Too Good to Ignore? A Primer on Listed Penny Stocks

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First draft: August 2011
This draft: March 2012

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ABSTRACT

This paper identifies distinct characteristics of U.S. penny stocks listed on NYSE, AMEX, and NASDAQ. They are characterized by high return, high beta, small capitalization, high book-to-market ratio, high idiosyncratic volatility, and poor liquidity. The liquidity costs as measured by Gibbs effective transaction costs for penny stocks are more than twice as large as the magnitude of non-penny stocks. Abnormal returns of penny stocks estimated using the Fama-French (1993) three-factor model and the Carhart (1997) four-factor model become insignificant after an illiquidity factor is introduced to the asset pricing model. Although abnormal returns become insignificant as an additional risk factor is considered, zero-cost portfolios built on firm characteristics (such as firm size, value, momentum, and idiosyncratic volatility) yield significant profitability.

JEL classification: G14; G18
Keywords: Listed Penny Stocks; Asset Pricing Model; Trading Strategies; Liquidity; Gibbs Effective Transaction Costs; Dimson Beta; Idiosyncratic Volatility

According to the US Securities and Exchange Commission (SEC), the term "penny stock" generally refers to low-priced (below $5.00) securities of very small companies. Penny stocks are generally quoted over-the-counter on the OTC Bulletin Board (OTCBB) or in the Pink Sheets, but the New York Stock Exchange (NYSE), American Stock Exchange (AMEX), and National Association of Securities Dealers Automated Quotations (NASDAQ) have a large number of listed stocks that are traded below $5.00.

Bad images penny stocks carry are well-known. Pejorative connotations on penny stocks include: extreme illiquidity, high volatility, "pump and dump", "short and distort", e-mail spams, internet fraud, boiler room operations for cold calls, gambling-like investments, etc. Many websites and newsletters are available to promote penny stocks. Some of them even insinuate that they can help investors make enormous investment returns of 100%, 500%, even 1000% in a short period of time.[1]

A careful review of SEC's various announcements on penny stocks suggests that market regulators are more concerned about "unlisted" penny stocks traded in the over-the-counter (OTC) market, especially those quoted in the Pink Sheets (to a lesser degree OTCBB stocks), rather than listed penny stocks.[2] As a result, a number of academic papers investigate various issues relevant to OTC stocks. These studies may be grouped into four broad categories: (i) market manipulation [Hanke and Hauser (2008); Böhme and Holz (2006)]; (ii) financial disclosure [Jiang, Petroni, and Wang (2012); Leuz, Triantis and Wang (2008); and Bushee and Leuz (2005)] (iii) market microstructure [Bollen and Christie (2009); Harris, Panchapagesan, and Werner (2008); Macey, O'Hara and Pompilio (2008); Angel, Harris, Panchapagesan, and Werner

[1] For example, Global Penny Stocks (www.pennystock.com) shows all-time winners with returns ranging from 328% (recorded for Iomega) to 3,487% (cited for Netegrity).

[2] Please refer to SEC's announcements:
(i) http://www.sec.gov/answers/penny.htm;
(ii) http://www.sec.gov/investor/pubs/microcapstock.htm; and
(iii) http://www.sec.gov/answers/cold.htm

(2004); Marosi and Massoud (2004)]; and (iv) IPOs [Brav, Michaely, Roberts, and Zarutskie (2009), Beatty and Kadiyala (2003)].

Two recent studies by Ang, Shtauber, and Tetlock (2011) and Eraker and Ready (2012) are closely related to our study because both of them focus on the pricing aspect of a comprehensive set of over-the-counter (OTC) stocks. Ang et al. (2011) find that cross sectional return patterns of OTC stocks are similar to those of listed stocks. They also report that premiums associated with value/growth and size dimensions of OTC stocks are consistent with those of exchange traded stocks, while the illiquidity premium of OTC stocks reaches 19.2% which is significantly greater than the illiquidity premium of 1.1% for comparable listed stocks. Eraker and Ready (2010) report that the average OTC stock return is -32%, which cannot be explained by the traditional valuation models. They conclude that the behavioral model of Barberis and Huang (2008) is able to explain the large negative returns.[3]

Simply because low-priced "listed" stocks (traded below $5.00) are also called penny stocks, they suffer from the same kind of degradation as unlisted penny stocks. To maintain the listing status, "listed" penny stocks have to file their financial reports with the SEC. They also have to meet listing maintenance requirements (especially, minimum net assets and minimum number of shareholders) imposed by the stock exchanges.[4] It is true that some listed companies experience financial distress which causes their share prices to be traded below $5.00. Unless financial distress continues to jeopardize the financial health of low-priced stocks, their status should not be pejorated. Think about the Bank of America which is the second largest financial

[3] Kumar's (2009) observation is similar to what Eraker and Ready (2012) report, but there is an important difference. Kumar's sample stocks are limited to listed stocks with gambling-like features such as high idiosyncratic skewness, low price, and idiosyncratic risk.

[4] Companies quoted on the OTCBB or the Pink Sheets have no obligation to meet the listing standards. Companies quoted in the Pink Sheet do not have to file financial reports with the SEC, whereas OTCBB stocks are obligated to do so.

institution in the United States. Its stock traded even below $3.00 during the recent subprime mortgage crisis.

Unfortunately, we know very little about "listed" penny stocks because academic researchers usually exclude those stocks that are traded below $5.00 from their studies. At the end of 2010, the number of listed penny stocks is 1,087 or slightly over 25% of 4,298 listed stocks on the three exchanges. The AMEX has the highest percentage of penny stocks with 64% of listed stocks, followed by NASDAQ's 31%, and NYSE's 7.4%.

In this study, we focus on "listed" penny stocks. We believe that this study is the first one which focuses on listed pennies. Our objectives are threefold: (i) first, we examine the characteristics of penny stocks and compare them with those of non-penny stocks; (ii) second, we identify the factor that can explain penny stock returns in the asset pricing model framework; and (iii) third, we construct investment strategies for penny stocks to evaluate their performance relative to non-penny stocks.

Our results can be summarized as follows. Penny stocks are characterized by small market capitalization, high beta, high book-to-market ratio, high idiosyncratic volatility, poor liquidity, and high transaction costs. We further investigate whether penny stocks earn abnormal returns after controlling for various risk factors. We first run the time-series regressions of monthly excess returns on penny and non-penny stocks using the conventional CAPM, the Fama-French (1993) three-factor model, and the Carhart (1997) four-factor model. Jensen's alphas from these models leave large positive unexplained returns for the penny stock portfolio, while these models explain the returns of non-penny stocks almost perfectly with estimated R^2 reaching 98%. In view of the serious illiquidity observed for the penny stocks, we introduce an additional illiquidity risk factor, into the three- and four-factor models. With the additional risk factor introduced, the abnormal returns of penny stocks disappear. The alphas of the penny stock portfolios become statistically insignificant and the R^2 value of the regressions dramatically

increases to 97%. Hence, we conclude that the seemingly high returns of penny stocks are readily explained by the illiquidity risk factor.

Although penny stocks as a whole do not earn abnormal profits after the liquidity risk factor is controlled for, it is still possible to make abnormal returns from a subset of them when we adopt some well-known investment strategies for penny stocks. To explore this possibility, we sort penny stocks into five quintile portfolios based on stock characteristics, such as firm size, the book value to market value (BM) ratio, previous one-month return reversals, momentum returns, or idiosyncratic volatility, and hold those portfolios for varying holding periods. We run the time-series regressions of the equal- and value-weighted excess returns on each portfolio against the extended seven-factor model. Zero-cost portfolios are constructed using two extreme quintile portfolios with the lowest and the highest characteristics (such as firm size, value, momentum, and idiosyncratic volatility). Zero-cost portfolios yield significant profitability. Nevertheless, further analyses are warranted for trading strategies because these results are sensitive to portfolio weighting scheme (value vs. equal weight) and the lengths of holding periods,

The paper is organized as follows: Section I identifies the distinct characteristics of penny stocks in comparison with non-penny stocks. Section II examines whether penny stocks yield higher returns than non-penny stocks in the context of one- through seven-factor models. Section III analyzes different trading strategies for penny stocks. Section IV presents conclusions.

I. Characteristics of Penny Stocks

A. Data

CRSP is the source of price data, which includes NYSE, AMEX, and NASDAQ stock daily and monthly returns from July 2001 to December 2010. Since the computation of penny stock returns is sensitive to the minimum tick size (ranging from $1/8 to $1/16 prior to

decimalization), we conduct our study in the post-decimalization period.[5] NYSE and AMEX shifted all their stocks to decimal prices on January 29, 2001 and NASDAQ completed its decimalization on April 9, 2001.

COMPUSTAT is the source of accounting data for individual stocks. We match the accounting data for all fiscal year-end in calendar year *t*-1 with the returns from July of year *t* to June of *t*+1. This matching scheme allows stock returns to be explained by accounting variables with some time-lag. In particular, we use a firm's market equity at the end of December of year *t*-1 to compute its BM ratio for *t*-1, and match this ratio with the returns from July of year *t* to June of *t*+1. Hence, the July 2001 beginning of the study period is chosen to facilitate this matching scheme. As far as firm size as measured by market capitalization is concerned, we update it on the monthly basis. Finally, we use NYSE/AMEX/NASDAQ index returns as the market returns and one-month Treasury bill yields as the risk-free rates.

B. Characteristics of Penny Stocks

Although the SEC uses the $5 benchmark price to determine penny stocks, we have to exercise special care in identifying penny stocks. We adopt two decision rules. First, at the beginning of each month during the study period, we look back the past one-year period to compute the average price for each stock. If the average price of a stock is below $5, then it is considered a penny stock. It is quite possible that its price moves up beyond $5 in the following months. The exclusion of this stock from the penny stock portfolio may understate the portfolio return. Hence, the second rule is introduced. Once a penny stock is identified, we give it a one-year grace period. During this grace period, it remains as a penny stock. To confirm the robustness of our results and to examine the effect of price level on stock performance, we construct three portfolios of penny stocks: (i) Penny 1 ($P \leq \$1.00$); Penny 2 ($\$1 < P \leq \$3$); and

[5] Please refer to Ikenberry and Weston (2009) and Liang, Kim, and Wood (2009) for price discovery in the post-decimalization period.

