The Performance, Pervasiveness and Determinants of Value Premium in Different US Exchanges: 1985-2006

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ABSTRACT

Using AMEX, NASDAQ and NYSE stock market data for the period 1985-2006, this paper sheds further light into the value premium and the discussion of whether the value premium is driven by risk or behavioral factors. The paper utilizes a more comprehensive set of data and tests than previous studies and a research methodology that minimizes potential data snooping problems and confounding inferences. We document a consistently strong value premium in all markets examined, which persists in both bull and bear markets, as well as in recessions and recoveries. We show that the value premium is not driven by a few outliers, but it is pervasive as the overwhelming majority of stocks in the value portfolio have positive returns, and the majority of the industries in our sample have positive value premiums. The value premium, in general, remains positive and statistically significant over time. Our results are consistent with, but, in general, stronger than, those of other US studies. Previous studies' results seem to be driven primarily by AMEX and NYSE stocks, as NASDAQ stocks experience much stronger value premium than other markets. In terms of explaining the drivers of the value premium, having looked at this question from many angles, we conclude that the evidence is mixed. It seems that both risk and mispricing may play a role in explaining the value premium, although the scale of the evidence seems to tilt more to the side of mispricing. The paper's conclusions both with regards to the value premium and its drivers hold up well to various robustness tests.

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1. Introduction

Ever since Basu (1977) showed that value stocks (i.e., low price-to-earnings (P/E) stocks) tend to have higher average returns than growth stocks (i.e., high P/E stocks), there has been a large body of academic research which has confirmed the existence of a value premium, namely, that value stocks outperform growth stocks. More recently, Chan, Hamao and Lakonishok (1991) found evidence consistent with a positive value premium using Japanese data. Similarly, studies carried out by Fama and French (1992, 1993, 1996), Lakonishok, Shleifer and Vishny (1994) and Chan and Lakonishok (2004) in both US markets and around the globe have reinforced such findings using not only P/E based classifications of stocks into value and growth, but also other search criteria which value investors have traditionally used to divide stocks into value and growth, such as price-to-book value (P/BV) and dividend yield.

As a result, in US academic circles, most arguments now revolve around the reasons for the superior performance of value stocks. Proponents of efficient markets, such as Fama and French (1992, 1993, 1996, 1998), argue that the value premium exists because value stocks bear more risk. Others, however, such as La Porta, Lakonishok, Shleifer and Vishny (1997), and Chan and Lakonishok (2004), argue against market efficiency and rational pricing. They advocate that systematic errors made by investors and agency problems faced by institutional investors prevent the value premium from disappearing.

Recently Doukas, Kim and Pantzalis (2002) provide evidence to indicate that the value premium is not explained or induced by over optimism in analysts forecasting of EPS, thus rejecting their non-risk based explanation of the value premium. In a subsequent paper, Doukas, Kim and Pantzalis (2004) find support for the risk factor explanation as the source of value premium. They use the standard deviation of analysts' EPS forecasts a proxy for risk, which they believe to be a better measure of risk borne by investors[1]. Their findings suggest that the return advantage of value stocks reflects compensation for higher risk as measured by the dispersion in analysts' forecasts. Moreover, Petkova and Zhang (2005) show that the economic fundamentals of value firms respond negatively to economic shocks while this is not true for growth stocks. They use this as evidence that value stocks are riskier than growth stocks, at least in the adverse states of the world. Nevertheless, Phalippou (2008) finds no support for risk-based explanations of the value premium. Phalippou (2008) shows that the value premium is concentrated in stocks mostly held by individual investors and that, consistent with behavioral explanations, the value premium declines from the lowest to the largest institutional ownership decile. Finally, Lettau and Wachter (2007) propose a dynamic risk-based model which they test using simulated portfolio sortings and find that growth

[1] Other researchers have also argued in the past that the standard deviation of analysts' forecasts represents a true measure of the forward risk of a stock (See Malkiel (1982) and Williams (1977)).

firms (long-horizon equity) covary more with the discount rate than do value firms (short-horizon equity) which covary more with cash flows. They conclude that value stocks do not appear to be riskier than growth stocks.

Consequently, the jury is still out with regards to the drivers of the value premium.

Using AMEX, NASDAQ and NYSE stock market data for the period 1985-2006, the purpose of this paper is to shed further light into the value premium and, particularly, the discussion of whether the value premium is driven by risk or behavioral factors. The paper utilizes a more comprehensive set of data and tests than previous studies and a research methodology that minimizes potential data snooping problems and confounding inferences.

This study differs from previous studies in a number of distinct ways.

All previous studies of the value premium in the US have examined stock data from the CRSP database, which aggregates NYSE, NASDAQ and AMEX stocks. And the question is: Is the value premium pervasive across all markets? Is the value premium concentrated only in one of the above markets and unfounded generalizations have been made by grouping all data together? As different markets tend to attract different liquidity, capitalization and industry stocks, is the value premium pervasive across all these separate markets?[2]

Moreover, most previous studies have used the P/BV ratio to examine the value premium, primarily motivated by the Fama and French (1992, 1993, 1995) results that shed doubt to the validity of the Capital Asset Pricing Model by showing that P/BV ratio and size were the key explanatory variables of cross sectional average stock returns. We will also employ P/E ratios, in addition to P/BV ratios, to examine the value premium as a robustness test.[3]

In addition, while all previous studies use the COMPUSTAT database to derive **trailing** price to earnings (P/E) and price to book value (P/BV) ratios, where sorting in value and growth takes place as of June of year (t), with earnings per share (EPS) and book value per share (BVPS) as of December of year (t-1), this study will employ: (a) COMPUSTAT and trailing ratios, as above; (b) COMPUSTAT and trailing ratios, where sorting in value and growth occurs in December of year (t-1);[4] and (c) I/B/E/S database for the P/E ratio calculation, whereby P/E is defined as the ratio of price per share to

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[2] Previous studies have also differentiated these exchanges in terms of their stock return properties and speed of price discovery (See Chung and Hrazdil (2009) for a discussion of the institutional details of the three markets).

[3] Chan and Lakonishok (2004) indicate that while the P/BV ratio "has garnered the lion's share of attention … other measures might also serve as the bases for investment strategies" and one of those other measures proposed was the P/E ratio. Moreover, value investors seem to focus more on the P/E ratio as an "…important gauge of a stock's relative value" (See Brandes (2004), p. 61).

[4] P/E ratios are calculated using stock price in December and trailing earnings per share (EPS) as at December of year *t-1*. Returns are then calculated for year *t*. While, historically, such calculations present

forward earnings per share as opposed to trailing earnings per share, and where sorting occurs in December of year (t-1).[5]

As opposed to many other studies, and in accordance with simulations carried out by Conrad, Cooper and Kaul (2003), we will form quartiles rather than deciles in an effort to avoid biasing the tests in favor of finding support for the value premium[6]. Finally, while previous studies have excluded financial stocks from the sample of companies examined, our study will also include such stocks.

Looking at the value premium from a number of different angles will enable us to make generalizations about the pervasiveness of the value premium, before we move on to the determinants of the value premium.

As far as examining the drivers of the value premium, previous studies have used data either from the Institutional Brokers Estimate System (I/B/E/S) and CRSP databases or CRSP and CDA/Spectrum 13F databases, but no study in the past has combined all three data bases at the same time. In this study, in addition to COMPUSTAT, we will also employ CRSP, I/B/E/S and CDA/Spectrum 13F databases to examine the determinants of the value premium. This will enable us to utilize a more comprehensive set of data, tests and evidence.

In this paper, we document a consistently strong and pervasive value premium over the 1985-2006 sample period, which persists in all markets examined and in both bull and bear markets, as well as in recessions and recoveries. We show that the value premium is not driven by a few outliers, but it is pervasive as the majority of stocks in the value portfolio have positive returns. Moreover, a value premium is evident in the majority of industries in our sample. The value premium, in general, remains positive and statistically significant over time. Our results are consistent with, but, in general, stronger than, those of other US studies. A better picture of the value premium is obtained when looking at markets individually, as opposed to in aggregate. Previous studies' results seem to be driven primarily by AMEX and NYSE stocks, as NASDAQ stocks experience much stronger value premium than other markets. In terms of explaining the drivers of the value premium, having looked at this question from many angles, we conclude that the evidence is mixed. It seems that both risk and mispricing may play a role in explaining the value premium, although the scale of the evidence seems to tilt more to the side of mispricing. The paper's conclusions both with regards to the value premium and its drivers hold up well to various robustness tests.

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no problem, the forward implementation of this strategy may run into the problem that year *t-1* actual annual reports of December fiscal year end companies do not become available until sometime in February or March of year *t*. Nevertheless, by December of year *t-1*, analysts and other institutional investors have a good sense of the annual EPS for year *t-1* as evidenced by the fact that analysts' forecast error of annual EPS is zero by the last few months of the year for December fiscal year end companies (See Ackert and Athanassakos (1997)).

[5] I/B/E/S analyst forecasts for year (t) are available in December of year (t-1) and, as a result, historic and forward implementation of this strategy presents no problem.

[6] Most of the published papers on one-way strategies have used 10 portfolio sorts and almost all have used between 5 and 10 portfolio sorts (See Conrad, et al. (2003)).

The rest of the paper is structured as follows. Section 2 develops the research questions. Section 3 discusses the data sources, sample selection and methodology. Section 4 reports the empirical results and robustness tests, and Section 5 concludes the paper and discusses the implications of findings for ongoing research on the value premium.

2. Research Questions and Formation of Expectations

Value investors start their analysis with a search process for possibly undervalued stocks. This process involves looking for stocks which are neglected and/or undesirable due to bad performance. With regards to the first criterion, this translates into stocks which are generally avoided by large institutional investors due to small size or lack of analyst coverage, that is, stocks which are not viewed as the glamour stocks everyone wants to own. With regards to the second criterion, this translates into stocks with low P/E ratio or low P/BV ratio, which in turn generally means stocks with high analyst pessimism about future prospects, financial distress or stocks that are experiencing problems, such as a lawsuit or poor subsidiary performance.

Given the search process that value investors follow, two schools of thought have emerged to explain the value premium. One school of thought has argued that the value premium is driven by the higher risk of value portfolios. To test the proclamations of this school of thought, one needs to examine the relationship between the value premium and risk proxies, such as stock liquidity, the standard deviation of stock returns or the standard deviation of analysts' EPS forecasts of stocks in the value vs. growth portfolios. The other school of thought has talked about mispricing as the drivers of the value premium. To empirically test the predictions of this school of thought one needs to examine the relationship between the value premium and institutional holdings, analyst following, analysts' forecast optimism or firm size, all of which have been used as proxies for visibility and possible mispricing in the Finance literature (See Merton (1987) and Bushan (1989)).[7]

2.1. Risk Considerations

According to the proponents of the efficient market hypothesis, value investing produces superior performance simply because value portfolios bear more risk and once risk is taken into account the "anomaly" should dissolve—superior performance should be explained away. The key proponents of this argument are Fama and French (1992, 1993, 1996 and 1998).

[7] The issue of whether risk (or behavioral factors) drives the value premium has arisen because academics deal only with the first step of the value investing process. The second step, which involves valuing all the potentially undervalued stocks from step one to determine the truly undervalued stocks to actually invest in, is not known to academics. Not knowing what stocks value investors buy, academics resort to arguments related to risk.

It is not inconceivable that what value investors do may indeed add more risk to their portfolios vis-à-vis growth based portfolios, and this may explain the value premium. For example, in their search process, value investors look for undesirability. This includes companies in bankruptcy or suffering from severe financial distress, companies in industries that suffer from overcapacity, a sudden increase in imports, general decline or threat of legislative or regulatory punishment. Lawsuits, both current and potential, may also make companies undesirable. In most of these cases, there is overreaction.

Of course, this argument is a combination of risk and mispricing. Undesirability due to financial duress implies higher risk, but at the same time it also implies less desire to own by large institutional investors and hence mispricing. In this paper, to test the risk argument, we use the relationship of number of proxies for risk, such as stock liquidity, the standard deviation of stock returns and the standard deviation of analysts' forecasts, to value premium[8].

a. Stock Liquidity

Academic research has found a negative relationship between stock liquidity and stock returns (See Pastor and Stambaugh (2003) and Hasbrouck (2006)). Since liquidity may decrease when one needs to sell a stock in the future, investors face liquidity risk. Investors need to be compensated for this risk, and, as a result, liquidity risk increases the required return of a stock. The higher required return leads to a contemporaneous drop in prices. Baker and Stein (2004) and Fang et al. (2008) show that high liquidity stocks have higher P/E and P/BV ratios and lower expected returns; the opposite is true for low liquidity stocks.

Based on this argument, value (low P/E or P/BV) stocks should have higher returns than growth stocks if value stocks are exposed to higher liquidity risk. Many proxies for liquidity have been used in the literature. In this paper, we proxy liquidity with the ratio of volume to shares outstanding (See Datar et al. (1998)).

This discussion leads to our first expectation:

$H_{0,1}$: *There is a negative relationship between stock liquidity and the value premium.*

[8] The standard deviation of returns is used, rather than other measures of risk such as beta, as recent evidence shows that unsystematic risk is also priced, as well and hence a total risk measure may be a better and all inclusive measure of risk (See Jiang and Lee (2004)). Moreover, researchers such as Fama and French (1992) have shed doubt to the validity of beta as a measure of risk.

b. Standard Deviation of Stock Returns

The standard deviation of stock returns reflects both systematic and unsystematic risk. Companies in financial distress or carrying excessive amounts of leverage should have higher standard deviation of returns than other less financially distress companies. Hecht (2002) argues that leverage is the key driver behind the value premium. He finds that capital structure plays a very important role in that sense.

This discussion leads to our second expectation:

$H_{0,2}$: *There is a positive relationship between the standard deviation of stock returns and the value premium.*

At the same time, companies employing higher leverage and being under conditions of financial distress will be more severely affected and exposed to the various states of the world, such as recession and bear markets. As a result, related to $H_{0,2}$ is the following argument. If value stocks bear higher risk than growth stocks, and value stocks are particularly riskier than growth stocks in "bad" times, as Petkova and Zhang (2005) argue, this will prompt value stocks to have sharper corrections during recessions and bear markets. This leads to the following two subsidiary expectations:

$H_{0,3}$: *The value premium is negative during recessions.*

$H_{0,4}$: *The value premium is negative during bear markets.*

c. Standard Deviation of Analysts' Forecasts (Analyst Forecast Dispersion)

The dispersion of analysts' forecasts represents an indication of the heterogeneity of beliefs among analysts. The higher the uncertainty about the future prospects of a firm, possibly due to financial leverage, financial distress, suffering from overcapacity, a sudden increase in imports, threat of legislative or regulatory punishment, lawsuits, both current and potential, the higher the disagreement among analysts about a company's future prospects. The standard deviation of analysts' forecasts can be used as a proxy for the level of uncertainty associated with the information and environment in which a company operates. The higher the uncertainty about a company's environment, the higher the disparity in earnings forecasts by analysts (See Ackert and Athanassakos (1997)). This increases the perception of the associated risk of an investment investors are exposed to and consequently makes them demand higher rates of return. In fact, the standard deviation of analysts' forecasts may be a better measure of risk than the standard deviation of stock returns, as it is forward looking whereas the standard deviation of stock returns is based on historical data. Other researchers in the past, such as Malkiel (1982), Williams (1977), Ackert and Athanassakos (1997), have also conjectured that the dispersion in analysts' earnings forecasts represents a better measure of risk. This definition of risk, however, has mostly been ignored in the recent finance literature, with a few exceptions. Doukas, Kim, and Pantzalis (2004), for example, use the dispersion in analysts' earnings forecasts as a proxy for risk. They hypothesize, and find support, that

value stocks have higher exposure to dispersion in analysts' forecasts than growth stocks and hence should earn a higher return.

This discussion leads to our fifth expectation:

$H_{0,5}$: There is a positive relationship between the standard deviation of analysts' forecasts and the value premium.

2.2. Mispricing Considerations

The mispricing argument goes as follows. Investors, for behavioral or institutional reasons, commit systematic errors when they value securities that induce them to pay too much for winners (glamour (high P/E or P/BV) stocks) and too little for losers (boring, poorly performing, unknown and unloved (low P/E or P/BV) companies. Arbitrage may not fully work to eliminate the value premium due to the persistence and power of the institutional/behavioral influences and/or various impediments to arbitrage. These biases shape investment returns and the value premium. The key proponents of this argument are Lakonishok, Shleifer and Vishny (1994), and Chan and Lakonishok (2004).

In this paper, to test this argument, we use the relationship of a number of proxies of neglect and undesirability, such as institutional holdings, firm size, analysts' optimism, and analyst following to value premium.

a. Limits on Arbitrage

The existence and persistence of the value premium has been extensively documented. However, in light of large rewards for uncovering mis-pricings in security markets, why does it persist? It is possible that arbitrage may only partially adjust prices down to their appropriate level because of several impediments in arbitrage, in light of the severity of the behavioral/institutional factors (See Barberis and Thaler (2002), D'Avolio (2002)). Nevertheless, given the extent to which the value premium has been documented around the world, investors should be able to, at least partly, correct pricing errors over time. Thus one would expect the value premium to decline over time (See Phalippou (2008)), albeit not disappear, for the reasons discussed above.

