Earnings Dispersion and Aggregate Stock Returns*

Bjorn Jorgensen, Jing Li, and Gil Sadka†

April 3, 2009

Abstract

While aggregate earnings should affect aggregate stock returns, standard portfolio theory predicts that the cross-sectional dispersion in firm-level earnings *per se* would not affect aggregate stock returns. Nonetheless, this paper documents that cross-sectional earnings dispersion is positively related with contemporaneous stock returns and negatively related with lagged stock returns. A possible interpretation of our findings is that an increase in uncertainty causes expected returns to rise, which in turn causes prices to fall. Since prices anticipate future earnings, the uncertainty is manifested in earnings dispersion in the following year (resulting in a negative relation between earnings dispersion and lagged returns). In addition, because the higher earnings dispersion is associated with higher expected returns, the contemporaneous relation between dispersion and stock return is positive. Our findings are robust to including macroeconomic indicators that prior research show is correlated with stock returns.

JEL classification: E32, G12, G14, M41.

Keywords: accounting valuation, earnings dispersion, expected-return variation, profitability

---

*We would like to thank an anonymous referee, Daniel Cohen, SP Kothari (editor), Bugra Ozel, Nick Polson, Efraim Sadka, Ronnie Sadka, Michael Staehr, Ane Tamayo (discussant), and Igor Vaysman as well as the workshop participants at Columbia University, London Business School Accounting Symposium, University of Chicago, University of Connecticut, and University of Pennsylvania (Wharton) for valuable comments and suggestions. Any errors are our own.

†Bjorn is from University of Colorado at Boulder, Jing is from Carnegie Mellon University, and Gil is from Columbia University, e-mail: bjorn.jorgensen@colorado.edu, jl2491@columbia.edu, and gs2235@columbia.edu.

1 Introduction

Prior studies investigate the relation between firm-level earnings and firm-level stock returns and document that, all else equal, higher expected earnings are associated with higher stock prices because higher earnings signal higher expected future cash flows. For example, Ball and Brown (1968) document a positive contemporaneous relation between firm-level earnings changes and firm-level stock returns, where earnings changes represent earnings surprises. Several recent studies investigate whether this relation also holds between aggregate earnings and aggregate market returns.[1] The firm-level results should hold for the aggregate-level or market-level as well. However, the contemporaneous relation between aggregate earnings changes and aggregate stock returns is negative. There are two possible explanations for this negative relation in the aggregate. First, Kothari, Lewellen and Warner (2006) suggest that earnings changes can be positively related to return news (changes in expected returns). Second, Sadka and Sadka (2008) suggest that earnings changes may be predictable and negatively correlated with expected returns. Thus, the aggregate-level implications of earnings changes are consistent with the firm-level as both explanations suggest that *all else euqal*, an increase in expected aggregate earnings should result in an increase in stock prices.

While one would expect aggregate earnings to affect aggregate stock prices, standard portfolio theory suggests that the cross-sectional dispersion in earnings *per se* should not affect aggregate prices. To illustrate this basic point, consider two single-period economies each with two assets. In the first economy, each asset will payout \$100 at the end of the period. In the second economy, the two assets will payout \$50 and \$150, respectively. A fully diversified investor holding both assets is indifferent between these two economies. In both economies, the diversified investor will receive an overall payment of \$200. Note that the price of each security may differ beween the two economies. However, the combined price for the market portfolio should be the same as the cash flows generated by the market portfolio is identical in both economies. In sum, investors should focus on the expected aggregate profits of their portfolio of assets regardless of how these profits are distributed among the different assets in the portfolio. This is, of course, simply a consequence of traditional asset pricing results, including Capital Asset Pricing Model (CAPM), Intertemporal CAPM, and Arbitrage Pricing Theory (APT).[2] For this reason, the prior literature largely ignores

[1] See Kothari, Lewellen, and Warner (2006), Anilowski, Feng, and Skinner (2007), Ball, Sadka, and Sadka (2008), Hirshleifer, Hou, and Teoh (2009), Sadka (2007), and Sadka and Sadka (2008), among others.

[2] See Sharpe (1964), Lintner (1965), Merton (1973), and Ross (1976).

the effects of cross-sectional dispersion on aggregate stock returns.[3]

While earnings dispersion per se should not matter, earnings dispersion would be priced if it is associated with macroeconomic indicators and/or consuption related factors. Notable examples include French, Schwert, and Stambaugh (1987), Lambert, Leuz, and Verrecchia (2007) and Angeletos and Pavan (2007). First, Frech, Schwert and Stambaugh (1987) demonstrate that aggregate returns are sensitive to aggregate uncertainty (measured as volatility). To the extent that earnings dispersion is associated with uncertainty their model can explain the relation between aggregate stock returns and earnings dispersion. Second, Lambert, Leuz, and Verrecchia (2007) demonstrate that accounting quality can affect firms' systematic risk premium when earnings are informative about the covariance between the future cash flows of the firm and of the overall market. To the extent that this covariance is correlated with cross-sectional earnings dispersion, we would expect dispersion to matter in the aggregate. Third, Angeletos and Pavan (2007) demonstrate that when managers possess private information about aggregate shocks, the managers' optimal decisions based on private information result in cross-sectional dispersion in earnings and affects aggregate prices.

Even though standard portfolio theory suggests that cross-sectional dispersion in earnings should *not* affect aggregate stock returns, this paper documents a surprisingly robust relation between cross-sectional dispersion in earnings changes and aggregate stock returns. Specifically, we document that the cross-sectional dispersion in earnings changes is negatively correlated with prior year aggregate stock returns. This finding suggest that when investors anticipate high dispersion in earnings changes, they demand higher rates of return, i.e., expected returns are positively correlated with expected cross-sectional earnings dispersion (henceforth, earnings dispersion).[4] If investors demand higher rates of return when they expec high earnings dispersion, one would expect that earnings dispersion would be positively correlated with contemporaneous stock returns. Consistently, we document that the cross-sectional dispersion in earnings changes is positively correlated with contemporaneous (current year) aggregate stock returns.[5] Furthermore, the contemporaneous

[3] Exceptions include Campbell and Lettau (1999), Park (2005), and Jiang (2007) on cross-sectional disperion in stock returns, analysts forecasts, and book-to-market, respectively.

[4] See, for example, Fama and French (1988, 1989), Campbell and Shiller (1988a, 1988b), Lamont (1998), and Ball, Sadka, and Sadka (2008).

[5] We use a common measure for earnings changes consistent with prior studies such as Collins, Kothari, and Rayburn (1987), Collins and Kothari (1989), and Kothari and Sloan (1992). Specifically, earnings changes are defined as earnings at period t minus earnings at period $t-1$, scaled by the stock price at $t-1$.

and lagged relation together suggest that investors react negatively to expected future earnings dispersion, lowering aggregate stock prices, because investors demand higher (expected) rates of return. Finally, we find no evidence relating earnings dispersion to future (lead) stock returns.

Conceptually, this empirical relation between earnings dispersion and aggregate stock returns is motivated from models that derive asset prices from the macroeconomy (including Lucas, 1978; Abel, 1988; and Cox, Ingersoll and Ross, 1985, French, Schwert, and Stambaugh, 1987). These papers find that asset prices depend on the past, current, and the expected future state of the macroeconomy as well as uncertainty about the production technology. Earnings dispersion is associated with both the state of the economy, as we find that high dispersion is associated with high rates of unemployment, as well as uncertainty about technologies. When technologies are uncertain, firms are more likely to make investments decisions that differ based on their understanding of their production technology. Only some of these investments will be successful as technological uncertainty is resolved over time. We hypothesize that technological uncertainty curtails investors' ability to predict aggregate earnings. In contrast, when technologies and their applications are well understood, firms are more likely to undertake similar investments, resulting in lower future earnings dispersion. Within this framework, we provide evidence consistent with two alternative interpretations, which are not mutually exclusive.

We conduct several robustness tests. Our results are robust to including other macroeconomic indicators that have been shown to be correlated with stock returns. First, since earnings dispersion can rise during recessions we include measures of the health of the economy such as real-GDP growth, inflation, and industrial production (e.g., Fama, 1990; and Schwert, 1990) as well as an indicator variable for recessions (using the NBER recession dates). In addition, we control for the consumption-to-wealth rario (Lettau and Ludvigson, 2001) and the labor income-to-consumption ratio (Santos and Veronesi, 2006). Second, Lilien (1982) suggests that dispersion can increase unemployement,[6] which is likely to be associated with stock returns (e.g., Jagannathan and Wang, 1996; and Santos and Veronesi, 2006).[7] Our findings are robust to including unemployment. Finally, our results are also robust to allowing for time-varying volatility in market returns (French, Schwert, and Stambaugh, 1987).

[6] For more on the relation between unemployment and sectoral shifts, see Abraham and Katz (1986), Hamilton (1988), Loungani, Rush, and Tave (1990), and Hosios (1994).

[7] Boyd, Hu, and Jaganathan (2006) find that the market response to unanticipated unemployment news depends on the market conditions.

In addition to including macroeconomic indicators, we include additional tests. First, since Jiang (2007) documents that aggregate stock returns are correlated with the dispersion in book-to-market ratios and other fundamentals, we test whether our results are driven by similar factors. Our results are robust to including the cross-sectional dispersion in the book-to-market ratio. This suggests that our findings are not due to scaling with beginning period market values. To further corroborate that our results are not induced by the scaling variable, we used dispersion in return-on-assets and again find similar results. Second, the relation between earnings dispersion and lagged stock returns holds after controlling for the dispersion in stock returns as well.[8] Finally, we use the CRSP value-weighted and equal-weighted market returns using all available firms and find similar results.

The remainder of the paper is organized as follows. Section 2 suggests why earnings dispersion might matter for contemporaneous and lagged aggregate stock returns. Section 3 describes the data and its sources. Section 4 tests for the relation between earnings dispersion and aggregate stock returns. Section 5 describes our robustness tests. Section 6 concludes.

2 Earnings Dispersion and Uncertainty

As noted above, the cross-sectional dispersion in earnings should not affect aggregate stock returns according to standard portfolio theory. In this section, we develop the argument for why cross-sectional dispersion in earnings may be correlated with contemporaneous and lagged stock returns. The argument is based on how investor uncertainty or ambiguity manifests itself in financial markets.

Our argument is based on intertemporal asset pricing models in the presence of technology shocks. Lucas (1978), Cox, Ingersoll and Ross (1985), French, Schwert and Stambaugh (1987), and Abel (1988), among others, predict that asset prices reflect technological uncertainty. we hypothesize that higher technological uncertainty could manifest itself in higher expected earnings dispersion. Consider, for example, the energy market which is characterized by high uncertainty about future demands, future regulation, and future cost of alternative energy sources or technolo-

[8] We cannot include the contemporaneous return dispersion due to the high correlation with average stock returns. Consider the case where the spread in market betas is constant over time; the average market returns will determine the cross-sectional dispersion in returns. For the same reason, we included both earnings dispersion and average earnings changes as independent variables.

gies. As a result of technological uncertainty, firms invest in different production technologies such as coal, gas, nuclear, wind, solar, etc. This leads investors to have estimation uncertainty regarding the future profitability of the sector and the economy as a whole and at the same time, we expect future dispersion in performance as technology evolves. To the extent that periods with high dispersion are predictable in the previous period, we would expect the following. In anticipation of higher dispersion in future earnings, i.e., higher estimation uncertainty concerning the next period, investors require a higher expected return in the next period which in turn depresses current stock prices resulting in lower current period stock return.

