ to $t-1$. The month lag between the latest ranking period and the holding period is traditional in the price momentum literature. I employ the lag here to account for any potential problems with earnings announcement dates in Compustat. Note that the average return to the compound portfolio is the

[6]This method of forming portfolios is standard in the price momentum literature. See for instance, Moskowitz and Grinblat (1999), Chordia and Shivakumar (2000) and Rouwenhorst (1998). It is closely related to methods for conducting calendar-time event studies. See early discussions of this method of performing calendar-time event studies in Jaffee (1973) and Mandelker (1974). A more recent discussion can be found in Fama (1998).

average return to stocks in the k months after the ranking period. In this study, I set $k = 6$. This selection was not based on an examination of the data.

Having formed a "winners" and a "losers" portfolio in this manner, I form a zero investment portfolio that is \$1 long in the winners portfolio and \$1 short in the losers portfolio. The return to this zero-investment portfolio is the profit per dollar long of investing \$1 in the earnings momentum strategy under consideration. I also form a price momentum portfolio, WML, using a similar routine, except stocks are ranked on their returns over the past 6 months.

As a proxy for the market portfolio, I use the value-weighted CRSP index, provided by CRSP. The FF factors come from Kenneth French's website[7]. I use a selection of instruments for predicting returns. These are representative of those used in the return predictability literature. See, among many, many others, Ferson and Harvey (1991), Fama (1990), Fama and French (1989), Chordia and Shivakumar (2000), Ferson and Harvey (1999). The instruments include the term spread (TERM), the default spread (DEF), the 30-day treasury bill rate (TBILL), and the dividend yield to the value-

[7]I thank Kenneth French for kindly making these data available.

weighted CRSP index (DP). The term spread is the difference between the yield of a 10-year treasury bond and a 30-day treasury bill. The treasury bill data come from CRSP. The default spread is the difference between average yields of BBB and AAA bonds. These yield data come from Datastream[8]. The dividend yield to the value-weighted CRSP index is computed in the standard fashion as the sum of dividends paid over the previous 12 months divided by the current value of the index.

In addition, I make use of two macroeconomic aggregates, industrial production growth and consumption growth. The industrial production growth series is the difference in the natural logs of the seasonally adjusted monthly industrial production index. The consumption growth series is the difference in the natural logs of real, per-capita, seasonally adjusted, nondurable personal consumption. The consumption, industrial production and population series were provided by the St. Louis Federal Reserve.

For reference, panel A of Table 1 lists the average returns to the ES and EA portfolios. Panels B and C present monthly, quarterly and annual risk adjustments with the CAPM and the FF three factor model. Quarterly and annual risk adjustments are provided for comparability with work in

[8]I thank Gregory Bauer for providing me with these data.

the following sections. Quarterly and annual returns to the ES and EA portfolios are approximated as follows. The quarterly return at time t is formed by summing the monthly returns from time t to $t-2$. The annual return at time t is formed by summing the monthly returns from time t to $t-11$.

Panel A indicates that the ES portfolio returns around 60 basis points per dollar long, per month and the EA portfolio returns around 50 basis points per month, per dollar long. The reason that average returns to these portfolios are considered anomalous with respect to the CAPM is immediately apparent from the estimated alphas in panel B. Since both portfolios have essentially zero market beta, they have alphas as large as their raw returns. These large alphas are not attenuated by adding the FF factors to the regression. Indeed, as can be seen in panel C, the ES portfolio's monthly abnormal return rises to 80 basis points per month. This is consistent with the results in Chan, Jegadeesh and Lakonishok (1995) and is an intuitive result. It is difficult to see why the FF factors would help price either earnings momentum or price momentum since it seems reasonable to expect that both types of momentum portfolios would load negatively on the SMB and HML factors.

Since price and earnings momentum seem closely related, one might wonder, as an aside, if the earnings momentum effect could be removed by including a price momentum factor with the FF 3-factor model, similar to the Carhart (1997) model. The answer, according to panel A of Table 2, is no. For both the ES and EA portfolios, the alphas in the Carhart (1997) model are between 40 and 50 basis points per month, and are highly significant.

On the other hand, a 5-factor model including EA, ES and the FF factors does seem to "explain" the price momentum effect. The estimates in Table 2, panel B indicate that with respect to the 5-factor earnings momentum model, the WML's alpha is small and statistically insignificant. Panel B also shows that 4-factor models that include either EA or ES do not perform as well, although we cannot reject that the alpha in the ES 4-factor model is zero at conventional levels.

These results seem to indicate that the combination of ES and EA can "price-away" the price momentum effect, while the reverse is not true. Of course, this does not mean that the earnings momentum 5-factor pricing model should be taken seriously as a rational, empirical, asset pricing model since it's not clear what underlying risk factor the returns to the ES and EA factors represent. In fact, since the results below indicate that the ES and

EA are negatively related to future economic activity, it is hard to see how ES and EA could be functioning as fundamental risk factors. See further discussion below.

3 Predictability in Earnings Momentum Returns

This section considers whether the returns to earnings momentum portfolios are predictable. Table 3 presents the results from regressions of the ES and EA portfolios on lagged instruments. The instruments are selected to be consistent with the variables used in the return predictability literature. As discussed above, these 'usual suspects' are a January dummy, the default premium (DEF), the term premium (TERM), the dividend yield on the CRSP index (DP), and the 30-day T-bill rate (TBILL). Standard errors are from the Newey-West (1987) heteroskedasticity and autocorrelation consistent (HAC) covariance matrix.

The results indicate that the ES and EA portfolios are predictable. Notably, the default premium and short-rate appear to have power to forecast the returns to the EA and ES portfolios, at least in sample. Both regressions have adjusted R^2's of nearly 14%. Considering that the dependent variables are zero-investment portfolios with essentially zero loading on the value-weighted index, this is somewhat surprising. It should be noted that the adjusted R^2's remain around 2-3% in both regressions if the January dummy is not included in the regression; a respectable R^2 for a zero investment portfolio of equities.

Interestingly, the profits to the earnings momentum strategy are expected to be significantly worse in January. Note that some type of January effect is present with all of the major anomalies. Cooper, Gulen and Vassalou (2001) document that the SMB and HML perform significantly better in January, while Chordia and Shivakumar (2000) document that profits to price momentum strategies are significantly worse in January.

Given that the ES and EA portfolios appear to be predictable with aggregate financial market variables, the question arises as to whether an asset pricing model with time-varying moments might perform better in explaining the ES and EA returns than the static CAPM. For instance, it is conceivable that variation in the ES and EA betas (related to the instruments above) causes the portfolio to be extremely risky at times when the price of risk is quite high and to have very little risk at other times. This could explain, in principal at least, the anomalously large average return to the ES and EA portfolios relative to their unconditional betas.

To investigate this possibility, I estimate a conditional CAPM relationship. As above, I use the value-weighted index as a proxy for the market portfolio. To estimate the model, I use the method suggested by Shanken (1990). For parsimony, I model both the alphas and betas as linear functions of DEF, TBILL and the January dummy. That is, I specify:

$$\alpha_i = a_{0i} + a_{1i}Jandum + a_{2i}DEF + a_{3i}TBILL$$

$$\beta_i = b_{0i} + b_{1i}Jandum + b_{2i}DEF + b_{3i}TBILL$$

I then substitute these relationships into a standard market model regression equation and estimate the resulting model via OLS. The conditional CAPM, with the value-weighted index as a proxy for the market portfolio, implies that $a_{0i} = 0, a_{1i} = 0, a_{2i} = 0, a_{3i} = 0$. The results can be found in Table 4.