This discussion leads to our sixth expectation:

$H_{0,6}$: The value premium decreases over time.

b. The Percentage of Institutional Ownership

For institutions, investment biases are a consequence of either policy or bias (see Greenwald et al. (2001)). For example, many institutional investors are prevented from owning shares in small, less liquid and obscure stocks, or shares of companies deemed to be engaged in socially irresponsible business, be it environmental, health or regime related. As a result, the stock of such companies may be undervalued, as measured by current earnings or growth prospects. It will take change in investment policy, change in

corporate social behaviour, or a reorganisation of the business to eliminate the bias and allow shares to be priced properly. On the other hand, large institutional ownership implies companies are in the public eye, have been subjected to higher demand and they are possibly overvalued.

This discussion leads to our seventh expectation:

$H_{0,7}$: There is a negative relationship between the percentage of institutional ownership of a stock and the value premium.

c. Firm Size

Kothari, Shanken and Sloan (1995) and Loughran (1997) have found that the value premium is stronger for small cap stocks. Naturally, the question is whether or not firm-size is a proxy for missing risk factors. In this paper, we argue that firm-size is not an omitted risk factor, but one that gives rise to mispricing. Many institutional investors, constrained either by their mandate or by the fact that they have too much money to manage and small cap stocks can not absorb enough flow, tend to avoid such stocks (See Greenwald et al. (2001)). As smaller companies evolve to bigger companies through growth, they may become eligible for purchase by more mutual/pension fund companies and their shares are bid up. Moreover, smaller cap companies tend to be followed by fewer analysts (See Ackert and Athanassakos (2003)). Hence, smaller cap companies, followed by fewer analysts and owned by a smaller number of institutions, tend to be more obscure and less in the public eye than larger companies. This leads to their possible underpricing vis-à-vis larger stocks. We use firm-size as a proxy for visibility and for firms which are neglected or ignored by institutional investors and, hence, as proxy for possible mispricing. If the value premium is the result of mispricing, and if firm-size is related to mispricing, we would expect the value premium to be inversely related to firm-size.

This discussion leads to our eight expectation:

$H_{0,8}$: There is a negative relationship between the market cap of a stock and the value premium.

d. Analysts' Optimism

Security analysts exhibit herd mentality. Good analysts tend to herd to protect their status, while incompetent analysts tend to herd to look good. Analysts tend to be overoptimistic, especially at the beginning of the year (See Ackert and Athanassakos (1997)), as this makes selling stocks to portfolio managers, who rebalance at that time, easier. Analysts tend to be more optimistic for growth stocks than boring value stocks. As growth or glamour stocks are catching more the attention of investors, analysts are more likely to be successful in pushing these stocks to portfolio managers and, hence, they tend to be more optimistic for growth rather than value stocks. Moreover, growth stocks are more likely to be tapping the financial markets for capital, too and this gives further

inducement to analysts to be more optimistic for growth than value stocks as this way they will benefit the investment banking arm of their company. This affects prices. As exuberant expectations of growth are revised down or as actual future earnings growth tends to be lower than expected, growth stocks will tend to underperform value stocks.[9]

This discussion leads to our ninth expectation:

$H_{0,9}$: There is a negative relationship between analysts' forecast optimism and the value premium.

e. Analyst Following

Value investors believe that hidden value can be found in securities that are obscure. These tend to be the stock of companies that lack coverage by security analysts. Institutional investors would tend to avoid stocks that are obscure and not followed by analysts. It does not look good in their annual reports to have in their portfolios stocks that are not in the public eye and which are not considered glamour stocks. Moreover, institutional managers can always blame analysts' coverage if something goes wrong. In other words, there are many (career-related) risks to which institutional managers are exposed to by investing in obscure stocks or stocks that no (or only few) analysts cover. Institutional disinvestment from and avoidance of such stocks affects their prices. As a result, stocks which are ignored and obscure (i.e., stocks that value investors tend to invest in) tend to be undervalued.

This discussion leads to our tenth expectation:

$H_{0,10}$: There is a negative relationship between the number of analysts following a firm and the value premium.

3. Data Sources, Sample Selection and Methodology

This study uses data from four data bases.

The first data base is the CRSP database from which monthly and daily stock prices and returns, as well as monthly volume and shares outstanding are obtained, respectively, for AMEX, NASDAQ, and NYSE stocks. From this database, stock return volatility for firm *i* at time t (SIGMA) is calculated as the annualized standard deviation of daily CRSP stock returns from the month *m-1* to month *m*. For example, for the month

[9] The behavior of portfolio managers and analysts is interlinked. Analysts are optimistic because they want to sell stocks to portfolio managers, and the easiest way to do this is to be optimistic, especially when portfolio managers rebalance their portfolios. Portfolio managers purchase the stocks for which analysts are optimistic, as they can always blame analysts for their potential investment failures. Both analysts and portfolio managers like growth stocks as this is where there is a higher expectation of profit and this is where the outlook for the future may be most uncertain enabling analysts to hide (or justify) their over optimism in (by) the uncertainty involving these stocks (See Ackert and Athanassakos (1997)).

of June, SIGMA is calculated by annualizing (i.e., multiplying by $\sqrt{252}$) the standard deviation of daily percentage CRSP stock returns from June 1 to June 30. For stock *i*, this database is also employed to derive market capitalization (SIZE) by multiplying shares outstanding by price per share and the measure of liquidity (LIQUID) by dividing monthly volume by shares outstanding all as at the end of prior month.

The second database is COMPUSTAT from which trailing EPS and book value per share and the industry in which a stock belongs to are obtained. The third data base is CDA/Spectrum 13F database from which data are obtained for the number of shares of a given stock held by institutions. For stock *i*, the percentage of institutional ownership (%INST) is then derived by dividing shares held by institutions by shares outstanding both as at the end of prior month.

The final data base is the Institutional Brokers Estimate System (I/B/E/S) data base. Starting from about June of a given year, say year t-1, and ending in January of year t+1, I/B/E/S reports monthly, among other statistics, the number of analysts forecasting EPS (#ANALYSTS), the mean and median of the analysts' EPS forecasts, and the standard deviation of analysts' forecasts, for a given firm for calendar year t. We truncate the monthly observations from June-December of year t-1 and January of year t+1. This gives us twelve monthly non-overlapping observations for the above variables in every year of the sample for a given firm. Price to earnings ratios (P/E: December, forward) are derived from this database by dividing price per share at the end of December for year (t-1) by the December year (t-1) estimated (median forecast of) annual earnings per share for year (t).[10] We use the I/B/E/S data for such derivation as a robustness test of our findings since this database and approach for the calculation of P/E ratios are different from the ones typically employed in the literature for the derivation of P/E ratios and sorting into value and growth stocks. Moreover, forward looking P/E ratios may be a better indication of expectations and ability to identify value and growth stocks.

In addition, from I/B/E/S/, for month *m* we standardize the standard deviation of analysts' forecasts by the firm *i* stock price to derive analysts' forecast dispersion (DISP).[11] The standardization renders our dispersion measure scale free across firms for the cross sectional analysis conducted in each month. It is true that DISP could reflect something more than the contemporaneous disagreement among analysts. This is the case when analysts do not have access to the same information sets and do not issue and communicate their EPS updates to I/B/E/S on the same day. Nevertheless, any differential lag-induced bias in analysts' forecast dispersion only adds noise to the DISP measure and works against our expectation (See Ajinkya, Atiase and Gift (1991)).

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[10] As discussed in footnote 3, value investors seem to prefer using P/E ratios in their search process for finding value investing opportunities. Moreover, the new breed of value investors prefer to use expected earnings in the calculation rather than trailing earnings, as nowadays, as opposed to earlier years, expected earnings are readily available in such data bases as I/B/E/S (See Brandes (2004), p. 69). Finally, using expected earnings in the P/E ratio calculation is more theoretically sound.

[11] We also standardized by the absolute mean of EPS forecast and obtained qualitatively similar results. Moreover, dividing by EPS tends to produce many more outliers that dividing by price due to the fact that extremely small EPS tend to blow up the standardized measure. As a result, we only report the results based on stock price standardization.

Finally, from this database, we also estimate our measure of optimism (OPT). Optimism is estimated in a way consistent with Ackert and Athanassakos (1997), as follows:

$$OPT_{i,\,t-m} = (FEPS_{i,\,t-m} - EPS_{i,\,t}) / Price_{i,\,t}$$

where $FEPS_{i,\,t-m}$ is the consensus forecast (defined as the median forecast) at time *t-m* of time t earnings per share for firm *i* and $EPS_{i,\,t}$ is the actual earnings level for firm *i* at time t. [12]

The timing of recessions/recoveries and bear/bull markets is obtained from www.thedowtheory.com/bear&recessions.htm.[13]

Our data is for each month in the 1985 to 2006 period. The firms included in the final sample passed through several filters, as described below:

(i) The price per share exceeds $1.
(ii) The I/B/E/S database includes analysts' consensus forecasts for twelve consecutive months from January to December of the forecast year, starting in 1985 and ending in 2006.
(iii) Matching daily stock return data are available from CRSP for the period 1985-2006.
(iv) Companies are required to have return data available for the year following the determination of P/E and P/BV ratios.
(v) Companies with negative P/E ratios are excluded from the sample, and so are those with negative P/BV ratios.

The first criterion ensures that the sample is not dominated by penny stocks as severe liquidity problems exist in this group of stocks, and extremely high stock returns are not unusual for such stocks biasing value and growth stock returns. Moreover, the stock price is used as a divisor in the optimism proxy and DISP and excluding penny stocks prevents these ratios from reaching extreme values. The second criterion ensures data continuity and availability of successive monthly observations that help us overcome data-overlapping problems. Moreover, this criterion makes sure that the stocks in our sample are those that professional portfolio managers would tend to invest in as they normally avoid stocks for which there are no consensus forecasts available. The third criterion ensures that we have daily data necessary for the construction of monthly standard deviations of stock returns. The fourth criterion is necessary as without it this study would not be possible. The fifth criterion prevents problems resulting from the

[12] Ackert and Athanassakos (1997) divide by the absolute value for EPS, but we divide by price per share, as their OPT measure is undefined when actual earnings are zero and small earnings levels produce extreme values.

[13] The timing of recessions from this database is consistent with NBER's business cycle dates. However, this database also makes available dates for bull and bear markets. The following years were flagged as bear market years: 1987, 1990, 2000 and 2002. The following years were flagged as recession years: 1990 and 2001.

inclusion of companies with negative P/E or negative P/BV ratios or deals with potential data errors (See La Porta et al. (1997), and Cohen et al. (2003)).

After all screens and further adjustments for missing observations, the intersection of the four databases resulted in a total of 12,804, 313,779, and 344,712 cross sectional-time series (month-firm) observations for our final sample of 583, 4908 and 2977 AMEX, NASDAQ and NYSE unique firms, respectively, representing 10 industries as classified by the 1-digit Standard Industrial Classification (SIC) code. Examining the value premium in different markets will ensure that the value premium is pervasive and not limited only in a particular market.

To further examine the pervasiveness, robustness and the generability of the value premium to various markets, sensitivity analysis will be carried out whereby a number of different sorting approaches will be used to classify companies into value and growth. First, at the end of June of every year, starting in June 1985, firms are ranked based on P/E (trailing, June) and P/BV (June, trailing) ratios from low to high and the ranked firms are divided into four groups of equal size. Second, at the end of December of every year, starting in December 1985, firms are ranked based on P/E (December, forward) ratios from low to high and the ranked firms are divided into four groups of equal size. Finally, at the end of December of every year, starting in December 1985, firms are ranked based on P/E (P/BV) (December, trailing) ratios from low to high and the ranked firms are divided into four groups of equal size[14]. Sorting procedures #2 and #3 will be used to test the robustness of the value premium when different sorting procedures are used. The above processes are repeated for every year of our sample. Membership in a quartile changes each year as multiples change from year to year. Inclusion in a quartile depends on a stock's multiple in relation to other stocks' multiples. Because multiples change over time, an arbitrary measure across time for all stocks in our sample would be inappropriate. Returns are then obtained either from July to following June (starting in July 1985) (sorting procedure #1) or from January to December (starting in January 1986) (sorting procedures # 2 and #3) for each stock within each quartile and equally weighted mean returns for each quartile are derived (See Fama and French (1992), Lakonishok, Shleifer and Vishny (1994), La Porta, Lakonishok, Shleifer and Vishny (1997) and, especially, Dichev (2007)). Quartile-1 (Q1) is the low P/E (P/BV) ratio quartile or the value stocks, while Quartile-4 (Q4) is the high P/E (P/BV) ratio quartile or the growth stocks. A cross sectional-time series of non-overlapping monthly returns are obtained for each quartile from July 1985 to June 2006 or January 1986 to December 2006, depending on the procedure followed as described above, sub-periods, recessions/recoveries, and bear/bull markets.[15] Firms are also grouped by industry and

[14] For sorting procedure #1, the price (P) is as of the end of June of year (t) and E and BV are, respectively, the basic annual earnings per share and book value per share for companies with fiscal year end (t-1), as reported in COMPUSTAT. For sorting procedure #2, P is as of the end of December of year (t-1) and forward E is for fiscal year (t), as reported in I/B/E/S, while, for sorting procedure #3, P is as of the end of December of year (t-1) and trailing E and BV are for fiscal year end (t-1), as reported in COMPUSTAT.

[15] For a recession or bear market to be flagged and considered in this study, the recession/bear market had to cover a period of at least 8 months within a calendar year. This ensured that, when a recession/bear market was flagged, it had enough length to possibly impact returns.

P/E (P/BV) based quartiles are formed to examine the sensitivity of value and growth stocks to industry classification. Finally, to examine the pervasiveness of the value premium and, at the same time, facilitate the investigation of the drivers of the value premium, within each P/E (P/BV) quartile, quartiles are formed independently based on stock liquidity (LIQUID), market capitalization (SIZE), analysts' forecast dispersion (DISP), analyst following (#ANALYSTS), analysts' forecast optimism (OPT), standard deviation of stock returns (SIGMA) and percentage of institutional ownership (%INST).

Uni(bi)variate analysis of the variables of interest (i.e., value premium, LIQUID, SIZE, DISP, #ANALYSTS, OPT, SIGMA and %INST) for the various stocks and quartiles ensues that looks at value and growth stock performance and carries out a first stage examination of the drivers of the value premium. To further, and more formally, examine the drivers of the value premium, and the robustness and pervasiveness of the value premium, in addition to the uni(bi)variate analysis, we also carry out regression analysis and a number of robustness tests. First, we regress subsequent returns of the value and growth stocks against a number of explanatory variables drawn from previous research and our own earlier findings. Second, we examine the presence of a value premium when sorting is based on December of year (t-1) P/E, where EPS is either trailing or forward as at year (t-1). Finally, to further explore the risk argument, we also examine whether the risks specified by a formal asset pricing model, such as the Fama and French (1993) three factor model, explain the returns of our value and growth stocks.

There are key differences between our methodology and that followed by other researchers. First, we employ a more comprehensive set of data and tests than previous studies. Second, we sort into quartiles. Most published papers on the one way sorts use 10 portfolio sorts (see Conrad, Cooper and Kaul (2003)). As Conrad, et al. (2003) have shown, support of the value premium increases with the fineness of sorting. Third, we sort in December using trailing and forward P/E metrics and in June using trailing P/E and P/BV metrics separately for AMEX, NASDAQ and NYSE stocks and track each market's value and growth stock performance over the following year. Finally, while previous studies have excluded financial stocks from the sample of companies examined, our sample includes such stocks. Examining P/E ratios (as well as P/BV ratios) enable us to utilize this industry rather than exclude it. In this sense, we will provide out of sample tests by looking at the behavior of value vs. growth stocks within this industry, as well.

4. Empirical Results

4.1. P/E and P/BV (June, Trailing) Sortings: Univariate Analysis

4.1.1. The Value Premium Over Time and at Different States of the World

Table 1, Panels A, B and C report, respectively, the mean AMEX, NASDAQ and NYSE monthly stock returns of P/E sorted quartiles and the value premium (Q1 minus Q4) per year, sub-period and total sample, as well for different states of the world. Figures 1 and 2 show diagrammatically the results. It is quite apparent that a value premium exists and it is quite impressive for its size and consistency, especially for

NASDAQ and NYSE stocks. With the exception of seven years for the AMEX, five years for NASDAQ and three years for the NYSE, the rest of the years in our sample experience positive mean value premiums. However, even for those negative value premium years, the magnitude of the negative values for the value premium is mostly quite small, when compared with the years when the value premium has been positive. Overall, the mean monthly value premium is 0.0052 (6.24% annualized) for AMEX stocks, 0.0095 (11.40% annualized) for NASDAQ stocks and 0.005 (6.00% annualized) for NYSE stocks. By any measure, the value premium is economically and statistically significant.

Table 1, Panels A, B and C also report the value premium per sub-period. It purports to show the evolution of the value premium from 1986-1995 to 1996-2006. As can be seen from Table 1, there is a positive value premium in both sub-periods in all markets examine, which is statistically significant only in the NASDAQ and NYSE markets. Moreover, the hypothesis that the mean value premiums per sub-period are equal is rejected at conventional levels of statistical significance for NASDAQ and NYSE, but not for the AMEX market. The value premium has declined over time for NYSE, it has remained mostly flat for AMEX and has increased for NASDAQ. This finding is quite interesting and may indicate that arbitrage has worked in NYSE, even though the impediments to arbitrage, arising from the existence of behavioral/institutional factors, have prevented the value premium from being completely eliminated over the years.[16] This finding supports $H_{0,6}$. What is, however, the implication with regards to NASDAQ, where value premium seems to have increased substantially over time and, to a lesser extent, for AMEX? This finding may be more spurious than real as, according to Phalippou (2008), for any mispricing argument to be really tested one needs to have a time homogeneous sample. Otherwise, the fact that smaller and smaller stocks are added to the CRSP database over time may confound inferences. Arbitrage may decrease mispricing, but the addition of more problematic and higher risk stocks in the CRSP database, which should be more the case for NASDAQ (and to a lesser extent for AMEX) stocks than the stocks in NYSE, may spuriously give the impression that arbitrage has failed.