An extensive literature in finance investigates the effect of estimation uncertainty on equilibrium stock returns, including Barry and Brown (1985), Clarkson, Guedes, and Thompson (1996), Coles and Loewenstein (1988), and Coles, Loewenstein, and Suay (1995). In these single period horizon models, investors are a priori uncertain about parameters that determine the level of future cash flows or the variance of future cash flows. When investors have higher degree of estimation uncertainty, they require compensation in the form of a higher risk premium. Thus, as estimation uncertainty changes, time varying risk premia are predicted to result. This estimation uncertainty likely has both a firm-specific component and an economy-wide component.[9] While the initial literature focused on the firm-specific component of estimation uncertainty, recent papers such as Barberis, Vishny, and Shleifer (1998) could be viewed as incorporating the economy-wide component as regime shifts which could explain investor sentiment. In a similar vein, Easley and O'Hara (2006) use prospect theory to argue that some investors refrain from participating in the stock market when there is too much ambiguity about the future payoffs. Overall, this literature suggests how market-wide returns are affected by estimation uncertainty. Alternatively, dispersion in earnings may lead to increased heterogeneity in investors' beliefs which in turn may affect stock prices (see Varian, 1985, among others).

2.1 The Role of Predictability

The empirical implications our findings rely on predictability of both earnings changes and dispersion. To see this, consider initially an efficient market where earnings changes are unpredictable. In

[9] In the limit, with infinitely large number of firms, we expect firm-level variations to be diversifiable. However, since the number of firms in the market is finite and the earnings distribution has fat tails (see Abarbanell and Lehavy, 2003), firm-level earnings variation may not be fully diversifiable.

that case, prior period prices and lagged returns can not reflect future earnings changes and earnings dispersion. Consequently, we would only expect a contemporaneous relation between earnings dispersion and returns. Consider instead an efficient market where investors partially anticipate future earnings changes and their dispersion. In this setting, prior period prices would reflect investors' information about future earnings changes and dispersion and therefore lagged returns would be associated with next period earnings changes and earnings dispersion.

Predictability also affects the interpretation of the contemporaneous relation between returns and predictable variables such as earnings changes and dispersion. Stock returns have three components: expected returns, $E_{t-1}(r_t)$ (the discount rate demanded by investors), return news - N_r, and cash flow news, N_{cf} (Campbell, 1991). Since earnings changes and dispersion are predictable, their contemporaneous relation with returns are affected through the expected returns (Chen, 1991).[10] For example, if contemporaneous technological uncertainty leads to high expected dispersion (high future dispersion), stock returns would decline - resulting in a negative association between returns and future earnings dispersion. In other words, $cov(Dispersion_{t+1}, r_t) < 0$ because $cov(Dispersion_{t+1}, N_{t,r}) > 0$. At the same time, investors respond in anticipation of earnings dispersion and therefore demand higher (expected) rates of returns, resulting in a positive contemporaneous relation between earnings dispersion and aggregate returns [$cov(Dispersion_{t+1}, E_t r_{t+1}) > 0$]. Note that since the news component of returns is likely to be larger than the expected component, we expect a more robust relation between earning dispersion and lagged returns compared with contemporaneous returns.

3 Data

Our sample consists of all firms with December fiscal year-end from 1951 to 2005, with available return data in the CRSP monthly file and accounting data in the COMPUSTAT annual database. The December fiscal year-end requirement avoids misspecifications due to different reporting periods. The annual return is measured by cumulative return from April of year t until March of year $t+1$. We calculate the equal-weighted and value-weighted return of all individual stocks in our sample in each year. We measure earnings as income before extraordinary items, scaled

[10] Note that the positive contemporaneous relation between expected earnings dispersion and expected aggregate stock returns imply the predictability of stock returns as well (see Fama and French, 1988, 1989; Campbell and Shiller, 1988a, 1988b; Campbell, 1991; Lamont, 1998; Lettau and Ludvigson, 2001; and Ang and Bekaert, 2007).

by market value at the beginning of the fiscal period. We use equal-weighted and value-weighted cross-sectional mean of individual stock's earnings changes. Our value weights are the market capitalizations at the beginning of the period.

For each year, we exclude stocks with the beginning-of-period prices below $1 and the top and bottom 5% of firms ranked by earnings changes used in the tests. We also exclude firms in top and bottom 5% ranked by value weights since extreme value weights can cause inaccurate calculations of second moments (suggested by SAS). Finally, we exclude firms with negative book value. The average number of stocks per year is about 1,320 in our sample, increasing from 220 in 1951 to 2,865 in 2005.

Table 1 reports summary statistics for our sample. Both equal-weighted and value-weighted market returns are approximately 15% annually in our sample. These figures are consistent with prior studies such as Sadka (2007). The equal-weighted and value-weighted aggregate earnings change results in similar statistics. For example, the equal-weighed and value-weighted mean earnings changes are 0.006 and 0.004, respectively.

3.1 The Time-Series of Earnings and Returns

Figure 1 presents the time-series of aggregate earnings changes scaled by beginning period price. The figure plots both the equal-weighted (Figure 1a) and value-weighted (Figure 1b) earnings changes. Each figure also plots the corresponding equal-weighted and value-weighted market returns. These figures are consistent with those reported in Kothari, Lewellen, and Warner (2006). Note that neither earnings nor returns exhibit a trend or any particular serial correlation.

Figure 1 also reveals some interesting patterns regarding the relation between earnings changes and stock returns, previously documented in Kothari, Lewellen, and Warner (2006) and Sadka and Sadka (2008). In particular, earnings changes appear to lag stock returns, i.e., stock returns are positively correlated with the one-period ahead earnings changes. This result is consistent with accounting conservatism insofar as accounting income (earnings) lags economic income as reflected in stock returns. In addition, earnings changes appear to be negatively correlated with contemporaneous stock returns. These apparent relations between earnings changes and contemporaneous and lagged stock returns are consistent with the correlations reported in Table 2. For example, equal-weighted stock returns have a -0.170 correlation with contemporaneous equal-weighted earnings changes and a 0.295 correlation with the one-period ahead equal-weighted earnings changes.

3.2 Our Dispersion Measure

Our earnings dispersion measure, $DISP_t$, is based on the cross-sectional standard deviation of firm-level changes in earnings scaled by beginning period stock price ($\sigma\left[\left(\Delta X_{j,t}\right)/P_{j,t-1}\right]$).[11] While earnings changes and returns do not appear to have a trend, the cross-sectional firm-level dispersion in earnings changes is increasing over time (Figure 2a). The time trend in cross-sectional dispersion is apparent from casual inspection. This trend in dispersion is probably not due to the increase over time in the number of firms in our sample. If the earnings distribution remains unchanged, sampling more observations should not change its standard deviation. A larger sample should increase the accuracy of our measures for both average earnings change and for dispersion, but a larger sample should not generate a trend.[12]

The trend in earnings dispersion is more likely due to changes in the distribution of earnings. In particular, Basu (1997) and Givoly and Hayn (2000) suggest that accounting conservatism has increased over time, which should increase the dispersion in earnings changes. Note that the time trend, apparent in Figure 2a, is similar to the trend in the earnings response to bad news reported in Basu (1997). Figure 3 presents the evolution of the Basu (1997) measure of conservatism as bad news coefficient, $(\beta_1 + \beta_2)$, from the following cross-sectional regression equation:

$$\frac{X_{j,t}}{P_{j,t-1}} = \alpha_0 + \alpha_1 \cdot DR_{j,t} + \beta_1 \cdot R_{j,t} + \beta_2 \cdot DR_{j,t} \cdot R_{j,t} + \eta_{j,t} \tag{1}$$

where $X_{j,t}$ and $R_{j,t}$ denote net income before extraordinary items and stock returns for firm j in period t. $P_{j,t-1}$ denotes market value for firm j at the beginning of period t. $DR_{j,t}$ is a dummy variable that equals 1 if $R_{j,t} < 0$ and zero otherwise. Figure 3 presents the sensitivity of earnings to negative returns (bad news), $\beta_1 + \beta_2$, along with raw dispersion, σ_t. The figure is consistent with the hypothesis that earnings dispersion has increased due to an increase in conservatism. For example, both dispersion and asymmetric timeliness increase significantly after 1973, the year the

[11] Formally, we define dispersion for a cross-sectional variation in $\{x_{j,t}\}_{j=1}^{J}$ as: $\sigma_t = \sqrt{\sum_{j=1}^{J}\left(x_{j,t} - \overline{x}_t\right)^2/J}$ where $\overline{x}_t = \sum_{j=1}^{J} x_{j,t}/J$ and J is the number of observations in year t.

[12] Since the opening of the Nasdaq exchange significantly increases our sample, we excluded the Nasdaq firms and found the same trend in earnings dispersion. In addition, our remaining findings are not sensitive to the exclusion of Nasdaq firms. These results are not tabulated.

Financial Accounting Standard Board (FASB) was formed.

In addition to the trend, the cross-sectional dispersion in earnings changes are serially correlated. Therefore, in order to estimate shocks in the cross-sectional dispersion, we use the following regression models to obtain shocks to the cross-sectional raw dispersion in earnings changes:

$$\sigma_t = \alpha_0 + \alpha_1 \cdot t + \alpha_2 \cdot D_{1973} + \sum_{n=1}^{3} \gamma_n \cdot \sigma_{t-n} + \varepsilon_t \qquad (2)$$

where t is a time variable, D_{1973} is a dummy variable, which equals one if the year is after 1973, and 0 otherwise. We added this time dummy to control for the spike in conservatism reported in Basu (1997). Figure 2b presents the shocks to dispersion defined as the residual of these regression models. That is, the time-series of shocks to earnings dispersion, $DISP_t$, is the time-series estimate of the regression residuals, ε_t, which we henceforth refer to as dispersion.

Because we employ the full sample period to estimate Equation (2), we may introduce a forward looking bias. However, this forward bias is important only if we found that dispersion predicts returns, which we do not. In fact, our results, reported below, suggests that earnings dispersion is anticipated and does not predict future aggregate stock returns.

Since the results are highly sensitive to the definition of shocks, it is important to note that the relation between the cross-sectional dispersion of earnings changes and aggregate stock returns holds for several different models. In particular, the results hold when excluding the time variables and the dummy variable. Our results are also robust to excluding the third lag cross-sectional standard deviation, σ_{t-3}. In addition, one can add t^2 to the regression model in Equation (2), with no significant qualitative change to the results. In sum, we believe our results to be robust to different estimates of shocks in dispersion.

Table 1 reports summary statistics for our time-series shocks to earnings dispersion (henceforth, earnings dispersion). By construction, the mean shock is zero. In addition, the median shock to dispersion, -0.002, is very low in absolute value.

3.3 Earnings Dispersion and Aggregate Earnings

The value-weighted average $\Delta X_t/P_{t-1}\_vw$ and equal weighted average $\Delta X_t/P_{t-1}\_ew$ are as expected highly correlated, 0.957. The results reported in Table 2 suggest that the cross-sectional dispersion in firm-level earnings changes is higher during period of low aggregate earnings changes, i.e., dispersion is higher during bad times. The contemporaneous correlation between earnings dispersion, $DISP_t$, and the average earnings change varies from -0.295 and -0.380. These correlations are statistically significant as well. This high correlation may be in part attributed to accounting conservatism. The conservatism principle does not allow the full recognition of economic gains until they are realized, but requires the full recognition of an economic loss when anticipated.[13] Therefore, accounting earnings are more sensitive to "bad" news than they are to "good" news and, hence, the cross-sectional dispersion in earnings is likely to be higher during periods of lower aggregate profits.