Interestingly, the two portfolios have different beta dynamics. The EA beta is significantly positively related to the default premium. The ES beta appears to be negatively related to the default premium, though based on the t-statistic of 1.6, the statistical evidence of the relationship is not especially strong. This implies that the EA portfolio becomes more risky, and the ES portfolio becomes (if anything) less risky, at times when the default premium is high. These are typically thought to be low points in the business cycle.

Despite the evidence of changing betas, the alpha equations for the two portfolios indicate that return predictability in the EA and ES portfolios is not fully captured by time-varying expected returns related to the market index. This amounts to a rejection of this specification for the conditional CAPM. The alphas of both the ES and EA portfolios vary with the January dummy, the default premium and the level of the short rate. Note, however, that the statistical evidence for predictability based on the default premium and the short rate is weaker for the ES portfolio.

What are we to make of these results? Many behavioral stories in the extant literature attempt to explain earnings momentum and its lack of market risk by asserting that agents underreact to information in earnings surprises. Under this story, as the market slowly realizes its mistake, a portfolio long in the winners and short in the losers yields a positive return without loading on the market factor. It is hard to imagine how this behavior could give rise to earnings momentum profits that vary with variables like the default premium and the short interest rate.

However, one simple behavioral story which could be consistent with the evidence above (though not necessarily with the evidence in the next section) is the following. If the spread between the earnings news of the winners and the earnings news of losers in the ranking period were to change with macroeconomic conditions, predictable patterns in the earnings momentum profits might be generated. Suppose for a moment that the agent's underreaction to earnings surprises is proportional to the magnitude of the earnings surprise. If the cross-sectional variation in earnings surprises were to systematically change with business conditions, then the total amount of reaction left to occur subsequent to the ranking period would change over time with business conditions. In this case, the earnings momentum returns might be predictable based on business cycle variables. If the cross-sectional variation was smaller late in the calendar year, for some reason, the January effect documented above might also be "explained". However, this story would not explain the evidence that the beta dynamics of the earnings momentum strategies are related to the default premium, and thus, presumably the business cycle.

Table 5 contains evidence bearing on this hypothesis. Panel A presents regressions of ES and EA on the same predictive variables discussed above. Included in both regressions are 3 lags of the variable IQR. $IQR(t)$ is the cross-sectional inter-quartile range of seasonal earnings growth in months t to $t-2$. IQR is intended to proxy for cross-sectional variation in earnings surprises during the ranking period. The lags included in the regressions span the period over which the stocks in the earnings momentum portfolio at time t were ranked. See discussion of the composition of the portfolios above.

If the above hypothesis were driving the predictability of the earnings momentum returns, we would expect that past values of IQR would predict the profits to the earnings momentum strategy. We would also expect that the other predictive variables, including the January dummy, would lose their predictive ability in the presence of IQR. Furthermore, we expect that the early lags would have the largest impact on the earnings momentum profits since the literature indicates that much of the delayed reaction comes in the first months after the announcement of earnings.

None of this actually happens. While the lags of IQR attenuate the magnitude of some of the coefficients and reduce the statistical significance of some of the predictive variables, only $IQR(t-7)$ is significant, and then only in the EA equation. More importantly, comparing the adjusted R^2's for the regressions in panel A with those in Table 3 indicates that the lags of IQR add little in the way of predictive power to the original regressions. This can also be seen in panel B of Table 5. The adjusted R^2's in regressions of ES and EA on lags of IQR alone are 0 or negative. Furthermore, in both panel A and panel B, the first lags have the wrong sign. Thus, there is little evidence for this simple behavioral explanation for the predictability of the earnings momentum portfolios.

Despite the fact that the above conditional CAPM specification is rejected, rational stories could be compatible with the predictability documented above. Clearly if the EA and ES portfolios were to load on some missing risk-factor with time-varying loadings and/or a time-varying price of risk, we might observe both the predictability of the ES and EA returns as well as the time variation in their CAPM alphas documented above. However, while rational time-varying risk premia might plausibly generate predictability, it is not clear what the missing factor is. Finally, it is not clear why, in a frictionless, rational world, expected returns to the earnings momentum strategies would be smaller in January. Thus, this evidence is puzzling from the point-of-view of a rational model, even aside from the conditional CAPM.

4 Earnings Momentum Strategies and Macroeconomic Aggregates

Evidence of an economically important relationship between earnings momentum and the real economy would constitute an important stylized fact about the earnings momentum anomaly. Such a relationship would be difficult for many of the behavioral stories, particularly those based on investor mis-reaction to firm-specific earnings shocks, to explain. On the other hand, any plausible, risk-based story would presumably imply a positive relationship between earnings momentum returns and macroeconomic variables such as production and consumption growth. Without such a positive relationship, it is difficult to see how the EA and ES portfolios could be considered a proxy for a source of fundamental risk[9]. As mentioned above, the extant literature contains little in the way of examination of the relationship between earnings momentum and the macroeconomy.

Following Fama (1990), I assess the relationship between earnings momentum and macroeconomic aggregates by regressing monthly, quarterly

[9]This is not to say that it is impossible for some rational story to accommodate a negative relation.

and annual growth rates of industrial production and consumption on lagged quarterly returns from the earnings momentum portfolios. The ES and EA quarterly returns are approximated by summing the month t to $t-2$ returns. The rationale for these regressions is that if future production and consumption growth affect future cash flows and expected returns to earnings momentum portfolios, then we expect that the current realized returns to the earnings momentum portfolios would forecast future industrial production and consumption growth. What's more, it seems reasonable that for EA and ES to be considered risky, their current realized returns should be *positively* associated with future macroeconomic variables.

To see why, note that under a standard (rational) business cycle story (see Fama and French (1989)), positive news about future economic activity should be associated with positive current realized returns to risky assets. There are two reasons for this. First, positive news about future economic activity should represent positive news about future cash flows and result in a positive realized return today. Second, because expected returns tend to be low when times are good and marginal utility is low, positive news about future economic activity should constitute negative news about future expected returns. Like positive cash flow news, negative news about future expected returns tends to result in a *positive* realized return today. This occurs because a drop in future expected returns raises prices today (for discussion see Campbell (1991)). Therefore, according to this rational story, if EA and ES are risky assets, positive news about future economic activity should be associated with positive realized returns on the EA and ES portfolios today.

Table 6 contains the regression estimates for industrial production growth. Table 7 contains the results for consumption growth. The estimates in panel A of Table 6 show that most of the coefficients on the ES and EA lags are large relative to their standard errors. It is interesting to note, however, most of the coefficients are *negative*. This is the opposite of what Fama (1990) found for the value-weighted index and what the above intuition suggests would be the case under a rational story. F-tests indicate that we can reject the null of no predictability based on ES and EA for each of the regressions. Furthermore, it appears from the adjusted R^2's in panel A that a substantial fraction of industrial production growth can be accounted for by the ES and EA portfolios alone. Four quarterly lags of the ES portfolio capture around 11% of the variation in monthly industrial production growth. This rises to 18% and 17% for the quarterly and annual industrial production growth rates. The EA portfolio captures somewhat less variation, only 4% at the monthly level. However, this rises to around 16% at the annual level. These $R^{2\prime}s$ seem surprisingly high for zero investment portfolios with essentially zero market betas.