Penny 3 ($3 < P ≤ $5). The one-year averaging rule and the one-year grace period rule remain applicable to the three portfolios based on sorts on price per share of component stocks to avoid the over- and under-estimation of portfolio returns. We also sort non-penny stocks into five quintile portfolios. Non-penny 1 [5] is the portfolio of non-penny stocks with the lowest [highest] closing prices among non-penny stocks.

B.1. Value- and Equally-weighted Monthly Returns

Table I reports the characteristics of penny and non-penny stock portfolios as well as three penny stock portfolios and five non-penny stock portfolios. During the study period, listed on the three exchanges are a total of 4,621 common stocks with 1,110 penny stocks and 3,511 non-penny stocks.[6] The average prices are only $2.58 for penny stocks and $52.63 for non-penny stocks, respectively. The penny portfolio 1 ($0 < P ≤$1) has a total 156 component stocks with an average price of $0.67. This average may appear unusual given the $1.00-delisting rule imposed by the NYSE, AMEX, and NASDAQ since September 1991, but the average price below $1.00 is possible because of the grace period (60 days or longer) allowed for listed stocks to trade below $1.00 and the occasional lifting of this delisting rules by the exchanges depending on the market conditions.[7] For example, this rule was suspended between October 2008 and July 2009.

[Insert Table I]

Panel A of Table I reports equally-weighted (EW) average returns. They are 1.61% per month for penny stocks and 0.82% for non-penny stocks in the one-month holding period (month *t*) immediately following the portfolio formation month *t*-1. The annualized return for listed penny stocks amounts to 21%, which is a dramatic contrast with large negative returns (-31% to -38%) compiled by Eraker and Ready (2012) for OTC stocks. The EW average monthly returns of

[6] These figures (obtained from the 10-year period) are different from those cited in the introduction. In the introduction, the 2010 figures are cited.

[7] Please refer to Rhee and Wu (2011).

three penny stock portfolios ranges from 1.08% to 2.48%: the lower the price level, the higher the average return. In contrast, the EW average returns of the five non-penny stock portfolios range from 0.70% of non-penny 5 to 0.95% of non-penny 2. The average portfolio returns do not necessarily decrease in price levels for non-penny stocks. Non-penny 2 shows a higher return than non-penny 1. The EW returns in month t and month *t*-1 indicate that return momentum exists for penny stocks, but not non-penny stocks.

We also report the value-weighted (VW) average monthly returns for each of the price-sorted portfolios in the same holding period (month *t*). The VW average monthly return of penny stocks is 0.59%, which is much smaller than the EW returns of 1.61%. All three penny stock portfolios also show much smaller VW returns than EW returns. This is not surprising considering that penny stocks are issued mostly by small cap companies.

In contrast, the VW return of non-penny stocks is 0.35% which is also smaller than the EW returns of 0.82%. The five quintile portfolios of non-penny stocks exhibit the same trend that the VW returns are smaller than the EW returns. This is not unexpected because firm size has a significant impact on the differences between VW and EW returns. The VW returns of five non-penny stocks do not decline monotonically as the price level increases. The comparison between VW returns in month *t* and *t*-1 yields an interesting contrast. First of all, VW returns illustrate a dramatic decline in the price level, ranging from 0.84% for non-penny 5 to 8.07% of penny 1. Another interesting observation is the return reversals from month *t*-1 to *t* for all price sort portfolios. These two observations should be taken into account as one of factors when the asset pricing model is assessed for both penny and non-penny stocks.

B.2. Traditional Risk Measures

We evaluate the riskiness of penny stocks on the basis of systematic risk and idiosyncratic risk in comparison with non-penny stocks. Two versions of beta are estimated: (i) the beta estimates from the conventional market model; and (ii) Dimson's (1979) beta in view of

infrequent trading of penny stocks. The traditional betas are estimated using the 100 size/beta sorted portfolio, following Fama and French (1992). Dimson's betas are estimated using $R_{j,t} = \beta1*RM_t + \beta2*RM_{t-1} + \beta3*RM_{t-2}$, where the beta is the sum of coefficients of three (lagging) market returns ($\beta = \beta1 + \beta2 + \beta3$). A total of 24 to 60 monthly returns (as available) in the five-year period is used for regressions. Idiosyncratic risk is measured by idiosyncratic volatility (IV) from the residuals of the Fama-French (1993) three-factor model regression, following Ang, et al. (2006).

As summarized in Panel B of Table I, market model-based beta estimates are 1.6 for penny stocks and 1.05 for non-penny stocks, respectively. In contrast, Dimson's beta estimates are 1.99 for penny stocks and 1.14 for non-penny stocks. These results confirm that infrequent trading understates traditional beta estimates. Both beta estimates decline as the price level increases. For example, traditional beta [Dimson's beta] estimates are 1.67 [2.20] for the penny portfolio 1 of stocks with the lowest price level and 0.85 [0.88] for the non-penny 5 portfolio of stocks with the highest price level.

The average idiosyncratic volatilities are 17.99% for penny stocks and 8% for non-penny stocks, which suggests that the returns of penny stocks are twice as much volatile as those of non-penny stocks. Both systematic and idiosyncratic risk measures monotonically decrease as the price level increases.

B.3. Firm Size and BM Ratio

Firm size is measured by market capitalization. The average market capitalization of penny stocks is $134 million, which is compared with $3.72 billion estimated for non-penny stocks. Firm size is positively related to the price level, as high-priced stocks generally exhibit larger market capitalization. In particular, the average market capitalization of the penny portfolio 1 is $31.28 million followed by penny 2 portfolio's $81.77 million and penny 3's $231.28 million.

The average BM ratio of penny stocks is higher than that of non-penny stocks (1.16 vs. 0.66), which implies that penny stocks may suffer from severe financial distress [Fama and French (1996)] or they may exhibit higher growth potential.

B.4. Liquidity Measures

Penny stocks are well-known for poor liquidity. Illiquidity problems, as reflected by infrequent trading, large bid-ask bounces, and high transaction costs, are particularly severe for penny stocks. To assess the poor liquidity of penny stocks, we compile three measures: (i) the percentage of zero-return days; (ii) Amihud (2002) measure; and (iii) Gibbs effective transaction costs. The poor liquidity should be captured by the percentage of zero-return days. Daily returns may be zero after active trading, but infrequent trading should be the main reason for zero returns.[8] Penny stocks do have zero returns on 12.13% of trading days while non-penny stocks show 8.56%. A strong negative correlation exists between the percentage of zero-return days and the price level. For example, this percentage ranges from 16.98% for the penny portfolio 1 to 6.39% for the non-penny portfolio 5. Among the three exchanges, AMEX shows zero returns on 15.43% [13.14%] of trading days for penny [non-penny] stocks, followed by NASDAQ's 11.15% [8.77%] and NYSE's 10.03% [6.32%] for penny stocks.

The Amihud (2002) liquidity measure is estimated by the square root of the average daily absolute return ($|r_d|$) over the daily dollar volume (VOL_d): $[|r_d|/VOL_d]^{1/2}$. This measure closely follows Kyle's (1985) price impact definition of liquidity, which measures the response of stock price to its order flow. The advantage of this measure is that it can be calculated for days when there is no price change, which is of particular concern for penny stocks. Low ratio implies high liquidity because large volume can be accommodated with a small price change whereas high ratio implies low liquidity because a large volume cannot be

[8] Ang et al. (2011) use the proportion of non-trading days to measure the degree of illiquidity.

absorbed without a large price change. Penny stocks exhibit the ratio of 1.3 which contrasts with the ratio of 0.29 estimated for non-penny stocks. Again, the Amihud ratio declines as the price level increase. The penny portfolio 1 shows the ratio of 2.24 whereas the non-penny portfolio 5 has the ratio of 0.07.

Hasbrouck (2009, 2006) advocates the Gibbs effective transaction cost as an alternative measure of liquidity. The Gibbs effective transaction costs exhibits a high correlation with the bid-ask spread and can be readily estimated using daily data.[9] The Gibbs effective transaction cost for each stock is constructed based upon daily data during the calendar year. For the estimation, we require that stocks have at least 50 trading days during that calendar year. It is a Bayesian version of Roll's (1984) transaction cost measure.[10]

The Gibbs effective transaction cost of penny stocks is 1.42% of their share price, which is almost 3 times greater than 0.53% estimated for non-penny stocks. Previous literature has documented that the round-trip trading costs for large capitalization stocks are generally between 1% and 2% of their share price, while for small capitalization stocks the estimates are much larger at 5% to 9% of their share price [see Stoll and Whaley (1983); Keim and Madhavan (1998)]. The Gibbs effective transaction cost estimates suggest that the round-trip trading cost is 2.84% of the average share price for penny stocks and 1.06% for non-penny stocks, which is consistent to published reports. Gibbs transaction costs are the largest for the penny portfolio 1 and the lowest for the non-penny portfolio 5, which is expected.

II. Do Penny Stocks Earn High Abnormal Returns?

[9] Hasbrouck (2009) demonstrates that Gibbs effective transaction costs from daily CRSP data and bid-ask spread estimates from high-frequency TAQ data have a high correlation of 0.965 over a period, 1993-2005, when both high-frequency TAQ and daily CRSP data are available.

[10] Please refer to Joel Hasbrouck's website http://pages.stern.nyu.edu/~jhasbrou/.