4 The Intertemporal Relation Between Earnings Dispersion and Aggregate Stock Returns

This section tests the relation between the cross-sectional firm-level dispersion in earnings changes and aggregate stock returns. We test the contemporaneous relation, the lead relation (between contemporaneous dispersion and future returns), and the lag relation (between contemporaneous dispersion and one-period prior returns). Since our dispersion measure is correlated with the average earnings changes, it is important to control for the latter. This section utilizes the following regression model:

$$R_{t+\tau} = \delta_0 + \delta_1 \cdot \Delta X_t / P_{t-1}\_w + \delta_2 \cdot DISP_t + \xi_{t+\tau} \tag{3}$$

where $\tau = \{-1, 0, 1\}$ and $w = \{ew, vw, CRSP_{vw}\}$.

The time-series of shocks to the cross-sectional dispersion in earnings changes appears to have some significant spikes. Note that the results in this section holds when we exclude these observations. Specifically, our results are robust to excluding years 1975, 1991, 2001, and 2003.

[13] See for example, Basu (1997), Ball, Kothari, and Robin (2000), and Ball, Robin, and Sadka (2008).

4.1 The Relation between Earnings Dispersion and Contemporaneous Stock Returns

Table 2 reports the correlation between shocks to cross-sectional dispersion ($DISP_t$) and both equal-weighted market returns (R_t_ew), the value-weighted market returns (R_t_vw), as well as the full sample CRSP value-weighted buy and hold returns. The results indicate a positive association between the cross-sectional earnings dispersion and contemporaneous aggregate stock returns. The correlation varies from 0.184 to 0.345 and is statistically significant.

Table 3 reports OLS (all statistics employ Newey-West adjusted standard errors) results for estimating the regression presented in Equation (3). The results in Table 3 are consistent with the correlations reported in Table 2: $DISP_t$ is positively related to contemporaneous aggregate stock returns. The regression coefficient on dispersion varies from 1.968 to 6.677 and the t-statistic varies from 0.92 to 2.59. The relation between dispersion and contemporaneous stock returns is also reflected in the adjusted-R^2 of the regression. Excluding CRSP returns, adding $DISP_t$ compared to running Equation (3) with only $\Delta X_t/P_{t-1}\_w$ more than doubles the adjusted-R^2.

In addition to the results regarding the relation between dispersion and stock returns, Table 3 reaffirms previously documented results regarding the relation between aggregate earnings changes and aggregate stock returns. Consistent with Kothari, Lewellen, and Warner (2006), Sadka (2007), and Sadka and Sadka (2008), Table 3 documents a negative association between earnings changes and contemporaneous stock returns. The coefficient varies from -1.199 to -4.010 with a t-statistic varying from -0.43 to -1.78.

4.2 The Relation between Earnings Dispersion and Lagged Stock Returns

It is well documented in the accounting literature that earnings are not timely (e.g., Ball and Brown, 1968; and Basu, 1997). Therefore, earnings lag stock returns and are predictable. In fact, Sadka and Sadka (2008) find that contemporaneous aggregate earnings changes provide little or no new information, and that cash-flow news are reflected mostly in future earnings. Therefore, it is possible that earnings dispersion is predictable as well. To investigate this, we test the relation between earnings dispersion and lagged (period $t-1$) stock returns.

Table 4 reports OLS results for estimating Equation (3) above for lagged aggregate stock returns,

$\tau = -1$. The results are consistent with prior studies, suggesting the earnings lack timeliness and are predictable. High contemporaneous dispersion is preceded by lower aggregate stock returns. The coefficient on dispersion varies from -8.411 to -10.076. The t-statistic varies from -3.39 to -4.49, i.e., the relation is statistically significant in all models. This result is consistent with the correlations reported in Panel B of Table 2 where the correlations between $DISP_t$ and R_{t-1}_w (for $w = \{ew, vw, CRSP_{vw}\}$) vary from -0.513 to -0.554 and are statistically significant as well.

The results in Table 4 suggest that expected earnings dispersion explains a significant portion of the time-series variation in lagged aggregate stock returns. When earnings dispersion is added as an independent variable in Equation (3), the explanatory power more than quadruples. For example, when regressing value-weighted returns on value-weighted earnings changes, the adjusted-R^2 is 2.8%. When dispersion is added, the adjusted-R^2 increases significantly to 26.1%.

The combined results in Tables 2-4 suggest that the cross-sectional earnings dispersion is positively correlated with contemporaneous stock returns and negatively correlated with lag stock returns. Therefore, the results are consistent with investors demanding higher (expected) rates of return during periods of high expected earnings dispersion, which results in price declines overall.

4.3 The Relation between Earnings Dispersion and Lead Stock Returns

One possible reason for the positive association between earnings dispersion and contemporaneous stock returns is that high contemporaneous dispersion is associated with declines in the expected rates of returns. The Campbell (1991) return decomposition is useful for demonstrating the intuition.[14] Campbell decomposes stock returns into three components: expected returns, cash-flow news, and returns news as follows:

$$r_t = E_{t-1}(r_t) + N_{cf} - N_r \tag{4}$$

where r_t denotes stock returns (lower case letters denotes logs here). News about cash flow, N_{cf}, is defined as $N_{cf} = (E_t - E_{t-1}) \sum_{n=0}^{\infty} \rho^n \Delta d_{t+n}$, where d denotes dividends and ρ denotes the discount factor, i.e., changes in expected cash flows. Consistently, returns news (changes in expected returns), N_r, is defined as $N_r = (E_t - E_{t-1}) \sum_{n=1}^{\infty} \rho^{n-1} r_{t+n}$.

[14] See also Callen and Seagal (2004) and Khan (2008).

The relation between contemporaneous dispersion and contemporaneous and lagged returns results suggest that $corr\left(r_t, DISP_t\right) > 0$, because dispersion is predictable and $corr\left(E_{t-1}\left(r_t\right), DISP_t\right) > 0$. However, it is also possible that $corr\left(r_t, DISP_t\right) > 0$, because $corr\left(N_r, DISP_t\right) < 0$. To test the latter hypothesis, we estimate Equation (3) above for future returns, $\tau = 1$. The results are reported in Table 5.

The results in Table 5 are not consistent with the hypothesis that $corr\left(N_r, DISP_t\right) < 0$. The coefficient changes signs in the different regression models. In addition, the coefficient is statistically insignificant in all models. Panel C of Table 2 reaffirms this conclusion. While the correlation between earnings dispersion and lead stock returns is negative with correlations of -0.172 and -0.260, it is statistically insignificant for both equal-weighted and value-weighted returns and only marginally significnat for CRSP value-weighted returns.

Equation (4) states that the positive relation between earnings dispersion and aggregate stock returns may be due to a positive relation between dispersion and future cash flows, $corr\left(N_{cf}, DISP_t\right) > 0$. In unreported results, we find some evidence consistent with a positive relation between earnings dispersion and lead aggregate earnings changes. This relation is apparent from the fact that $corr\left(N_{cf}, DISP_t\right) \simeq 0.4$. In sum, while we find some evidence that earnings dispersion may provide a signal for future aggregate earnings, we do not believe this to be the main reason for the observed relation between aggregate stock returns and earnings dispersion. The reason is that if high earnings dispersion suggests higher future profits, then high expected dispersion should result in high stock returns. Nevertheless, our findings suggest that the relation between earnings dispersion and lagged stock returns is negative.

4.4 Controlling for Previously Identified Macroeconomic Factors

Prior asset pricing literature recognizes that expected returns vary over time and identifies variables that relate to expected returns. In this section, we document the extent to which dispersion adds to previously identified macroeconomic factors that relate to expected returns. We first describe these macroeconomic factors. Second, we demonstrate that our measure of earnings dispersion has incremental explanatory power.

We first control for business cycles as Fama and French (1989) documents that expected stock return is related to business conditions. We include in the regression an indicator variable, D_rec_t, which equals one in the recession periods using the business cycle dates provided by NBER and zero otherwise.[15]

The next two variables we consider are consumption-to-wealth ratio (cay_t) as in Lettau and Ludvigson (2001) and labor income-to-consumption ratio (s_t^w) as in Santos and Veronesi (2006). The data for cay_t is available from the authors' website for the years 1948 to 2001.[16]

We also control for several macro variables, such as GDP growth, industrial production growth, inflation rate, and unemployment. For these variables, we use an AR(3) time series model to estimate shocks in each year. We extract the data on Unemployment, real GDP, inflation and industrial production from the Federal Reserve Economic Data (FRED).

Finally we control for unexpected (unpredictable) market volatility as measured in French, Schwert and Stambaugh (1987). We first estimate the variance of annual return to market portfolio as below:

$$\sigma_t^2 = \sum_{i=1}^{N_t} r_{i,t}^2 + 2 \sum_{i=1}^{N_t-1} r_{i,t} r_{i,t+1} \tag{5}$$

Where there are N_t daily value-weighted market returns, $r_{i,t}$, in year t. We next use a GARCH (1, 2) model to estimate the unexpected component of realized market volatility in year t, denoted by $MVOL_t$.

Panels A and B of Table 6 reports the time-series regression of equally-weighted (value-weighted) returns on contemporaneous equally-weighted (value-weighted) earnings changes, earnings dispersion and the macroeconomic variables outlined above. Panel C reports results using the CRSP value-weighted returns. The coefficient on earnings dispersion remains positive in all specifications but one, yet the statistical significance varies. Each of the first eight columns of Panel A, which presents results using equal-weighted returns, report the results of adding individual macroeconomic factors. Overall, the results are qualitatively similar after adding individual macroeconomic factors. First, several macroeconomic factors – GDP, unemployment, market volatility and inflation – have statistically significant coefficients. Second, when adding all the macroeconomic factors

[15] http://www.nber.org/cycles.html

[16] The data for cay_t is extracted from: http://faculty.haas.berkeley.edu/lettau/data_cay.html. For the variable s_t^w, we follow Santos and Veronesi (2006) and measure consumption as nondurables plus services. In a similar vein, we measure labor income as wages and salaries, plus transfer payment plus other labor income minus personal contributions for social insurances minus taxes. These data are obtained from Bureau of Economic Analysis.

from the prior literature, the adjusted R^2 increases to 32.4%. In the right most column, where all macroeconomic factors are included, the statistical significance of our dispersion measure declines and becomes statistically insignificant.

Panels B and C reports results using the value-weighted returns and the CRSP value-weighted returns. Consistent with results reported in Table 3, the results are generally weaker when using the value-weighted measures. Our dispersion measure is largely statistically insignificant, albeit positive.

Table 7 reports the association between earnings dispersion and lagged stock returns after controlling for prior macroeconomic variables. Only two variables, inflation and unemployment, are statistically significant in all three specifications using equal-weighted, value-weighted, and CRSP value-weighted returns. Comparing Table 4 and Panel A of table 7, we observe that the effect of adding inflation and unemployment is an increase in adjusted R^2 from 29% to 42.8% and 32%, respectively. Panels B and C report similar increases in the adjusted R^2. In terms of our earnings dispersion measure, the coefficient remains both negative and statistically significant in all specifications after controlling for other macroeconomic factors.

To further assess whether earnings dispersion adds explanatory power for understanding time-varying expected returns, we also omitted dispersion from the regression. We find that earnings dispersion contributes little in explaining contemporaneous stock returns, but significantly contributes in explaining lagged returns. Specifically, the adjusted R^2 increases from 23.7% to 36.7% when earnings dispersion is added in explaining the equal-weighted market returns (Table 7 Panel A). Similarly, the adjusted R^2 increases from 24.8% to 36.0% when earnings dispersion is added in explaining the value-weighted market returns (Table 7 Panel B). Finally, the adjusted R^2 increases from 24.8% to 36.0% when earnings dispersion is added in explaining the CRSP value-weighted market returns (Table 7 Panel C).