Many researchers, such as Fama and French (1992, 1993, 1996, 1998) and Petkova and Zhang (2005) among others, have argued that risk differences may be the reason for the discrepancy in returns between the value and growth stocks. Table 1 Panels A, B and C report the value premium in bull and bear markets and in recessions as well as in recoveries for AMEX, NASDAQ and NYSE stocks, respectively. No matter what the state of the world is the value strategy beats the growth strategy in all three markets. Overall, the mean monthly value premium in bear markets is 0.0028 for AMEX stocks, 0.0163 for NASDAQ stocks and 0.0071 for NYSE stocks, while the corresponding returns are 0.0062, 0.0084, and 0.0045 in bull markets. In recessions, the value premium is 0.0117 for AMEX stocks, 0.0083 for NASDAQ stocks and 0.0205 for NYSE stocks, while the corresponding returns are 0.0046, 0.0206 and 0.0009 in recoveries. These mean

[16] However, in a recent paper, Brav and Heaton (2006) find that "anomalous positive stock returns are strongest when limits to arbitrage are lowest". Based on this, limits to arbitrage were higher in the second sub-period, which may seem counterintuitive.

returns are statistically different from zero at traditional levels of significance only for NASDAQ and NYSE stocks. This evidence rejects $H_{0,3}$ and $H_{0,4}$. The findings overall are consistent with Chan and Lakonishok (2004), but inconsistent with the empirical work by Petkova and Zhang (2005).

Table 2, Panels A, B and C report, respectively, the mean AMEX, NASDAQ and NYSE monthly stock returns of P/BV (June, trailing) sorted quartiles and the value premium (Q1 minus Q4) per year, sub-period and total sample, as well for different states of the world. Figures 3 and 4 show diagrammatically the results. The Table shows that the value premium is even stronger when value and growth classification takes place based on P/BV sortings. The mean value premium for AMEX stocks is 0.0124 (11.40% annualized), for NASDAQ stocks is 0.0112 (13.44% annualized) and for NYSE stocks 0.0059 (7.08% annualized). In all markets a strong value premium exists both in bear and bull markets and in recessions and recoveries. Results are statistically significant. Moreover, the value premium increases over time, except for the NYSE market.

The overall evidence in this section seems to reject $H_{0,3}$ and $H_{0,4}$ and only accept $H_{0,6}$ for NYSE, but not AMEX or NASDAQ.

4.1.2. Risk and Behavioral Attributes of Value and Growth Stocks and the Value Premium

Table 1, Panels A, B and C also provide a first glance at the relationship of SIGMA, DISP, #ANALYSTS, SIZE, OPTIMISM, LIQUID and %INST to value and growth stock returns and the value premium for the AMEX, NASDAQ and NYSE markets, respectively. Do these proxies of risk and behavioral factors differ systematically between value and growth stocks? Table 1 shows that behavioral factors are more consistently related to the value premium, based on our priors developed in Section 2, than risk measures. AMEX, NASDAQ and NYSE value stocks are followed by fewer analysts, are smaller, are subject to more pessimism in analysts' forecasts and have lower percentage of institutional ownership than growth stocks, with most differences been statistically significant. On the other hand, whereas value stocks have lower liquidity (higher liquidity risk) than growth stocks, the other two risk measures (the standard deviation of analyst forecasts and the standard deviation of returns) give conflicting signals with regards to the relationship of risk to the value premium in the NASDAQ and NYSE markets.

The preliminary evidence in this section supports the mispricing related expectations $H_{0,7,}$ $H_{0,8,}$ $H_{0,9,}$ $H_{0,10,}$ as well as one of the risk related expectations $H_{0,1,}$ but gives conflicting evidence with regards to $H_{0,2}$ and $H_{0,5}$. Similar conclusions are drawn from Table 2 and P/BV sortings.

As the evidence on the value premium is stronger when sorting takes place using the P/BV ratio, and since previous papers have mostly used the P/BV ratio for sorting into value and growth, and for brevity's sake, from now on we will only report the evidence with regards to the P/E ratios. If the evidence supports the presence of a value

premium and its drivers using P/E ratios, it will be even more supportive when using P/BV ratios as the basis for classifying stocks into value and growth.

4.1.3. The Frequency of Positive and Negative Value Premiums

Could it be that the value premium is driven only by a few value stocks with very large positive returns? Table 3, Panels A, B and C report the percentage of AMEX, NASDAQ and NYSE stocks, respectively, with positive and the percentage of stocks with negative returns for the lowest and highest P/E sorted quartiles over our sample period. The persistence of the value premium is quite obvious. For the low P/E sorted quartile 54.3% of the AMEX stocks had a positive return as opposed to only 47.9% of the stocks for the high P/E sorted quartile. The corresponding percentages for the NASDAQ and NYSE stocks were 56.1% and 58.9% for the value stocks and 43.9% and 49.8% for growth stocks, respectively. As a result, the value premium is pervasive and not concentrated only in a few stocks which are outliers.

4.1.4. The Value Premium Across Industries

Is the value premium industry specific? Could it be that the value premium is driven only by a specific industry leading to unfounded generalizations? Table 4, Panels A, B and C report the mean AMEX, NASDAQ and NYSE monthly value and growth stock returns and value premiums per industry for the ten 1-digit SIC Code industries to which the companies in our sample belong. With the exception of three industries in AMEX and two industries in NASDAQ and NYSE, the rest of the industries have a positive value premium. Moreover, the value premium is mostly statistically significant for those industries for which the value premium is positive; this is not the case when the value premium is negative. Hence, once more, the value premium seems to be pervasive across industries and not concentrated only in a few sectors of the economy. In fact, the value premium for NASDAQ and NYSE is negative in two of the riskier sectors of our sample, namely, mining and construction. Less risky NASDAQ and NYSE sectors, such as wholesale and finance, have a large positive value premium, further weakening any association of the value premium to risk factors.

The univariate evidence in this section strongly supports the existence and pervasiveness of the value premium. Moreover, while the issue of the determinants of the value premium will also be revisited later, the evidence to this point seems to favor mispricing as the more consistent determinant of the value premium, in all markets examined.

4.2. Time Series-Cross Sectional Analysis: Bivariate Analysis

We now attempt to further examine the pervasiveness of the value premium and its drivers by looking at this question from different angles. To this end, we sub-divide the P/E sorted quartiles, independently, in quartiles by the percentage of institutional ownership (%INST), firm-size (SIZE), analyst forecast optimism (OPT), analyst following (#ANALYSTS), stock liquidity (LIQUID), standard deviation of stock returns

(SIGMA) and analysts' forecast dispersion (DISP) and examine not only whether value beats growth at the highest and lowest quartile of the (risk and behavioral) proxy variables referred to earlier (first test), but also how the value premium evolves as we go from the lowest to the highest quartile of the proxy variables (second test). The first test will further examine the pervasiveness of the value premium, while the second test will provide evidence in relation to the drivers of the value premium. Due to space limitations, we only report below the evidence when sorting independently by the percentage of institutional ownership (%INST) and standard deviation of stock returns (SIGMA), as these were the only two proxy variables for which our expectations were supported - with the evidence on %INST supporting the behavioral argument ($H_{0,6}$) and the evidence on SIGMA supporting the risk related argument ($H_{0,2}$).[17] Nevertheless, in all independent sortings, reported and not, irrespective of the proxy sorted quartile, value stocks beat growth stocks, further supporting the pervasiveness of the value premium.

4.2.1. The Value Premium and Percentage of Institutional Ownership

In this section, each previously P/E sorted quartile is now independently sorted by the percentage of institutional ownership (%INST). Table 5, Panels A, B and C report the mean monthly returns, standard deviation of stock returns (SIGMA), analyst forecast dispersion (DISP), analyst following (#ANALYSTS), firm-size (SIZE), analysts' forecast optimism (OPT) and stock liquidity (LIQUID), respectively, for each of the value (lowest quartile, Q1) and growth (highest quartile, Q4) AMEX, NASDAQ and NYSE portfolios for the lowest (Q1) and highest (Q4) quartiles of percentage of institutional ownership (%INST).

In this Table, we see that AMEX, NASDAQ and NYSE value stocks outperform growth stocks irrespective of the %INST sorted quartile. The value premium declines as we go from low %INST to high %INST for AMEX and NYSE, and holds steady for NASDAQ stocks.

This evidence is mostly supportive of $H_{0,7}$ and the mispricing explanation of the value premium.

Generally, AMEX, NASDAQ and NYSE value stocks in the low %INST quartile have higher DISP and lower #ANALYSTS, SIZE and LIQUID than value stocks in the high %INST quartile. This also appears to be the case for the growth stocks, as well. The other variables show no consistent relationship among the three markets examined. Irrespective of %INST, value stocks have higher DISP, but lower OPT, LIQUID, #ANALYSTS and SIZE than growth stocks.

[17] The findings on sorting independently by firm-size (SIZE), analyst forecast optimism (OPT), analyst following (#ANALYSTS), stock liquidity (LIQUID), and analysts' forecast dispersion (DISP), which are not reported here, are available from the author upon request.

4.2.2. The Value Premium and the Standard Deviation of Returns

In this section, each previously P/E sorted quartile is now independently sorted by the standard deviation of stock returns as a measure of risk (SIGMA). Table 6, Panels A, B and C report the mean monthly returns, DISP, #ANALYSTS, SIZE, OPT, LIQUID and %INST, respectively, for each of the value (lowest quartile, Q1) and growth (highest quartile, Q4) AMEX, NASDAQ and NYSE portfolios for the lowest (Q1) and highest (Q4) quartiles of standard deviation of returns (SIGMA).

In Table 6, we observe that irrespective of the SIGMA quartile, AMEX, NASDAQ and NYSE value stocks outperform the growth stocks, as evidenced by the higher monthly mean returns for the value vs. the growth portfolios. In other words, when we control for risk (proxied by SIGMA), value beats growth. Moreover, the value premium strongly increases as we go from low SIGMA to high SIGMA, which supports $H_{0,2}$. The higher the risk, the higher is the value premium as per the risk argument.

This is the strongest evidence yet found in support of the risk explanation as the driving force behind the value premium. It seems that SIGMA is an important risk proxy driving the value premium. Interestingly, DISP decreases from value to growth stocks within each SIGMA quartile and increases from the low to the high SIGMA quartile. While this evidence further supports the risk explanation, it may also indicate that the reason SIGMA appears to be important is because it may be correlated with DISP and so the evidence in favor of SIGMA may actually be spurious due to its relationship to DISP. Could it be that SIGMA here proxies for DISP, as previous evidence (See Doukas, et al. (2004)) has shown that DISP is a more important measure of risk than SIGMA? When we examine independent sortings by DISP (not reported here), we find that this is not the case and that the risk argument is not supported when using DISP as a proxy for risk - this contradicts the findings of Doukas, et al. (2004).

As we go from low to high SIGMA quartiles, OPT and LIQUID increase and %INST, SIZE and #ANALYSTS decline for both value and growth stocks. Moreover, irrespective of SIGMA, value stocks have lower #ANALYST, SIZE, OPT, LIQUID and %INST, but lower DISP than growth stocks.

The bivariate evidence in this section, while it fully supports the presence and pervasiveness of a value premium, gives mixed results regarding its drivers, as some supporting evidence is found for both risk and mispricing arguments.[18]

[18] In section 4.2, we report that value beats growth irrespective of the proxy sorted quartile. But is the risk of the value portfolio higher than the risk of the growth portfolio within each proxy sorted quartile? As SIGMA appears to be a very important risk variable in our study, the lack of any consistent relationship between value and growth and direction of SIGMA within each proxy sorted quartile, documented in this section, indicates that the outperformance of value over growth within each proxy sorted quartile is not driven by risk (SIGMA).

4.3. Regression Analysis: Explaining Returns

In order to more formally examine the relationship between returns of value and growth strategies and the variables identified in this paper as having an effect on returns, and test the risk and behavioral research questions discussed in Section 2, we estimate the following regression (1) for each of AMEX, NASDAQ and NYSE stocks.[19]

$$RET^{n}_{i,t} = a_0 + a_1\, PERATIO_{i,t-1} + a_2\, \#ANALYSTS_{i,t-1} + a_3\, LLIQUID_{i,t-1} + a_4\, LSIGMA_{i,t-1} + a_5\, LDISP_{i,t-1} + e_{i,t} \qquad (1),$$

where, RET is the monthly return for firm *i* at time *t* and either for the total sample or for the lowest and highest P/E ratio sorted quartile *n*. The independent variables include the P/E ratio (PERATIO), #ANALYSTS defined as the number of analysts following a stock, LLIQUID defined as the natural log of one plus our liquidity measure (i.e., LIQUID), LDISP defined as the natural log of one plus DISP[20], where DISP is defined as the standard deviation of analysts' forecast scaled by stock price, and LSIGMA defined as the natural log of the annualized monthly standard deviation of stock returns calculated from daily data over a given month (i.e., SIGMA). All the independent variables are as at the end of the month prior to the month for which returns are calculated.

Regression (1) coefficients are estimated using monthly data from July 1985 through June 2006 and the Fama and MacBeth (FM) (1973) procedure. We use the Fama and MacBeth (1973) procedure to avoid bias in the estimated standard errors because of the possibility of cross-sectional serial correlation in the residuals in a given year.[21] This procedure involves estimating regression (1) for each year and then averaging the annual estimates over the 1985-2006 period. Significance levels are based on pooled t-statistics, computed as follows:

$$t_j = \frac{\bar{b}_{jt}}{\sigma_j / \sqrt{T}}$$

where the numerator is the average of the annual coefficient estimates for a given independent variable (j), σ is the standard deviation of the coefficient estimates of a given variable, and T is the number of years over our sample period. Diagnostic tests rejected multicollinearity in the error terms of regression (1).[22]

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[19] The SIZE, OPT and %INST are highly correlated with each other and with some of the other variables for AMEX, NASDAQ and NYSE and, hence, are dropped from the respective regressions. The correlation coefficients between PERATIO and #ANALYSTS, LDISP, LSIGMA, and LLIQUID are about .06, .01, .03 and .07, respectively for all markets examined; between #ANALYSTS and LDISP, LSIGMA and LLIQUID about .10 .01 and .03, respectively; between LDISP and LSIGMA and LLIQUID about .14 and -.01, respectively; and between LSIGMA and LLIQUID about .13.

[20] See Falkenstein (1996) for the transformation of this variable.

[21] Fama and French (2006) argue that the "FM regressions give more weight to tiny stocks because they tend to have more extreme values of the explanatory variables and more extreme returns". This should not present a problem in our study as we run regressions not only for the total sample, but also for each of the P/E based quartiles. Furthermore, unlike other studies that carry our extremely fine sortings, we sort into quartiles which should mitigate the problem with extreme values.

[22] We employed the VIF option in the REG SAS procedures to carry out such diagnostic tests.

Table 7, Panels A, B and C report the estimates of regression (1), respectively, for the AMEX, NASDAQ and NYSE total sample and the value and growth portfolios, using the Fama-McBeth estimation procedure referred to above. Table 7 shows, as expected, that the P/E ratio is, in general, negatively related to returns for the total sample and both the low and high P/E ratio sorted quartiles for all markets examined, after controlling for #ANALYSTS, LLIQUID, LSIGMA and LDISP. Other than the P/E ratio variable, the most consistently significant variables across markets are #ANALYSTS and LDISP. Interestingly enough these are two of the variables that personify the argument amongst researchers as to whether the value premium is driven by mispricing or risk differentials. #ANALYSTS is statistically negatively related to returns only in the NASDAQ and NYSE markets. The more analysts follow a stock, the lower the expected returns. That is, the more under the microscope a stock is the lower its expected returns and vice versa. This is consistent with the mispricing argument and, specifically, supports $H_{0,10}$. The other significant variable is LDISP. The LDISP variable, which many argue is a better proxy for risk (See Doukas, et al. (2004)), has a statistically significant negative and fairly consistent sign across both value and growth stocks and for the total sample. This indicates that the higher the LDISP the lower the returns. This evidence is inconsistent with the risk related explanation and, specifically, does not support $H_{0,5}$. However, it is consistent with Ackert and Athanassakos (1997) who find that analysts tend to be more optimistic for firms with higher uncertainty about their future, as reflected in their high LDISP, leading eventually to lower monthly returns. It is also consistent with Haugen and Baker (2009) who find that the stocks with the highest expected returns in their sample are those with the lowest risk. This is along the lines of the behavioral argument. LSIGMA, the other risk related proxy employed in this study is positively related to returns only for the AMEX stocks, indicating that the higher the standard deviation of stocks returns the higher stock returns. Higher risk leads to higher returns. Both value and growth stocks respond similarly to LSIGMA for AMEX stocks. This is consistent with the risk argument and, specifically, supports $H_{0,2}$, but only for the AMEX stocks. LSIGMA, however, is not statistically significant for the NASDAQ and NYSE regressions.

The evidence from this section provides again some mixed results. It seems that mispricing is a more plausible explanation for the value premium in the NASDAQ and NYSE markets, as there is support for $H_{0,10}$, but not *for* $H_{0,1,}$ $H_{0,2}$ or $H_{0,5}$. The risk argument is more consistent with the results found in the AMEX market, when risk is proxied by LSIGMA, not LDISP or LIQUID, as there is support for $H_{0,2}$, but not for $H_{0,5}$ or $H_{0,1}$.