Fama (1990) shows that the value-weighted index can predict industrial production. Furthermore, Liew and Vassalou (1999) demonstrate that the HML and SMB factors can predict GNP. One might reasonably ask whether the ES and EA portfolios can predict industrial production after accounting for these other factors. Panel B of Table 6 addresses this question. Panel B shows the results of regressing industrial production growth on lagged returns from ES, EA, value-weighted index, and the FF SMB and HML factors. The estimates indicate that ES and EA predict industrial production growth even after accounting for the value-weighted index, the SMB and HML factors. Most of the ES and EA coefficients are significantly negative and likelihood ratio tests reject the null that ES and EA add no predictive power to the regressions.

Table 7 presents regressions of consumption growth on lags of ES and EA. Here, ES and EA, both alone and in combination with the value-weighed index and the FF factors, explain very little of the variance of consumption growth. This is perhaps not surprising since a large literature has documented the apparent lack of a strong relationship between asset returns and consumption[10]. However, as in the industrial production regressions, the coefficients on lagged ES and EA returns are usually negative and some are significantly so.

The regressions in Table 8 shed light on the percentage of the ES and EA return variation that is associated with macroeconomic aggregates and financial variables. As above, quarterly ES and EA returns are approximated by summing the month t to $t-2$ returns. Annual returns are approximated by summing month t to $t-11$ returns. Lagged values of the predictive variables from the previous section are included to control for the level of expected returns. Contemporaneous and future values of industrial production growth and consumption growth are included to proxy for cash flow and expected return news related to the macroeconomy.

Panel A indicates that the macroeconomic variables explain a considerable fraction of the variance of the ES and EA returns, from around 15% in monthly data to around 40% in annual data. What's more, as discussed in Kothari and Shanken (1992), since quarterly consumption and industrial pro-

[10]For a review of this literature see Campbell (1998).

duction realizations measure news about these aggregates with error, these R^2's *understate* the true fraction of the explained variance. In addition, note that the relation between ES, EA and the macroeconomic aggregates is negative.

As mentioned above, the literature has noted that the value-weighted index, the HML and the SMB factors are positively related to the macroeconomy, consistent with the notion that they may be related to fundamental risk factors. Since these factors are not orthogonal to the EA and ES portfolios (see Table 1), some might argue that the results in Table 1, panel A could simply reflect the fact that EA/ES profits are correlated with the FF factors and the FF factors are correlated with the macroeconomy.

Panel B addresses this concern by including contemporaneous values of the market and FF factors in the regression. In each case, the FF factors are significant. However, comparison of the results in Panel B with the R^2's in Table 1 indicates that the macroeconomic variables are important even after the inclusion of the FF factors and the value-weighted index. The adjusted R^2's of the regressions in Panel B of Table 8 are higher, in each case, than the corresponding FF regressions in Table 1. This is particularly true of the quarterly and annual regressions. For instance, the regression of ES on the FF factors and the value-weighted index in Table 1 has an adjusted R^2 of 34%. The corresponding figure in Panel B of Table 8 is around 55%. Furthermore, F-tests reject the null that the macro-variables add no predictive power to the regressions after inclusion of the FF factors.

What do we make of this evidence? The results seem difficult to reconcile with both rational models and behavioral stories. Since ES and EA are zero investment portfolios with large, positive, average returns, a risk-based explanation requires that they have positive betas on some, presumably macroeconomic, risk factor. The problem is that while a large fraction of the ES and EA return variation is associated with news about macroeconomic aggregates, the negative relation between ES/EA and the macroeconomic variables indicates that the earnings momentum portfolios would tend to be a *hedge* against events involving production and consumption. In a risk-based world, this would imply that earnings momentum should have a negative average return, rather than a large positive average return.

This evidence is also inconsistent with many existing behavioral stories. The typical behavioral theories offered to explain momentum phenomena involve either underreaction or continuing overreaction to information, in this case, earnings information. These stories cannot explain the evidence in Table 8, without qualification. For instance, suppose that we assume that the information contained in the earnings surprises (say, for instance, SUE's) is predominately firm-specific. Let us also assume that investors either underreact to this information, or overreact to it, and for some period of time this overreaction continues. Many behavioral explanations in the literature have this flavor. For instance, these assumptions might hold in a world where investors mis-react to management's manipulation of earnings or fail to fully appreciate the implications of current accruals and cash flows for future cash flows.

Under these simple models, the earnings momentum portfolio would indeed have a positive average return. However, since by the above assumptions firms are selected into the long/short portfolios based on firm-specific information, we would expect that the winners and the losers would, on average, have similar relationships to systematic, macroeconomic variables. Systematic information would therefore tend to be "washed-out" of the realized profits to the earnings momentum portfolio. Thus, this simple underreaction story implies *no* relationship between the returns from an earnings momentum portfolio and the macroeconomy.

While this prediction is consistent with the zero beta on the value-weighted index and a *lack* of a relationship to the macroeconomy, it does not appear to be able to explain the substantial relationship documented above. This logic suggests that for behavioral stories to explain earnings momentum they will have to explicitly focus on how investors react to systematic information. Until recently, there has been little such focus in the literature. Daniel,Hirshleifer and Subrahmanyam (2001) do present a model where investors overreact to systematic information. However, since their model incorporates neither underreaction nor continuing overreaction, it cannot explain earnings (or price) momentum.

5 Conclusion

As many authors have noted, earnings momentum and its cousin the post-earnings announcement drift, present a significant challenge for rational models. This has led many to suggest that behavioral explanations are naturally better able to explain the earnings momentum phenomenon. The evidence presented here, on the other hand, represents a puzzle for both rational and certain behavioral theories. First, consider the challenges to rational theories. Any frictionless, rational world would presumably require a relationship between earnings momentum profits and the macroeconomy. That is, earnings momentum profits would have to be priced by a stochastic discount factor representing the marginal rate of substitution or transformation in the real economy. I find that earnings momentum profits are indeed related to the macroeconomy. For instance, the evidence in this paper indicates that expected earnings momentum returns vary with interest rates and the default premium. However, while one can never rule out that this could be the result of time-varying risk premia or factor loadings on some unknown risk factor, I reject that the time variation is consistent with a parsimonious specification for the conditional CAPM. Perhaps more damaging to potential rational explanations, the results also show a substantial *negative* relation between earnings momentum returns and news about future values of macroeconomic aggregates such as industrial production. It is hard to understand how the large, positive abnormal returns to earnings momentum strategies could be explained by a plausible rational model when earnings momentum returns are *negatively* related to news about the real economy. Clearly, any rational model that purports to explain earnings momentum will have to address these puzzling results.

These results also pose a challenge for some behavioral theories. First, a successful behavioral explanation will have to explain why earnings momentum returns are predictable based on aggregate financial variables such as interest rates and the default premium. This may involve considering some form of time-variation in the tendency to under or overreact based on, say, the business cycle. I am unaware of a behavioral model that has considered such issues.