5 Robustness Tests

The empirical tests above are conducted using equal-weighted and value-weighted returns for the firms in our sample. In this section, we replicate our tests using the full sample CRSP equal-weighted and value-weighted returns. In addition, our results using price-deflated earnings dispersion might be driven purely by the denominator, i.e., the dispersion of stock prices. To address this concern, we perform additional robustness tests. First, we redo the contemporaneous and lagged return regressions in Tables 3 and 4 while controlling for the dispersion in book-to-market. Second, we use different dispersion measures, such as earnings changes deflated by total assets. Third, we test whether our results hold for returns in excess of the risk-free rate. Fourth, we also control for other macro-economic variables. Finally, We also controlled for the possibility of time-varying volatility in aggregate stock returns. Our results are robust to all these additional tests.

5.1 Using Volatility Index as a Measure of Uncertainty

VIX_t and VXO_t are the annual average of CBOE Volatility Index under new methodology and old methodology respectively, where CBOE changed the methodology of calculating implied volatility in 2003. The new methodology measure starts from 1990. The old methodology measure starts from 1986.[17]

The results using VIX_t and VXO_t are reported in Table 8 in Panels A and B, respectively. Since using VIX_t and VXO_t limits the number of observations, we add only these measures individually as controls. Our findings are similar to those reported in Table 3. The contemporaneous relation between earnings dispersion and aggregate stock returns is positive and weakly statistically significant. The relation between earnings dispersion and lagged stock returns remains statistically significantly negative in all specifications (using the equal-weighted, the value-weighted and the CRSP value-weighted aggregate returns).

5.2 Controlling for Book-to-Market

The data on book value is available in COMPUSTAT after year 1962. Therefore, our first robustness test covers the period from 1963 to 2005. We further delete the up and bottom 5% of firms ranked by book-to-market ratio each year. Similar to earnings dispersion, we first obtain the time-series shocks to cross-sectional dispersion in book-to-market ratio, $DISP_t\_btm$, as the estimated residual from the following regression model:

[17] http://www.cboe.com/micro/vix/historical.aspx

$$\sigma_t\_btm = a_0 + \sum_{n=1}^{3} b_n \cdot \sigma_{t-n}\_btm + \varepsilon_t\_btm \tag{6}$$

If our previous results were driven by the beginning-of-period price volatility, we would expect that the book-to-market dispersion at the beginning of period will capture this effect and make the earnings dispersion insignificant. The untabulated results show that the coefficients on cross-sectional earnings dispersion are still consistent with previous tests. In sum, controlling for book-to-market dispersion does not qualitatively affect our results.

5.3 Scaling by Total Assets

We also perform tests using the alternative earnings dispersion measure: Earnings change deflated by the beginning of period total assets. We delete the bottom 10% and up 5% of the asset deflated earnings change since accounting numbers are more negatively skewed due to conservatism. We calculated both the equal-weighted and asset value-weighted means and standard deviations for asset deflated earnings changes.[18] The shocks to asset-deflated earnings dispersion are again obtained from the AR(1) time series model with a dummy variable for years after 2000.[19] The untabulated results using the asset-deflated earnings change measures are consistent with our prior tests results. The earnings dispersion is positively related to contemporaneous returns and negatively related to lagged returns.

5.4 Excess Returns

Our results above use the raw aggregate market returns. As robustness, we test whether the relation between earnings dispersion and stock returns holds for returns in excess of the risk-free rate (extracted from the Fama and French database on WRDS). In untabulated results, we find that the relation between earnings dispersion and stock returns holds for returns in excess of the risk-free rate as well, suggesting that earnings dispersion is not driven by variation in the risk-free rate but is in fact related to the risk premium. For example, excess returns are high during periods

[18] We use total asset value as weights to calculate the weighted average and standard deviation of asset-deflated earnings changes in a similar fashion to the aggregate measure (dE/B-agg) in Kothari, Lewellen, and Warner (2006).

[19] The shock model for earnings dispersion includes a dummy variable for the years after 2000, as the trend plot of raw dispersion shows an apparent change in the time-series pattern after 2000. Excluding the dummy variable in the shock model will not change the results substantially.

of high dispersion because investors demand a high risk premium.

6 Conclusion

As noted above, traditional asset pricing model suggest that cross-sectional dispersion in earnings per se should not matter. However, this paper provides initial evidence that cross-sectional dispersion in earnings changes are negatively (positively) associated with (past) contemporaneous aggregate stock returns. Our findings are robust to including different macroeconomic indicators that prior studies show to be related to stock returns.

While this paper documents a robust relation between earnings dispersion, the source of these relation remains unclear. A possible interpretation of our findings is that earnings dispersion is associated with investors uncertainty, which affects equilibrium stock returns. However, absent a comprehensive measure of investor uncertainty, we cannot easily test this hypothesis. We leave this for future research.

7 References

Abarbanell, Jeffery, and Reuven Lehavy, 2003. Biased forecasts or biased earning? The role of reported earnings in explaining apparent bias and over/underreaction in analysts' earnings forecasts. *Journal of Accounting and Economics* 36, 105-146.

Abel, Andrew B, 1988 Stock prices under time-varying dividend risk : An exact solution in an infinite-horizon general equilibrium model. *Journal of Monetary Economics* 22 (3): 375-393

Abraham, Katharine G., and Lawrence F. Katz, 1986. Cyclical unemployment: Sectoral shifts or aggregate disturbances? *The Journal of Political Economy* 94, 507-522.

Ang, Andrew, and Geert Bekaert, 2007. Stock return predictability: Is it there? *Review of Financial Studies* 20, 651-707.

Angeletos, George-Marios, and Alessandro Pavan, 2007. Efficient use of information and social value of information. *Econometrica* 75, 1105-1143.

Anilowski, Carol, Mei Feng, and Douglas J. Skinner, 2007. Does earnings guidance affect market returns? The nature and information content of aggregate earnings guidance. *Journal of Accounting and Economics* 44, 36-63.

Ball, Ray, and Philip Brown, 1968. An empirical evaluation of accounting income numbers. *Journal of Accounting Research* 6, 159-178.

Ball, Ray, S.P. Kothari, and Ashok Robin, 2000. The effect of international institutional factors on properties of accounting earnings. *Journal of Accounting and Economics* 29, 1-51.

Ball, Ray, Ashok Robin, and Gil Sadka, 2008. Is financial reporting shaped by equity markets or by debt markets? An international study of timeliness and conservatism. *Review of Accounting Studies* 13, 168-205.

Ball, Ray, Gil Sadka, and Ronnie Sadka, 2008. Aggregate earnings and asset prices, working paper - Columbia University.

Barberis, Nicholas, Robert W. Vishny, and Andrei Shleifer, 1998. A model of investor sentiment. *Journal of Financial Economics* 49, 307-343

Barry, Christopher B., and Stephen J. Brown, 1985. Differential information and security market equilibrium. *Journal of Financial and Quantitative Analysis* 20, 407-422.

Basu, Sudipta, 1997. The conservatism principle and the asymmetric timeliness of earnings. *Journal of Accounting and Economics* 24, 3-37.

Boyd, John H., Jian Hu, and Ravi Jagannathan, 2006. The stock market's reaction to unemployment news: Why bad news is usually good for stocks. *Journal of Finance* 60, 549-672.

Brown, Lawrence D., Paul A. Griffin, Robert L. Hagerman, and Mark E. Zmijewski, 1987. An evaluation of alternative proxies for the market's assessment of unexpected earnings. *Journal of Accounting and Economics* 9, 159-193.

Callen, Jeffrey L., and Dan Segal, 2004. Do accruals drive stock returns? A variance decomposition analysis. *Journal of Accounting Research* 42, 527-560.

Campbell, John Y., 1991. A variance decomposition for stock returns. *Economic Journal* 101, 157-179.

Campbell, John Y., and Martin Lettau, 1999. Dispersion and volatility in stock return: An empirical investigation. Unpublished Manuscript.

Campbell, John Y., Martin Lettau, Burton G. Malkiel, and Yexiao Xu, 2001. Have individual stocks become more volatile? An empirical exploration of idiosyncratic risk. *The Journal of Finance* 56, 1-43.

Campbell, John Y., and Robert J. Shiller, 1988a. The dividend-price ratio and expectations of future dividends and discount factors. *Review of Financial Studies* 1, 195-227.

Campbell, John Y., and Robert J. Shiller, 1988b. Stock prices, earnings, and expected dividends. *The Journal of Finance* 43, 661-676.

Chen, Nai-Fu, 1991. Financial investment opportunities and the macroeconomy. *Journal of Finance* 46, 529-554.

Clarkson, Pete, Jose Guedes, and Rex Thompson, 1996. On the diversification, observability, and measurement of estimation risk. *The Journal of Financial and Quantitative Analysis* 31, 69-84.

Coles, Jeffrey L., and Uri Loewenstein, 1988. Equilibrium pricing and portfolio composition in the presence of uncertain parameters. *Journal of Financial Economics* 22, 279-303.

Coles, Jeffrey L., Uri Loewenstein, and Jose Suay, 1995. On equilibrium pricing under parameter uncertainty. *Journal of Financial and Quantitative Analysis* 30, 347-364.

Collins, Daniel W., S.P. Kothari, 1989. An analysis of intertemporal and cross-sectional determinants of earnings response coefficients. *Journal of Accounting and Economics* 11, 143-181.

Collins, Daniel W., S.P. Kothari, and Judy D. Rayburn, 1987. Firm size and the information content of prices with respect to earnings. *Journal of Accounting and Economics* 9, 111-138.

Collins, Daniel W., S.P. Kothari, Jay Shanken and Richard G. Sloan, 1994. Lack of timeliness and noise as explanations for the low contemporaneous return-earnings association. *Journal of Accounting and Economics* 18, 289-324.

Cox, John C., Jonathan E. Ingersoll, Jr., and Stephen A. Ross, 1985. An interremporal general equilibrium model of asset prices. *Econometrica* 53, 363-384.

Easley, David, and Maureen O'Hara, 2006. Microstructure and ambiguity. Working paper - Cornell University.

Fama, Eugene F., 1990. Stock returns, expected returns, and real activity. *Journal of Finance* 45, 1089-1108.

Fama, Eugene F., and Kenneth R. French, 1988. Dividend yields and expected stock returns. *Journal of Financial Economics* 22, 3-25.

Fama, Eugene F., and Kenneth R. French, 1989. Business conditions and expected returns on stocks and bonds. *Journal of Financial Economics* 25, 23-49.

Fama, Eugene F., and Kenneth R. French, 1997. Industry costs of equity. *Journal of Financial Economics* 43, 153-193.

French, Kenneth R., G. William Schwert, and Robert F. Stambaugh, 1987. Expected stock returns and volatility. *Journal of Financial Economics* 19, 3-29.

Givoly, Dan, and Carla Hayn, 2000. The changing time-series properties of earnings, cash flows and accruals: Has financial reporting become more conservative? *Journal of Accounting and Economics* 29, 287-320.

Hamilton, James D., 1988. A neoclassical model of unemployment and the business cycle. *Journal of Political Economy* 96, 593-617.

Hirshleifer, David, Kewei Hou, and Siew Hong Teoh, 2009. Accruals, cash flows, and aggregate stock returns. *Journal of Financial Economics* 91, 389-406.

Hosios, Arthur J., 1994. Unemployment and vacancies with sectoral shifts. *American Economic Review* 84, 124-144.

Jagannathan, Ravi, and Zhenyu Wang, 1996. The CAPM is alive and well. *Journal of Finance* 51, 3–53.

Jiang, Danling, 2007. Cross-sectional dispersion of firm valuations and expected returns. Working Paper - Florida State University.

Khan, Mozaffar, 2008. Are accruals mispriced? Evidence from tests of an Intertemporal Capital Asset Pricing Model. *Journal of Accounting and Economics* 45, 55-77.

Kothari, S.P., Jonathan W. Lewellen, and Jerold B. Warner, 2006. Stock returns, aggregate earnings surprises, and behavioral finance. *Journal of Financial Economics* 79, 537-568.