4.4. Robustness tests

The purpose of this section is two-fold: First is to examine whether the value premium is sensitive to the timing of the sorting and to the use of trailing or forward P/E ratios. That is, the first task is to provide evidence on the robustness of the value premium, a key objective of this paper. Second is to further explore the risk argument by examining whether the risks specified by a formal asset pricing model, such as the Fama

and French (1993) three factor model, explain the returns of the value and growth stocks in our sample.

4.4.1. P/E (December, Forward) Findings and the Value Premium

Table 8, Panels A, B and C report, respectively, the mean AMEX, NASDAQ and NYSE monthly stock returns of P/E sorted quartiles (December of year (t-1) sorting based on forward P/E ratios) and the value premium (Q1 minus Q4) per year, sub-period and total sample, as well for different states of the world. A value premium exists only in NASDAQ and NYSE based on this procedure, but it is not as strong for NASDAQ as when sorting is based on trailing P/E (or P/BV) ratios. Nevertheless, the results for NASDAQ and NYSE are consistent with those reported earlier. There is a value premium both in bull and bear markets and in recession/recoveries. Overall, the mean monthly value premium is 0.0020 (2.40% annualized) for NASDAQ stocks and 0.0097 (11.64% annualized) for NYSE stocks. The value premium is economically and statistically significant in NASDAQ and NYSE markets. Moreover, there is a positive value premium in both sub-periods in the NASDAQ and NYSE markets examined, which is both economically and statistically significant. In both markets, the value premium increases over time, but the increase is only significant for the NASDAQ market where the value premium increased quite substantially over time. This finding is consistent with our previous evidence and may reinforce our earlier comment that either arbitrage has not worked in NASDAQ or the fact that our sample is non-homogeneous has artificially made the value premium appear to be increasing over time. Notwithstanding this, this finding does not support $H_{0,6}$. No matter what the state of the world is the value strategy beats the growth strategy in NASDAQ and NYSE. Overall, the mean monthly value premium in bear markets is 0.0020 for NASDAQ stocks and 0.0133 for NYSE stocks, while the corresponding returns are 0.0024, and 0.0073 in bull markets. In recessions, the value premium is 0.0030 for NASDAQ stocks and 0.0098 for NYSE stocks, while the corresponding returns are 0.0016, and 0.0096 in recoveries. This evidence rejects $H_{0,3}$ and $H_{0,4}$.

NASDAQ value stocks have higher (statistically significant) risk than growth stocks based on the standard deviation of analyst forecasts, the liquidity measure and the standard deviation of returns, all of which are consistent with the risk explanation and $H_{0,5}$, $H_{0,1}$ and $H_{0,2}$, respectively. For NYSE, it is only the liquidity measure that is consistent with the risk argument. At the same time, value stocks are followed by fewer analysts, are smaller and have lower percentage of institutional ownership than growth stocks, with all differences been statistically significant, which is consistent with the mispricing explanation and $H_{0,10}$, $H_{0,8}$ and $H_{0,6}$, respectively. However, unlike earlier evidence, when P/E was measured in June of year (t) based on trailing earnings per share, value stocks have more optimism associated with them than growth stocks; this is inconsistent with the mispricing argument and, specifically, does not support $H_{0,9}$. This is the case in both NASDAQ and NYSE markets. As a result, the evidence is mixed, as there is some support for both risk and mispricing explanations depending on the measure used and market examined.

4.4.2. P/E (December, Trailing) Findings and the Value Premium

Table 9, Panels A, B and C report, respectively, the mean AMEX, NASDAQ and NYSE monthly stock returns of P/E sorted quartiles (December of year (t-1) sorting based on trailing P/E ratios) and the value premium (Q1 minus Q4) per year, sub-period and total sample, as well for different states of the world. It is quite apparent that a large value premium exists, which is quite impressive for its magnitude and its consistency. In fact, the value premium is at its largest when this sorting procedure is followed vis a vis the previously reported results. With the exception of three years for the mean value premium in AMEX and NASDAQ and four years in NYSE, the rest of the years experience positive value premiums. However, even for those years, the magnitude of the negative values for the value premium is quite small, when compared with the years when the value premium has been positive. Overall, the mean monthly value premium is 0.0098 (11.76% annualized) for AMEX stocks, 0.0132 (15.84% annualized) for NASDAQ stocks and 0.0055 (6.60% annualized) for NYSE stocks. By any measure, the value premium is economically and statistically significant. There is a positive value premium in both sub-periods in all markets examined, which is both economically and statistically significant. Moreover, the hypothesis that the mean value premiums per sub-period are equal is rejected at conventional levels of statistical significance. The value premium has declined for AMEX and NYSE over time, supporting $H_{0,6}$, but has increased for NASDAQ, not supporting $H_{0,6}$. This finding indicates, once again, that arbitrage has worked in AMEX and NYSE, but not in NASDAQ. The NASDAQ findings, however, may be affected by the fact that we have used a non-homogenous sample and the riskier firms added on NASDAQ over time may have biased the findings. No matter what the state of the world is the value strategy beats the growth strategy in all three markets. Overall, the mean monthly value premium in bear markets is 0.0060 for AMEX stocks, 0.0154 for NASDAQ stocks and 0.0069 for NYSE stocks, while the corresponding monthly returns are 0.0094, 0.0126, and 0.0053 in bull markets. In recessions, the value premium is 0.0267 for AMEX stocks, 0.0321 for NASDAQ stocks and 0.0140 for NYSE stocks, while the corresponding returns are 0.0080, 0.0118, and 0.0048 in recoveries. This evidence rejects $H_{0,3}$ and $H_{0,4}$.

Table 9, Panels A, B and C also provide a glance at the relationship of SIGMA, DISP, #ANALYSTS, SIZE, OPTIMISM, LIQUID and %INST to value and growth stock returns and the value premium for the AMEX, NASDAQ and NYSE markets, respectively. All proxies for mispricing work are as expected in all markets and support $H_{0,6}$, $H_{0,7}$, $H_{0,8}$, $H_{0,9}$ and $H_{0,10}$. That is, value stocks are owned by fewer institutional investors, are smaller, face more pessimism about future outlook and followed by fewer analysts. As far the proxies for risk are concerned, the evidence is mixed as some times the relationships are consistent with the risk argument (i.e., AMEX value stocks have higher SIGMA and DISP than growth stocks), but other times the evidence is not consistent with the risk argument (i.e., liquidity is same for value and growth AMEX stocks, and SIGMA is lower for value than growth NASDAQ and NYSE stocks).

4.4.3. Fama and French Three-Factor Model and Risk Considerations: Further Analysis (P/BV June, Trailing)

The Fama and French three factors are the excess return of the value weighted market portfolio (RMF), the return on small minus the return on large stocks (SMB) and the return on high minus the return on low book-to-market (B/M) ratio firms (HML)[23]. In this section, to be consistent with the Fama-French three factor model, we use the B/M ratio for the sorting procedure and the Fama-French portfolio formation. Moreover, to keep the analysis consistent with Fama and French, we aggregate all stocks of the three markets examined, namely, AMEX, NASDAQ and NYSE, into one overall market or portfolio of stocks, as reported in CRSP. Our value and growth portfolios, whose excess returns are the dependent variable in the Fama-French equation, are still determined by sorting based on trailing P/E ratios.

The Fama and French three factor estimation equation is expressed as follows:

$$R_{pt} - R_{ft} = a + b(R_{mt} - R_{ft}) + c(R_{st} - R_{bt}) + d(R_{ht} - R_{lt}) + e_t \qquad (2)$$

where,

R_{pt} = monthly return of the portfolio in question
R_{ft} = risk free rate (return on the one-month t-bill, monthly basis)
R_{mt} = monthly return on the value weighted market portfolio
R_{st} = monthly return on the small Fama-French stock portfolio
R_{bt} = monthly return on the large Fama-French stock portfolio
R_{ht} = monthly return on the high Fama-French B/M portfolio
R_{lt} = monthly return in the low Fama-French B/M portfolio
e_t = error term

In June of year (t), we form, as per Fama and French (1993), six size and B/M portfolios by independently sorting stocks into two groups by size and then sorting each size sorted portfolio into three groups based on trailing B/M. Monthly value weighted returns for each of the six portfolios and ($R_{mt} - R_{ft}$), ($R_{st} - R_{bt}$) and ($R_{ht} - R_{lt}$) excess returns are then calculated from July of year *(t)* to June of year *(t+1)*. Finally, monthly excess returns of equally weighted smallest size/lowest P/E (small-value), smallest size/highest P/E (small-growth), largest size/lowest P/E (large-value) and largest size/highest P/E (large-growth) portfolios are regressed against the aforementioned Fama-French three factors for the period July 1985 to June 2006. The slope coefficients of these regressions determine the expected risk exposure of a stock portfolio to the market portfolio, firm-size and B/M ratio. All return data for the Fama-French portfolios are from CSRP, and so are shares outstanding and prices per share. Trailing book values per shares are from COMPUSTAT.

Table 10 reports the time series regression results for the sub-samples of small-value, small-growth, large-value and large-growth portfolios for the period July 1985 to

[23] The B/M ratio is the inverse of the P/BV ratio which has been used in the paper up to this point.

June 2006. This Table shows the following. There is a positive relationship between the excess returns of small (big)-value and small (big)-growth stocks and the market and size premiums. However, only the slope coefficients for the small-value and small-growth stock regressions are consistently statistically significant at traditional levels of significance. Small-value stocks are less sensitive to the market and size effects than small-growth stocks. The sensitivity of small (big)-value and growth stocks to the value effect is as would be expected for these sub-samples. That is, small (big)-value stocks are positively related and small (big)-growth stocks are negatively related to the value effect. In all regressions, the alphas are not significantly different from zero, as would be expected in these sub-samples. Moreover, the R^2's, particularly of the small-value and small-growth portfolio regressions, are quite high.

The three factor model results are consistent with previous findings. The risk of value stocks is lower than the risk of the growth stocks given that both sensitivities to the market and size (the other risk factor within the three-factor model) effects are lower for value than growth stocks. As a result, from this section, we can conclude that what drives the value premium is not risk, or at least it is not only risk.

5. Conclusions

Using AMEX, NASDAQ and NYSE stock market data for the period 1985-2006, the purpose of this paper was to shed further light into the value premium and, particularly, the discussion of whether the value premium is driven by risk or behavioral factors. The paper utilized a more comprehensive set of data and tests than previous studies and a research methodology that minimized potential data snooping problems and confounding inferences.

We document a consistently strong value premium over the 1985-2006 sample period, which persists in both bull and bear markets, as well as in recessions and recoveries. We show that the value premium is not driven by a few outliers, but it is pervasive as the overwhelming majority of stocks in the value portfolio have positive returns, and the majority of industries in our sample have positive value premiums. The value premium, in general, remains positive and statistically significant over time. Our results are consistent with, but, in general, stronger than, those of other US studies. A better picture of the value premium is obtained when looking at markets individually, as opposed to in aggregate. Previous studies' results seem to be driven primarily by AMEX and NYSE stocks, as NASDAQ stocks experience much stronger value premium than other markets. Finally, the value premium is robust to different timing of sortings and to the use of trailing and forward P/Es.

In terms of explaining the drivers of the value premium, having looked at this question from many angles, using summary statistics and uni(bi)variate analysis, we find some support for both explanations, although the evidence seems to lean more in favor of the mispricing argument. To investigate this interesting finding further, we carried out various forms of regression analysis.

From the first set of (Fama-McBeth) regressions, we find that the P/E ratio is negatively related to returns, after controlling for #ANALYSTS, LDISP, LSIGMA, and LLIQUID. The most consistently significant other variables are #ANALYSTS and LDISP both of which are negatively related to returns. The LDISP variable has a statistically significant negative and fairly consistent sign across quartiles and for the total sample in all markets examined. This indicates that the higher the LDISP the lower the returns, thus negating earlier evidence (See Doukas, et. al (2004)) that LDISP drives the value premium and is inconsistent with the risk-related explanation of the value premium. On the other hand, the negative sign of #ANALYSTS is consistent with the mispricing argument. The only other variable that is significant in these regressions is LSIGMA, which is positively related to returns only for AMEX stocks. This relationship is consistent with the risk argument, but it does not apply across all markets, only for the AMEX market. We do not know why this is the case for AMEX and future research may wish to investigate the characteristics of AMEX in explaining this relationship and the validity of the risk argument for this market.

From the second set of (Fama-French) regressions, we find that the risk of value stocks is lower than the risk of the growth stocks given that both the sensitivities to the market and size (the other risk factor within the three-factor model) effects are lower for value than growth stocks. As a result, one can conclude that what drives the value premium is not risk or it is not only risk.

What value investors do may actually involve both risk and mispricing (See Section 2.1) and so what we find is exactly this. It is both mispricing and risk factors and their inter-relationships that drive the value premium. And so the evidence is mixed. It is not surprising then that some papers find evidence supporting risk and others evidence supporting mispricing. This is because the previous papers examine only one market and one of the variables employed here, and as we saw in this paper depending on what variables and markets one decides to examine, he/she can find support for risk, while others can find support for mispricing. However, having said that, the findings seem to tilt more heavily in favor of mispricing rather than risk as the key driving force behind the value premium.

The paper's conclusions both with regards to the value premium and its drivers hold up well to various robustness tests.

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Table 1
Mean Monthly Stock Returns to P/E Ratio (June, Trailing) Based Value and Growth Strategies by Year, Sub-period and State of the World: July 1985-June 2006

Panel A
Mean Monthly AMEX Stock Returns

Year	P/E Ratio Sorted Quartiles		Total	Value Premium	Q1 ≠ Q4
	Q1 (Value)	Q4 (Growth)		Q1 - Q4	P-Values
1986	-0.0298	-0.0426	-0.0070	0.0128	0.4176
1987	-0.0023	-0.0293	-0.0338	0.0270	0.2571
1988	0.0055	0.0104	0.0068	-0.0049	0.7401
1989	-0.0132	0.0058	-0.0004	-0.0190	0.1843
1990	-0.0329	-0.0267	-0.0337	-0.0062	0.6953
1991	0.0186	0.0091	0.0166	0.0095	0.4710
1992	0.0170	-0.0008	0.0088	0.0178	0.1633
1993	0.0232	0.0214	0.0103	0.0018	0.9099
1994	-0.0040	-0.0118	-0.0072	0.0078	0.5755
1995	0.0210	0.0103	0.0047	0.0107	0.3999
1996	0.0119	0.0038	0.0049	0.0081	0.5333
1997	0.0159	-0.0111	0.0048	0.0270	0.1063
1998	-0.0587	-0.0462	-0.0374	-0.0125	0.6170
1999	-0.0113	0.0160	0.0020	-0.0273	0.2056
2000	-0.0178	-0.0235	-0.0194	0.0057	0.7957
2001	0.0166	-0.0213	0.0121	0.0379	0.1020
2002	-0.0250	-0.0057	-0.0060	-0.0193	0.5394
2003	0.0378	0.0259	0.0283	0.0119	0.6902
2004	0.0066	0.0028	0.0172	0.0038	0.8555
2005	0.0002	-0.0104	-0.0053	0.0106	0.5716
2006	-0.0079	-0.0053	0.0057	-0.0026	0.8945
1986-2006	-0.0006	-0.0058	-0.0017	0.0052	0.0323
1986-1995	0.0029	-0.0022	-0.0024	0.0051	0.2522
1996-2006	-0.0066	-0.0115	-0.0005	0.0049	0.4947
Bear Markets	-0.0205	-0.0233	-0.0245	0.0028	0.7998
Bull Markets	0.0039	-0.0023	0.0032	0.0062	0.1293
Recessions	-0.0129	-0.0246	-0.0135	0.0117	0.3891
Recoveries	0.0008	-0.0038	-0.0005	0.0046	0.2566
Sigma	0.0286	0.0280	0.0277	0.0006	0.2644
Dispersion	0.0132	0.0048	0.0107	0.0084	0.0001
# Analysts	2.31	3.51	2.63	-1.20	0.0001
Size ($000)	151701.00	486523.00	312573.00	-334822.00	0.0001
Optimism	-0.0082	0.0166	0.0075	-0.0248	0.0001
Liquidity	0.0020	0.0029	0.0021	-0.0009	0.0001
% Inst	23.50	26.90	25.70	-3.40	0.4923