We construct return series from various investment strategies and run the time-series regressions against the Fama-French (1993) three factors and the Carhart (1997) momentum factor that captures the medium-term continuation of returns originally documented by Jegadeesh and Titman (1993). If the intercept (Jensen's alpha) is significantly different from zero, risk loadings of these three or four factors are not sufficient to explain the portfolio return. We run the following time series regression to examine whether penny stocks earn abnormal returns:

$$r_{p,t} = a_p + \beta^p_{MKT} \cdot MKT_t + \beta^p_{SMB} \cdot SMB_t + \beta^p_{HML} \cdot HML_t + \beta^p_{UMD} \cdot UMD_t + \varepsilon_{p,t}, \quad (1)$$

where, $r_{p,t}$ is the excess return on the portfolio of penny stocks or non-penny stocks, MKT is the market excess return, *SMB* is the difference between the return on a portfolio of small-cap stocks and the return on a portfolio of large-cap stocks (the size premium), *HML* is the difference between the return on a portfolio comprised of high book-to-market stocks and the return on a portfolio comprised of low book-to-market stocks (the value premium), and *UMD* is the difference between the return on a portfolio comprised of stocks with high returns from *t* - 12 to *t* - 2 and the return on a portfolio comprised of stocks with low returns from *t* - 12 to *t* - 2 (the momentum premium).

Table II reports the results of time-series regressions of EW monthly excess returns on penny stock portfolios and non-penny stock portfolios in the one-, three-, and four-factor models. The intercept terms estimated for the entire penny stocks are 1.06% on the single-factor CAPM, 0.69% on the three-factor model, and 0.75% on the four-factor model.[11] The increase in Jenson's alpha with the momentum factor added may be explained by the fact that penny stocks behave like small, value, and loser stocks since they load heavily on SMB, HML and negatively on UMD. In contrast, the four-factor model explains the return of entire non-penny stocks very well; the

[11] We observe that the estimated intercept terms are smaller during our study period than those observed in the longer study period, 1963-2005, reported in an earlier version of this paper. We believe that decimalization may have its impact on the profitability of penny stocks because this study is limited to the post-decimalization period, July 2001 - December 2010).

intercepts on the four-factor model are insignificant for all non-penny portfolios. Overall, penny stocks exhibit significant abnormal returns after adjusting for the conventional four factors, while non-penny stocks do not.

[Insert Table II]

Although penny stocks earn abnormal returns relative to the single-factor CAPM and the four-factor model, it is still premature to conclude that penny stocks are really profitable. In fact, if there are high transaction costs, a seemingly profitable investment strategy may not be economically feasible. Penny stocks are illiquid and experience return reversals. Stocks of low liquidity must carry high expected returns in order to compensate investors for the inability of timely trade [Amihud and Mendelson (1986), Brennan et al. (1998), and Datar et al. (1998)]. To examine this possibility, we add one additional risk factor to the conventional four-factor model.

$$r_{p,t} = \alpha_p + \beta_{MKT}(MKT_t) + \beta_{SMB}(SMB_t) + \beta_{HML}(HML_t) + \beta_{UMD}(UMD_t) + \beta_{LIQ}(LIQ_t) + \varepsilon_{p,t} \quad (2)$$

where LIQ_t is the aggregate liquidity risk factor which is constructed using the difference between the return on the portfolio with highest Gibbs transaction cost (lowest liquidity) stocks and the return on the portfolio with lowest transaction cost (highest liquidity) stocks. The dependent variable, $r_{p,t}$, are EW returns.

The bottom half of each panel in Table II reports the results of time-series regression after liquidity risk factor is added to the four-factor model. We observe that the liquidity risk factor LIQ_t is loaded positively on both penny stocks and non-penny stocks. However, the magnitude of the estimated coefficients of LIQ_t is dramatically different between penny and non-penny stocks [1.04% vs. 0.05%]. The coefficients of LIQ_t are significant in all three regressions for the penny portfolios 1, 2, and 3, which suggests that LIQ_t is a good proxy for liquidity risk. After the liquidity risk factor LIQ_t is included in the four-factor model, the intercepts of all three penny

stock portfolios become insignificant. More importantly, the new seven-factor model significantly increases the adjusted R^2: 97% of return variations of penny stocks can be explained by the extended five-factor model, while the conventional four- factor model only explains 72% of return variations. Overall, the results show that high returns of penny stocks are driven by their liquidity risk and their abnormal returns can be largely explained by the additional liquidity risk factor. All three penny portfolios 1, 2, and 3 show the similar results.

In contrast, non-penny stocks show significant loadings on *LIQ*, but this *LIQ* factor contributes very little to the increase in R^2 beyond the traditional three- and four-factor model. Another interesting observation is the negative loading of *LIQ* for the non-penny portfolios 3, 4 and 5 of higher-priced stocks.

A major finding from the five risk-factor pricing model is clear for penny stocks. The extended model can explain the returns of the penny stock portfolios very well. Meanwhile, the non-penny stock portfolios need only the four-factor model to explain their returns. In short, we conclude that positive abnormal returns of penny stocks from the four-factor model are driven by those "missing" risk factors, especially the liquidity risk factor. Penny stocks do not earn abnormal returns once we introduce the additional risk factors.[12]

III. Penny Stock Trading Strategies

Section II demonstrates that if investors buy a portfolio including all penny stocks, they cannot make significant abnormal profits with additional liquidity-risk and reversal risk-factors are included in the asset pricing model. However, investors are unlikely to hold all of penny stocks in their portfolio; it is not a practical and wise investment strategy.

Many studies have shown some investment strategies based on firm characteristics could make considerable abnormal profits: The size effect [Banz (1981)]; the book-to-market effect

[12] Although the results are not reported to save the space, the time series regressions using VW average excess returns for both penny and non-penny stocks provide qualitatively similar findings.

[Basu (1983)]; the short-term return reversal effect [Jegadeesh (1990)]; the momentum effect [Jegadeesh and Titman (1993)]; and the volatility effect [Ang et al. (2006)]. These investment strategies could make abnormal returns by holding a limited number of stocks according to some firm characteristics. In this section, we examine if investors can make abnormal profits from penny stocks by employing those characteristics-based investment strategies rather than holding all of the penny stocks. We also examine the profitability of the same set of investment strategies for non-penny stocks for the purpose of comparison.

Stocks with higher transaction costs per trade are generally held by investors for longer holding periods to minimize total trading costs [Amihud and Mendelson (1986)]. Penny stocks have higher transaction costs on the average and investors may hold them for longer time period to maximize their profits. We examine the investment strategies applicable to varying holding periods, ranging from one month to 12 months.[13]

We construct trading strategies based on J-month formation periods and a K-month holding periods. At time *t*, we sort penny stocks into quintile portfolios according to their characteristics, such as firm size, BM ratio, the previous one-month return, momentum return, or idiosyncratic volatility during the past J-months, then hold those portfolio for the next K-months. The portfolios are rebalanced each month, and we use the market capitalization at the end of the formation month as the weight to compute VW monthly portfolio return for the holding period considered.

[13] We first consider a one-month holding period and then we proceed to examine the robustness of our results with varying holding periods. A subtle but important caveat we must recognize when we hold a portfolio for multiple periods. As an example, suppose we want to construct a portfolio from an investment strategy based on the size effect for a 12-month holding period. Each month we construct an EW or VW portfolio using a stock's market capitalization observed at the preceding month-end prior to the formation month. Similarly, we form another portfolio based on the stock's market capitalization ending two months, three months, …., and 12 months prior to the portfolio formation date. We then take a simple average of these twelve portfolios. Hence, each size quintile portfolio changes $1/12^{th}$ of its composition each month, where each $1/12^{th}$ part of the portfolio consists of an EW or VW portfolio. The first (fifth) quintile portfolio consists of 1/12th of the smallest (largest) size portfolio from one month ago, $1/12^{th}$ of the smallest (largest) size portfolio two months ago, etc.

We run time-series regressions of the excess returns on each portfolio against our extended seven-factor model in equation (2) and report the intercepts of these regressions. Given various risk factors in the regression, these intercepts represent abnormal returns of the portfolios.

A. Investment Strategy Based on Firm Size

The large differences between EW- and VW-returns in Table I confirm that a significant size effect exists among penny stocks. Therefore, our first investment strategy is based on firm size of penny stocks. Each month we sort penny stocks into quintile portfolios based on market capitalization at the end of previous month and then hold those portfolios for one-, three-, six-, nine- and 12-month periods. Quintile 1 (5) is the portfolio of penny stocks with the smallest (largest) market capitalization. Table III reports the average monthly abnormal returns of zero-cost portfolio which is long quintile 1 portfolio and short quintile 5 portfolio over the varying holding periods.[14] Panel A reports the results for penny stocks and Panel B summarizes the results for non-penny stocks. The abnormal returns are the intercept terms estimated from the seven-factor model. As shown in Panel A of Table III, the zero-cost portfolio that buys the smallest penny quintile portfolio and sells the largest penny quintile portfolio provides the EW [VW] abnormal return 1.38% [0.91%] with *t*-ratio of 3.14 [1.97] during the one-month holding period. As the holding period increases, the abnormal returns of size-based investment strategy remain significant. In contrast, no abnormal returns are found for the zero-cost portfolios of non-penny stocks.

[Insert Table III]

B. Investment Strategy Based on Book-to-Market Ratio

Lakonishok et al. (1994) and Fama and French (1992, 1996) report that value strategies (buying stocks that have low prices relative to earnings, dividends, historical prices, book assets,

[14] To simplify the table format and to save the space, we report the results for the zero-cost portfolio only which is long quintile 1 portfolio and short on quintile 5 portfolio. Even though not reported for each of quintile portfolios, we may discuss the results when necessary. The detailed results can be made available to interested readers.

or cash flow, other measures of intrinsic value) yield higher returns. To examine whether the value penny stocks (with high BM ratio) outperform the growth penny stocks (with low BM ratio), we form five BM-sorted penny stock quintile portfolios every month based on the BM ratio of an individual stock and hold them portfolios over different periods. Quintile 1 (5) portfolio contains stocks with lowest (highest) BM ratios. Panel A of Table IV presents the results for penny stocks and Panel B summarizes the results for non-penny stocks. The zero-cost portfolio (which is long quintile 5 portfolio of value penny stocks and short quintile 1 portfolio of growth penny stocks) yields EW abnormal returns ranging from 1.15% (12-month holding period) to 1.32% (one-month holding period). In contrast, VW abnormal returns are insignificant. This may be explained by the profitability of quintile portfolios: (i) the higher the BM ratio, the larger the EW abnormal returns during five holding periods considered; and (ii) the reverse trend is observed for the VW abnormal returns while they are far less significant than the EW abnormal returns.