Kothari, S.P., and Richard G. Sloan, 1992. Information in prices about future earnings: Implications for earnings response coefficients. *Journal of Accounting and Economics* 15, 143-171.

Lamont, Owen, 1998. Earnings and expected returns. *Journal of Finance* 53, 1563-1587.

Lambert, Richard A., Christian Leuz, and Robert E. Verrecchia, 2007. Accounting information, disclosure, and the cost of capital. *Journal of Accounting Research* 45, 385-420.

Lettau, Martin, and Sydney C. Ludvigson, 2001. Resurrecting the (C)CAPM: A cross-sectional test when risk premia are time-varying. *The Journal of Political Economy* 109, 1238-1287.

Lilien, David M., 1982. Sectoral shifts and cyclical unemployment. *The Journal of Political Economy* 90, 777-793.

Lintner, John, 1965. The valuation of risk assets and the selection of risky investments in stock portfolios and capital budgets. *Review of Economics and Statistics* 47, 13-37.

Loungani, Prakash, Mark Rush, and William Tave, 1990. Stock market dispersion and unemployment. *Journal of Monetary Economics* 25, 367-388.

Lucas, Robert E., Jr., 1978. Asset prices in an exchange economy. *Econometrica* 46, 1429-1445.

Merton, Robert C., 1973. An intertemporal capital asset pricing model. *Econometrica* 41, 867-887.

Park, Cheolbeom, 2005. Stock return predictability and the dispersion in earnings forecasts. *Journal of Business* 78, 2351-2376.

Ross, Stephen A., 1976. The arbitrage theory of capital asset pricing. *Journal of Economic Theory* 13, 341-360.

Sadka, Gil, 2007. Understanding stock price volatility: The role of earnings. *Journal of Accounting Research* 45, 199-228.

Sadka, Gil, and Ronnie Sadka, 2008. Predictability and the earnings-returns relation. *Journal of Financial Economics* (forthcoming).

Santos, Tano, and Pietro Veronesi, 2006. Labor income and predictable stock returns. *Review of Financial Studies* 19, 1-44.

Schwert, William G., 1990. Stock returns and real activity: A century of evidence. *Journal of Finance* 45, 1237-1257.

Sharpe, William F., 1964. Capital asset prices: A theory of market equilibrium under conditions of risk. *Journal of Finance* 19, 425-442.

Varian, Hal R., 1985. Divergence of opinion in complete markets: A note. *Journal of Finance* 40, 309-317.

Figure 1a Aggregated Annual Returns, 1951-2005

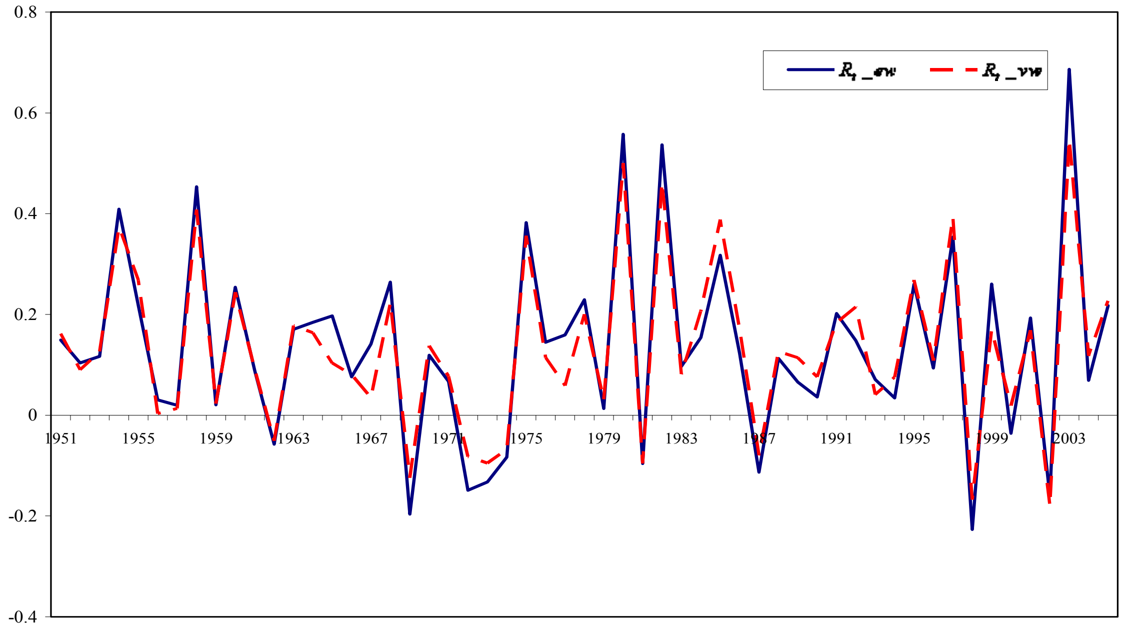
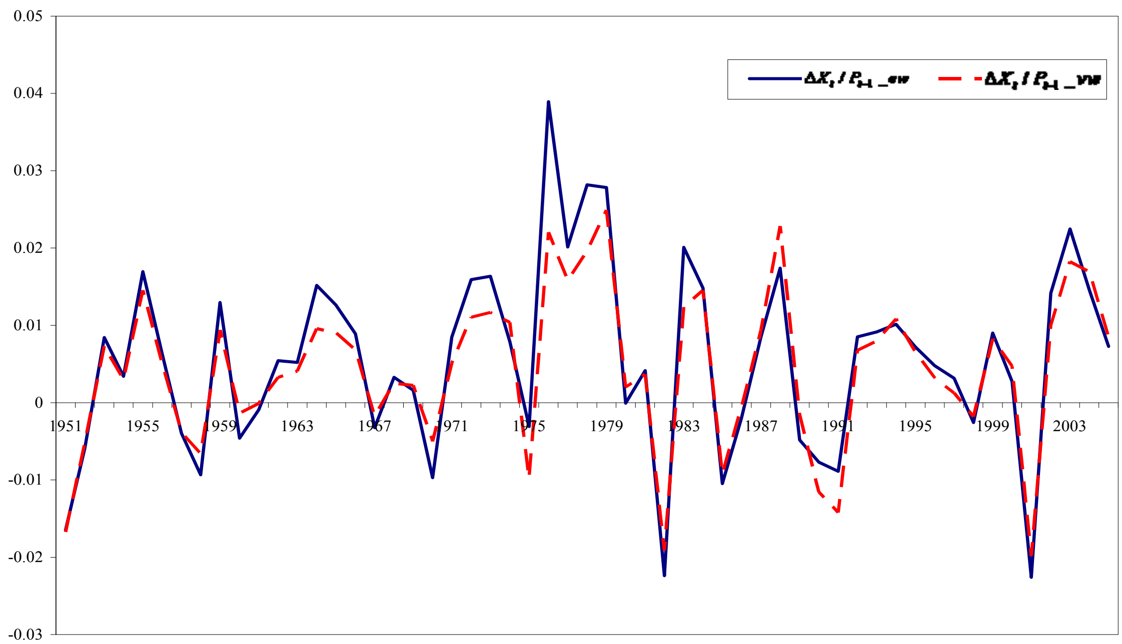


Figure 1b Aggregated Annual Earnings Change, 1951-2005



This figure plots the time series average return and earnings changes for all firms from 1951 to 2005. $\Delta X_t / P_{t-1}$*_ew* and $\Delta X_t / P_{t-1}$*_vw* are the average deflated change in earnings which is defined as the ratio of change in earnings before extraordinary items from fiscal year *t-1* to fiscal year *t*, deflated by the stock price at the beginning of fiscal year *t*. R_t*_ew* and R_t*_vw* are equal-weighted and value-weighted returns, calculated as cumulative market return from April of year t until March of year *t+1*.

Figure 2a Raw Dispersion of Earnings Change (σ_t) , 1951-2005

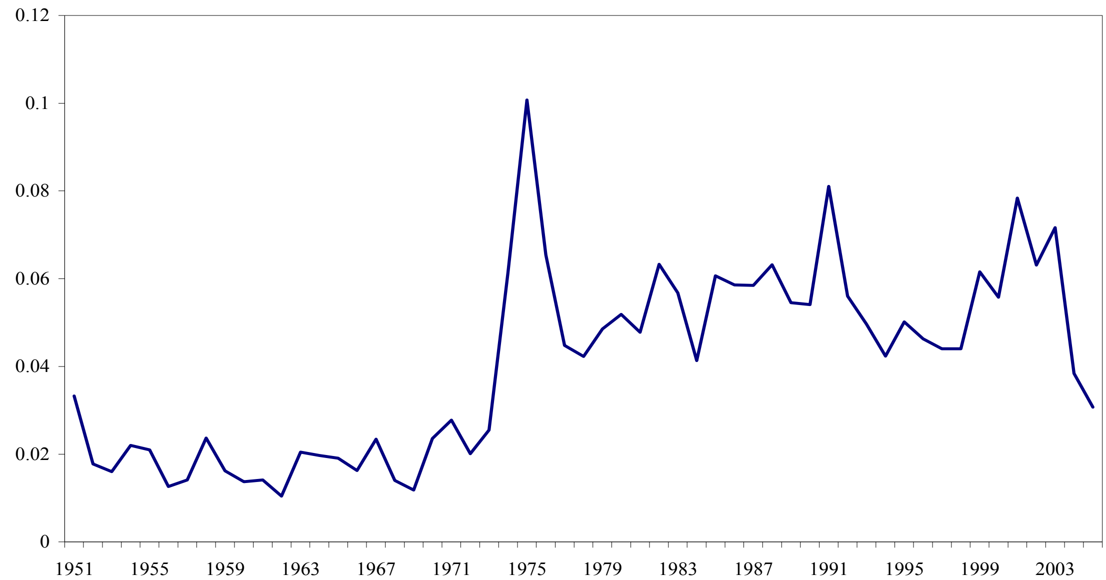


Figure 2b Dispersion of Earnings Change ($DISP_t$), 1954-2005

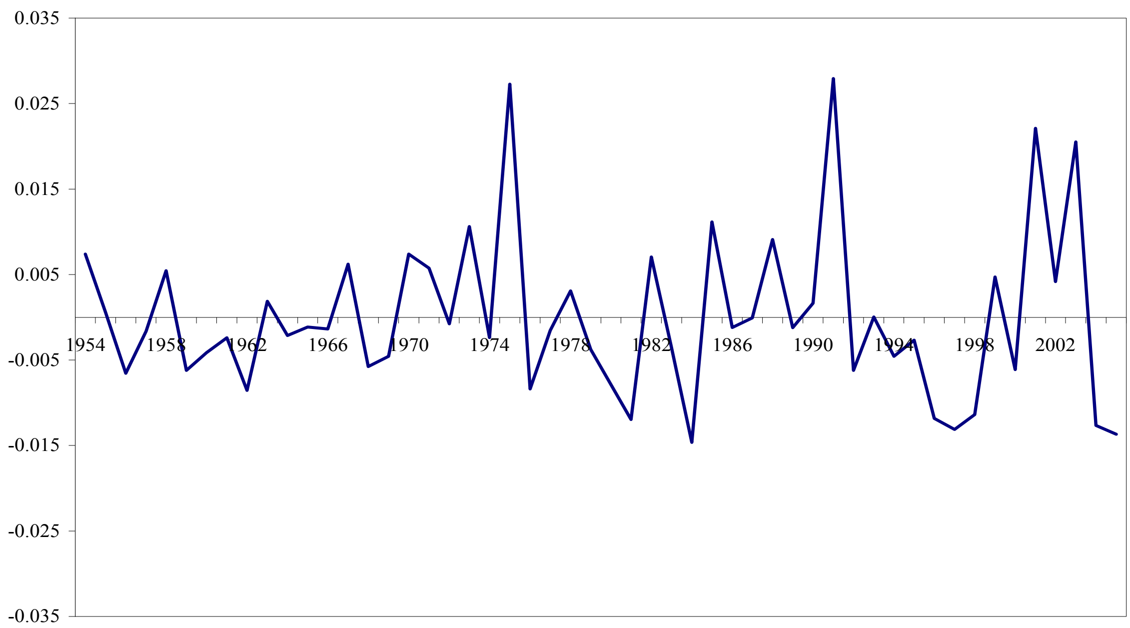


Figure 2a plots the time series of raw dispersion of earnings change and Figure 2b presents its de-trended time series. The raw dispersion, σ_t, is the dispersion of earnings changes. Earnings changes are scaled by beginning period market value, that is, $\left(\Delta X_t / P_{t-1}\right)$ for all sample firms in year *t*. $DISP_t$ is the estimated residual, ε_t, from the regression: $\sigma_t = \alpha_0 + \alpha_1 t + \alpha_2 D_{1973} + \gamma_1 \sigma_{t-1} + \gamma_2 \sigma_{t-2} + \gamma_3 \sigma_{t-3} + \varepsilon_t$, where D_{1973} is a dummy variable equal to 1 for years after 1973, and 0 otherwise. The scales of the left and right vertical axes are for equal-weighted and value-weighted values, respectively.