Second, behavioral models also have to explain why the earnings momentum returns would be negatively related to news about real activity. Explanations based on underreaction or continuing overreaction to idiosyncratic earnings shocks do not seem easy to square with the evidence that a sizable fraction of the variation in earnings momentum profits are related to macroeconomic aggregates. This is simply because sorting firms based on idiosyncratic shocks cannot produce variation in loadings on systematic factors.

As Campbell (2000) notes, even the full-fledged equilibrium behavioral models in the literature[11] do not consider general equilibrium issues, such as the relationship of asset prices to the macroeconomy or the effects of systematic risk on asset prices. The evidence in this paper suggests that these kinds of considerations will be important in attempts to explain earnings

[11] See for example, Hong and Stein (1999), Daniel, Hirshleifer and Subrahmanyam (1998) and Barberis, Scheifer and Vishny (1998).

momentum with behavioral theories.

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Table I: Raw and Risk Adjusted Returns to Earnings Momentum Portfolios

Panel A contains the average returns to two earnings momentum strategies labeled ES and EA. The ES portfolio at time t is long/(short) in stocks in the top/(bottom) decile of SUE's in months t-3 to t-1. The EA portfolio at time t is long/(short) in stocks in the top/(bottom) decile of announcement day returns in months t-3 to t-1. Panel B presents estimates of regressions of the ES and EA portfolios on the CRSP value-weighted index in excess of the 30-day t-bill rate. Quarterly and annual ES and EA returns are approximated by the sum of ES and EA returns from t-11 to t. Panel C presents estimates of regressions of ES and EA portfolios on the excess return of the value-weighted index and the FF HML and SMB factors. All Standard errors are Newey - West heteroskedasticity and autocorrelation consistent standard errors.

Panel A: Monthly Average Raw Returns and Standard Deviations to the Earnings Momentum Portfolios

	ES	EA
Mean	0.6%	0.5%
Std. Dev.	2.0%	1.1%
Std. Error	0.1%	0.1%
t-statistic	5.1	7.4

Panel B: Regressions of ES and EA on the Value-Weighted Index in Excess of the 30-day T-bill Rate.

ES:

	Monthly				***Quarterly***				***Annual***		
	α	β	Adj. R^2		α	β	Adj. R^2		α	β	Adj. R^2
	0.6%	0.01	-0.3%		1.9%	-0.07	2.8%		7.4%	-0.09	2.7%
Std. Error	0.1%	0.04		Std. Error	0.3%	0.04		Std. Error	0.9%	0.06	
t-Statistic	5.52	0.33		t-Statistic	6.94	-1.85		t-Statistic	8.29	-1.44	
p-value	0.0%	74.0%		p-value	0.0%	6.5%		p-value	0.0%	15.1%	

EA:

	α	β	Adj. R^2		α	β	Adj. R^2		α	β	Adj. R^2
	0.5%	0.01	-0.2%		1.5%	-0.03	1.5%		5.9%	-0.03	0.9%
Std. Error	0.1%	0.02		Std. Error	0.2%	0.02		Std. Error	0.5%	0.03	
t-Statistic	7.53	0.43		t-Statistic	8.77	-1.45		t-Statistic	11.71	-0.97	
p-value	0.0%	66.6%		p-value	0.0%	14.8%		p-value	0.0%	33.5%	

Table I: Raw and Risk Adjusted Returns to Earnings Momentum Portfolios, con't.

Panel C: Regressions of ES and EA on the FF Factors and the Value-Weighted Index In Excess of the 30-day T-bill Rate.

ES:

	Monthly						***Quarterly***						***Annual***				
	α	β	h	s	Adj. R^2		α	β	h	s	Adj. R^2		α	β	h	s	Adj. R^2
	0.8%	-0.05	-0.35	-0.25	28.6%		2.4%	-0.10	-0.33	-0.22	33.3%		10.1%	-0.17	-0.32	-0.19	34.1%
Std. Error	0.1%	0.04	0.08	0.08		Std. Error	0.2%	0.04	0.07	0.05		Std. Error	0.7%	0.06	0.08	0.05	
t-Statistic	8.33	-1.27	-4.21	-3.26		t-Statistic	10.00	-2.67	-4.77	-3.96		t-Statistic	13.93	-2.86	-4.16	-4.04	
p-value	0.0%	20.5%	0.0%	0.1%		p-value	0.0%	0.8%	0.0%	0.0%		p-value	0.0%	0.5%	0.0%	0.0%	

EA:

	α	β	h	s	Adj. R^2		α	β	h	s	Adj. R^2		α	β	h	s	Adj. R^2
	0.5%	0.00	-0.10	-0.13	12.4%		1.6%	-0.02	-0.09	-0.14	17.8%		6.6%	-0.04	-0.09	-0.13	17.0%
Std. Error	0.1%	0.02	0.04	0.03		Std. Error	0.2%	0.03	0.04	0.03		Std. Error	0.6%	0.04	0.06	0.03	
t-Statistic	9.21	0.16	-2.44	-4.94		t-Statistic	10.33	-0.65	-2.35	-5.06		t-Statistic	11.19	-0.93	-1.55	-3.87	
p-value	0.0%	87.2%	1.5%	0.0%		p-value	0.0%	51.6%	1.9%	0.0%		p-value	0.0%	35.3%	12.1%	0.0%	

Table II: Pricing the ES, EA and WML portfolios with factor models

Panel A contains estimates of regressions of the ES and EA returns on the Carhart-4 factor model which includes the excess return on the market, the FF HML and SMB portfolios, and a price momentum portfolio, WML. The WML portfolio consists of a $1 long / (short) position in stocks in the highest / (lowest) decile of returns over the t-6 to t-1 period. Panel B contains estimates of regressions of the WML portfolio on various multifactor models. Here the factors consist of the excess return on the market, the FF HML and SMB portfolios and either the ES or EA portfolios, or both. All standard errors are Newey-West (HAC) standard errors.

Panel A: Pricing ES and EA with the Carhart 4 Factor Model

ES:

	α	β	h	s	w	Adj. R^2
	0.5%	-0.055	-0.238	-0.186	0.279	51.7%
Std. Error	0.1%	0.026	0.051	0.047	0.039	
t-Statistic	5.430	-2.114	-4.624	-3.937	7.116	
p-value	0.0%	3.5%	0.0%	0.0%	0.0%	

EA:

	α	β	h	s	w	Adj. R^2
	0.4%	0.002	-0.043	-0.077	0.131	29.0%
Std. Error	0.1%	0.019	0.031	0.021	0.018	
t-Statistic	7.227	0.088	-1.382	-3.682	7.306	
p-value	0.0%	93.0%	16.8%	0.0%	0.0%	

Panel B: Pricing the WML Portfolio With Factor Models Including ES and EA

5 Factor Model: Market, HML, SMB, EA and ES:

	α	β	h	s	ea	es	Adj. R^2
	-0.1%	0.074	0.019	0.121	0.863	0.942	44.9%
Std. Error	0.2%	0.058	0.109	0.080	0.168	0.112	
t-Statistic	-0.561	1.267	0.176	1.508	5.131	8.425	
p-value	57.5%	20.6%	86.1%	13.3%	0.0%	0.0%	