The investment strategies based on the BM ratio does not work for non-penny stocks regardless of whether returns are EW- or VW-weighted.

[Insert Table IV]

C. Investment Strategy Based on Past One-Month Returns

Table V reports the results for the monthly abnormal returns of trading strategies based on short-term return reversals documented by Jegadeesh (1990). Every month, we sort components stocks into five quintile portfolios according to their past one-month returns, and then hold those portfolios for varying holding periods. Quintile 1 (5) portfolio contains loser (winner) stocks in the previous one-month period. We examine whether the contrarian investment strategy is more profitable from buying the loser penny stocks and short-selling the winner penny stocks as shown in Panel A. No significant returns are detected for both EW- and VW-weighted abnormal returns for the zero-cost portfolio. Apparently, after the short-term reversal factor, ST_REV_t , is controlled for, no abnormal profits are feasible.

Although the short-term reversal risk factor was not critical for non-penny stocks, no profit opportunities are found for non-penny stocks as shown in Panel B of Table V

[Insert Table V].

D. Investment Strategy based on Momentum

Jegadeesh and Titman (1993, 2001) empirically confirm that the stocks that perform the best [worst] over the previous 3 to 12 months tend to continue to perform well [poorly] over the subsequent 3 to 12 months, and the zero-cost portfolio that buy past winner stocks and short sell past loser stocks earn significant profits.

To examine if the momentum strategy works for penny stocks, at the beginning of month *t*, the penny stocks are ranked in the ascending order on the basis of the past six- and 12-month returns. Five quintile portfolios are formed, where quintile 1 (5) contains the loser [winner] penny stocks with the lowest [highest] returns. A zero-cost portfolio is formed each month by taking a long position with the winner penny stocks and a short position with the loser penny stocks. The portfolios are held and examined in the next three-, six-, nine- and 12-month periods. The portfolio is rebalanced monthly. The number of momentum strategies depends on the combinations of the formation period J and the holding period M. We examine a total of 8 strategies, where J = 6 and 12 and M = 3, 6, 9, and 12, respectively.

We compute both EW and VW monthly returns for all quintile portfolios and the zero-cost portfolio, then run the time-series regressions of the excess returns on each momentum strategy against the extended seven risk-factor model to estimate the abnormal returns. Panel A of Table VI reports the results on penny stocks while Panel B presents the results on non-penny stocks. Given the portfolio formation period of six months, the three-month holding period yields the EW [VW] abnormal returns of 0.92% [1.61%] and the six-month holding period render 0.95% for the VW abnormal returns for the momentum strategy while all other holding periods produce insignificant profits. Given the portfolio formation period of 12 months, the momentum strategy

yields no abnormal returns. One exception is the three-month holding period which shows VW abnormal return of 1.59%.

Non-penny stocks show different results. Given the six-month formation period, the zero-cost investment strategy yields positive abnormal returns across four different holding periods. Similar findings are observed for the 12-month formation period as well.

[Insert Table VI]

E. Investment Strategy Based on Idiosyncratic Volatility

Ang et al. (2006, 2009) document the negative relationship between idiosyncratic volatility and future stock returns. They further demonstrate that the strategy that buys the stocks with low idiosyncratic volatility and short-sells the stocks with high idiosyncratic volatility makes significant abnormal profits relative to the conventional four factor model.[15]

To investigate whether the idiosyncratic volatility-based strategy also works for penny stocks, we conduct the following analysis. At the end of each month, we construct quintile portfolios based on the ranking of the idiosyncratic volatility of each individual stock in the past one month. Quintile 1 (5) is the portfolio of stocks with the lowest (highest) idiosyncratic volatility. A zero-cost portfolio is formed each month by going long with quintile 1 penny stocks and going short with quintile 5 penny stocks. Each of the quintile portfolios and the zero-cost portfolio are held for the same holding periods under consideration. The portfolio is rebalanced monthly.

Panel A of Table VII reports the results for penny stocks and Panel B for non-penny stocks. The volatility-based zero-cost investment strategies earn significant EW- and VW-weighted abnormal profits for penny stocks in the one-, three-, and six-month holding periods.

[15] Huang et al. (2010) demonstrate that the omission of the previous month's stock returns can lead to a negatively biased estimate of the relation. In the follow up study, Huang et al. (2011) demonstrate that the dominance of loser stocks in December and a reversal effect in the subsequent month lead to a positive relation between idiosyncratic volatility and portfolio returns in January, but, for the rest of the year, a negative relation arises between the idiosyncratic volatility and subsequent monthly returns on portfolios composed of best-performing stocks with relatively larger size and worst-performing stocks with smaller market value.

However, no significant profits (both EW and VW) are observed for longer holding periods for non-penny stocks. The evidence here suggests that the trading strategies based on the idiosyncratic volatility are profitable only on the short time horizon.

It is interesting to observe that the zero-cost investment strategy works also for non-penny stocks for EW-weighted returns. The VW-weighted profitability shows mixed results: Although the magnitude is small but the holding periods of three to nine months show respectable returns as shown in Panel B of Table VII.

[Insert Table VII]

In summary, it is possible to get statistically and economically significant returns using penny stocks. The investment strategies based on the firm size, and BM ratio can make considerable profits both over short and long holding periods. However, the short term contrarian investment strategies, the momentum strategies, and the volatility-based investment strategies are only profitable in the short run and cannot persist, and they also depend on whether we construct VW or EW portfolio returns. Naturally, further analyses are warranted to understand why the results vary depending on the weighting scheme and the different holding periods.

IV. Conclusion

Although many industry practitioners believe that penny stocks are high risk, high reward investments, there is limited academic research to confirm this view. This paper examines the characteristics and pricing behavior of penny stocks comprehensively. Our efforts are warranted considering that a significant portion of US listed stocks are penny stocks that are traded below $5.00: the AMEX has the highest percentage of penny stocks with 64% of listed stocks, followed by NASDAQ's 31%, and NYSE's 7.4%.

Penny stocks are characterized by high return, high beta, high BM ratio, high idiosyncratic volatility, and low liquidity. Our time series analyses suggest that penny stocks do not earn abnormal positive profits in the five-factor asset pricing model framework (size, book-to-

market, momentum, and liquidity). We conduct further analyses to investigate whether popular investment strategies for non-penny stocks developed on the basis of firm characteristics work for penny stocks. Although the aggregate penny stock portfolio does not earn abnormal return in the context of the seven-factor model, investors can still make abnormal profits from penny stocks by employing some characteristics-based investment strategies. We have considered firm size, value, contrarian, momentum, and idiosyncratic volatility. Our paper facilitates our understanding of the characteristics and pricing behavior of penny stocks, but this study represents a small beginning of future research on listed penny stocks. We also believe that more academic research should focus on the OTC penny stocks.

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Table I
Characteristics of Penny and Non-Penny Stocks

This table reports the characteristics of the four penny stock portfolios and six non-penny stock portfolios. At the beginning of every month, we first construct the penny stock portfolio including stocks whose average monthly closing prices over past 12 months are less than $5 per share at the end of previous month; To confirm the robustness of our results and to examine the effect of price level on stock performance, we then construct three portfolios of penny stocks: (i) Penny 1 (P <$1.00); Penny 2 ($1 ≤ P <$3); and Penny 3 ($3 ≤ P <$5). Next we assign the rest of stocks (non-penny stocks) into five quintile portfolio based on the ranking of their average monthly closing prices over past 12 months at the end of previous month. Non-penny portfolio 1(5) is the portfolio of non-penny stocks with the lowest (highest) average monthly prices over past 12 months. We also form an aggregate non-penny stock portfolio which includes all of non-penny stocks. We hold those portfolios for one month, and they are rebalanced each month.

The sample includes all NYSE/AMEX/NASDAQ common stocks over the period from July 2001 to December 2010. The summary statistics represent the time-series averages of the month by month cross-sectional means for each variable. N is the average of number of stocks in the portfolio. EW [VW] Rt (Rt-1) is the equally-weighted [value-weighted] average monthly return during holding months (formation months). Last month closing price is the average price per share at the end of the formation month.

Two versions of beta for each stock are estimated every month using 24 to 60 monthly returns during past five years (as available): (i) the beta estimates from the conventional market model; and (ii) In the sprint of Dimson (1979), we estimate the beta based on the equation $R_{j,t} = \beta1*RM_t+\beta2*RM_{t-1}+\beta3*RM_{t-2}$, where the beta is the sum of coefficients of three (lagging) market returns ($\beta = \beta1 + \beta2 + \beta3$).

Size is market capitalization in $million during the formation period. B/M is the book-to-market ratio. IV is the equally weighted idiosyncratic volatility of the portfolio in the formation period. The idiosyncratic volatility is estimated using regression residuals from the Fama and French (1993) three-factor model using daily return data over the previous month, following Ang et al. (2006). The Amihud (2002) liquidity measure is estimated by the square root of the average daily absolute return, $|r_d|$, over the daily dollar volume, VOL_d: $1000*[|r_d|/VOL_d]^{1/2}$. The Gibbs effective transaction cost for each stock is constructed based upon daily data during the calendar year. For the estimation, we require that stocks have at least 50 trading days during that calendar year, following Hasbrouck (2009, 2006).