Panel B
Mean Monthly NASDAQ Stock Returns

Year	P/E Ratio Sorted Quartiles		Total	Value Premium	Q1 ≠ Q4
	Q1 (Value)	Q4 (Growth)		Q1 - Q4	P-Values
1986	-0.0173	-0.0440	-0.0109	0.0267	0.0018
1987	-0.0600	-0.0340	-0.0343	-0.0260	0.0001
1988	-0.0037	0.0107	0.0123	-0.0144	0.0001
1989	-0.0131	0.0039	0.0033	-0.0170	0.0009
1990	-0.0097	-0.0258	-0.0293	0.0161	0.0001
1991	0.0236	0.0185	0.0237	0.0051	0.4076
1992	0.0174	0.0102	0.0112	0.0072	0.2222
1993	0.0163	-0.0014	0.0099	0.0177	0.0014
1994	-0.0053	-0.0140	-0.0087	0.0087	0.0294
1995	0.0253	0.0077	0.0158	0.0176	0.0001
1996	0.0108	-0.0153	0.0018	0.0261	0.0001
1997	0.0200	-0.0059	0.0079	0.0259	0.0001
1998	-0.0299	-0.0299	-0.0312	0.0000	0.9953
1999	0.0123	0.0293	0.0213	-0.0170	0.0007
2000	-0.0083	-0.0527	-0.0301	0.0444	0.0001
2001	0.0210	-0.0087	0.0067	0.0297	0.0001
2002	-0.0074	-0.0374	-0.0203	0.0300	0.0001
2003	0.0365	0.0287	0.0400	0.0078	0.0053
2004	0.0135	0.0031	0.0085	0.0104	0.0001
2005	-0.0066	-0.0055	-0.0044	-0.0011	0.6216
2006	0.0080	0.0024	0.0054	0.0056	0.0560
1986-2006	0.0034	-0.0061	0.0007	0.0095	0.0001
1986-1995	-0.0019	-0.0060	0.0019	0.0041	0.0010
1996-2006	0.0071	-0.0062	0.0002	0.0133	0.0001
Bear Markets	-0.0215	-0.0378	-0.0275	0.0163	0.0001
Bull Markets	0.0098	0.0014	0.0067	0.0084	0.0001
Recessions	0.0035	-0.0048	-0.0067	0.0083	0.0001
Recoveries	0.0033	-0.0173	0.0014	0.0206	0.0001
Sigma	0.0450	0.0417	0.0420	0.0033	0.0001
Dispersion	0.0040	0.0240	0.0033	-0.0200	0.0010
# Analysts	3.96	6.19	4.62	-2.23	0.0001
Size ($000)	297285.00	1337476.00	618575.00	-1040191.00	0.0001
Optimism	-0.0263	0.0080	-0.0046	-0.0343	0.0001
Liquidity	0.0048	0.0086	0.0062	-0.0038	0.0001
% Inst	29.70	39.90	26.90	-10.20	0.0001

Panel C
Mean Monthly NYSE Stock Returns

Year	P/E Ratio Sorted Quartiles		Total	Value Premium	Q1 ≠ Q4
	Q1 (Value)	Q4 (Growth)		Q1 - Q4	P-Values
1986	-0.0058	-0.0231	-0.0009	0.0173	0.0065
1987	-0.0314	-0.0356	-0.0259	0.0042	0.5441
1988	0.0093	0.0104	0.0074	-0.0011	0.7716
1989	0.0075	0.0031	0.0068	0.0044	0.2750
1990	-0.0228	-0.0258	-0.0230	0.0030	0.5456
1991	0.0260	0.0167	0.0208	0.0093	0.0414
1992	0.0146	-0.0027	0.0041	0.0173	0.0001
1993	0.0110	0.0041	0.0069	0.0069	0.0926
1994	-0.0060	-0.0108	-0.0083	0.0048	0.1443
1995	0.0093	-0.0039	0.0022	0.0132	0.0771
1996	-0.0296	-0.0361	-0.0398	0.0065	0.0214
1997	-0.0032	-0.0097	-0.0100	0.0065	0.0028
1998	-0.0242	-0.0220	-0.0217	-0.0022	0.5241
1999	0.0029	0.0017	0.0022	0.0012	0.6760
2000	0.0122	0.0028	0.0111	0.0094	0.0001
2001	0.0308	0.0231	0.0363	0.0077	0.0056
2002	-0.0122	-0.0185	-0.0148	0.0063	0.0207
2003	0.0289	0.0210	0.0229	0.0079	0.0001
2004	0.0110	0.0083	0.0899	0.0027	0.2344
2005	0.0083	0.0059	0.0087	0.0024	0.2010
2006	0.0192	0.0201	0.0230	-0.0009	0.5631
1986-2006	0.0034	-0.0016	0.0021	0.0050	0.0001
1986-1995	-0.0052	-0.0118	-0.0101	0.0066	0.0001
1996-2006	0.0073	0.0031	0.0072	0.0042	0.0001
Bear Markets	-0.0056	-0.0127	-0.0061	0.0071	0.0001
Bull Markets	0.0054	0.0009	0.0039	0.0045	0.0001
Recessions	0.0177	-0.0028	0.0239	0.0205	0.0020
Recoveries	0.0019	0.0010	0.0054	0.0009	0.0001
Sigma	0.0238	0.0250	0.0231	-0.0012	0.1262
Dispersion	0.0033	0.0019	0.0024	0.0014	0.0001
# Analysts	8.58	9.85	9.11	-1.27	0.0001
Size ($000)	2731316.00	4726480.00	3490647.00	-1995164.00	0.0001
Optimism	-0.0398	0.0086	-0.0123	-0.0484	0.0001
Liquidity	0.0048	0.0051	0.0047	-0.0003	0.0001
% Inst	48.50	53.40	51.30	-4.9000	0.0001

***Notes*:** This Table reports the summary statistics of the key variables used in this study for the period 1986-2006. Every year, starting in June 1985, firms are ranked based on *P/E* ratios from low to high and the ranked firms are divided into four groups of equal size. Returns are then obtained for the following months starting in July 1985. This Table reports the mean subsequent month monthly returns of prior June *P/E* sorted quartiles (from lowest (Q1) to highest (Q4)), respectively and the value premium (Q1-Q4) per year, sub-period (1986-1995 and 1996-2006) and total sample (1986-2006). The Table also reports the mean sigma, dispersion, # analysts, firm size, optimism, liquidity and % institutional ownership of the various *P/E* sorted portfolios. It also reports mean monthly returns in bull and bear markets and in recessions as opposed to recoveries for each of the P/E sorted portfolios, respectively and the value premium (Q1-Q4) at the different states of the world. P-values for the mean tests are based on the t-statistic for testing the null hypothesis that the mean returns of the value and growth strategies are equal. Return stands for the monthly subsequent month returns of the sample stocks. *P/E* stands for the ratio of the price per share at the end of a given June divided by trailing earnings per share as at the end of December of the year before. Size refers to market capitalization and is estimated by multiplying shares outstanding by price per share from the CRSP database (i.e., SIZE). Sigma is stock return volatility for firm i at time t and is calculated as the annualized standard deviation of daily CRSP stock returns from month m-1 to month m (i.e., SIGMA). Dispersion is the standard deviation of analysts' forecasts standardized by the firm i stock price (i.e., DISP). # Analysts is the number of analyst forecasting EPS (i.e., #ANALYSTS). Optimism is the difference in actual EPS from forecasted EPS divided by the firm i stock price (i.e., OPT). Liquidity is the percentage of shares outstanding that traded (i.e., LIQUID). %Inst is the percentage of shares outstanding held by institutional investors (i.e., %INST). Monthly stock returns, price per share, shares outstanding and volume are from CRSP, while estimates of EPS, analyst forecasts, standard deviation of analysts' forecasts and optimism are from I/B/E/S. The % of institutional ownership is calculated from CDA/Spectrum 13F database. Trailing BVPS are from COMPUSTAT. The total number of observations is 12,804 for AMEX, 313,779 for NASDAQ and 344,712 for NYSE.

Table 2
Mean Monthly Stock Returns to P/BV Ratio (June, Trailing) Based Value and Growth Strategies by Year, Sub-period and State of the World: July 1985-June 2006

Panel A
Mean Monthly AMEX Stock Returns

Year	P/BV Ratio Sorted Quartiles		Total	Value Premium	Q1 ≠ Q4
	Q1 (Value)	Q4 (Growth)		Q1 - Q4	P-Values
1986	-0.0394	-0.0379	-0.0071	-0.0015	0.9216
1987	-0.0178	-0.0242	-0.0338	0.0064	0.7892
1988	0.0146	-0.0068	0.0068	0.0214	0.1639
1989	-0.0118	0.0012	-0.0004	-0.0130	0.3857
1990	-0.0329	-0.0414	-0.0337	0.0085	0.5872
1991	0.0126	0.0114	0.0166	0.0012	0.9232
1992	0.0098	-0.0067	0.0088	0.0165	0.1473
1993	0.0220	0.0103	0.0103	0.0117	0.4050
1994	0.0020	-0.0166	-0.0072	0.0186	0.2015
1995	0.0158	0.0200	0.0047	-0.0042	0.7345
1996	0.0106	-0.0112	0.0050	0.0218	0.1026
1997	0.0235	-0.0245	0.0048	0.0480	0.0040
1998	-0.0552	-0.0769	-0.0374	0.0217	0.3203
1999	-0.0068	-0.0036	0.0021	-0.0032	0.8753
2000	-0.0165	-0.0207	-0.0195	0.0042	0.8364
2001	0.0412	-0.0136	0.0121	0.0548	0.0188
2002	0.0046	-0.0196	-0.0060	0.0242	0.3989
2003	0.0292	0.0229	0.0283	0.0063	0.8178
2004	0.0011	-0.0156	0.0176	0.0167	0.3949
2005	-0.0171	0.0085	-0.0053	-0.0256	0.1340
2006	0.0053	-0.0093	0.0057	0.0146	0.3383
1986-2006	0.0002	-0.0122	-0.0017	0.0124	0.0012
1986-1995	0.0012	-0.0076	-0.0025	0.0088	0.0489
1996-2006	-0.0015	-0.0195	-0.0006	0.0180	0.0084
Bear Markets	-0.0193	-0.0282	-0.0246	0.0089	0.3943
Bull Markets	0.0045	-0.0086	0.0032	0.0131	0.0010
Recessions	-0.0025	-0.0303	-0.0136	0.0278	0.0376
Recoveries	0.0005	-0.0102	-0.0006	0.0107	0.0069
Sigma	0.0283	0.0267	0.0277	0.0016	0.0123
Dispersion	0.0146	0.0031	0.0107	0.0115	0.0001
# Analysts	2.13	3.91	2.63	-1.78	0.0001
Size ($000)	141164.00	586178.00	312578.00	-445014.00	0.0001
Optimism	0.0088	0.0056	0.0075	0.0032	0.0001
Liquidity	0.0017	0.0032	0.0021	-0.0015	0.0001
% Inst	24.70	27.10	25.70	-2.40	0.0001

Panel B
Mean Monthly NASDAQ Stock Returns

Year	P/BV Ratio Sorted Quartiles		Total	Value Premium	Q1 ≠ Q4
	Q1 (Value)	Q4 (Growth)		Q1 - Q4	P-Values
1986	-0.0196	-0.0507	-0.0108	0.0311	0.0001
1987	-0.0516	-0.0350	-0.0343	-0.0166	0.0007
1988	0.0011	0.0111	0.0123	-0.0100	0.0007
1989	0.0104	0.0039	0.0033	0.0065	0.0414
1990	-0.0138	-0.0266	-0.0293	0.0128	0.0005
1991	0.0196	0.0274	0.0237	-0.0078	0.1923
1992	0.0210	-0.0053	0.0112	0.0263	0.0001
1993	0.0165	0.0008	0.0099	0.0157	0.0052
1994	-0.0019	-0.0125	-0.0087	0.0106	0.0083
1995	0.0247	0.0022	0.0159	0.0225	0.0001
1996	0.0136	-0.0130	0.0018	0.0266	0.0001
1997	0.0197	-0.0087	0.0079	0.0284	0.0001
1998	-0.0234	-0.0326	-0.0312	0.0092	0.0701
1999	-0.0104	0.0310	0.0213	-0.0414	0.0001
2000	-0.0065	-0.0555	-0.0300	0.0490	0.0001
2001	0.0259	-0.0127	-0.0067	0.0386	0.0001
2002	-0.0002	-0.0393	-0.0203	0.0391	0.0001
2003	0.0403	0.0253	0.0400	0.0150	0.0001
2004	0.0094	0.0050	0.0085	0.0044	0.0913
2005	-0.0071	-0.0047	-0.0040	-0.0024	0.3033
2006	0.0108	-0.0003	0.0054	0.0111	0.0001
1986-2006	0.0041	-0.0071	0.0007	0.0112	0.0001
1986-1995	-0.0027	-0.0073	0.0012	0.0046	0.0003
1996-2006	0.0101	-0.0069	0.0002	0.0170	0.0001
Bear Markets	-0.0204	-0.0410	-0.0275	0.0206	0.0001
Bull Markets	0.0115	0.0003	0.0067	0.0112	0.0001
Recessions	-0.0002	-0.0182	-0.0067	0.0180	0.0001
Recoveries	0.0047	-0.0059	0.0014	0.0106	0.0001
Sigma	0.0365	0.0508	0.0419	-0.0143	0.0001
Dispersion	0.0044	0.0021	0.0034	0.0023	0.0001
# Analysts	3.87	6.61	4.62	-2.74	0.0001
Size ($000)	254438.00	1685297.00	618575.00	-1430859.00	0.0001
Optimism	-0.0077	-0.0034	-0.0046	-0.0043	0.0001
Liquidity	0.0042	0.0098	0.0062	-0.0056	0.0001
% Inst	28.60	43.40	33.00	-14.80	0.0001

Panel C
Mean Monthly NYSE Stock Returns

Year	P/BV Ratio Sorted Quartiles		Total	Value Premium	Q1 ≠ Q4
	Q1 (Value)	Q4 (Growth)		Q1 - Q4	P-Values
1986	-0.0102	-0.0331	-0.0009	0.0229	0.0008
1987	-0.0192	-0.0339	-0.0259	0.0147	0.0286
1988	0.0077	0.0082	0.0075	-0.0005	0.8782
1989	0.0048	0.0079	0.0067	-0.0031	0.4389
1990	-0.0310	-0.0194	-0.0230	-0.0116	0.0200
1991	0.0257	0.0186	0.0208	0.0071	0.1202
1992	0.0134	-0.0079	0.0041	0.0213	0.0001
1993	0.0126	0.0001	0.0069	0.0125	0.0028
1994	-0.0053	-0.0123	-0.0083	0.0070	0.0346
1995	0.0082	0.0022	0.0022	0.0060	0.0507
1996	-0.0296	-0.0421	-0.0398	0.0125	0.0001
1997	0.0013	-0.0117	-0.0100	0.0130	0.0001
1998	-0.0227	-0.0206	-0.0217	-0.0021	0.5400
1999	0.0001	0.0033	0.0022	-0.0032	0.2291
2000	0.0115	0.0049	0.0111	0.0066	0.0081
2001	0.0305	0.0231	0.0363	0.0074	0.0069
2002	-0.0132	-0.0169	-0.0148	0.0037	0.1838
2003	0.0317	0.0197	0.0229	0.0120	0.0001
2004	0.0120	0.0081	0.0099	0.0039	0.0855
2005	0.0085	0.0044	0.0087	0.0041	0.0308
2006	0.0232	0.0171	0.0230	0.0061	0.0002
1986-2006	0.0036	-0.0023	0.0021	0.0059	0.0001
1986-1995	-0.0056	-0.0134	-0.0100	0.0078	0.0001
1996-2006	0.0079	0.0030	0.0072	0.0049	0.0001
Bear Markets	-0.0063	-0.0103	-0.0061	0.0040	0.0001
Bull Markets	0.0059	-0.0005	0.0039	0.0064	0.0201
Recessions	0.0145	0.0123	0.0239	0.0022	0.3483
Recoveries	0.0025	-0.0038	-0.0001	0.0063	0.0001
Sigma	0.0237	0.0246	0.0231	-0.0009	0.2778
Dispersion	0.0042	0.0010	0.0024	0.0032	0.0001
# Analysts	7.29	11.56	9.11	-4.27	0.0001
Size ($000)	1522834.00	8137544.00	3490647.00	-6614710.00	0.0001
Optimism	-0.0137	-0.0111	-0.0123	-0.0026	0.0001
Liquidity	0.0040	0.0053	0.0047	-0.0013	0.0001
% Inst	47.40	54.70	50.00	-7.30	0.0001

***Notes*:** This Table reports the summary statistics of the key variables used in this study for the period 1986-2006. Every year, starting in June 1985, firms are ranked based on P/BV ratios from low to high and the ranked firms are divided into four groups of equal size. Returns are then obtained for the following months starting in July 1985. This Table reports the mean subsequent month monthly returns of prior June P/BV sorted quartiles (from lowest (Q1) to highest (Q4)), respectively and the value premium (Q1-Q4) per year, sub-period (1986-1995 and 1996-2006) and total sample (1986-2006). The Table also reports the mean sigma, dispersion, # analysts, firm size, optimism, liquidity and % institutional ownership of the various P/BV sorted portfolios. It also reports mean monthly returns in bull and bear markets and in recessions as opposed to recoveries for each of the P/BV sorted portfolios, respectively and the value premium (Q1-Q4) at the different states of the world. P-values for the mean tests are based on the t-statistic for testing the null hypothesis that the mean returns of the value and growth strategies are equal. Return stands for the monthly subsequent month returns of the sample stocks. P/BV stands for the ratio of the price per share at the end of a given June divided by trailing book value per share as at the end of December of the year before. Size refers to market capitalization and is estimated by multiplying shares outstanding by price per share from the CRSP database (i.e., SIZE). Sigma is stock return volatility for firm i at time t and is calculated as the annualized standard deviation of daily CRSP stock returns from month m-1 to month m (i.e., SIGMA). Dispersion is the standard deviation of analysts' forecasts standardized by the firm i stock price (i.e., DISP). # Analysts is the number of analyst forecasting EPS (i.e., #ANALYSTS). Optimism is the difference in actual EPS from forecasted EPS divided by the firm i stock price (i.e., OPT). Liquidity is the percentage of shares outstanding that traded (i.e., LIQUID). %Inst is the percentage of shares outstanding held by institutional investors (i.e., %INST). Monthly stock returns, price per share, shares outstanding and volume are from CRSP, while estimates of EPS, analyst forecasts, standard deviation of analysts' forecasts and optimism are from I/B/E/S. The % of institutional ownership is calculated from CDA/Spectrum 13F database. Trailing BVPS are from COMPUSTAT. The total number of observations is 12,804 for AMEX, 313,779 for NASDAQ and 344,712 for NYSE.