4 Factor Model: Market, HML, SMB and EA:

	α	β	h	s	ea	Adj. R^2
	0.4%	0.010	-0.256	-0.198	1.474	29.7%
Std. Error	0.2%	0.072	0.119	0.132	0.227	
t-Statistic	1.768	0.134	-2.162	-1.495	6.504	
p-value	7.8%	89.4%	3.1%	13.6%	0.0%	

4 Factor Model: Market, HML, SMB and ES:

	α	β	h	s	es	Adj. R^2
	0.2%	0.081	0.005	0.066	1.170	39.7%
Std. Error	0.2%	0.063	0.119	0.086	0.137	
t-Statistic	0.786	1.286	0.046	0.765	8.534	
p-value	43.3%	20.0%	96.3%	44.5%	0.0%	

Table III: Predictive Regressions

ES and EA returns are regressed on a January dummy (Jandum) and one lag of the default premium (DEF), the dividend yield of the value-weighted index (DP), the 30-day t-bill rate (TBILL), and the term premium (TERM). DEF is the difference between the yields of BBB and AAA bonds. DP is computed as the sum of dividends to the CRSP index over the past 12 months divided by the current value of the index. TERM is the difference between the yields of 10-year bonds and 30-day t-bills. All standard errors are from the Newey-West (HAC) covariance matrix. The F-stat is for the null hypothesis that all coefficients save the intercept are jointly zero.

Panel A: ES

	Intercept	Jandum	DEF	DP	TBILL	TERM	Adj. R^2	F-stat	p-value
Coefficient	0.008	-0.025	-11.161	0.005	1.505	0.796	0.135	10.27	<.0001
Std error	0.004	0.007	5.541	0.143	0.953	1.483			
t-stat	0.452	-3.633	-2.014	0.032	1.580	0.537			

Panel B: EA

	Intercept	Jandum	DEF	DP	TBILL	TERM	Adj. R^2	F-stat	p-value
Coefficient	0.007	-0.014	-6.483	-0.069	1.102	0.474	0.13	10.90	<.0001
Std error	0.002	0.004	2.787	0.085	0.505	0.721			
t-stat	3.079	-3.990	-2.326	-0.810	2.181	0.657			

Table IV: ES and EA Alphas and Betas

The ES and ES portfolio returns are regressed on a constant and the excess return from the CRSP value-weighted index. Both the alpha and beta coefficients are modeled as linear functions of a January dummy (Jandum), the default premium (DEF) and the 30-day T-bill rate (TBILL). All standard errors are from the Newey-West (HAC) covariance matrix.

Panel A: ES

	α Equation				β Equation			
	Intercept	**Jandum**	**DEF**	**TBILL**	**Intercept**	**Jandum**	**DEF**	**TBILL**
Coefficient	0.007	-0.02	-6.60	1.14	0.24	-0.19	-150.54	-7.31
Std. Error	0.00	0.00	4.12	0.65	0.10	0.18	95.88	14.88
t-Statistic	2.66	-4.33	-1.60	1.77	2.46	-1.01	-1.57	-0.49

Panel B: EA

	α Equation				β Equation			
	Intercept	**Jandum**	**DEF**	**TBILL**	**Intercept**	**Jandum**	**DEF**	**TBILL**
Coefficient	0.008	-0.01	-8.72	0.89	-0.05	-0.06	77.90	3.24
Std. Error	0.00	0.00	2.06	0.33	0.05	0.08	40.27	8.24
t-Statistic	5.15	-3.97	-4.23	2.68	-1.16	-0.79	1.93	0.39

Table V: Predictive Regressions Including Lagged IQR

ES and EA returns are regressed on a January dummy (Jandum) and one lag of the default premium (DEF), the dividend yield of the value-weighted index (DP), the 30 day t-bill rate (TBILL), and the term premium (TERM). DEF is the between the yields of BBB and AAA bonds. DP is computed as the sum of dividends to the CRSP index over the past 12 months divided by the current value of the index. TERM is the difference between the yields of 10-year bonds and 30-day t-bills. IQR(t) is the cross-sectional inter-quartile range of seasonal earnings growth in months t to t-2. All standard errors are from the Newey-West (HAC) covariance matrix. The F-stat is for the null hypothesis that all coefficients save the intercept are jointly zero.

Panel A: Regressions Including Predictive Variables and Lags of IQR.

	Intercept	Jandum	DEF	TERM	DP	TBILL	IQR(-2)	IQR(-4)	IQR(-7)	Adj. R^2	F-stat	p-value
Coefficient	0.012	-0.026	-10.247	0.311	0.044	1.384	-0.008	-0.004	0.009	0.135	6.786	0.000
Std. Error	0.010	0.007	6.391	1.553	0.135	0.933	0.008	0.008	0.008			
t-Statistic	1.202	-3.632	-1.603	0.200	0.326	1.483	-0.957	-0.568	1.124			
Prob.	0.230	0.000	0.110	0.842	0.744	0.139	0.340	0.571	0.262			

	Intercept	Jandum	DEF	TERM	DP	TBILL	IQR(-2)	IQR(-4)	IQR(-7)	Adj. R^2	F-stat	p-value
Coefficient	0.013	-0.015	-4.100	-0.051	-0.016	0.890	-0.002	-0.004	0.000	0.133	6.864	0.000
Std. Error	0.004	0.004	3.056	0.800	0.092	0.504	0.003	0.003	0.000			
t-Statistic	2.966	-3.992	-1.342	-0.064	-0.176	1.766	-0.659	-1.209	1.637			
Prob.	0.003	0.000	0.181	0.949	0.860	0.078	0.511	0.228	0.103			

Panel B: Regressions Including Only Lags of IQR.

	Intercept	IQR(-2)	IQR(-4)	IQR(-7)	Adj. R^2	F-stat	p-value
Coefficient	0.012	-0.007	-0.002	0.004	-0.004	0.570	0.635
Std. Error	0.009	0.008	0.008	0.007			
t-Statistic	1.284	-0.823	-0.242	0.593			
Prob.	0.200	0.411	0.809	0.554			

	Intercept	IQR(-2)	IQR(-4)	IQR(-7)	Adj. R^2	F-stat	p-value
Coefficient	0.011	-0.002	-0.002	0.000	0.002	1.185	0.316
Std. Error	0.004	0.003	0.003	0.000			
t-Statistic	2.630	-0.830	-0.846	2.665			
Prob.	0.009	0.407	0.398	0.008			

Table VI: Estimated regressions of Monthly, Quarterly and Annual Industrial Production Growth

Panel A presents estimated regressions of monthly, quarterly and annual industrial production growth on lags of quarterly ES and EA returns. The notation E_Q(-k) refers to the coefficient of ES in quarter t-k if the coefficient is in the ES column and the coefficient of EA in quarter t-k if the coefficient is in the EA column. Quarterly ES and EA returns are approximated by summing the monthly returns over from t to t-2. Annual ES and EA returns are approximated by summing the monthly return from t to t-11. Panel B presents estimated regressions of monthly, quarterly and annual industrial production growth on lags of ES, EA, the excess return on the market, and the FF factors. The likelihood ratio statistic is for the null hypothesis that the coefficients on the ES and EA lags are jointly zero. The interpretation of the notation E_Q(-k) is consistent with that in Panel A.