Panel A: Returns and Prices

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	EW R_t (%)	EW R_{t-1} (%)	VW R_t (%)	VW R_{t-1} (%)	N	No of NYSE	No of AMEX	No of NASDAQ	One Year Average Price ($)	Last Month Closing Price ($)
Entire Penny Stocks	1.61	1.41	0.59	3.89	1110	76	233	801	2.58	2.54
Penny Portfolio 1 $0<P\leq1$	2.48	1.69	0.72	8.07	156	4	67	88	0.67	0.66
Penny Portfolio 2 $1<P\leq3$	1.61	1.47	0.63	4.51	537	29	106	402	1.97	1.94
Penny Portfolio 3 $3<P\leq5$	1.08	1.04	0.62	3.32	418	46	61	312	3.97	3.91
Entire Non-Penny Stocks	0.82	0.90	0.35	1.00	3511	1,332	181	1,998	52.63	53.40
Non-penny Portfolio 1	0.84	0.92	0.23	2.78	702	114	72	516	7.19	7.16
Non-penny Portfolio 2	0.95	0.99	0.53	1.78	702	179	41	483	12.54	12.60
Non-penny Portfolio 3	0.85	0.90	0.43	1.26	702	244	31	428	19.18	19.28
Non-penny Portfolio 4	0.78	0.87	0.31	0.94	702	324	20	358	28.48	28.64
Non-penny Portfolio 5	0.70	0.80	0.32	0.84	702	471	17	213	195.83	199.37
Penny -Non-penny	0.78 [1.27]		0.24 [0.34]							

Panel B: Risk, BM, Size and Liquidity

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	CAPM Beta	Dimson Beta	Amihud Liquidity Measure ($x10^3$)	IV (%)	BM	Size	Zero-Return Percent (%)	Zero-Return Percent NYSE (%)	Zero-Return Percent AMEX (%)	Zero-Return Percent NASDAQ (%)	Gibbs Cost (%)
Entire Penny Stocks	1.6	1.99	1.3	17.99	1.16	133.74	12.13	10.03	15.43	11.15	1.42%
Penny Portfolio 1 $0<P\leq1$	1.67	2.2	2.24	26.23	1.49	31.28	16.98	14.16	19.66	13.80	2.32%
Penny Portfolio 2 $1<P\leq3$	1.63	2.05	1.36	18.36	1.18	81.77	12.11	11.16	14.21	11.59	1.47%
Penny Portfolio 3 $3<P\leq5$	1.53	1.85	0.85	14.17	1.00	231.28	10.09	9.14	12.48	9.68	1.04%
Entire Non-Penny Stocks	1.05	1.14	0.29	8.00	0.66	3,715.74	8.56	6.32	13.14	8.77	0.53%
Non-penny Portfolio 1	1.38	1.60	0.56	11.38	0.87	339.68	9.28	7.61	12.98	8.90	0.80%
Non-penny Portfolio 2	1.14	1.27	0.41	8.99	0.75	843.24	9.21	6.64	13.77	9.31	0.64%
Non-penny Portfolio 3	0.98	1.03	0.26	7.56	0.64	2043.27	8.35	6.20	12.74	8.71	0.51%
Non-penny Portfolio 4	0.91	0.92	0.15	6.46	0.56	4005.27	7.33	5.80	12.11	7.79	0.40%
Non-penny Portfolio 5	0.85	0.88	0.07	5.62	0.49	11349.04	6.39	5.66	11.32	6.69	0.31%

Table II
Time Series Regressions for Penny and Non-Penny Stocks

This table reports results from the time series regressions. We construct the EW monthly average excess returns on penny and non-penny portfolios in Table I to run the time-series regressions against the Fama-French (1993) three factors and the Carhart (1997) momentum factor:

$$r_{p,t} = a_p + \beta^p_{MKT} \cdot MKT_t + \beta^p_{SMB} \cdot SMB_t + \beta^p_{HML} \cdot HML_t + \beta^p_{UMD} \cdot UMD_t + \varepsilon_{p,t},$$

where, $r_{p,t}$ is the excess return on the portfolio of penny stocks or non-penny stocks, MKT is the market excess return, SMB is the difference between the return on a portfolio of small-cap stocks and the return on a portfolio of large-cap stocks (the size premium), HML is the difference between the return on a portfolio comprised of high book-to-market stocks and the return on a portfolio comprised of low book-to-market stocks (the value premium), and UMD is the difference between the return on a portfolio comprised of stocks with high returns from t - 12 to t - 2 and the return on a portfolio comprised of stocks with low returns from t - 12 to t - 2 (the momentum premium). We also run the following seven-factor model:

$$r_{p,t} = \alpha_p + \beta_{MKT}(MKT_t) + \beta_{SMB}(SMB_t) + \beta_{HML}(HML_t) + \beta_{UMD}(UMD_t) + \beta_{LIQ}(LIQ_t) + \varepsilon_{p,t},$$

The additional independent variable liquidity risk factor (LIQ). The data of RM-RF, SMB, HML, momentum factor (UMD) are from French's website. LIQ is the aggregate liquidity risk factor which is constructed based on Gibbs effective transaction cost. We divide all of common stocks into five portfolios based on their Gibbs effective transaction cost, as described in Hasbrouck (2009). LIQ is constructed using the difference between the return on the portfolio with highest transaction cost (lowest liquidity) stocks and the return on the portfolio with lowest transaction cost (highest liquidity) stocks. The Newey-West (1987) robust t-statistics are reported in square brackets. +, *, and **, denote statistical significance at the 10%, 5%, and 1% levels. Newey-West standard errors with six lags are used to adjust for autocorrelation. The sample period is from July 2001 to December 2010.

	Constant	RM-RF	SMB	HML	UMD	LIQ	Adj. R^2
	1.06	1.36					
	[1.67]+	[15.41]**					0.63
	0.69	1.18	0.87	0.04			
Penny	[1.17]	[11.94]**	[5.20]**	[0.17]			0.69
	0.75	1.00	0.89	0.05	-0.29		
	[1.43]	[11.45]**	[4.59]**	[0.17]	[-3.06]**		0.72
	-0.02	1.01	0.51	0.1	-0.14	1.04	
	[-0.17]	[36.02]**	[8.45]**	[1.22]	[-4.48]**	[16.63]**	0.97
	1.92	1.43					
	[1.70]+	[8.22]**					0.37
	1.49	1.21	1.12	-0.11			
Penny1	[1.39]	[7.23]**	[3.44]**	[-0.23]			0.42
	1.55	1.01	1.14	-0.11	-0.33		
	[1.56]	[7.48]**	[3.19]**	[-0.22]	[-2.21]*		0.44
	1.57	1.03	1.16	-0.12	-0.32		
	0.19	1.07	0.35	-0.23	-0.05	1.89	
	[0.56]	[15.32]**	[2.71]**	[-1.22]	[-0.75]	[19.83]**	0.89
	1.07	1.34					
	[1.69]+	[15.06]**					0.61
Penny2	0.72	1.17	0.84	0.04			
	[1.2]	[11.15]**	[4.60]**	[0.15]			0.67
	0.77	0.99	0.86	0.04	-0.29		
	[1.45]	[9.74]**	[4.09]**	[0.15]	[-2.83]**		0.7

	-0.03	0.99	0.49	0.15	-0.14	1.08	
	[-0.17]	[24.99]**	[7.58]**	[1.44]	[-3.66]**	[15.58]**	0.96
	0.55	1.33					
	[1.19]	[17.89]**					0.73
	0.16	1.15	0.86	0.1			
Penny3	[0.41]	[14.88]**	[8.66] **	[0.61]			0.81
	0.21	1.00	0.87	0.1	-0.24		
	[0.61]	[13.94] **	[7.49] **	[0.60]	[-2.90] **		0.84
	-0.28	1.00	0.65	0.18	-0.15	0.66	
	[-1.80]	[29.28] **	[8.73] **	[2.82] **	[-3.13] **	[10.19] **	0.96
	0.37	1.05					
	[2.15] *	[23.50] **					0.89
	0.06	0.91	0.60	0.20			
Non-Penny	[0.69]	[39.02] **	[28.19] **	[5.75] **			0.98
	0.07	0.86	0.61	0.20	-0.08		
	[0.96]	[70.59] **	[22.02] **	[4.69] **	[-3.34] **		0.98
	0.03	0.86	0.58	0.19	-0.07	0.05	
	[0.49]	[65.82] **	[15.16] **	[4.08] **	[-2.91] **	[2.81] **	0.98
	0.33	1.21					
	[1.16]	[21.62] **					0.81
Non-penny 1	-0.04	1.04	0.80	0.15			
	[-0.18]	[21.04] **	[12.38] **	[2.00] *			0.91
	-0.01	0.95	0.8	0.15	-0.15		
	[-0.05]	[31.95] **	[9.76] **	[1.72]+	[-3.27] **		0.92
	-0.25	0.96	0.67	0.13	-0.1	0.33	
	[-2.00]	[62.81] **	[8.96] **	[1.86]+	[-3.11] **	[8.31] **	0.96
	0.48	1.08					
	[2.15] *	[18.3] **					0.83
Non-penny 2	0.12	0.91	0.71	0.25			
	[0.80]	[21.55] **	[20.25] **	[5.08] **			0.94
	0.14	0.82	0.72	0.25	-0.14		
	[1.21]	[32.13] **	[15.37] **	[4.27] **	[-4.39] **		0.96
	0.07	0.83	0.64	0.19	-0.12	0.11	
	[0.76]	[41.6] **	[11.81] **	[3.03] **	[-3.89] **	[3.81] **	0.97
	0.40	1.02					
	[2.10] *	[19.09] **					0.86
Non-penny 3	0.06	0.87	0.62	0.3			
	[0.58]	[33.83] **	[22.04] **	[5.69] **			0.96
	0.07	0.82	0.62	0.3	-0.08		
	[0.85]	[42.56] **	[21.89] **	[5.16] **	[-3.17] **		0.97
	0.11	0.81	0.6	0.24	-0.09	-0.05	
	[1.34]	[51.94] **	[14.37] **	[4.89] **	[-3.25] **	[-2.98] **	0.97
	0.34	0.99					
	[2.24] *	[19.89] **					0.88
Non-penny 4	0.05	0.86	0.55	0.23			
	[0.70]	[38.51] **	[15.37] **	[4.76] **			0.97
	0.06	0.83	0.56	0.23	-0.05		
	[0.86]	[43.01] **	[15.87] **	[4.70] **	[-1.53]		0.97
	0.12	0.81	0.59	0.24	-0.07	-0.09	
	[1.71]+	[39.18] **	[14.99] **	[4.43] **	[-1.80]+	[-6.14] **	0.97
	0.27	0.94					
Non-penny 5	[2.40] *	[21.78] **					0.94
	0.11	0.87	0.33	0.07			
	[1.20]	[21.68] **	[8.85] **	[1.28]			0.97
	0.11	0.88	0.33	0.07	0.02		