Table 3
Percentage of Positive and Negative Monthly Stock Returns to P/E Ratio (June, Trailing) Based Value and Growth Strategies: July 1985-June 2006

Panel A
Percentage of Positive and Negative Monthly AMEX Stock Returns

	P/E Ratio Sorted Quartiles	
	Q1 (Value)	Q4 (Growth)
% Positive	54.3	47.9
% Negative	45.7	52.1

Panel B
Percentage of Positive and Negative Monthly NASDAQ Stock Returns

	P/E Ratio Sorted Quartiles	
	Q1 (Value)	Q4 (Growth)
% Positive	56.1	43.9
% Negative	43.9	56.1

Panel C
Percentage of Positive and Negative Monthly NYSE Stock Returns

	P/E Ratio Sorted Quartiles	
	Q1 (Value)	Q4 (Growth)
% Positive	58.9	49.8
% Negative	41.6	50.2

Notes: Every year, starting in June 1985, firms are ranked based on P/E ratios from low to high and the ranked firms are divided into four groups of equal size. Returns are then obtained for the following months starting in July 1985. This Table reports the percentage of stocks with positive and the percentage of stocks with negative subsequent month monthly returns for the lowest (Q1) and highest (Q4) prior June P/E sorted quartiles over our sample period. Monthly stock returns and prices per share are from CRSP. Trailing EPS are from COMPUSTAT.

Table 4
Mean Monthly Stock Returns to P/E Ratio (June, Trailing) Based Value and Growth Strategies by Industry: July 1985-June 2006

Every year, starting in June 1985, firms are ranked based on P/E ratios from low to high and the ranked firms are divided into four groups of equal size. Returns are then obtained for the following months starting in July 1985 This Table reports the mean subsequent month monthly returns and value premiums (Q1-Q4 returns) per industry for the ten industries to which the companies in our sample belong, which we obtained from COMPUSTAT. Prior June P/E sortings determine Q1 (lowest) and Q4 (highest) P/E quartiles. Monthly stock returns and prices per share are from CRSP. Trailing EPS are from COMPUSTAT. P-Values for the mean tests are based on the t-statistic for testing the null hypothesis that the mean returns of the value and growth strategies are equal. No of OBS refers to approximate number of observations per each quartile.

Panel A
Mean Monthly AMEX Stock Returns by Industry

No of OBS	**Industry**	**Q1 (Value)**	**Q4 (Growth)**	**Value Premium**	**Q1 ≠ Q4 (P-Values)**
N/A	Agriculture, Forestry and Fishing	-	-	-	N/A
408	Mining	0.0162	-0.0060	0.0222	0.2158
18	Construction	-0.0123	-	-	N/A
1350	Manufacturing	-0.0026	-0.0084	0.0058	0.3087
390	Transporation & Public Utilities	-0.0068	0.0005	-0.0073	0.6334
60	Wholesale Trade	-0.0102	0.0032	-0.0134	0.5500
156	Retail Trade	0.0167	-0.0069	0.0236	0.0637
228	Finance, Insurance & Real Estate	-0.0076	0.0079	-0.0155	0.1232
552	Services	0.0189	-0.0103	0.0292	0.0812
N/A	Public Administration	-	-	-	N/A

Panel B
Mean Monthly NASDAQ Stock Returns by Industry

No of OBS	**Industry**	**Q1 (Value)**	**Q4 (Growth)**	**Value Premium**	**Q1 ≠ Q4 (P-Values)**
328	Agriculture, Forestry and Fishing	-0.0038	-0.0086	0.0048	0.7889
2201	Mining	0.0012	0.0064	-0.0052	0.3908
611	Construction	-0.0112	0.0048	-0.0160	0.2304
37075	Manufacturing	0.0031	-0.0076	0.0107	0.0001
6648	Transporation & Public Utilities	-0.0006	-0.0034	0.0028	0.3556
4155	Wholesale Trade	0.0034	-0.0079	0.0113	0.0099
6612	Retail Trade	0.0043	-0.0088	0.0131	0.0001
36803	Finance, Insurance & Real Estate	0.0045	-0.0029	0.0074	0.2821
16628	Services	0.0034	-0.0082	0.0116	0.0001
N/A	Public Administration	-	-	-	N/A

Panel C
Mean Monthly NYSE Stock Returns by Industry

No of OBS	**Industry**	**Q1 (Value)**	**Q4 (Growth)**	**Value Premium**	**Q1 ≠ Q4 (P-Values)**
360	Agriculture, Forestry and Fishing	-0.0054	-0.0083	0.0029	0.7388
7880	Mining	0.0006	-0.0023	0.0029	0.0023
738	Construction	0.0069	0.0092	-0.0023	0.7180
36399	Manufacturing	0.0023	-0.0023	0.0046	0.0001
8923	Transporation & Public Utilities	0.0030	0.0009	0.0021	0.2627
2166	Wholesale Trade	0.0098	-0.0043	0.0141	0.0004
6072	Retail Trade	0.0069	-0.0031	0.0100	0.0016
11730	Finance, Insurance & Real Estate	0.0021	0.0020	0.0001	0.9960
11579	Services	0.0087	-0.0040	0.0127	0.0001
252	Public Administration	-0.0042	0.0023	-0.0065	0.5336

Table 5
Mean Monthly Stock Returns, Sigma, Dispersion, # Analysts, Size, Optimism and Liquidity to P/E Ratio (June, Trailing) Based Value and Growth Strategies by % Inst-Based categories: July 1985-June 2006

Panel A
Mean Monthly AMEX Stock Returns, Sigma, Dispersion, # Analysts, Size, Optimism and Liquidity

	Q1 (Value)	Q4 (Growth)	Q1 ≠ Q4 (P-Values)
Q1 (Low % Inst.)			
Returns	0.0043	-0.0142	0.0121
Sigma	0.0362	0.0330	0.0001
Dispersion	0.0146	0.0056	0.0001
# Analysts	1.40	1.89	0.1916
Size ($000)	45122.0	273229.0	0.0001
Optimism	-0.0150	0.0345	0.0001
Liquidity	0.0015	0.0029	0.0001
Q4 (High % Inst.)			
Returns	0.0003	-0.0034	0.1598
Sigma	0.0226	0.0236	0.2244
Dispersion	0.0046	0.0019	0.0001
# Analysts	3.15	5.13	0.0001
Size ($000)	260435.0	906408.0	0.0001
Optimism	-0.0103	0.0014	0.0021
Liquidity	0.0027	0.0035	0.0277
Q1 ≠ Q4 (P-Values)			
Returns	0.1423	0.0066	
Sigma	0.0001	0.0009	
Dispersion	0.0001	0.0001	
# Analysts	0.0001	0.0001	
Size ($000)	0.0064	0.0001	
Optimism	0.0561	0.0006	
Liquidity	0.0001	0.0401	

Panel B
Mean Monthly NASDAQ Stock Returns, Sigma, Dispersion, # Analysts, Size, Optimism and Liquidity

	Q1 (Value)	Q4 (Growth)	Q1 ≠ Q4 (P-Values)
Q1 (Low % Inst.)			
Returns	0.0043	-0.0076	0.0011
Sigma	0.0417	0.0416	0.6723
Dispersion	0.0063	0.0068	0.1001
# Analysts	1.75	2.82	0.1916
Size ($000)	85626.00	232694.0	0.0001
Optimism	-0.0107	0.0187	0.0001
Liquidity	0.0028	0.0052	0.0001
Q4 (High % Inst.)			
Returns	0.0047	-0.0080	0.0001
Sigma	0.0114	0.0335	0.0044
Dispersion	0.0034	0.0011	0.0001
# Analysts	6.16	8.50	0.0001
Size ($000)	614713.0	1553654.0	0.0001
Optimism	-0.0486	-0.0001	0.0001
Liquidity	0.0088	0.0137	0.0001
Q1 ≠ Q4 (P-Values)			
Returns	0.1124	0.2866	
Sigma	0.0001	0.0009	
Dispersion	0.0001	0.0001	
# Analysts	0.0001	0.0001	
Size ($M)	0.0064	0.0001	
Optimism	0.0001	0.0001	
Liquidity	0.0001	0.0001	

Panel C
Mean Monthly NYSE Stock Returns, Sigma, Dispersion, # Analysts, Size, Optimism and Liquidity

	Q1 (Value)	Q4 (Growth)	Q1 ≠ Q4 (P-Values)
Q1 (Low % Inst.)			
Returns	0.0000	-0.0113	0.0001
Sigma	0.0242	0.0261	0.0001
Dispersion	0.0051	0.0029	0.0001
# Analysts	4.87	6.54	0.0016
Size ($000)	1345028.0	3355389.0	0.0001
Optimism	-0.0364	0.0136	0.0001
Liquidity	0.0028	0.0036	0.0001
Q4 (High % Inst.)			
Returns	0.0046	0.0000	0.0121
Sigma	0.0287	0.0228	0.0244
Dispersion	0.0020	0.0013	0.0001
# Analysts	10.77	11.52	0.2745
Size ($000)	2528011.0	3126913.0	0.0001
Optimism	-0.0396	0.0036	0.0001
Liquidity	0.0045	0.0063	0.0001
Q1 ≠ Q4 (P-Values)			
Returns	0.0124	0.0001	
Sigma	0.0001	0.0009	
Dispersion	0.0001	0.0001	
# Analysts	0.0001	0.0001	
Size ($M)	0.0064	0.1233	
Optimism	0.0001	0.0001	
Liquidity	0.0001	0.0001	

Table 6
Mean Monthly AMEX Stock Returns, Dispersion, # Analysts, Size, Optimism, Liquidity and %Inst to P/E Ratio (June, Trailing) Based Value and Growth Strategies by Sigma-Based categories: July 1985-June 2006

Panel A
Mean Monthly AMEX Stock Returns, Dispersion, # Analysts, Size, Optimism, Liquidity and %Inst

	Q1 (Value)	Q4 (Growth)	Q1 ≠ Q4 (P-Values)
Q1 (Low Sigma)			
Returns	-0.0032	-0.0058	0.2201
Dispersion	0.0044	0.0023	0.0052
# Analysts	2.2500	4.1200	0.0060
Size ($000)	192030.00	708769.00	0.0001
Optimism	-0.0268	0.0083	0.0001
Liquidity	0.0012	0.0015	0.3578
% Inst.	29.30	31.00	0.0611
Q4 (High Sigma)			
Returns	0.0174	-0.0042	0.0001
Dispersion	0.0377	0.0080	0.0001
# Analysts	1.9200	2.9100	0.0245
Size ($000)	67513.00	200512.00	0.0012
Optimism	0.0271	0.0302	0.1263
Liquidity	0.0027	0.0048	0.0065
% Inst.	19.00	19.80	0.6544
Q1 ≠ Q4 (P-Values)			
Returns	0.0029	0.3518	
Dispersion	0.0001	0.0001	
# Analysts	0.1126	0.0018	
Size ($M)	0.0021	0.0092	
Optimism	0.0001	0.0004	
Liquidity	0.0001	0.0001	
% Inst.	0.0001	0.0001	

Panel B
Mean Monthly NASDAQ Stock Returns, Dispersion, # Analysts, Size, Optimism, Liquidity and %Inst

	Q1 (Value)	Q4 (Growth)	Q1 ≠ Q4 (P-Values)
Q1 (Low Sigma)			
Returns	0.0019	-0.0007	0.1001
Dispersion	0.0017	0.0014	0.2052
# Analysts	4.5200	6.6800	0.0001
Size ($000)	446842.00	2007239.00	0.0001
Optimism	-0.0271	0.0037	0.0001
Liquidity	0.0027	0.0052	0.0001
% Inst.	23.70	45.30	0.0001
Q4 (High Sigma)			
Returns	0.0066	-0.0165	0.0001
Dispersion	0.0081	0.0048	0.0001
# Analysts	3.4500	5.2600	0.0245
Size ($000)	151997.00	672410.00	0.0124
Optimism	-0.0391	0.0143	0.0001
Liquidity	0.0076	0.0134	0.0001
% Inst.	16.70	38.50	0.0001
Q1 ≠ Q4 (P-Values)			
Returns	0.0288	0.0001	
Dispersion	0.0001	0.0001	
# Analysts	0.1126	0.6818	
Size ($M)	0.0001	0.0001	
Optimism	0.0001	0.0004	
Liquidity	0.0001	0.0001	
% Inst.	0.0301	0.0112	

Panel C
Mean Monthly NYSE Stock Returns, Dispersion, # Analysts, Size, Optimism, Liquidity and %Inst

	Q1 (Value)	Q4 (Growth)	Q1 ≠ Q4 (P-Values)
Q1 (Low Sigma)			
Returns	0.0040	0.0015	0.0210
Dispersion	0.0017	0.0014	0.2052
# Analysts	9.6600	10.2100	0.5660
Size ($000)	4069132.00	6226104.00	0.0001
Optimism	-0.0331	0.0048	0.0001
Liquidity	0.0032	0.0037	0.0201
% Inst.	47.00	58.70	0.0001
Q4 (High Sigma)			
Returns	0.0041	-0.0074	0.0001
Dispersion	0.0056	0.0027	0.0001
# Analysts	6.9900	8.2700	0.0245
Size ($000)	1264298.00	2362805.00	0.0124
Optimism	-0.0482	0.0146	0.0001
Liquidity	0.0066	0.0074	0.0065
% Inst.	44.00	50.50	0.0004
Q1 ≠ Q4 (P-Values)			
Returns	0.7288	0.0018	
Dispersion	0.0001	0.0001	
# Analysts	0.0126	0.0118	
Size ($M)	0.0001	0.0001	
Optimism	0.0001	0.0004	
Liquidity	0.0001	0.0001	

Notes: Returns = Monthly Returns, Sigma = Standard Deviation of Returns, Dispersion = Dispersion in Analysts Forecasts, # Analysts = Number of Analysts following a stock, Size = Market Cap, Optimism= Analysts' Forecast Optimism, Liquidity = Stock Liquidity and % Inst. = Percentage of Institutional Ownership.

Every year, starting in June 1985, firms are ranked based on P/E ratios from low to high and the ranked firms are divided into four groups of equal size. Returns are then obtained for the following months starting in July 1985. In Tables 5 to 11, each previously P/E sorted quartile is now independently sorted into quartiles by % inst, size, optimism, # analysts, used here as a proxy for mispricing, and liquidity, sigma, and dispersion, used here as the proxy for risk, respectively. They report the mean subsequent month monthly returns and those of all other variables for each of the value (lowest quartile, Q1) and growth (highest quartile, Q4) portfolios for the lowest (Q1) and highest (Q4) quartile of other variables which were previously sorted into quartiles by P/E. Monthly stock prices, returns (and sigma), liquidity and size are from CRSP. The % Institutional holdings variable is from CDA/Spectrum 13F data base, while the rest of variables are from I/B/E/S. Trailing EPS are from COMPUSTAT. The total number of observations is 12,804 for AMEX, 313,779 for NASDAQ and 344,712 for NYSE. P-values for the mean tests are based on the t-statistic for testing the null hypothesis that the mean returns of the value and growth strategies or the low and high other variables portfolios are equal. Similar tests are carried out to test the difference in the means of all other variables of the value and/or growth portfolios.