Panel A: Earnings Momentum Portfolios Alone

	Monthly Industrial Production IPG(t-1,t)			
	ES		EA	
	b	t(b)	b	t(b)
C	0.00	7.09	0.00	5.45
E_Q(-1)	-0.03	-1.70	-0.03	-1.00
E_Q(-3)	-0.05	-3.52	-0.06	-1.52
E_Q(-6)	-0.03	-2.35	-0.06	-2.05
E_Q(-9)	-0.01	-1.04	-0.02	-0.84
Adj. R^2		0.11		0.04
F-stat		9.43		4.28
p-value		0.00		0.00

	Quarterly Industrial Production IPG(t-3,t)			
	ES		EA	
	b	t(b)	b	t(b)
C	0.01	7.52	0.01	5.54
E_Q(-3)	-0.16	-4.04	-0.17	-2.26
E_Q(-6)	-0.09	-2.67	-0.17	-1.99
E_Q(-9)	-0.05	-1.68	-0.07	-1.18
E_Q(-12)	-0.06	-1.68	-0.14	-2.19
Adj. R^2		0.18		0.09
F-stat		16.86		7.76
p-value		0.00		0.00

	Annual Industrial Production IPG(t-12,t)			
	ES		EA	
	b	t(b)	b	t(b)
C	0.05	7.66	0.06	7.73
E_Q(-12)	-0.41	-3.57	-0.63	-3.11
E_Q(-15)	-0.31	-2.64	-0.62	-2.79
E_Q(-18)	-0.21	-2.18	-0.53	-2.35
E_Q(-21)	-0.12	-1.37	-0.47	-2.22
Adj. R^2		0.17		0.16
F-stat		15.31		15.22
p-value		0.00		0.00

Table VI: Estimated regressions of Monthly, Quarterly and Annual Industrial Production Growth con't

Panel B: ES, EA, the Market and the FF Factors

Monthly Industrial Production					**Quarterly Industrial Production**					**Annual Industrial Production**				
IPG(t-1,t)					**IPG(t-3,t)**					**IPG(t-12,t)**				
	ES		***EA***			***ES***		***EA***			***ES***		***EA***	
	b	t(b)	b	t(b)		b	t(b)	b	t(b)		b	t(b)	b	t(b)
C	0.00	3.24	0.00	1.27	C	0.01	3.58	0.01	1.80	C	0.03	3.29	0.04	4.04
E_Q(-1)	-0.02	-1.36	0.02	0.65	E_Q(-3)	-0.13	-3.83	-0.10	-1.75	E_Q(-12)	-0.38	-3.32	-0.66	-3.92
E_Q(-3)	-0.04	-2.61	-0.06	-1.92	E_Q(-6)	-0.06	-1.88	-0.14	-2.68	E_Q(-15)	-0.20	-1.72	-0.48	-2.24
E_Q(-6)	-0.03	-2.41	-0.04	-1.96	E_Q(-9)	-0.03	-0.83	-0.04	-0.81	E_Q(-18)	-0.10	-0.86	-0.41	-1.90
E_Q(-9)	-0.01	-0.45	-0.02	-0.86	E_Q(-12)	-0.08	-2.17	-0.11	-1.92	E_Q(-21)	-0.11	-1.04	-0.26	-1.65
VWQ(-1)	0.00	-0.34	0.00	-0.45	VWQ(-3)	0.03	1.58	0.05	2.99	VWQ(-12)	0.15	2.36	0.26	3.53
VWQ(-3)	0.01	2.32	0.03	3.04	VWQ(-6)	0.06	3.51	0.10	4.25	VWQ(-15)	0.15	2.51	0.20	4.23
VWQ(-6)	0.03	3.30	0.04	4.14	VWQ(-9)	0.05	3.38	0.08	4.53	VWQ(-18)	0.11	1.86	0.11	2.23
VWQ(-9)	0.02	3.17	0.02	4.38	VWQ(-12)	0.03	2.75	0.04	3.55	VWQ(-21)	0.08	1.60	0.08	1.91
SMBQ(-1)	0.03	2.47	0.05	3.08	SMBQ(-3)	0.07	2.61	0.08	2.55	SMBQ(-12)	0.04	0.55	-0.06	-0.67
SMBQ(-3)	0.00	0.00	-0.01	-0.92	SMBQ(-6)	-0.01	-0.29	-0.03	-1.02	SMBQ(-15)	-0.01	-0.12	-0.02	-0.21
SMBQ(-6)	-0.02	-1.67	-0.02	-1.82	SMBQ(-9)	0.00	-0.01	-0.01	-0.40	SMBQ(-18)	0.01	0.12	0.06	0.62
SMBQ(-9)	0.00	0.06	0.00	-0.34	SMBQ(-12)	-0.03	-1.16	-0.01	-0.35	SMBQ(-21)	-0.09	-1.06	0.02	0.23
HMLQ(-1)	0.00	-0.22	0.01	0.93	HMLQ(-3)	-0.02	-0.87	0.02	0.79	HMLQ(-12)	-0.05	-0.70	-0.04	-0.64
HMLQ(-3)	0.01	0.97	0.01	1.31	HMLQ(-6)	0.03	1.07	0.05	1.45	HMLQ(-15)	0.07	0.83	0.01	0.09
HMLQ(-6)	0.00	-0.13	0.01	1.00	HMLQ(-9)	0.00	-0.16	0.01	0.56	HMLQ(-18)	0.10	1.04	0.08	1.07
HMLQ(-9)	0.00	-0.18	0.00	-0.47	HMLQ(-12)	0.00	-0.02	0.00	-0.05	HMLQ(-21)	0.12	1.33	0.16	2.28
Adj. R^2		0.20		0.29	Adj. R^2		0.34		0.43	Adj. R^2		0.29		0.4
Likelihood ratio		15.82		10.03	Likelihood ratio		36.39		21.14	Likelihood ratio		29.5		47.6
p-value		0.00		0.04	p-value		0.00		0.00	p-value		0.00		0.00

Table VII: Estimated regressions of Monthly, Quarterly and Annual Consumption Growth

Panel A presents estimated regressions of monthly, quarterly and annual consumption growth on lags of quarterly ES and EA returns. The notation E_Q(-k) refers to the coefficient of ES in quarter t-k if the coefficient is in the ES column and the coefficient of EA in quarter t-k if the coefficient is in the EA column. Quarterly ES and EA returns are approximated by summing the monthly returns over from t to t-2. Annual ES and EA returns are approximated by summing the monthly return from t to t-11. Panel B presents estimated regressions of monthly, quarterly and annual consumption growth on lags of ES, EA, the excess return on the market, and the FF factors. The likelihood ratio statistic is for the null hypothesis that the coefficients on the ES and EA lags are jointly zero. The interpretation of the notation E_Q(-k) is consistent with that in Panel A.