Figure 3 Raw Dispersion of Earnings and
Coefficient of Negative Returns in Basu (1997)

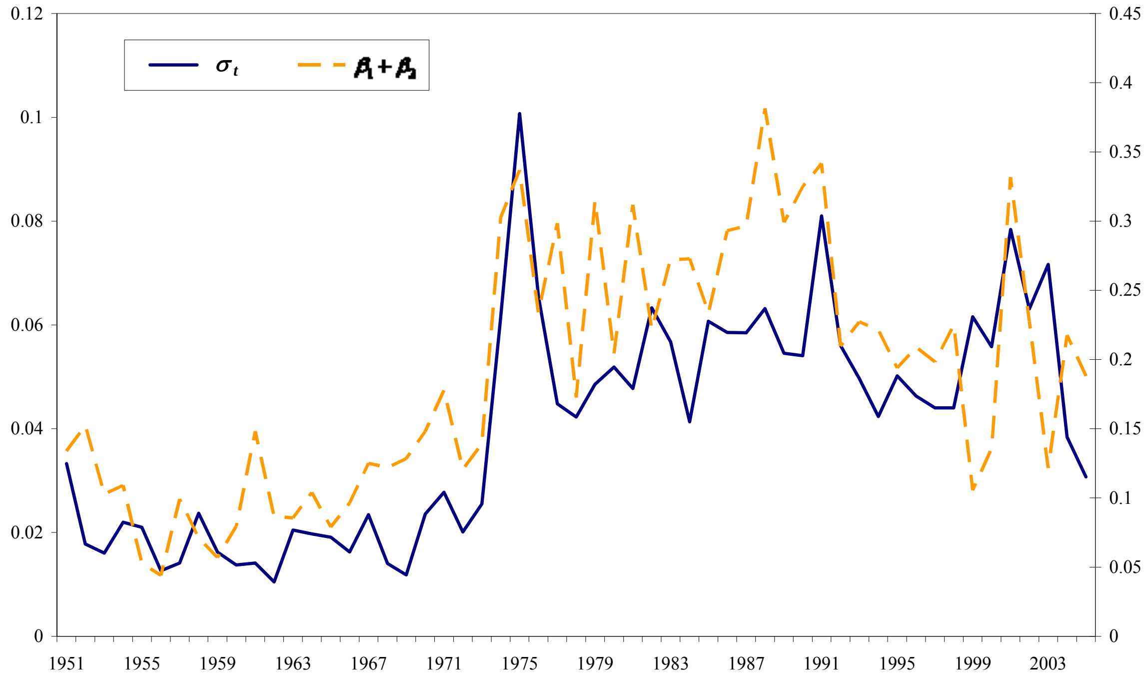


Figure 3 plots the time series equal-weighted raw dispersion and the slope coefficient of earnings on negative return in Basu (1997). The raw dispersion, σ_t, is the standard deviation of earnings change per share ($\Delta X_t/P_{t-1}$) for all sample firms in year t. We estimate $\beta_1+\beta_1$ from the following regression $X_{j,t}/P_{j,t-1}=\alpha_0+\alpha_1 DR_{j,t}+\beta_1 R_{j,t}+\beta_2 DR_{j,t}*R_{j,t}+\eta_{j,t}$, where $X_{j,t}/P_{j,t-1}$ is market-adjusted earnings deflated by the price at the beginning of fiscal year t, $R_{j,t}$ is the market-adjusted return for firm j in year t, and $DR_{j,t}$ is a dummy variable for negative return firm-year observations. The scale of the left vertical axis is for σ_t, and scale of the right vertical axis is for the Basu coefficient, $\beta_1+\beta_1$.

Table 1
Descriptive Statistics

This table reports the descriptive statistics for aggregate stock returns, earnings changes, earnings dispersion, and unemployment from 1951 to 2005. Return is the cumulative market return from April of year t until March of year $t+1$. R_t_ew and R_t_vw are equal-weighted and value-weighted returns of our sample firms, respectively. $CRSPvw_t$ is the CRSP value weighted return accumulated from April of year t until March of year $t+1$. $\Delta X_t/P_{t-1}$ is the average change in income before extraordinary items in fiscal year t from fiscal year $t-1$, deflated by the market value at the beginning of period t. σ_t is the standard deviation of equal-weighted earnings changes per share ($\Delta X_t/P_{t-1}$) for all sample firms in year t. The value-weighted measures use the market value at the beginning of fiscal year t as the weight. $DISP_t$ is the de-trended dispersion (standard deviation) of earnings changes in year t. We exclude data for firms with non-December fiscal year-end for 1954-2005, stock price below \$1, and the top and bottom 5% of firms ranked by $\Delta X_t/P_{t-1}$ and the weight variables.

	Returns			Earnings		
				Average Earnings		Dispersion
	R_t_ew	R_t_vw	$CRSPvw_t$	$\Delta X_t/P_{t-1}\_ew$	$\Delta X_t/P_{t-1}\_vw$	$DISP_t$
Mean	0.159	0.142	0.126	0.006	0.004	0.000
Std.dev	0.201	0.167	0.171	0.012	0.010	0.010
Median	0.131	0.124	0.127	0.006	0.005	-0.002
Min.	-0.185	-0.188	-0.258	-0.023	-0.021	-0.016
Max.	0.790	0.548	0.470	0.043	0.026	0.031

Table 2
Correlation Matrix

This table reports the correlations among time series returns, earnings changes, and earnings dispersion. Return is the cumulative market return from April of year *t* until March of year *t+1*. R_t_*ew* and R_t_*vw* are equal-weighted and value-weighted returns, respectively. $CRSPvw_t$ is the CRSP value weighted return accumulated from April of year *t* until March of year *t+1*. $\Delta X_t/P_{t-1}$ is the average change in earnings before extraordinary items in fiscal year *t* from fiscal year *t-1*, deflated by the market value at the beginning of period *t*. σ_t *is* the standard deviation of scaled earnings changes ($\Delta X_t/P_{t-1}$) for all sample firms in year *t*. The value-weighted measures use the market value at the beginning of fiscal year *t* as the weight. $DISP_t$ is the de-trended dispersion of earnings change in year *t*, respectively. The data covers 1954-2005. We exclude firm-years with non-December fiscal year-end, stock price below $1, and the top and bottom 5% of firms ranked for each year by $\Delta X_t/P_{t-1}$ and the weight variables. *p*-value of Pearson correlation is reported in parenthesis.

Panel A: Correlation between contemporaneous returns and earnings measures

	R_t_ew	R_t_vw	$CRSPvw_t$	$\Delta X_t/P_{t-1}\_ew$	$\Delta X_t/P_{t-1}\_vw$	$DISP_t$
R_t_ew	1					
R_t_vw	0.970	1				
	(0.000)					
$CRSPvw_t$	0.851	0.931	1			
	(0.000)	(0.000)				
$\Delta X_t/P_{t-1}\_ew$	-0.170	-0.210	-0.238	1		
	(-0.215)	(-0.124)	(-0.089)			
$\Delta X_t/P_{t-1}\_vw$	-0.191	-0.218	-0.227	0.957	1	
	(-0.161)	(-0.110)	(-0.105)	(0.000)		
$DISP_t$	0.345	0.291	0.184	-0.295	-0.380	1
	(0.012)	(0.036)	(0.192)	(-0.034)	(-0.005)	

Panel B: Correlation between lagged returns and earnings measures

	R_{t-1}_ew	R_{t-1}_vw	$CRSPvw_{t-1}$	$\Delta X_t/P_{t-1}\_ew$	$\Delta X_t/P_{t-1}\_vw$	$DISP_t$
R_{t-1}_ew	1	0.970	0.851	0.295	0.261	-0.535
		(0.000)	(0.000)	(0.031)	(0.057)	(-0.000)
R_{t-1}_vw		1	0.931	0.223	0.188	-0.513
			(0.000)	(0.104)	(0.172)	(-0.000)
$CRSPvw_{t-1}$			1	0.229	0.231	-0.554
				(0.102)	(0.099)	(-0.000)

Panel C: Correlation between forwarded returns and earnings measures

	R_{t+1}_ew	R_{t+1}_vw	$CRSPvw_{t+1}$	$\Delta X_t/P_{t-1}\_ew$	$\Delta X_t/P_{t-1}\_vw$	$DISP_t$
R_{t+1}_ew	1	0.970	0.851	0.183	0.193	-0.190
		(0.000)	(0.000)	(0.184)	(0.161)	(-0.182)
R_{t+1}_vw		1	0.931	0.176	0.203	-0.172
			(0.000)	(0.204)	(0.140)	(-0.227)
$CRSPvw_{t+1}$			1	0.122	0.186	-0.260
				(0.387)	(0.188)	(-0.062)

Table 3
Earnings Dispersion and Contemporaneous Stock Returns

This table reports time series regression results for contemporaneous stock returns. The dependent variables are equal-weighted (R_t_*ew*) and value-weighted (R_t_*vw*) returns in year *t*. These returns are measured from April of year *t* to March of year *t+1*. $CRSPvw_t$ is the CRSP value weighted return accumulated from April of year *t* until March of year *t+1*. The independent variables are aggregate earnings changes and earnings dispersion measures. $\Delta X_t /P_{t-1}$_*ew* and $\Delta X_t /P_{t-1}$_*vw* are the equal-weighted and value-weighted average changes in earnings before extraordinary items from fiscal year *t-1* to fiscal year *t*, deflated by the market value at the beginning of period *t*. $DISP_t$ is the de-trended dispersion of earnings changes. The data covers 1954-2005. We exclude firm-years with non-December fiscal year-end, stock price below \$1, and the top and bottom 5% of firms ranked for each year by $\Delta X_t /P_{t-1}$ and the weight variables. *t*-statistic with Newey-West standard errors is reported in parenthesis.