	[1.20]	[24.64] **	[8.60] **	[1.31]	[0.74]		0.97
	0.13	0.86	0.39	0.17	0.01	-0.05	
	[1.57]	[36.16] **	[11.42] **	[3.49] **	[0.49]	[-2.28] *	0.98

Table III
Trading Strategies Based on Firm Size

This table reports the monthly abnormal returns over various holding periods for five size-sorted quintile penny stock portfolios and a zero-cost portfolio in Panel A and for five size-sorted quintile non-penny stock portfolios and a zero-cost portfolio in Panel B. We form five quintile portfolios every month by sorting penny stocks based on each penny stock's capitalization at the end of the previous month, and hold them for one month, three months, six months, nine months and twelve months. Portfolios are rebalanced every month. Quintile 1 (5) is the portfolio of penny stocks with the smallest (largest) capitalization. "1-5" is the zero-cost portfolio that buys quintile portfolio 1 and short sells quintile portfolio 5. After the portfolios are formed, the equally (value)-weighted return of each portfolio is calculated every month in percentage terms over different holding periods, and the weights are based upon the stock's market capitalization at the end of the formation month. Then we run the time-series regressions of the excess returns on each portfolio against the extended seven risk factor model in equation (9), and report the intercepts of these regressions relative to the extended model for each of the quintile portfolios and the zero-cost portfolio. The Newey and West (1987) consistent *t*-statistics are reported in the square brackets. +, *, and **, denote statistical significance at the 10%, 5%, and 1% levels. Newey-West standard errors with six lags are used to adjust for autocorrelation. The sample period is from July 2001 to December 2010.

Panel A: Penny Stocks

Holding Period		Quintile1	Quintile2	Quintile3	Quintile4	Quintile5	Quintile1-Quintile5
1	EW	1.15	-0.07	-0.27	-0.32	-0.23	1.38
		[4.25]**	[-0.33]	[-0.97]	[-1.32]	[-0.72]	[3.14]**
	VW	0.8	-0.08	-0.28	-0.31	-0.12	0.91
		[2.9]**	[-0.41]	[-1.01]	[-1.28]	[-0.31]	[1.97]*
3	EW	1.09	0.11	-0.2	-0.34	-0.32	1.41
		[4.48]**	[0.52]	[-0.77]	[-1.45]	[-1.03]	[3.41]**
	VW	0.8	0.08	-0.18	-0.33	-0.31	1.12
		[3.47]**	[0.38]	[-0.69]	[-1.38]	[-0.86]	[2.48]*
6	EW	0.94	0.19	-0.15	-0.42	-0.55	1.5
		[3.99]**	[0.94]	[-0.68]	[-1.94]+	[-2.74]**	[4.40]**
	VW	0.68	0.18	-0.15	-0.42	-0.64	1.32
		[3.01]**	[0.89]	[-0.66]	[-1.99]*	[-2.54]*	[3.57]**
9	EW	0.9	0.2	-0.11	-0.32	-0.46	1.36
		[4.01]**	[1.07]	[-0.5]	[-1.68]	[-2.92]**	[4.30]**
	VW	0.65	0.2	-0.1	-0.32	-0.57	1.23
		[3.07]**	[1.02]	[-0.46]	[-1.76]	[-2.62]**	[3.74]**
12	EW	0.91	0.19	-0.03	-0.18	-0.41	1.32
		[4.16]**	[1.09]	[-0.12]	[-0.96]	[-2.75]**	[4.24]**
	VW	0.7	0.17	-0.02	-0.19	-0.52	1.22
		[3.45]**	[0.96]	[-0.1]	[-1.04]	[-2.42]*	[3.95]**

Panel B: Non-Penny Stocks

Holding Period		Quintile1	Quintile2	Quintile3	Quintile4	Quintile5	Quintile1-Quintile5
1	EW	0.12	0.07	-0.08	0.04	0.04	0.08
		[0.55]	[0.74]	[-0.85]	[0.62]	[0.58]	[0.35]
	VW	0.16	0.04	-0.09	0.05	-0.06	0.21
		[0.78]	[0.43]	[-0.95]	[0.73]	[-1.1]	[0.93]
3	EW	0.04	0.09	-0.03	0.06	0.06	-0.02
		[0.2]	[0.92]	[-0.31]	[0.89]	[0.96]	[-0.08]
	VW	0.07	0.05	-0.03	0.08	-0.03	0.1
		[0.35]	[0.54]	[-0.3]	[1.11]	[-0.75]	[0.46]
6	EW	-0.04	0.06	-0.04	0.06	0.06	-0.1
		[-0.16]	[0.55]	[-0.5]	[0.88]	[0.99]	[-0.42]
	VW	-0.02	0.03	-0.03	0.08	-0.02	0.00
		[-0.1]	[0.28]	[-0.41]	[1.2]	[-0.41]	[-0.02]
9	EW	-0.06	0.03	-0.03	0.09	0.07	-0.13
		[-0.27]	[0.25]	[-0.38]	[1.44]	[1.19]	[-0.58]
	VW	-0.05	0	-0.02	0.1	-0.01	-0.04
		[-0.24]	[0.05]	[-0.27]	[1.67]	[-0.32]	[-0.16]
12	EW	-0.04	0.03	0	0.13	0.09	-0.13
		[-0.19]	[0.26]	[-0.01]	[2.03]	[1.51]	[-0.61]
	VW	-0.03	0.01	0.01	0.15	-0.01	-0.02
		[-0.16]	[0.08]	[0.12]	[2.21]	[-0.27]	[-0.1]

Table IV
Value Trading Strategies Based on the Book-to-Market Ratio

This table reports the monthly abnormal returns over various holding periods for five BM-sorted quintile penny stock portfolios and the zero-cost portfolio in Panel A and for five BM-sorted quintile non-penny stock portfolios and the zero-cost portfolio in Panel B. We form five quintile portfolios every month by sorting penny stocks based on each penny stock's book-to-market ratio at the end of the previous month, and hold them for one month, three months, six months, nine months and twelve months. Portfolios are rebalanced every month. Quintile 1 (5) is the portfolio of penny stocks with the lowest (highest) BM ratio. "5-1" is the zero-cost portfolio that buys quintile portfolio 5 and short sells quintile portfolio 1. After the portfolios are formed, the equally (value)-weighted return of each portfolio is calculated every month in percentage terms over different holding periods, and the weights are based upon the stock's market capitalization at the end of the formation month. Then we run the time-series regressions of the excess returns on each portfolio against the extended seven risk factor model in equation (9), and report the intercept of these regressions relative to the extended model for each of the quintile portfolios and the zero-cost portfolio. The Newey and West (1987) consistent *t*-statistics are reported in the square brackets. +, *, and **, denote statistical significance at the 10%, 5%, and 1% levels. Newey-West standard errors with six lags are used to adjust for autocorrelation. The sample period is from July 2001 to December 2010.

Panel A: Penny Stocks

Holding Period		Quintile1	Quintile2	Quintile3	Quintile4	Quintile5	Quintile5-Quintile1
1	EW	-0.36	0.16	0.24	0.77	0.96	1.32
		[-1.11]	[0.84]	[0.99]	[3.38]**	[2.77] **	[2.99] **
	VW	-0.34	0.64	-0.34	0.88	-0.65	-0.32
		[-0.84]	[1.35]	[-0.98]	[1.61]	[-2.06] **	[-0.64]
3	EW	-0.23	0.19	0.31	0.69	1.03	1.26
		[-0.69]	[1.05]	[1.31]	[3.39] **	[3.32] **	[3.00] **
	VW	-0.59	0.34	-0.29	0.43	-0.37	0.22
		[-1.66]	[0.86]	[-0.92]	[1.09]	[-1.10]	[0.49]
6	EW	-0.22	0.21	0.3	0.57	0.98	1.20
		[-0.75]	[1.10]	[1.37]	[2.99] **	[3.15] **	[2.98] **
	VW	-0.76	0.2	-0.42	0.13	-0.23	0.52
		[-2.59] **	[0.80]	[-1.53]	[0.40]	[-0.70]	[1.27]
9	EW	-0.24	0.29	0.34	0.57	0.93	1.18
		[-0.94]	[1.43]	[1.55]	[2.89] **	[3.04] **	[3.09] **
	VW	-0.60	0.27	-0.29	0.12	-0.11	0.49
		[-2.30] *	[1.08]	[-1.02]	[0.37]	[-0.37]	[1.30]
12	EW	-0.23	0.3	0.35	0.52	0.92	1.15
		[-0.90]	[1.55]	[1.54]	[2.62] **	[2.96] **	[3.07]
	VW	-0.57	0.17	-0.3	0.06	-0.13	0.44
		[-2.34] **	[0.70]	[-1.09]	[0.20]	[-0.48]	[1.38]