Panel A: Regressions of Consumption Growth on Earnings Momentum Portfolios Alone

	Monthly Consumption Growth CG(t-1,t)					Quarterly Consumption Growth CG(t-3,t)					Annual Consumption Growth CG(t-12,t)			
	ES		EA			ES		EA			ES		EA	
	b	t(b)	b	t(b)		b	t(b)	b	t(b)		b	t(b)	b	t(b)
C	0.00	3.39	0.00	1.44	C	0.00	5.19	0.00	1.86	C	0.01	5.35	0.01	3.22
E_Q(-1)	0.01	0.49	0.01	0.37	E_Q(-3)	-0.03	-1.39	-0.02	-0.61	E_Q(-12)	-0.09	-2.24	-0.03	-0.41
E_Q(-3)	-0.02	-1.31	-0.01	-0.41	E_Q(-6)	-0.03	-2.05	-0.01	-0.40	E_Q(-15)	-0.09	-2.00	-0.03	-0.42
E_Q(-6)	-0.01	-0.83	0.01	0.64	E_Q(-9)	-0.02	-0.95	0.02	0.71	E_Q(-18)	-0.07	-1.40	-0.03	-0.44
E_Q(-9)	0.00	-0.29	0.00	-0.16	E_Q(-12)	-0.01	-0.54	0.00	0.02	E_Q(-21)	-0.06	-1.74	-0.06	-0.93
Adj. R^2		-0.01		-0.01	Adj. R^2		0.02		-0.01	Adj. R^2		0.08		-0.01
F-statistic		0.52		0.09	F-statistic		2.70		0.40	F-statistic		6.95		0.61
p-value		0.72		0.99	p-value		0.03		0.81	p-value		0.00		0.65

Table VII: Estimated regressions of Monthly, Quarterly and Annual Consumption Growth Con't

Panel B: Regressions of Consumption Growth on ES, EA the Market and the FF Factors

Monthly Consumption Growth CG(t-1,t)

	ES		EA	
	b	t(b)	b	t(b)
C	0.00	1.61	0.00	0.42
E_Q(-1)	-0.01	-0.51	-0.01	-0.55
E_Q(-3)	-0.01	-0.33	0.00	-0.19
E_Q(-6)	-0.01	-0.70	0.02	1.13
E_Q(-9)	0.00	-0.09	0.00	0.20
VWQ(-1)	0.01	1.40	0.01	1.48
VWQ(-3)	0.00	0.21	0.00	0.67
VWQ(-6)	0.00	0.47	0.01	1.50
VWQ(-9)	0.00	-0.63	0.00	-0.43
HMLQ(-1)	-0.02	-2.55	-0.01	-2.15
HMLQ(-3)	0.01	1.36	0.01	1.45
HMLQ(-6)	0.00	0.14	0.01	1.40
HMLQ(-9)	0.00	-0.01	0.00	0.11
SMBQ(-1)	-0.02	-2.41	-0.01	-2.04
SMBQ(-3)	0.01	0.65	0.00	0.05
SMBQ(-6)	0.00	-0.21	0.00	0.37
SMBQ(-9)	0.01	1.39	0.01	0.65
Adj. R^2		-0.01		-0.02
Likelihood ratio		0.98		0.97
p-value		0.91		0.92

Quarterly Consumption Growth CG(t-3,t)

	ES		EA	
	b	t(b)	b	t(b)
C	0.00	1.71	0.00	0.31
E_Q(-3)	-0.05	-2.30	-0.04	-1.19
E_Q(-6)	-0.02	-1.04	0.00	0.01
E_Q(-9)	-0.01	-0.28	0.03	0.96
E_Q(-12)	0.00	-0.24	0.01	0.33
VWQ(-3)	0.01	1.28	0.02	2.20
VWQ(-6)	0.01	0.82	0.02	2.04
VWQ(-9)	-0.01	-0.55	0.00	-0.23
VWQ(-12)	0.02	1.79	0.02	1.60
HMLQ(-3)	-0.02	-1.48	-0.01	-0.45
HMLQ(-6)	0.02	1.20	0.03	2.15
HMLQ(-9)	0.00	0.30	0.01	0.81
HMLQ(-12)	0.01	0.73	0.01	0.56
SMBQ(-3)	-0.03	-1.94	-0.03	-1.88
SMBQ(-6)	0.01	0.57	0.00	0.22
SMBQ(-9)	0.01	0.91	0.01	0.84
SMBQ(-12)	-0.01	-0.40	-0.01	-0.41
Adj. R^2		0.04		0.05
Likelihood ratio		8.66		4.07
p-value		0.07		0.40

Annual Consumption Growth CG(t-12,t)

	ES		EA	
	b	t(b)	b	t(b)
C	0.00	0.99	0.00	0.30
E_Q(-12)	-0.08	-1.74	-0.03	-0.44
E_Q(-15)	-0.04	-0.72	0.03	0.42
E_Q(-18)	-0.02	-0.34	0.03	0.45
E_Q(-21)	-0.01	-0.12	0.03	0.50
VWQ(-12)	0.04	1.41	0.05	2.01
VWQ(-15)	0.04	1.44	0.04	1.94
VWQ(-18)	0.02	0.68	0.01	0.68
VWQ(-21)	0.03	1.67	0.02	1.27
HMLQ(-12)	0.01	0.27	0.02	0.68
HMLQ(-15)	0.04	1.13	0.05	1.67
HMLQ(-18)	0.04	1.16	0.06	1.61
HMLQ(-21)	0.08	2.11	0.08	2.26
SMBQ(-12)	-0.01	-0.18	-0.02	-0.42
SMBQ(-15)	0.03	0.67	0.03	0.73
SMBQ(-18)	0.04	0.82	0.04	1.08
SMBQ(-21)	0.01	0.16	0.03	0.77
Adj. R^2		0.13		0.10
Likelihood ratio		5.74		2.50
p-value		0.22		0.64

Table VIII: Regressions of Monthly, Quarterly and Annual ES and EA Returns on Proxies for Expected Returns and Real Activity

Panel A follows Fama (1990) and presents estimated regressions of monthly, quarterly and annual ES and EA returns on a January dummy (Jandum) (monthly only), and one lag of the default premium (DEF), the dividend yield of the value weighted index (DP), the 30 day t-bill rate (TBILL), and the term premium (TERM). The DEF is the difference between the yields of BBB and AAA bonds. DP is computed as the sum of dividends to the CRSP index over the past 12 months divided by the current value of the index. TERM is the difference between the yields of 10-year bonds and 30-day t-bills. The proxies for expected return and cash flow news related to the real economy are leads of quarterly industrial production growth and quarterly consumption growth, denoted IPQ and CONQ respectively. The F-tests in Panel A are for the null hypothesis that the coefficients on all variables are jointly zero. Panel B presents estimated regressions of monthly, quarterly and annual ES and EA returns on a January dummy (Jandum) (monthly only), and one lag of the default premium (DEF), the dividend yield of the value-weighted index (DP), the 30-day t-bill rate (TBILL), and the term premium (TERM). Also included are the contemporaneous excess return on the value-weighted index as well as the SMB and HML factors. The F-tests in Panel B test whether the coefficients on the expected return and real activity proxies are jointly significant apart from the market, SMB and HML factors. All tests are conducted using the Newey-West (HAC) covariance matrix.