Panel A: Equal-weighted contemporaneous return regressions

	Dependent variable: R_t_*ew*			
Intercept	0.177	0.168	0.179	0.168
	(6.58)	(5.16)	(6.92)	(5.31)
$\Delta X_t/P_{t-1}$_*ew*	-2.541	-1.199		
	(-1.00)	(-0.43)		
$\Delta X_t/P_{t-1}$_*vw*			-4.010	-1.659
			(-1.36)	(-0.44)
$DISP_t$		6.677		6.453
		(2.59)		(2.17)
$AdjR^2$	0.003	0.091	0.018	0.092

Panel B: Value-weighted contemporaneous return regressions

	Dependent variable: R_t_*vw*			
Intercept	0.161	0.156	0.160	0.154
	(6.76)	(5.73)	(6.92)	(5.76)
$\Delta X_t/P_{t-1}$_*ew*	-2.842	-2.090		
	(-1.45)	(-0.99)		
$\Delta X_t/P_{t-1}$_*vw*			-3.678	-2.395
			(-1.50)	(-0.82)
$DISP_t$		3.742		3.520
		(2.05)		(1.70)
$AdjR^2$	0.022	0.048	0.027	0.052

Panel C: CRSP value weighted contemporaneous return regressions

	Dependent variable: $CRSPvw_t$			
Intercept	0.147	0.144	0.144	0.141
	(5.37)	(4.76)	(5.32)	(4.65)
$\Delta X_t/P_{t-1}$_*ew*	-3.331	-2.882		
	(-1.78)	(-1.44)		
$\Delta X_t/P_{t-1}$_*vw*			-3.902	-3.185
			(-1.60)	(-1.12)
$DISP_t$		2.234		1.968
		(1.17)		(0.92)
$AdjR^2$	0.038	0.036	0.033	0.026

Table 4
Earnings Dispersion and Lagged Stock Returns

This table reports time series regression results for one year lagged returns. The dependent variables are equal-weighted (R_{t-1}_*ew*) and value-weighted (R_{t-1}_*vw*) returns in year *t-1*. $CRSPvw_{t-1}$ is the CRSP value weighted accumulated return in year *t-1*. These returns are measured from April of year *t-1* to March of year *t*. The independent variables are earnings change and dispersion measures. $\Delta X_t/P_{t-1}$_*ew* and $\Delta X_t/P_{t-1}$_*vw* are the equal-weighted and value-weighted average change in earnings before extraordinary items from fiscal year *t-1* to fiscal year *t*, deflated by the market value at the beginning of period *t*. $DISP_t$ is the de-trended dispersion of earnings changes. The data covers 1954-2005. We exclude firm-years with non-December fiscal year-end, stock price below $1, and the top and bottom 5% of firms ranked for each year by $\Delta X_t/P_{t-1}$ and the weight variables. The *t*-statistic with Newey-West standard errors is reported in parenthesis.

Panel A: Equal-weighted one year lagged return regressions

	Dependent variable: R_{t-1}_*ew*			
Intercept	0.127	0.139	0.131	0.148
	(3.10)	(6.82)	(6.43)	(7.55)
$\Delta X_t/P_{t-1}$_*ew*	4.925	2.917		
	(3.10)	(1.86)		
$\Delta X_t/P_{t-1}$_*vw*			5.847	2.177
			(2.47)	(0.90)
$DISP_t$		-9.988		-10.076
		(-4.19)		(-4.46)
$AdjR^2$	0.067	0.290	0.061	0.271

Panel B: Value-weighted one year lagged return regressions

	Dependent variable: R_{t-1}_*vw*			
Intercept	0.121	0.132	0.124	0.138
	(5.95)	(6.97)	(6.37)	(7.62)
$\Delta X_t/P_{t-1}$_*ew*	3.054	1.364		
	(1.88)	(0.87)		
$\Delta X_t/P_{t-1}$_*vw*			3.702	0.567
			(1.77)	(0.27)
$DISP_t$		-8.411		-8.606
		(-4.13)		(-4.49)
$AdjR^2$	0.029	0.253	0.028	0.261

Panel C: CRSP value weighted lagged return regressions

	Dependent variable: $CRSPvw_{t-1}$			
Intercept	0.105	0.116	0.107	0.122
	(4.24)	(5.90)	(4.26))	(6.21)
$\Delta X_t/P_{t-1}$_*ew*	3.203	1.434		
	(1.76)	(0.89)		
$\Delta X_t/P_{t-1}$_*vw*			3.965	0.695
			(1.63)	(0.31)
$DISP_t$		-8.804		-8.975
		(-3.39)		(-3.69)
$AdjR^2$	0.034	0.289	0.034	0.281

Table 5
Earnings Dispersion and Lead Stock Returns

This table reports time series regression results for one year lead returns. The dependent variables are equal-weighted (R_{t+1}_*ew*) and value-weighted (R_{t+1}_*vw*) returns in year *t+1*. $CRSPvw_{t-1}$ is the CRSP value weighted accumulated return in year *t+1*. The independent variables are earnings change and dispersion measures. $\Delta X_t/P_{t-1}$_*ew* and $\Delta X_t/P_{t-1}$_*vw* are the equal-weighted and value-weighted average change in earnings before extraordinary items from fiscal year *t-1* to fiscal year *t*, deflated by the market value at the beginning of period *t*. $DISP_t$ is the de-trended dispersion of earnings changes. The data covers 1954-2005. We exclude firm-years with non-December fiscal year-end, stock price below $1, and the top and bottom 5% of firms ranked for each year by $\Delta X_t/P_{t-1}$ and the weight variables. The *t*-statistic with Newey-West standard errors is reported in parenthesis.

Panel A: Equal-weighted one year forwarded return regressions

	Dependent variable: R_{t+1}_*ew*			
Intercept	0.136	0.141	0.137	0.142
	(7.08)	(7.16)	(6.84)	(6.90)
$\Delta X_t/P_{t-1}$_*ew*	3.032	2.418		
	(1.57)	(1.18)		
$\Delta X_t/P_{t-1}$_*vw*			4.002	3.027
			(1.67)	(1.14)
$DISP_t$		-3.069		-2.736
		(-1.53)		(-1.31)
$AdjR^2$	0.014	0.016	0.019	0.015

Panel B: Value-weighted one year forwarded return regressions

	Dependent variable: R_{t+1}_*vw*			
Intercept	0.123	0.127	0.122	0.126
	(7.15)	(7.42)	(6.92)	(7.22)
$\Delta X_t/P_{t-1}$_*ew*	2.292	1.770		
	(1.15)	(0.87)		
$\Delta X_t/P_{t-1}$_*vw*			3.583	2.813
			(1.54)	(1.18)
$DISP_t$		-2.611		-2.161
		(-1.35)		(-1.12)
$AdjR^2$	0.008	0.012	0.026	0.021

Panel C: CRSP value weighted forward return regressions

	Dependent variable: $CRSPvw_{t+1}$			
Intercept	0.110	0.115	0.106	0.112
	(4.85)	(5.47)	(4.80)	(5.46)
$\Delta X_t/P_{t-1}$_*ew*	1.665	0.867		
	(0.86)	(0.44)		
$\Delta X_t/P_{t-1}$_*vw*			3.104	1.790
			(1.44)	(0.77)
$DISP_t$		-3.970		-3.606
		(-1.97)		(-1.72)
$AdjR^2$	-0.005	0.034	0.015	0.040

Table 6
Earnings Dispersion and Contemporaneous Return: Control for Macro Variables

This table reports time series regression results for contemporaneous stock returns, after controlling for various macro variables. The earnings and return measures are defined as in Table 3. D_rec_t is the dummy variable which equals 1 if year t is in the recession period based on the NBER definition. cay_t is the consumption to wealth ratio as in Lettau and Ludvigson (2001), available from 1954 to 2001. s^w_t is the labor income to consumption ration as in Santos and Veronesi (2006), available from 1954 to 2001. GDP_t is the de-trended shock in GDP growth rate in year t. $PROD_t$ is the de-trended shock in the growth rate of industrial production in year t. INF_t is the de-trended shock in the inflation rate in year t. U_t is the de-trended shock in the unemployment shock in year t. $MVOL_t$ is the unexpected market volatility measured following French, Schwert and Stambaugh (1987). The t-statistic with Newey-West standard errors is reported in parenthesis. *#Obs* is the number of observations used in each regression.

Panel A: Equal-weighted contemporaneous return regressions

	Dependent variable: R_t_ew									
Intercept	0.183	0.168	0.433	0.156	0.172	0.168	0.148	0.172	0.577	0.702
	(5.83)	(5.42)	(0.67)	(5.64)	(5.29)	(5.31)	(5.98)	(5.550)	(1.06)	(1.02)
$\Delta X_t/P_{t-1}\_ew$	-1.850	-2.747	-2.590	0.656	-1.852	-1.191	1.535	-2.512	-1.550	-1.147
	(-0.62)	(-1.01)	(-0.91)	(0.27)	(-0.60)	(-0.42)	(0.67)	(-1.00)	(-0.61)	(-0.47)
$DISP_t$	7.036	4.680	4.810	5.512	6.724	6.665	4.947	6.128		1.827
	(2.67)	(2.07)	(2.09)	(2.08)	(2.50)	(2.56)	(1.84)	(2.43)		(0.68)
D_rec_t	-0.035								-0.063	-0.077
	(-0.47)								(-0.71)	(-1.08)
cay_t		-0.459							-2.103	-2.115
		(-0.28)							(1.20)	(-1.09)
s^w_t			-0.322						-0.505	-0.654
			(-0.40)						(-0.78)	(-0.79)
GDP_t				-2.013					2.162	2.302
				(-1.32)					(2.54)	(1.87)
$PROD_t$					0.413				1.413	1.276
					(0.75)				(1.98)	(1.55)
INF_t						0.148			0.898	0.798
						(0.07)			(0.75)	(0.49)
U_t							0.078		0.221	0.222
							(1.97)		(4.55)	(4.55)
$MVOL_t$								-1.617	-1.159	-1.087
								(-3.46)	(-3.55)	(-3.07)
$Adj.R^2$	0.076	0.060	0.062	0.100	0.080	0.072	0.135	0.215	0.334	0.324
#Obs	52	48	48	52	52	52	52	52	48	48

Panel B: Equal-weighted contemporaneous return regressions

	Dependent variable: R_t_vw									
Intercept	0.166	0.155	0.305	0.147	0.157	0.154	0.138	0.156	0.502	0.500
	(5.05)	(5.42)	(0.53)	(6.05)	(5.84)	(5.80)	(6.52)	(6.05)	(1.03)	(0.82)
$\Delta X_t/P_{t-1}\_vw$	-3.099	-4.008	-3.863	-0.983	-3.155	-2.390	0.351	-3.659	-3.124	-3.135
	(-0.88)	(-1.50)	(-1.35)	(-0.33)	(-1.01)	(-0.81)	(0.12)	(-1.45)	(-1.19)	(-1.11)
$DISP_t$	3.740	2.142	2.302	2.906	3.504	3.528	2.376	2.940		-0.030
	(1.86)	(1.06)	(1.05)	(1.37)	(1.62)	(1.66)	(1.11)	(1.51)		(-0.01)
D_rec_t	-0.029								-0.069	-0.068
	(-0.48)								(-0.87)	(-1.21)
cay_t		0.276							-0.858	-0.857
		(0.26)							(-0.86)	(-0.69)
s^w_t			-0.183						-0.421	-0.419
			(-0.26)						(-0.72)	(-0.57)
GDP_t				-1.303					3.117	3.115
				(-1.03)					(2.51)	(1.88)
$PROD_t$					0.437				1.232	1.234
					(0.89)				(1.96)	(1.71)
INF_t						-0.059			0.539	0.542
						(-0.03)			(0.50)	(0.31)
U_t							0.065		0.210	0.210
							(1.93)		(4.48)	(4.26)
$MVOL_t$								-1.378	-0.875	-0.814
								(-3.53)	(-3.56)	(-2.73)
$Adj.R^2$	0.076	0.060	0.062	0.046	0.042	0.028	0.135	0.181	0.343	0.325
#Obs	52	48	48	52	52	52	52	52	48	48