Panel B: Non-Penny Stocks

Holding Period		Quintile1	Quintile2	Quintile3	Quintile4	Quintile5	Quintile5-Quintile1
1	EW	-0.17 [-1.43]	0.12 [1.47]	0.28 [3.11]	0.16 [1.79]	0.24 [1.53]	0.42 [1.92]+
	VW	0.06 [0.62]	-0.05 [-0.39]	0.14 [1.19]	-0.08 [-0.58]	0.08 [0.80]	0.03 [0.18]
3	EW	-0.17 [-1.27]	0.19 [2.22]*	0.24 [2.77]**	0.19 [1.98]*	0.19 [1.09]	0.36 [1.46]
	VW	0.08 [0.81]	0.00 [0.04]	0.11 [0.89]	-0.06 [-0.40]	0.06 [0.54]	-0.02 [-0.15]
6	EW	-0.15 [-1.17]	0.19 [2.23]	0.2 [2.19]	0.17 [1.75]	0.19 [1.09]	0.34 [1.35]
	VW	0.09 [0.94]	0.04 [0.40]	0.11 [0.87]	-0.09 [-0.53]	0.11 [1.08]	0.02 [0.13]
9	EW	-0.11 [-0.87]	0.2 [2.21]*	0.22 [2.42]*	0.16 [1.63]	0.19 [1.05]	0.3 [1.15]
	VW	0.09 [0.93]	0.08 [0.83]	0.13 [1.04]	-0.09 [-0.52]	0.16 [1.48]	0.07 [0.43]
12	EW	-0.09 [-0.61]	0.23 [2.42]*	0.26 [2.78]**	0.19 [1.84]+	0.21 [1.13]	0.3 [1.06]
	VW	0.09 [0.82]	0.10 [1.03]	0.16 [1.26]	-0.07 [-0.38]	0.19 [1.70]+	0.10 [0.60]

Table V
Contrarian Trading Strategies Based on the Past One-Month Return

This table reports the monthly abnormal returns over various holding period for five quintile penny stock portfolios sorted based on the past one-month return and the zero-cost portfolio in Panel A and for five quintile non-penny stock portfolios sorted based on the past one-month return and the zero-cost portfolio in Panel B. We form five quintile portfolios every month by sorting penny stocks based on each penny stock's return over previous month, and hold them for one month, three months, six months, nine months and twelve months. Portfolios are rebalanced every month. Quintile 1 (5) is the portfolio of penny stocks with the lowest (highest) past one-month return. "1-5" is the zero-cost portfolio that buys quintile portfolio 1 and short sells quintile portfolio 5. After the portfolios are formed, the equally (value)-weighted return of each portfolio is calculated every month in percentage terms over different holding periods, and the weights are based upon the stock's market capitalization at the end of the formation month. Then we run the time-series regressions of the excess returns on each portfolio against the extended seven risk factor model in equation (9), and report the intercept of these regressions relative to the extended model for each of the quintile portfolio and the zero-cost portfolio. The Newey and West (1987) consistent *t*-statistics are reported in the square brackets. +, *, and **, denote statistical significance at the 10%, 5%, and 1% levels. Newey-West standard errors with six lags are used to adjust for autocorrelation. The sample period is from July 2001 to December 2010.

Panel A: Penny Stocks

Holding Period		Quintile1	Quintile2	Quintile3	Quintile4	Quintile5	Quintile1-Quintile5
1	EW	-0.15 [-0.56]	0.14 [0.77]	0.3 [0.96]	0.34 [1.53]	-0.17 [-0.54]	0.02 [0.05]
	VW	-0.4 [-0.86]	-0.23 [-0.64]	-0.19 [-0.42]	0.14 [0.39]	-0.38 [-0.89]	-0.02 [-0.03]
3	EW	-0.1 [-0.44]	0.16 [0.94]	0.36 [1.87]+	0.3 [1.41]	-0.21 [-0.91]	0.11 [0.67]
	VW	-0.39 [-0.9]	-0.5 [-1.64]	-0.19 [-0.61]	-0.11 [-0.32]	-0.26 [-0.66]	-0.13 [-0.38]
6	EW	-0.03 [-0.13]	-0.06 [-0.39]	0.22 [1.29]	0.19 [1.09]	-0.19 [-1.11]	0.16 [0.93]
	VW	-0.53 [-1.56]	-0.64 [-3.18]**	-0.29 [-1.51]	-0.45 [-2.00]*	-0.63 [-2.42]*	0.1 [0.34]
9	EW	0.01 [0.07]	0.04 [0.24]	0.23 [1.46]	0.17 [1.18]	-0.17 [-1.24]	0.19 [1.34]
	VW	-0.4 [-1.43]	-0.55 [-2.67]**	-0.15 [-0.8]	-0.48 [-2.42]*	-0.57 [-2.76]*	0.16 [0.76]
12	EW	-0.02 [-0.10]	0.12 [0.75]	0.26 [1.75]	0.21 [1.45]	-0.09 [-0.70]	0.08 [0.69]
	VW	-0.43 [-1.64]	-0.43 [-1.94]+	-0.14 [-0.78]	-0.43 [-2.20]*	-0.51 [-2.55]*	0.08 [0.48]

Panel B: Non-Penny Stocks

Holding Period		Quintile1	Quintile2	Quintile3	Quintile4	Quintile5	Quintile1-Quintile5
1	EW	0.1 [0.67]	0.16 [1.37]	0.15 [1.57]	0 [-0.03]	-0.21 [-1.47]	0.31 [1.21]
	VW	0.12 [0.58]	0.2 [1.88]+	-0.09 [-1.05]	-0.14 [-1.29]	-0.28 [-1.34]	0.39 [1.22]
3	EW	-0.02 [-0.18]	0.17 [1.92]+	0.19 [2.25]*	0.05 [0.66]	-0.15 [-1.18]	0.13 [0.61]
	VW	0.01 [0.07]	0.2 [2.19]*	0.04 [0.72]	-0.05 [-0.54]	-0.38 [-2.41]*	0.39 [1.55]
6	EW	-0.13 [-1.27]	0.12 [1.48]	0.14 [1.63]	0.08 [1.01]	-0.11 [-1.36]	-0.02 [-0.16]
	VW	-0.13 [-1.12]	0.12 [2.10]*	0.06 [0.98]	0.04 [0.56]	-0.28 [-2.65]*	0.15 [1.07]
9	EW	-0.13 [-1.30]	0.11 [1.38]	0.14 [1.51]	0.09 [1.08]	-0.12 [-1.62]	-0.01 [-0.09]
	VW	-0.15 [-1.42]	0.06 [1.09]	0.07 [1.34]	0.06 [1.11]	-0.16 [-1.72]	0.00 [0.02]
12	EW	-0.11 [-1.16]	0.11 [1.34]	0.16 [1.64]	0.12 [1.39]	-0.08 [-1.16]	-0.04 [-0.58]
	VW	-0.15 [-1.34]	0.04 [0.85]	0.06 [1.23]	0.06 [1.17]	-0.11 [-1.1]	-0.04 [-0.41]

Table VI
Trading Strategies Based on the Momentum

This table reports the abnormal return of various momentum strategies for five quintile penny stock portfolios and the zero-cost portfolio in Panel A and for five quintile non-penny stock portfolios and the zero-cost portfolio in Panel B. At the beginning of month *t*, the penny stocks are ranked based on the past six and twelve month returns. Five quintile portfolios are formed, where quintile 1(5) represents the portfolio of the lowest (highest) returns and is called the loser (winner) portfolio. A zero-cost portfolio (quintile 5 - quintile 1) is also formed each month by going long with the winner portfolio and going short with the loser portfolio. Each of portfolios are held and examined in the next three, six, nine and twelve months. The portfolio is rebalanced monthly.
The number of momentum strategies is dependent upon the combinations of the formation period J and the holding period K. A total of 8 strategies is examined, where J=6, 12 and K=3, 6, 9, 12, respectively. We compute both equally- and value-weighted time series monthly return for all portfolios, and the zero-cost portfolio, and the weights are based upon the stock's market capitalization at the end of the formation month. We then run the time-series regressions of the excess returns on the each portfolio against our extended seven risk factor model, and the intercepts are "abnormal" returns. The Newey and West (1987) consistent *t*-statistics are reported in the square brackets. +, *, and **, denote statistical significance at the 10%, 5%, and 1% levels. Newey-West standard errors with six lags are used to adjust for autocorrelation. The sample period is from July 2001 to December 2010.

Panel A: Penny Stocks

		Formation Period: J= 6 months						Formation Period: J= 12 months					
Holding Period		Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	Quintile5 - Quintile1	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	Quintile5 - Quintile1
K=3	EW	-0.25	-0.13	-0.07	0.3	0.67	0.92	0.02	-0.19	-0.05	0.26	0.47	0.45
		[-0.68]	[-0.54]	[-0.34]	[1.28]	[2.99]**	[2.11]*	[0.05]	[-0.83]	[-0.23]	[1.65]	[2.09]*	[0.93]
	VW	-1.12	-0.62	-0.14	-0.04	0.49	1.61	-1.09	-0.72	-0.51	-0.2	0.5	1.59
		[-1.85]	[-1.51]	[-0.43]	[-0.11]	[1.28]	[2.75]**	[-1.78]+	[-1.79]+	[-1.33]	[-0.66]	[1.21]	[-2.45]
K=6	EW	-0.19	-0.12	-0.03	0.19	0.31	0.5	0.15	-0.07	0.02	0.15	0.03	-0.11
		[-0.58]	[-0.6]	[-0.18]	[1.00]	[1.85]+	[1.23]	[0.37]	[-0.35]	[0.11]	[0.86]	[0.18]	[-0.24]
	VW	-1.00	-0.64	-0.44	-0.46	-0.05	0.95	-0.63	-0.67	-0.60	-0.21	-0.25	0.38
		[-2.36]*	[-2.15]*	[-2.13]*	[-1.88]+	[-0.20]	[2.04]	[-1.13]	[-2.10]*	[-1.91]	[-0.80]	[-0.89]	[0.64]
K=9	EW	-0.1	0.05	0.01	0.17	0.15	0.25	0.18	0.07	0.17	0.12	-0.16	-0.35
		[-0.38]	[0.26]	[0.04]	[1.05]	[1.09]	[0.76]	[0.51]	[0.38]	[0.85]	[0.64]	[-0.94]	[-0.79]
	VW	-0.82	-0.36	-0.47	-0.41	-0.17	0.65	-0.4	-0.54	-0.33	-0.25	-0.54	-0.13
		[-2.43]*	[-1.40]	[-2.73]**	[-1.85]+	[-0.90]	[1.68]+	[-0.89]	[-1.85]+	[-1.26]	[-1.05]	[-2.46]*	[-0.29]
K=12	EW	0.03	0.14	0.14	0.19	0.00	-0.03	0.19	0.16	0.22	0.15	-0.25	-0.44
		[0.11]	[0.80]	[0.82]	[1.24]	[-0.01]	[-0.1]	[0.6]	[0.94]	[1.15]	[0.75]	[-1.49]	[-1.11]