Panel A:

Monthly	ES		EA		Quarterly	ES		EA		Annual	ES		EA	
	b	t(b)	b	t(b)		b	t(b)	b	t(b)		b	t(b)	b	t(b)
C	0.02	3.03	0.01	3.37	C	0.04	3.14	0.02	2.72	C	0.14	6.40	0.07	4.76
JANDUM	-0.02	-3.69	-0.01	-3.81										
DEF(-1)	-6.86	-1.06	-3.20	-0.95	DEF(-3)	-19.32	-1.19	-6.01	-0.85	DEF(-12)	-58.98	-2.12	-27.98	-1.93
DP(-1)	-0.09	-0.48	-0.12	-1.22	DP(-3)	-0.28	-0.64	-0.52	-2.39	DP(-12)	-2.87	-2.92	-1.43	-2.63
TERM(-1)	1.25	0.80	0.50	0.74	TERM(-3)	1.72	0.56	0.87	0.42	TERM(-12)	7.78	1.13	10.69	3.83
TBILL(-1)	0.22	0.20	0.60	1.03	TBILL(-3)	1.52	0.55	2.44	1.43	TBILL(-12)	16.02	2.92	8.57	2.95
					IPQ	0.32	1.08	0.13	0.98	IPQ	-0.44	-1.20	-0.22	-1.37
IPQ(3)	-0.22	-3.31	-0.05	-1.59	IPQ(3)	-0.54	-3.72	-0.21	-2.51	IPQ(3)	-0.51	-1.56	-0.43	-3.12
IPQ(6)	-0.04	-0.61	-0.04	-1.29	IPQ(6)	-0.06	-0.51	-0.10	-1.39	IPQ(6)	-0.35	-1.22	-0.46	-3.38
IPQ(9)	-0.03	-0.34	0.01	0.16	IPQ(9)	0.00	-0.02	0.00	0.04	IPQ(9)	-0.36	-1.08	-0.30	-2.38
IPQ(12)	0.00	-0.04	-0.05	-1.37	IPQ(12)	-0.21	-1.00	-0.15	-1.92	IPQ(12)	-0.81	-1.82	-0.45	-2.76
					CONQ	-0.93	-2.77	-0.16	-1.15	CONQ	-1.46	-2.46	-0.02	-0.06
CONQ(3)	0.13	0.79	0.04	0.53	CONQ(3)	-0.25	-0.74	0.07	0.38	CONQ(3)	-0.64	-1.06	0.45	1.19
CONQ(6)	-0.27	-1.50	-0.05	-0.54	CONQ(6)	-0.43	-1.60	0.07	0.39	CONQ(6)	-0.17	-0.26	0.57	1.58
CONQ(9)	0.04	0.27	0.10	1.37	CONQ(9)	-0.08	-0.30	0.25	1.65	CONQ(9)	0.06	0.08	0.44	1.36
CONQ(12)	-0.27	-1.43	-0.01	-0.14	CONQ(12)	-0.09	-0.31	0.19	1.13	CONQ(12)	-0.26	-0.38	0.18	0.52
Adj. R^2		0.17		0.13	Adj. R^2		0.23		0.13	Adj. R^2		0.39		0.33
F-statistic		5.36		4.44	F-statistic		6.86		4.14	F-statistic		13.69		11.26
p-value		0.00		0.00	p-value		0.00		0.00	p-value		0.00		0.00

Table VIII: Regressions of Monthly, Quarterly and Annual ES and EA Returns on Proxies for Expected Returns and Real Activity, con't

Panel B:

	Monthly					Quarterly					Annual			
	ES		EA			ES		EA			ES		EA	
	b	t(b)	b	t(b)		b	t(b)	b	t(b)		b	t(b)	b	t(b)
C	0.01	2.30	0.01	2.81	C	0.03	2.45	0.02	2.28	C	0.13	4.65	0.07	4.50
JANDUM	-0.01	-3.94	-0.01	-3.69										
DEF(-1)	-3.68	-0.71	-2.17	-0.71	DEF(-3)	-7.09	-0.58	-1.16	-0.18	DEF(-12)	-6.13	-0.29	-0.18	-0.01
DP(-1)	-0.06	-0.30	-0.08	-0.80	DP(-3)	-0.26	-0.65	-0.33	-1.32	DP(-12)	-3.52	-3.32	-1.74	-3.10
TERM(-1)	1.50	1.18	0.35	0.50	TERM(-3)	3.36	1.27	0.68	0.38	TERM(-12)	14.14	2.29	10.54	3.70
TBILL(-1)	0.26	0.29	0.48	0.86	TBILL(-3)	1.54	0.73	1.56	1.03	TBILL(-12)	16.17	3.55	7.63	3.10
					IPQ	0.32	1.50	0.13	1.20	IPQ	-0.53	-1.70	-0.40	-2.49
IPQ(3)	-0.10	-1.46	-0.01	-0.15	IPQ(3)	-0.41	-2.95	-0.14	-1.41	IPQ(3)	-0.78	-2.50	-0.68	-3.93
IPQ(6)	-0.06	-0.75	-0.06	-1.54	IPQ(6)	-0.10	-0.80	-0.15	-1.84	IPQ(6)	-0.42	-2.02	-0.65	-4.37
IPQ(9)	-0.06	-0.75	0.00	-0.13	IPQ(9)	-0.15	-1.12	-0.06	-0.71	IPQ(9)	-0.39	-1.73	-0.42	-3.42
IPQ(12)	-0.06	-0.85	-0.08	-2.19	IPQ(12)	-0.27	-1.83	-0.22	-2.90	IPQ(12)	-0.54	-1.59	-0.48	-3.04
					CONQ	-0.77	-3.15	-0.16	-1.05	CONQ	-0.81	-1.65	0.34	1.04
CONQ(3)	-0.11	-0.80	-0.05	-0.72	CONQ(3)	-0.34	-1.35	-0.08	-0.43	CONQ(3)	0.01	0.01	0.77	2.06
CONQ(6)	-0.06	-0.49	0.00	0.05	CONQ(6)	-0.04	-0.19	0.16	0.86	CONQ(6)	0.39	0.70	0.95	2.55
CONQ(9)	0.12	0.81	0.11	1.58	CONQ(9)	0.21	0.88	0.36	2.19	CONQ(9)	0.30	0.53	0.77	2.70
CONQ(12)	-0.13	-1.02	0.03	0.38	CONQ(12)	0.13	0.60	0.26	1.64	CONQ(12)	0.43	0.75	0.60	2.00
VWMT	-0.01	-0.32	0.03	1.30	VWMTQ	-0.05	-1.55	0.02	0.84	VWMTA	-0.09	-1.86	0.03	0.75
HMLF	-0.30	-3.80	-0.07	-2.08	HMLFQ	-0.33	-5.11	-0.10	-2.49	SMBFA	-0.04	-0.61	-0.05	-1.52
SMBF	-0.21	-2.88	-0.10	-4.08	SMBFQ	-0.18	-3.42	-0.13	-4.26	HMLFA	-0.33	-4.25	-0.12	-2.61
Adj. R^2		0.33		0.20	Adj. R^2		0.45		0.25	Adj. R^2		0.52		0.43
F-stat. Macro=0		3.73		2.39	F-stat. Macro=0		4.05		2.79	F-stat. Macro=0		3.96		5.03
p-value		0.00		0.00	p-value		0.00		0.00	p-value		0.00		0.00