Panel C: CRSP value-weighted contemporaneous return regressions

	Dependent variable: $CRSP_t\_vw$									
Intercept	0.160	0.145	0.432	0.136	0.147	0.141	0.127	0.143	0.623	0.525
	(3.71)	(5.29)	(0.75)	(4.59)	(4.94)	(4.69)	(4.40)	(5.03)	(1.17)	(0.85)
$\Delta X_t/P_{t-1}\_vw$	-4.309	-4.221	-3.957	-2.204	-4.621	-3.138	-0.807	-4.482	-3.179	-3.750
	(-1.14)	(-1.48)	(-1.29)	(-0.73)	(-1.55)	(-1.12)	(-0.26)	(-1.79)	(-1.45)	(-1.28)
$DISP_t$	2.319	0.822	1.104	1.541	1.938	2.043	0.977	1.372		-1.502
	(1.23)	(0.35)	(0.44)	(0.72)	(0.91)	(0.96)	(0.45)	(0.65)		(-0.58)
D_rec_t	-0.047								-0.094	-0.084
	(-0.71)								(-1.40)	(-1.31)
cay_t		0.373							-0.601	-0.567
		(0.36)							(-0.55)	(-0.52)
s^w_t			-0.352						-0.571	-0.453
			(-0.49)						(-0.89)	(-0.61)
GDP_t				-0.906					2.615	2.516
				(-0.78)					(1.37)	(1.31)
$PROD_t$					0.826				1.429	1.542
					(1.57)				(2.07)	(1.95)
INF_t						-0.601			0.205	0.332
						(-0.33)			(0.14)	(0.21)
U_t							0.056		0.207	0.207
							(1.67)		(3.77)	(3.80)
$MVOL_t$								-1.414	-0.756	-0.812
								(-3.29)	(-2.37)	(-2.20)
$Adj.R^2$	0.017	0.016	0.020	0.014	0.056	0.009	0.055	0.167	0.350	0.339
#Obs	52	48	48	52	52	52	52	52	48	48

Table 7
Earnings Dispersion and Lagged Return: Control for Macro Variables

This table reports time series regression results for lagged stock returns, after controlling for various macro variables. The earnings and return measures are defined as in Table 4. D_rec_t is the dummy variable which equals 1 if year t is in the recession period based on the NBER definition. cay_t is the consumption to wealth ratio as in Lettau and Ludvigson (2001), available from 1954 to 2001. $s^w{}_t$ is the labor income to consumption ration as in Santos and Veronesi (2006), available from 1954 to 2001. GDP_t is the de-trended shock in GDP growth rate in year t. $PROD_t$ is the de-trended shock in the growth rate of industrial production in year t. INF_t is the de-trended shock in the inflation rate in year t. U_t is the de-trended shock in the unemployment shock in year t. $MVOL_t$ is the unexpected market volatility measured following French, Schwert and Stambaugh (1987). The t-statistic with Newey-West standard errors is reported in parenthesis. *#Obs* is the number of observations used in each regression.

Panel A: Equal-weighted lagged return regressions

	Dependent variable: R_{t-1}_ew									
Intercept	0.155	0.136	0.382	0.146	0.146	0.146	0.162	0.140	0.228	-0.319
	(4.94)	(6.89)	(0.79)	(7.14)	(6.74)	(7.63)	(7.36)	(6.89)	(0.34)	(-0.55)
$\Delta X_t/P_{t-1}\_ew$	2.226	2.894	3.095	1.927	1.976	2.649	0.629	2.613	3.906	2.147
	(1.03)	(1.60)	(1.64)	(1.09)	(1.21)	(1.66)	(0.39)	(1.69)	(1.54)	(0.84)
$DISP_t$	-9.607	-8.618	-8.398	-9.366	-9.917	-9.621	-8.540	-10.116		-7.984
	(-3.70)	(-3.42)	(-3.31)	(-3.57)	(-4.16)	(-3.73)	(-3.27)	(-4.33)		(-2.73)
D_rec_t	-0.037								-0.004	0.059
	(-0.58)								(-0.03)	(0.68)
cay_t		0.241							0.740	0.795
		(0.20)							(0.37)	(0.44)
$s^w{}_t$			-0.302						-0.097	0.553
			(-0.51)						(-0.12)	(0.79)
GDP_t				1.074					-1.846	-2.456
				(0.93)					(-0.85)	(-1.06)
$PROD_t$					0.602				-0.800	-0.198
					(1.24)				(-1.37)	(-0.42)
INF_t						-4.526			-4.680	-4.243
						(-3.84)			(-2.59)	(-2.80)
U_t							-0.065		-0.116	-0.118
							(-3.04)		(-1.97)	(-1.89)
$MVOL_t$								-0.375	0.360	0.049
								(-0.68)	(0.62)	(0.09)
$Adj.R^2$	0.280	0.243	0.246	0.284	0.293	0.428	0.320	0.283	0.237	0.367
#Obs	52	48	48	52	52	52	52	52	48	48

Panel B: Value-weighted lagged return regressions

	Dependent variable: R_{t-1}_vw									
Intercept	0.162	0.136	0.212	0.145	0.143	0.141	0.154	0.139	0.031	-0.394
	(5.17)	(7.60)	(0.47)	(7.42)	(7.09)	(8.65)	(7.29)	(7.58)	(0.06)	(-0.84)
$\Delta X_t/P_{t-1}\_vw$	-0.797	0.725	0.7785	-0.928	-0.624	0.895	-2.368	0.265	2.866	0.391
	(-0.30)	(0.31)	(0.32)	(-0.42)	(-0.31)	(0.42)	(-1.16)	(0.13)	(0.79)	(0.12)
$DISP_t$	-8.180	-7.395	-7.336	-7.954	-8.631	-8.086	-7.383	-8.744		-6.518
	(-3.85)	(-3.61)	(-3.49)	(-3.89)	(-4.65)	(-3.81)	(-3.54)	(-4.67)		(-2.65)
D_rec_t	-0.057								-0.006	0.037
	(-1.03)								(-0.06)	(0.49)
cay_t		-0.006							0.436	0.585
		(-0.01)							(0.26)	(0.38)
s^w_t			-0.093						0.139	0.650
			(-0.17)						(0.25)	(1.16)
GDP_t				1.380					-2.315	-2.751
				(1.35)					(-1.37)	(-1.55)
$PROD_t$					0.685				-0.657	-0.164
					(1.72)				(-1.50)	(-0.45)
INF_t						-4.165			-4.605	-4.054
						(-3.75)			(-3.01)	(-2.78)
U_t							-0.069		-0.114	-0.118
							(-3.15)		(-2.37)	(-2.19)
$MVOL_t$								-0.329	0.369	0.127
								(-0.76)	(0.74)	(0.27)
$Adj.R^2$	0.254	0.186	0.188	0.258	0.272	0.427	0.302	0.246	0.248	0.360
#Obs	52	48	48	52	52	52	52	52	48	48

Panel C: CRSP value-weighted lagged return regressions

	Dependent variable: $CRSP_{t-1}\_vw$									
Intercept	0.153	0.121	0.389	0.133	0.131	0.125	0.142	0.123	0.193	-0.255
	(4.96)	(5.68)	(0.85)	(6.21)	(6.22)	(6.82)	(6.04)	(6.26)	(0.37)	(-0.58)
$\Delta X_t/P_{t-1}\_vw$	-1.038	1.630	1.691	-1.579	-1.176	0.985	-2.805	0.524	3.385	0.776
	(-0.41)	(0.63)	(0.64)	(-0.68)	(-0.59)	(0.44)	(-1.21)	(0.24)	(0.72)	(0.20)
$DISP_t$	-8.434	-7.528	-7.568	-7.984	-9.014	-8.516	-7.516	-9.054		-6.866
	(-3.23)	(-3.13)	(-2.97)	(-3.18)	(-4.04)	(-3.24)	(-2.86)	(-3.78)		(-2.40)
D_rec_t	-0.073								-0.025	0.021
	(-1.44)								(-0.28)	(0.29)
cay_t		-1.604							-0.933	-0.779
		(-1.64)							(-0.64)	(-0.58)
s^w_t			-0.323						-0.067	0.470
			(-0.57)						(-0.11)	(0.88)
GDP_t				2.099					-2.529	-2.986
				(2.06)					(-1.79)	(-2.01)
$PROD_t$					1.076				-0.339	0.179
					(2.90)				(-0.92)	(0.48)
INF_t						-3.676			-3.917	-3.333
						(-3.03)			(-2.55)	(-2.26)
U_t							-0.082		-0.108	-0.111
							(-3.39)		(-2.02)	(-1.92)
$MVOL_t$								-0.187	0.461	0.206
								(-0.41)	(0.93)	(0.43)
$Adj.R^2$	0.293	0.230	0.213	0.313	0.352	0.413	0.373	0.268	0.249	0.369
#Obs	52	48	48	52	52	52	52	52	48	48

Table 8

Contemporaneous and Lagged Returns Regressions: Controlling for Implied Market Volatility

This table reports time series regression results for contemporaneous and lagged stock returns, controlling for implied market volatility. The earnings and return measures are defined as in Table 3 and 4. VIX_t and VXO_t are the annual average of CBOE Volatility Index under new methodology and old methodology respectively, where CBOE changed the methodology of calculating implied volatility in 2003. The new methodology measure starts from 1990. The old methodology measure starts from 1986.). The *t*-statistic with Newey-West standard errors is reported in parenthesis.

Panel A: Implied volatility with new methodology (1990-2005)

	Contemporaneous Return			Lagged Return		
	R_t_ew	R_t_vw	$CRSPvw_t$	R_{t-1}_ew	R_{t-1}_vw	$CRSPvw_{t-1}$
Intercept	0.276	0.307	0.291	0.143	0.181	0.135
	(1.15)	(1.67)	(1.64)	(0.96)	(1.74)	(0.94)
$\Delta X_t/P_{t-1}\_ew$	7.204			-0.375		
	(2.10)			(-0.13)		
$\Delta X_t/P_{t-1}\_vw$		4.289	1.354		-3.240	-3.186
		(1.50)	(0.43)		(-1.21)	(-0.89)
$DISP_t$	8.928	4.936	1.527	-9.982	-9.126	-10.276
	(2.19)	(1.37)	(0.33)	(-2.47)	(-3.16)	(-2.56)
VIX_t	-0.007	-0.008	-0.009	0.002	-0.001	0.000
	(-0.55)	(-0.86)	(-0.79)	(0.24)	(-0.23)	(0.03)
$AdjR^2$	0.129	-0.032	-0.170	0.154	0.290	0.365
#Obs	16	16	16	16	16	16

Panel B: Implied volatility with old methodology (1986-2005)

	Contemporaneous Return			Lagged Return		
	R_t_ew	R_t_vw	$CRSPvw_t$	R_{t-1}_ew	R_{t-1}_vw	$CRSPvw_{t-1}$
Intercept	0.353	0.352	0.344	0.165	0.176	0.146
	(1.93)	(2.41)	(2.29)	(1.39)	(2.33)	(1.45)
$\Delta X_t/P_{t-1}\_ew$	5.287			-1.907		
	(1.61)			(-0.63)		
$\Delta X_t/P_{t-1}\_vw$		2.579	0.809		-4.121	-3.943
		(0.95)	(0.29)		(-2.08)	(-1.29)
$DISP_t$	8.898	4.781	1.955	-10.702	-9.802	-10.846
	(1.85)	(1.18)	(0.42)	(-2.87)	(-3.53)	(-2.85)
VIX_t	-0.011	-0.010	-0.011	0.001	0.000	0.000
	(-1.21)	(-1.46)	(-1.27)	(0.10)	(-0.06)	(0.09)
$AdjR^2$	0.143	0.029	-0.051	0.220	0.339	0.398
#Obs	20	20	20	20	20	20