Table 7
Regression Estimates of Monthly Stock Returns Against P/E Ratios, # Analysts, Liquidity, Sigma and Dispersion (Fama-MacBeth Procedure): July 1985-June 2006

Panel A
AMEX stocks

Independent Variables	P/E Ratio Sorted Quartiles		
	Total Sample	Q1 (Value)	Q4 (Growth)
Intercept	0.0053	0.1924	-0.2017
(P-Value)	(0.05)	(0.02)	(0.58)
PERATIO	-0.0001	-0.0031	-0.0138
(P-Value)	(0.42)	(0.39)	(0.32)
#ANALYSTS	-0.0004	0.0072	0.0053
(P-Value)	(0.58)	(0.11)	(0.14)
LLIQUID	-0.0038	-0.0084	-0.0006
(P-Value)	(0.90)	(0.32)	(0.93)
LSIGMA	0.0126	0.0359	0.0381
(P-Value)	(0.03)	(0.00)	(0.01)
LDISP	-1.4944	-9.3421	-50.9977
(P-Value)	(0.00)	(0.10)	(0.25)
Adjusted R^2	0.02	0.06	0.06
(P-Value)	(0.00)	(0.09)	(0.04)

Panel B
NASDAQ stocks

Independent Variables	P/E Ratio Sorted Quartiles		
	Total Sample	Q1 (Value)	Q4 (Growth)
Intercept	-0.0202	0.049	-0.058
(P-Value)	(0.42)	(0.08)	(0.06)
PERATIO	-0.0003	-0.0156	-0.0000
(P-Value)	(0.00)	(0.05)	(0.19)
#ANALYSTS	-0.0008	-0.0004	-0.0005
(P-Value)	(0.00)	(0.17)	(0.05)
LLIQUID	-0.0031	0.0052	-0.001
(P-Value)	(0.16)	(0.06)	(0.63)
LSIGMA	-0.0064	0.0079	-0.0166
(P-Value)	(0.33)	(0.3)	(0.04)
LDISP	-1.4919	-2.6372	-2.4185
(P-Value)	(0.00)	(0.00)	(0.00)
Adjusted R^2	0.02	0.04	0.01
(P-Value)	(0.00)	(0.00)	(0.01)

Panel C
NYSE stocks

Independent Variables	P/E Ratio Sorted Quartiles		
	Total Sample	Q1 (Value)	Q4 (Growth)
Intercept	-0.0158	0.0394	-0.0328
(P-Value)	(0.58)	(0.21)	(0.24)
PERATIO	-0.0000	-0.0004	-0.0000
(P-Value)	(0.81)	(0.40)	(0.21)
#ANALYSTS	-0.0002	-0.0001	-0.0003
(P-Value)	(0.00)	(0.80)	(0.04)
LLIQUID	0.0024	-0.0003	0.001
(P-Value)	(0.03)	(0.82)	(0.38)
LSIGMA	-0.0046	0.0066	-0.0087
(P-Value)	(0.50)	(0.40)	(0.19)
LDISP	-1.2407	-1.7711	-1.6739
(P-Value)	(0.00)	(0.00)	(0.03)
Adjusted R^2	0.02	0.03	0.02
(P-Value)	(0.04)	(0.00)	(0.05)

Notes: Every year, starting in June 1985, firms are ranked based on P/E ratios from low to high and the ranked firms are divided into four groups of equal size. Returns are then obtained for the following months starting in July 1985. The Table examines the relationship between (subsequent) month monthly returns of the total sample and value (lowest quartile – Q1) and growth (highest quartile – Q4) stocks and the variables hypothesized to have an effect on such returns. To this end, the following regression is estimated for each of the AMEX, NASDAQ and NYSE stocks for the total sample and the value and growth stocks using the Fama-MacBeth (FM) procedure:

$$RET^{n}_{i,t} = a_0 + a_1\, PERATIO_{i,t-1} + a_2\, \#ANALYSTS_{i,t-1} + a_3\, LLIQUID_{i,t-1} + a_4\, LSIGMA_{i,t-1} + a_5\, LDISP_{i,t-1} + e_{i,t} \quad (1),$$

Where, RET is the monthly for firm i at time t and either for the total sample or for the lowest and highest P/E ratio sorted quartiles n. The independent variables include the P/E ratio (PERATIO), #ANALYSTS defined as the number of analysts following a stock, LLIQUID defined as the natural log of one plus our liquidity measure (i.e., LIQUID), LDISP defined as the natural log of one plus DISP, where DISP is defined as the standard deviation of analysts' forecast scaled by stock price, and LSIGMA defined as the natural log of the annualized monthly standard deviation of stock returns calculated from daily CRSP data over a given month (i.e., SIGMA). All the independent variables, except PERATIO, are as at the end of the month prior to the month for which returns are calculated. PERATIO is at the end of June when sorting took place.R^2's for the Fama-MacBeth approach are the average of cross sectional R^2's. Monthly stock returns, volumes, shares outstanding and prices per share are from CRSP. Trailing EPS are from COMPUSTAT. #ANALYSTS are from I/B/E/S. P-values are reported below the estimated coefficients. P-values are in brackets.

Table 8
Mean Monthly Stock Returns to P/E Ratio (Dec, Forward) Based Value and Growth Strategies by Year, Sub-period and State of the World: January 1986-December 2006

Panel A
Mean Monthly AMEX Stock Returns

Year	P/E Ratio Sorted Quartiles		Total	Value Premium	Q1 ≠ Q4
	Q1 (Value)	Q4 (Growth)		Q1 - Q4	P-Values
1986	-0.0118	-0.0123	-0.0071	0.0005	0.9586
1987	-0.0416	-0.0256	-0.0338	-0.0160	0.6749
1988	0.0128	-0.0021	0.0068	0.0149	0.2547
1989	-0.0233	0.0080	-0.0004	-0.0313	0.0037
1990	-0.0435	-0.0319	-0.0337	-0.0116	0.3842
1991	0.0087	0.0156	0.0166	-0.0069	0.5181
1992	0.0197	-0.0008	0.0088	0.0205	0.1825
1993	0.0122	0.0023	0.0103	0.0099	0.4161
1994	-0.0127	-0.0228	-0.0072	0.0101	0.4664
1995	0.0376	0.0147	0.0047	0.0229	0.1143
1996	-0.0038	-0.0099	0.0049	0.0061	0.6590
1997	0.0087	-0.0199	0.0048	0.0286	0.1127
1998	-0.0536	-0.0406	-0.0374	-0.0130	0.7598
1999	0.0089	0.0259	0.0020	-0.0170	0.4032
2000	-0.0365	0.0012	-0.0195	-0.0377	0.0597
2001	0.0021	-0.0147	0.0121	0.0168	0.5629
2002	0.0000	-0.0164	-0.0060	-0.0164	0.4964
2003	0.0709	0.0455	0.0283	0.0254	0.5690
2004	0.0027	-0.0111	0.0172	0.0138	0.7461
2005	-0.0271	-0.0195	-0.0053	-0.0076	0.1697
2006	0.0148	-0.0134	0.0057	0.0282	0.2607
1986-2006	-0.0060	-0.0062	-0.0017	0.0002	0.7020
1986-1995	-0.0044	-0.0049	-0.0025	0.0005	0.8350
1996-2006	-0.0103	-0.0080	-0.0006	-0.0023	0.8573
Bear Markets	-0.0411	-0.0177	-0.0246	-0.0234	0.0266
Bull Markets	0.0015	-0.0037	0.0032	0.0052	0.2607
Recessions	-0.0362	-0.0245	-0.0136	-0.0117	0.3423
Recoveries	-0.0029	-0.0043	-0.0006	0.0014	0.8270
Sigma	0.0361	0.0259	0.0328	0.0102	0.0001
Dispersion	0.0330	0.0044	0.0107	0.0286	0.0001
# Analysts	2.09	3.57	2.63	-1.48	0.0001
Size ($000)	191615.00	591888.00	312528.00	-400273.00	0.0001
Optimism	0.0650	-0.0217	0.0024	0.0867	0.0001
Liquidity	0.0025	0.0028	0.0021	-0.0003	0.0048
% Inst	19.30	27.10	22.70	-7.80	0.0001

Panel B
Mean Monthly NASDAQ Stock Returns

Year	P/E Ratio Sorted Quartiles		Total	Value Premium	Q1 ≠ Q4
	Q1 (Value)	Q4 (Growth)		Q1 - Q4	P-Values
1986	0.0061	-0.0057	-0.0009	0.0118	0.0533
1987	-0.0296	-0.0247	-0.0259	-0.0049	0.4746
1988	0.01590	0.0089	0.0075	0.0070	0.3077
1989	0.0061	0.0095	0.0067	-0.0034	0.1934
1990	-0.0358	-0.0132	-0.0230	-0.0226	0.0001
1991	0.0222	0.0183	0.0208	0.0039	0.3097
1992	0.0089	-0.0042	0.0041	0.0131	0.0004
1993	0.0027	0.0132	0.0069	-0.0105	0.4042
1994	-0.0054	-0.0036	-0.0083	-0.0018	0.3695
1995	0.0054	0.0037	0.0022	0.0017	0.3125
1996	-0.0347	-0.0402	-0.0398	0.0055	0.0060
1997	-0.0074	-0.0126	-0.0101	0.0052	0.0001
1998	-0.0264	-0.0172	-0.0217	-0.0092	0.6456
1999	0.0062	0.0033	0.0022	0.0029	0.1186
2000	0.0079	0.0068	0.0111	0.0011	0.0101
2001	0.0366	0.0254	0.0363	0.0112	0.0001
2002	-0.0158	-0.0165	-0.0148	0.0007	0.1112
2003	0.0261	0.0213	0.0229	0.0048	0.0118
2004	0.0119	0.0084	0.0099	0.0035	0.0145
2005	0.0068	0.0050	0.0087	0.0018	0.0076
2006	0.0177	0.0179	0.0230	-0.0002	0.0032
1986-2006	0.0029	0.0009	0.0021	0.0020	0.0002
1986-1995	-0.0085	-0.0105	-0.0101	0.0020	0.0541
1996-2006	0.0070	0.0048	0.0720	0.0022	0.0001
Bear Markets	-0.0067	-0.0087	-0.0061	0.0020	0.0006
Bull Markets	0.0051	0.0027	0.0039	0.0024	0.0001
Recessions	0.0215	0.0185	0.0239	0.0030	0.0131
Recoveries	0.0008	-0.0008	-0.0001	0.0016	0.0001
Sigma	0.0240	0.0231	0.0231	0.0009	0.0001
Dispersion	0.0041	0.0009	0.0024	0.0032	0.0001
# Analysts	7.67	10.60	9.11	-2.93	0.0001
Size ($000)	2675645.00	6456366.00	3490647.00	-3780721.00	0.0001
Optimism	0.0180	-0.0366	-0.0123	0.0546	0.0001
Liquidity	0.0047	0.0053	0.0047	-0.0006	0.0001
% Inst	49.50	57.80	50.00	-8.30	0.0001

Panel C
Mean Monthly NYSE Stock Returns

Year	P/E Ratio Sorted Quartiles		Total	Value Premium	Q1 ≠ Q4
	Q1 (Value)	Q4 (Growth)		Q1 - Q4	P-Values
1986	-0.0033	-0.0130	-0.0109	0.0097	0.1117
1987	-0.0365	-0.0289	-0.0343	-0.0076	0.9045
1988	0.0149	0.0099	0.0123	0.0050	0.2310
1989	-0.0001	0.0072	0.0033	-0.0073	0.5798
1990	-0.0477	-0.0180	-0.0293	-0.0297	0.0004
1991	0.0247	0.0306	0.0237	-0.0059	0.3386
1992	0.0192	0.0017	0.0112	0.0175	0.0126
1993	0.0076	0.0024	0.0099	0.0052	0.0637
1994	-0.0054	-0.0074	-0.0087	0.0020	0.4642
1995	0.0169	0.0139	0.0158	0.0030	0.8136
1996	0.0072	-0.0057	0.0018	0.0129	0.1269
1997	0.0176	-0.0001	0.0079	0.0177	0.0703
1998	-0.0335	-0.0283	-0.0312	-0.0052	0.0266
1999	0.0247	0.0493	0.0213	-0.0246	0.3327
2000	-0.0065	-0.0420	-0.0301	0.0355	0.5838
2001	0.0254	-0.0141	0.0067	0.0395	0.0002
2002	0.0001	-0.0379	-0.0203	0.0380	0.7585
2003	0.0468	0.0357	0.0400	0.0111	0.0200
2004	0.0127	0.0034	0.0085	0.0093	0.1827
2005	0.0012	-0.0064	-0.0044	0.0076	0.3604
2006	0.0083	-0.0007	0.0054	0.0090	0.8275
1986-2006	0.0047	-0.0050	0.0007	0.0097	0.0341
1986-1995	0.0025	0.0009	0.0012	0.0016	0.1701
1996-2006	0.0066	-0.0087	0.0002	0.0153	0.0339
Bear Markets	-0.0218	-0.0351	-0.0275	0.0133	0.1430
Bull Markets	0.0090	0.0017	0.0067	0.0073	0.0035
Recessions	-0.0055	-0.0153	-0.0067	0.0098	0.3160
Recoveries	0.0057	-0.0039	0.0014	0.0096	0.0963
Sigma	0.0455	0.0374	0.0419	0.0081	0.4949
Dispersion	0.0059	0.0013	0.0034	0.0046	0.0001
# Analysts	3.14	6.25	4.62	-3.11	0.0001
Size ($000)	243507.00	2035599.00	618575.00	-1792092.00	0.0001
Optimism	0.0037	-0.0247	-0.0046	0.0284	0.0001
Liquidity	0.0050	0.0182	0.0062	-0.0132	0.0001
% Inst	31.50	50.10	33.00	-18.60	0.0001

***Notes*:** This Table reports the summary statistics of the key variables used in this study for the period 1986-2006. Every year, starting in December 1985, firms are ranked based on *P/E* ratios from low to high and the ranked firms are divided into four groups of equal size. Returns are then obtained for the following months starting in January 1986. This Table reports the mean subsequent month monthly returns of prior December *P/E* sorted quartiles (from lowest (Q1) to highest (Q4)), respectively and the value premium (Q1-Q4) per year, sub-period (1986-1995 and 1996-2006) and total sample (1986-2006). The Table also reports the mean sigma, dispersion, # analysts, firm size, optimism, liquidity and % institutional ownership of the various *P/E* sorted portfolios. It also reports mean monthly returns in bull and bear markets and in recessions as opposed to recoveries for each of the P/E sorted portfolios, respectively and the value premium (Q1-Q4) at the different states of the world. P-values for the mean tests are based on the t-statistic for testing the null hypothesis that the mean returns of the value and growth strategies are equal. Return stands for the monthly subsequent month returns of the sample stocks. *P/E* stands for the ratio of the price per share at the end of a given December divided by forward earnings per share as at the end of December forecasted for the following year. Size refers to market capitalization and is estimated by multiplying shares outstanding by price per share from the CRSP database (i.e., SIZE). Sigma is stock return volatility for firm i at time t and is calculated as the annualized standard deviation of daily CRSP stock returns from month m-1 to month m (i.e., SIGMA). Dispersion is the standard deviation of analysts' forecasts standardized by the firm i stock price (i.e., DISP). # Analysts is the number of analyst forecasting EPS (i.e., #ANALYSTS). Optimism is the difference in actual EPS from forecasted EPS divided by the firm i stock price (i.e., OPT). Liquidity is the percentage of shares outstanding that traded (i.e., LIQUID). %Inst is the percentage of shares outstanding held by institutional investors (i.e., %INST). Monthly stock returns, price per share, shares outstanding and volume are from CRSP, while estimates of EPS, analyst forecasts, standard deviation of analysts' forecasts and optimism are from I/B/E/S. The % of institutional ownership is calculated from CDA/Spectrum 13F database. Trailing BVPS are from COMPUSTAT. The total number of observations is 12,804 for AMEX, 313,779 for NASDAQ and 344,712 for NYSE.

Table 9
Mean Monthly Stock Returns to P/E Ratio (Dec, Trailing) Based Value and Growth Strategies by Year, Sub-period and State of the World: January 1986-December 2006

Panel A
Mean Monthly AMEX Stock Returns

Year	P/E Ratio Sorted Quartiles		Total	Value Premium	Q1 ≠ Q4
	Q1 (Value)	Q4 (Growth)		Q1 - Q4	P-Values
1986	0.0024	-0.0098	-0.0071	0.0122	0.1708
1987	-0.0298	-0.0329	-0.0338	0.0031	0.8153
1988	0.0102	0.0079	0.0068	0.0023	0.7664
1989	0.0026	-0.0030	-0.0004	0.0056	0.5355
1990	-0.0137	-0.0316	-0.0337	0.0179	0.1169
1991	0.0255	0.0153	0.0166	0.0102	0.3301
1992	0.0259	0.0001	0.0088	0.0258	0.0050
1993	0.0148	0.0087	0.0103	0.0061	0.4841
1994	-0.0020	-0.0087	-0.0072	0.0067	0.4012
1995	0.0125	0.0112	0.0047	0.0013	0.8528
1996	0.0069	0.0027	0.0049	0.0042	0.6406
1997	0.0221	-0.0003	0.0048	0.0224	0.0091
1998	-0.0340	-0.0429	-0.0373	0.0089	0.4339
1999	0.0065	0.0045	0.0020	0.0020	0.8595
2000	-0.0262	-0.0108	-0.0195	-0.0154	0.2231
2001	0.0231	-0.0040	0.0121	0.0271	0.0293
2002	0.0102	-0.0101	-0.0060	0.0203	0.1026
2003	0.0400	0.0122	0.0283	0.0278	0.0278
2004	0.0085	0.0113	0.0172	-0.0028	0.8141
2005	-0.0074	-0.0062	-0.0053	-0.0012	0.9069
2006	0.0106	0.0004	0.0057	0.0102	0.2770
1986-2006	0.0055	-0.0043	-0.0017	0.0098	0.0001
1986-1995	0.0071	-0.0036	-0.0025	0.0107	0.0001
1996-2006	0.0032	-0.0053	-0.0005	0.0085	0.0168
Bear Markets	-0.0167	-0.0227	-0.0246	0.0060	0.3332
Bull Markets	0.0092	-0.0002	0.0032	0.0094	0.0001
Recessions	0.0074	-0.0193	-0.0136	0.0267	0.0015
Recoveries	0.0053	-0.0027	-0.0006	0.0080	0.0003
Sigma	0.0326	0.0301	0.0328	0.0025	0.0001
Dispersion	0.0262	0.0049	0.0107	0.0213	0.0001
# Analysts	2.07	3.57	2.63	-1.50	0.0001
Size ($000)	79875.00	215186.00	112578.00	-135311.00	0.0001
Optimism	-0.0367	0.0284	0.0074	-0.0651	0.0001
Liquidity	0.0024	0.0023	0.0213	0.0001	0.4306
% Inst	18.40	25.70	22.70	-7.30	0.0001