	VW	-0.61 [-1.76]+	-0.29 [-1.22]	-0.36 [-2.02]*	-0.37 [-1.54]	-0.28 [-1.72]+	0.33 [0.89]	-0.34 [-0.85]	-0.64 [-2.50]*	-0.28 [-1.07]	-0.33 [-1.38]	-0.63 [-2.75]*	-0.29 [-0.72]

Panel B: Non-Penny Stocks

		Formation Period: J= 6 months						Formation Period: J= 12 months					
Holding Period		Quintile1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	Quintile5 - Quintile1	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	Quintile5 - Quintile1
K=3	EW	-0.23 [-1.76]+	-0.01 [-0.09]	0.14 [1.66]	0.2 [2.41]*	0.13 [1.18]	0.36 [2.02]*	-0.3 [-2.13]*	0.03 [0.25]	0.15 [1.77]+	0.25 [3.09]**	0.04 [0.39]	0.34 [1.84]
	VW	-0.23 [-1.39]	0.04 [0.37]	0.04 [0.45]	-0.07 [-0.74]	-0.1 [-0.7]	0.13 [0.55]	-0.29 [-1.68]+	-0.05 [-0.38]	-0.03 [-0.28]	0.08 [0.80]	-0.08 [-0.91]	0.21 [1.04]
K=6	EW	-0.32 [-2.57]*	-0.04 [-0.41]	0.14 [1.60]	0.23 [2.81]*	0.08 [0.85]	0.40 [2.81]*	-0.29 [-1.91]+	0.02 [0.20]	0.17 [1.86]+	0.23 [2.68]**	-0.07 [-0.64]	0.22 [1.04]
	VW	-0.49 [-3.78]**	-0.11 [-1.29]	0.04 [0.51]	0.09 [1.00]	0.08 [0.75]	0.58 [3.49]**	-0.39 [-2.09]*	-0.14 [-1.15]	0 [-0.03]	0.11 [1.08]	-0.03 [-0.36]	0.36 [1.54]
K=9	EW	-0.27 [-2.21]*	-0.02 [-0.24]	0.15 [1.57]	0.21 [2.45]*	0.02 [0.25]	0.30 [2.11]*	-0.26 [-1.66]	0.03 [0.30]	0.18 [1.93]+	0.19 [2.03]*	-0.09 [-0.76]	0.17 [0.74]
	VW	-0.44 [-3.02]**	-0.12 [-1.43]	0.02 [0.39]	0.06 [0.77]	0.09 [1.07]	0.52 [3.41]**	-0.42 [-2.17]*	-0.12 [-1.20]	0.01 [0.14]	0.1 [1.12]	0.02 [0.24]	0.44 [1.85]+
K=12	EW	-0.20 [-1.42]	0.02 [0.23]	0.17 [1.83]+	0.19 [2.14]*	0.00 [0.05]	0.20 [1.23]	-0.18 [-1.08]	0.05 [0.51]	0.17 [1.80]	0.18 [1.76]	-0.06 [-0.53]	0.12 [0.49]
	VW	-0.36 [-1.98]*	-0.05 [-0.72]	0.02 [0.40]	0.05 [0.76]	0.05 [0.60]	0.41 [2.07]**	-0.39 [-1.72]+	-0.06 [-0.69]	0.03 [0.37]	0.10 [1.41]	0.04 [0.38]	0.43 [1.51]

Table VII
Trading Strategies Based on the Idiosyncratic Volatility

This table reports the abnormal return for five quintile penny stock portfolios sorted based on the idiosyncratic volatility and the zero-cost portfolio in Panel A and for five quintile non-penny stock portfolios sorted based on the idiosyncratic volatility and the zero-cost portfolio in Panel B. To calculate the idiosyncratic volatility, every month we run the Fama and French (1993) three-factor model regression for each stock using the daily return data, and calculate the standard deviation of the resulting daily residuals as the individual stock's idiosyncratic volatility.

At the end of each month, we construct quintile portfolios based on the ranking of the idiosyncratic volatility of each individual stock in the past one month. Quintile 1 (quintile 5) is the portfolio of stocks with the lowest (highest) volatility. A zero-cost portfolio (quintile 1- quintile 5) is also formed each month by going long with the lowest volatility portfolio and going short with the highest volatility portfolio. Each of these portfolios are held and examined in the next three, six, nine and twelve months. The portfolio is rebalanced monthly. Both equally- and value-weighted time series monthly returns for all portfolios, and the zero-cost portfolio are calculated. We then run the time-series regressions of the excess returns on each portfolio against our extended seven risk factor model, and the intercepts are "abnormal" returns. The Newey and West (1987) consistent *t*-statistics are reported in the square brackets. +, *, and **, denote statistical significance at the 10%, 5%, and 1% levels. Newey-West standard errors with six lags are used to adjust for autocorrelation. The sample period is from July 2001 to December 2010.

Panel A: Penny Stocks

Holding Period		Quintile1	Quintile2	Quintile3	Quintile4	Quintile5	Quintile1-Quintile5
1	EW	0.74 [3.18]**	0.47 [1.94]+	-0.06 [-0.24]	-0.19 [-0.7]	-0.73 [-3.25]**	1.47 [5.11]**
	VW	0.49 [1.36]	-0.05 [-0.11]	-0.72 [-2.27]*	-0.84 [-1.77]+	-1.46 [-2.32]*	1.95 [2.99]**
3	EW	0.68 [3.33]**	0.32 [1.58]	0.03 [0.13]	-0.25 [-1.16]	-0.4 [-1.76]+	1.08 [4.82]**
	VW	0.17 [0.54]	-0.27 [-0.81]	-0.3 [-0.88]	-0.83 [-1.93]+	-1.57 [-3.73]+	1.74 [3.92]**
6	EW	0.37 [1.92]+	0.14 [0.78]	-0.03 [-0.20]	-0.24 [-1.37]	-0.19 [-0.85]	0.56 [1.95]**
	VW	-0.27 [-1.17]	-0.43 [-1.96]*	-0.55 [-2.13]*	-0.84 [-2.43]*	-1.27 [-3.23]**	1.00 [2.17]**
9	EW	0.32 [1.69]+	0.11 [0.71]	0.02 [0.11]	-0.14 [-0.83]	-0.12 [-0.66]	0.44 [1.56]
	VW	-0.31 [-1.33]	-0.44 [-2.36]*	-0.5 [-2.18]*	-0.69 [-2.40]*	-0.96 [-2.54]*	0.65 [1.33]
12	EW	0.38 [2.06]*	0.17 [1.08]	0.03 [0.21]	-0.08 [-0.57]	-0.03 [-0.16]	0.41 [1.62]
	VW	-0.18 [-0.77]	-0.48 [-2.36]*	-0.49 [-2.48]*	-0.69 [-2.61]**	-0.77 [-2.26]*	0.59 [1.46]

Panel B: Non-Penny Stocks

Holding Period		Quintile1	Quintile2	Quintile3	Quintile4	Quintile5	Quintile1-Quintile5
1	EW	0.41 [4.41]**	0.18 [1.84]+	0.02 [0.18]	-0.17 [-1.55]	-0.49 [-2.21]*	**0.90 [3.38]****
	VW	0.08 [0.70]	-0.08 [-1.10]	-0.31 [-2.64]**	-0.28 [-1.52]	-0.44 [-1.23]	0.52 [1.45]
3	EW	0.35 [3.54]**	0.21 [2.18]*	0.08 [0.93]	-0.1 [-1.06]	-0.46 [-2.94]**	**0.81 [3.70]****
	VW	0.08 [0.86]	-0.03 [-0.40]	-0.16 [-1.48]	-0.3 [-1.99]*	-0.41 [-1.63]	0.49 [1.86]+
6	EW	0.33 [3.06]**	0.19 [1.92]+	0.06 [0.71]	-0.16 [-1.71]+	-0.46 [-2.95]**	**0.79 [3.34]****
	VW	0.1 [1.15]	-0.02 [-0.31]	-0.05 [-0.52]	-0.4 [-2.67]**	-0.39 [-1.58]	0.49 [1.73]+
9	EW	0.3 [2.53]**	0.19 [1.76]+	0.05 [0.58]	-0.15 [-1.73]+	-0.4 [-2.68]**	**0.70 [2.94]**
	VW	0.09 [1.13]	0.00 [0.00]	-0.12 [-1.09]	-0.3 [-2.02]*	-0.37 [-1.56]	0.46 [1.64]
12	EW	0.29 [2.43]**	0.18 [1.65]	0.07 [0.8]	-0.1 [-1.21]	-0.33 [-2.20]*	**0.63 [2.61]***
	VW	0.09 [1.11]	0.00 [-0.03]	-0.11 [-1.08]	-0.25 [-1.68]+	-0.26 [-1.04]	0.35 [1.18]