Panel B
Mean Monthly NASDAQ Stock Returns

Year	P/E Ratio Sorted Quartiles		Total	Value Premium	Q1 ≠ Q4
	Q1 (Value)	Q4 (Growth)		Q1 - Q4	P-Values
1986	0.0015	-0.0215	-0.0109	0.0230	0.0001
1987	-0.0354	-0.0274	-0.0343	-0.0080	0.0367
1988	0.0142	0.0131	-0.1230	0.0011	0.6261
1989	0.0039	0.0041	0.0033	-0.0002	0.9481
1990	-0.0205	-0.0234	-0.0293	0.0029	0.6527
1991	0.0265	0.0241	0.0237	0.0024	0.6864
1992	0.0196	0.0007	0.0112	0.0189	0.0005
1993	0.0179	-0.0016	0.0099	0.0195	0.0004
1994	-0.0012	-0.0140	-0.0087	0.0128	0.0004
1995	0.0261	0.0086	0.0159	0.0175	0.0001
1996	0.0154	-0.0071	0.0018	0.0225	0.0001
1997	0.0217	-0.0082	0.0079	0.0299	0.0001
1998	-0.0259	-0.0355	-0.0312	0.0096	0.0533
1999	0.0232	0.0429	0.0213	-0.0197	0.0439
2000	-0.0063	-0.0493	-0.0301	0.0430	0.0001
2001	0.0297	-0.0144	0.0067	0.0441	0.0001
2002	-0.0022	-0.0313	-0.0203	0.0291	0.0001
2003	0.0338	0.0313	0.0400	0.0025	0.3612
2004	0.0083	0.0054	0.0085	0.0029	0.1944
2005	0.0002	-0.0071	-0.0044	0.0073	0.0146
2006	0.0084	0.0014	0.0054	0.0070	0.0147
1986-2006	0.0075	-0.0057	0.0007	0.0132	0.0001
1986-1995	0.0036	-0.0026	0.0012	0.0062	0.0001
1996-2006	0.0111	-0.0086	0.0002	0.0197	0.0001
Bear Markets	-0.0189	-0.0343	-0.0275	0.0154	0.0001
Bull Markets	0.0132	0.0006	0.0067	0.0126	0.0001
Recessions	0.0152	-0.0169	-0.0067	0.0321	0.0001
Recoveries	0.0070	-0.0048	0.0014	0.0118	0.0001
Sigma	0.0420	0.0467	0.0419	-0.0047	0.0470
Dispersion	0.0038	0.0027	0.0034	0.0011	0.0001
# Analysts	3.95	6.10	4.62	-2.15	0.0001
Size ($000)	274232.00	1175927.00	618575.00	-901695.00	0.0001
Optimism	-0.0262	0.0072	-0.0046	-0.0334	0.0001
Liquidity	0.0044	0.0083	0.0062	-0.0039	0.0001
% Inst	28.50	39.10	33.00	-10.60	0.0001

Panel C
Mean Monthly NYSE Stock Returns

Year	P/E Ratio Sorted Quartiles		Total	Value Premium	Q1 ≠ Q4
	Q1 (Value)	Q4 (Growth)		Q1 - Q4	P-Values
1986	0.0078	-0.0026	-0.0009	0.0104	0.0246
1987	-0.0234	-0.0267	-0.0259	0.0033	0.6242
1988	0.0148	0.0027	0.0075	0.0121	0.0015
1989	0.0038	0.0064	0.0068	-0.0026	0.5160
1990	-0.0179	-0.0243	-0.0230	0.0064	0.1996
1991	0.0285	0.0107	0.0208	0.0178	0.0002
1992	0.0162	-0.0049	0.0041	0.0211	0.0001
1993	0.0116	0.0051	0.0069	0.0065	0.1150
1994	-0.0072	-0.0107	-0.0083	0.0035	0.2785
1995	0.0109	0.0019	0.0022	0.0090	0.0028
1996	-0.0292	-0.0313	-0.0398	0.0021	0.4582
1997	-0.0057	-0.0087	-0.0101	0.0030	0.1643
1998	-0.0237	-0.0225	-0.0217	-0.0012	0.7378
1999	0.0081	-0.0013	0.0022	0.0094	0.0006
2000	0.0142	0.0028	0.0111	0.0114	0.0001
2001	0.0362	0.0210	0.0363	0.0152	0.0001
2002	-0.0137	-0.0163	-0.0148	0.0026	0.3302
2003	0.0286	0.0227	0.0229	0.0059	0.0018
2004	0.0123	0.0077	0.0099	0.0046	0.0376
2005	0.0071	0.0079	0.0087	-0.0008	0.6823
2006	0.0180	0.0202	0.0230	-0.0022	0.1970
1986-2006	0.0044	-0.0011	0.0021	0.0055	0.0001
1986-1995	-0.0030	-0.0102	-0.0101	0.0072	0.0001
1996-2006	0.0080	0.0032	0.0072	0.0048	0.0246
Bear Markets	-0.0039	-0.0108	-0.0061	0.0069	0.0001
Bull Markets	0.0063	0.0010	0.0039	0.0053	0.0001
Recessions	0.0234	0.0094	0.0240	0.0140	0.0001
Recoveries	0.0026	-0.0022	-0.0001	0.0048	0.0001
Sigma	0.0235	0.0255	0.0231	-0.0020	0.0143
Dispersion	0.0031	0.0018	0.0024	0.0013	0.0001
# Analysts	8.31	9.95	9.11	-1.64	0.0001
Size ($000)	2520967.00	4963653.00	3490647.00	-2442686.00	0.0001
Optimism	-0.0340	0.0023	-0.0123	-0.0363	0.0001
Liquidity	0.0045	0.0054	0.0047	-0.0009	0.0001
% Inst	47.90	53.50	50.00	-5.60	0.0001

***Notes*:** This Table reports the summary statistics of the key variables used in this study for the period 1986-2006. Every year, starting in December 1985, firms are ranked based on *P/E* ratios from low to high and the ranked firms are divided into four groups of equal size. Returns are then obtained for the following months starting in January 1986. This Table reports the mean subsequent month monthly returns of prior December *P/E* sorted quartiles (from lowest (Q1) to highest (Q4)), respectively and the value premium (Q1-Q4) per year, sub-period (1986-1995 and 1996-2006) and total sample (1986-2006). The Table also reports the mean sigma, dispersion, # analysts, firm size, optimism, liquidity and % institutional ownership of the various *P/E* sorted portfolios. It also reports mean monthly returns in bull and bear markets and in recessions as opposed to recoveries for each of the P/E sorted portfolios, respectively and the value premium (Q1-Q4) at the different states of the world. P-values for the mean tests are based on the t-statistic for testing the null hypothesis that the mean returns of the value and growth strategies are equal. Return stands for the monthly subsequent month returns of the sample stocks. *P/E* stands for the ratio of the price per share at the end of a given December divided by trailing earnings per share as at the end of December of the year before. Size refers to market capitalization and is estimated by multiplying shares outstanding by price per share from the CRSP database (i.e., SIZE). Sigma is stock return volatility for firm i at time t and is calculated as the annualized standard deviation of daily CRSP stock returns from month m-1 to month m (i.e., SIGMA). Dispersion is the standard deviation of analysts' forecasts standardized by the firm i stock price (i.e., DISP). # Analysts is the number of analyst forecasting EPS (i.e., #ANALYSTS). Optimism is the difference in actual EPS from forecasted EPS divided by the firm i stock price (i.e., OPT). Liquidity is the percentage of shares outstanding that traded (i.e., LIQUID). %Inst is the percentage of shares outstanding held by institutional investors (i.e., %INST). Monthly stock returns, price per share, shares outstanding and volume are from CRSP, while estimates of EPS, analyst forecasts, standard deviation of analysts' forecasts and optimism are from I/B/E/S. The % of institutional ownership is calculated from CDA/Spectrum 13F database. Trailing BVPS are from COMPUSTAT. The total number of observations is 12,804 for AMEX, 313,779 for NASDAQ and 344,712 for NYSE.

Table 10

Time Series Regression Results of Size/Price-to-Earnings Based Stock Portfolio Monthly Returns on the Three Fama-French Factors - All Markets Aggregated: July 1985-June 2006

AMEX, NASDAQ and NYSE Stocks

Sub-sample	Intercept (a)	RMF (b)	SMB (c)	HML (d)	R-Square
Small Value	-0.0063	0.867	0.617	0.459	0.90
(P-Value)	(0.45)	(0.00)	(0.00)	(0.00)	
Small Growth	-0.0106	1.108	0.702	-0.491	0.92
(P-Value)	(0.36)	(0.00)	(0.00)	(0.00)	
Large Value	-0.013	0.982	0.043	0.205	0.80
(P-Value)	(0.24)	(0.00)	(0.19)	(0.00)	
Large Growth	-0.0192	1.013	0.107	-0.01	0.69
(P-Value)	(0.17)	(0.00)	(0.15)	(0.40)	

Notes: The following Fama and French three factor regression is employed to produce this Table:

$$R_{pt} - R_{ft} = a + b(R_{mt} - R_{ft}) + c(R_{st} - R_{bt}) + d(R_{ht} - R_{lt}) + e_t \qquad (2)$$

where, R_{pt} is the monthly return of the portfolio in question, R_{ft} is the monthly return on the risk free rate (one-month t-bill), R_{mt} is the monthly return on the value weighted market portfolio, R_{st} is the monthly return on the small stock portfolio, R_{bt} is the monthly return on the large stock portfolio, R_{ht} is the monthly return on the high B/M portfolio, R_{lt} is the monthly return in the low B/M portfolio and e_t is the error term. For the regressions, we form six size and B/M portfolios by independently sorting stocks into two groups by size and then sorting each size sorted portfolio into three groups based on trailing B/M. Monthly value weighted returns for each of the six portfolios and ($R_{mt} - R_{ft}$), ($R_{st} - R_{bt}$) and ($R_{ht} - R_{lt}$) excess returns are then calculated from July of year (*t)* to June of year *(t+1)*. Finally, monthly excess returns of equally weighted smallest size/lowest P/E (small-value), smallest size/highest P/E (small-growth), largest size/lowest P/E (large-value) and largest size/highest P/E (large-growth) portfolios are regressed against the aforementioned Fama-French three factors for the period July 1985 to June 2006. The slope coefficients of these regressions determine the expected risk exposure of a stock portfolio to the market portfolio, firm-size and B/M ratio. RMF is the return on the value weighted market portfolio less risk free rate, SMB is the return on the small stock portfolio less the return on the large stock portfolio and HML is the return on the high B/M portfolio less the return in the low B/M portfolio. B/M is the inverse of the P/BV ratio employed in the previous sections. B/M is employed in this Table to make the results consistent with the Fama-French three factor model. Monthly returns, shares outstanding and prices per share are from CRSP. Trailing Book Values per Share is from COMPUSTAT. P-values are in brackets.

Figure 1

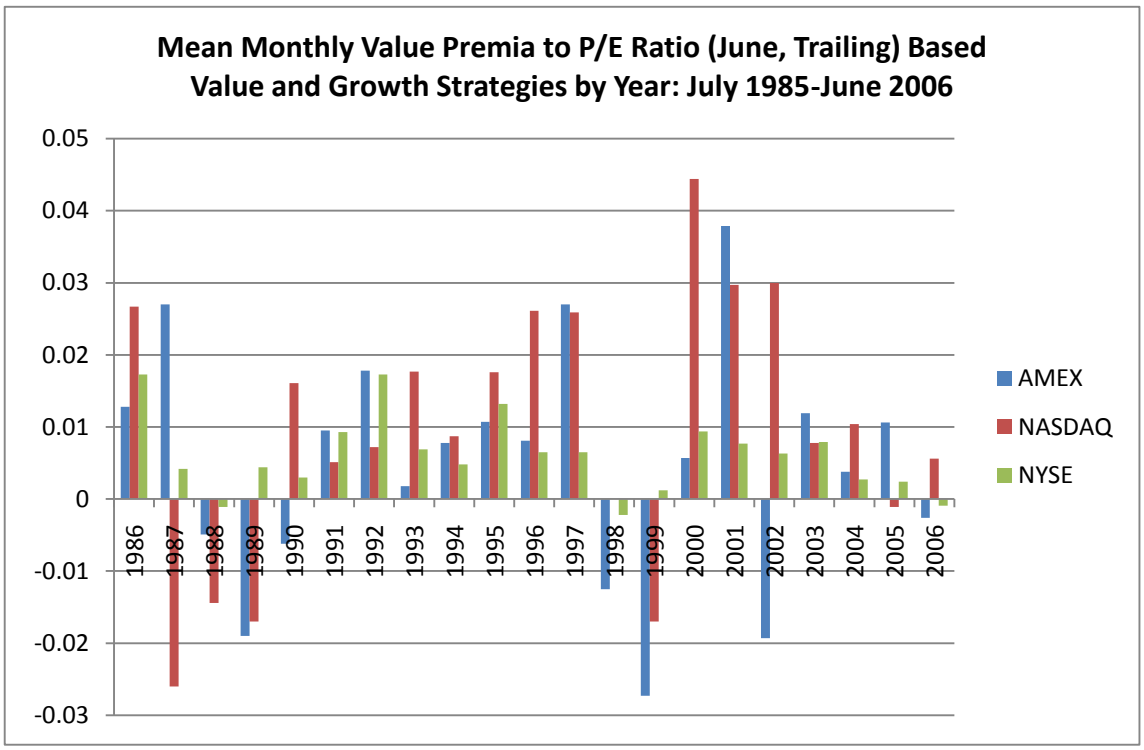

Figure 2

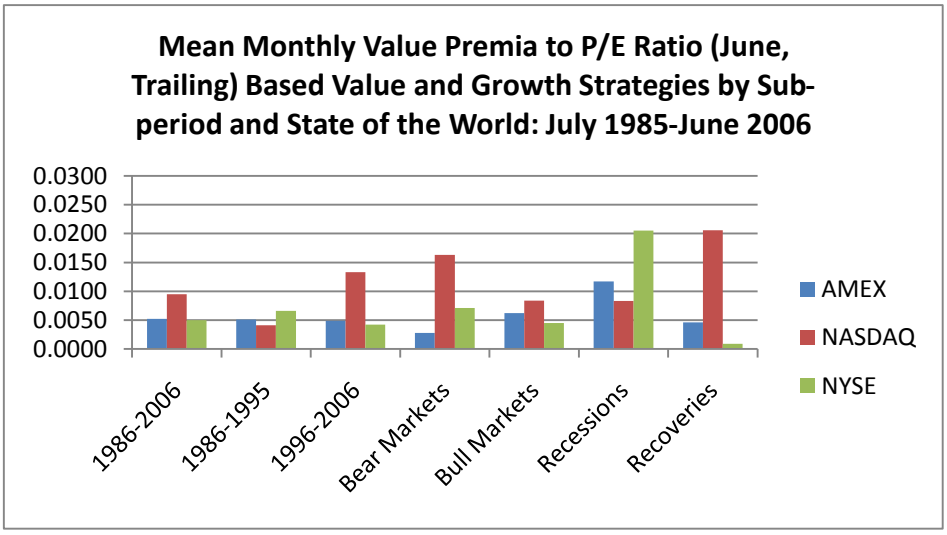

Figure 3

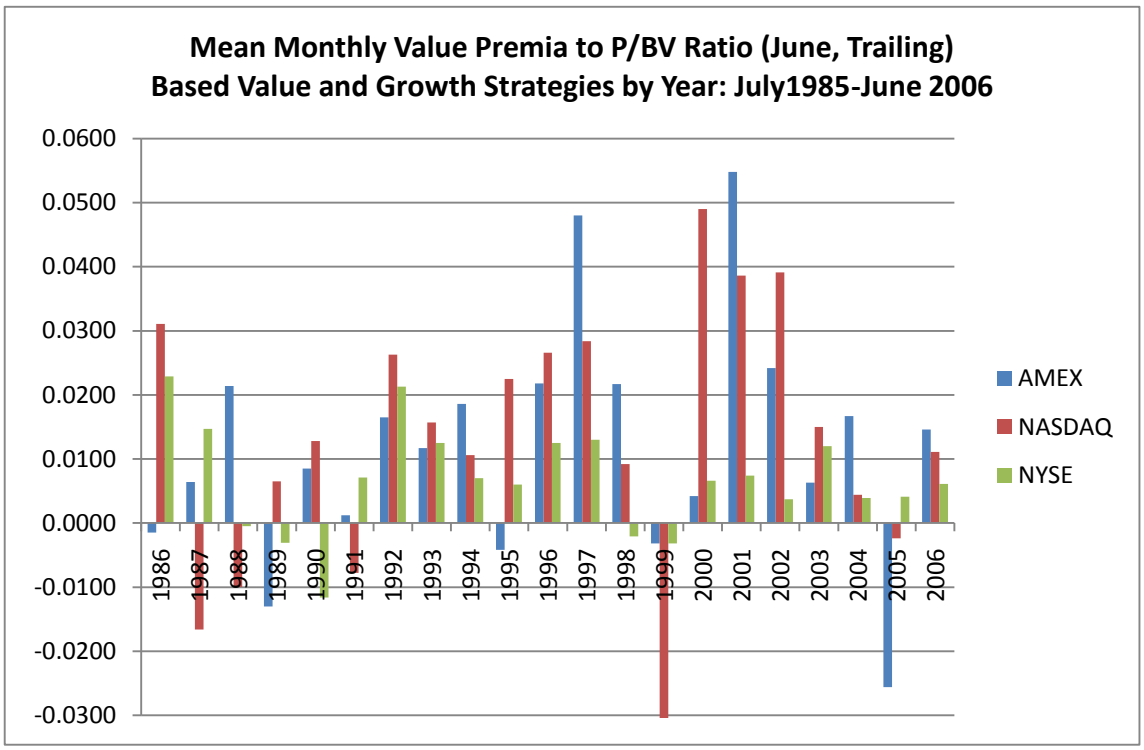

Figure 4