

Are Negative P/E and P/B ratio Firms Different?

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Abstract

Using separately AMEX, NASDAQ and NYSE stock market data for the period 1968-2011, the purpose of this paper is to examine whether negative multiple firms are different from positive ones by examining the performance of negative P/E or P/B firms and how this performance compared with the most widely examined positive multiples firms. We find that firms with negative multiples are indeed different than firms with positive in that (a) a relatively small number of firms with negative multiples experience high forward stock returns even though the majority of them does not resulting in a large difference between mean and median returns and (b) the small firm-low liquidity effect observed in positive multiple firms is not as clearly observed in the case of negative multiple firms. This indicates that prior academic research was right in excluding negative multiple firms from their analysis as inclusion would have affected the homogeneity of their sample and would have diluted their findings and tests of significance.

Keywords: Financial statement analysis; Positive and negative price-to-earnings; Positive and negative price-to-book

JEL Classification: G12, G14, M41

Introduction

A large body of academic research has examined the performance of firms with different levels of positive price-to-earnings (P/E) or price-to-book (P/B) stocks, but there is not much research with regards to the performance of negative P/E or P/B firms and how this performance compares with the most widely examined positive multiples firms [1-10]. Academic papers, such as the ones referred to above, exclude from their analysis negative P/E or P/B firms. Negative P/E or P/B firms were considered to be different from the positive multiple firms and had to be segregated in order to keep the homogeneity of the sample intact. But are they really different?

Using separately AMEX, NASDAQ and NYSE stock market data for the period 1968-2011, the purpose of this paper is to answer this question by examining the performance of negative P/E or P/B firms and how this performance compares with the most widely examined positive multiples firms.

While previous studies [3-8] derive trailing price to earnings (P/E) and price to book value (P/B) ratios using price as at the end of June of year (t) and earnings per share and book value per share as of December of year (t-1), this study will derive trailing ratios where price is as at the end of April of year (t), given that our sample only include firms that already have reported financials by the end of April of year (t). We see no reason to wait until June given that a stock selection strategy can be implemented at an earlier time.

First, we will examine the performance of positive multiple firms and then that of the negative multiples firms and draw conclusions. Given the implicit assumption made by academic papers to date regarding positive and negative multiple firms, our null hypothesis is that negative and positive multiple firms exhibit similar return and fundamental financial characteristics.

This paper shows that firms with negative multiples are indeed different than firms with positive in that (a) a relatively small number of firms with negative multiples experience high forward stock returns even though the majority of them does not resulting in a large difference between mean and median returns and (b) the small firm-low liquidity effect observed in positive multiple firms is not as clearly

observed in the case of negative multiple firms. This indicates that prior academic research was right in excluding negative multiple firms from their analysis as inclusion would have affected the homogeneity of their sample and would have diluted their findings and test of significance.

The rest of the paper is structured as follows. Section 2 discusses the data sources and sample selection. Section 3 reports the empirical results and compares the performance of positive and negative multiples stocks and Section 4 concludes the paper and discusses the implications of findings.

Data and Methodology

Our sample includes all AMEX, NASDAQ, NYSE companies that traded on US Stock Exchanges for the period 1969-2011, as well as their financials for the period 1968-2009.

As in Athanassakos [11], this paper uses data from COMPUSTAT from which earnings per share (E), book value per share (B), shares outstanding, trading volume, stock prices and dividends paid, as well as company financials are obtained, and from which trailing price to earnings (P/E), trailing price to book (P/B), total returns, stock liquidity, market cap and firm fundamentals are derived.¹ For the trailing P/E (P/B) ratios, the price (P) is as of the end of April of year (t) and E (B) is the fully diluted annual earnings per share (book value per share) for companies with fiscal year end in year (t-1), as reported in COMPUSTAT. Annual total stock returns are calculated as the price change plus the dividend from May 1 of year (t) to April 30 of year (t+1) over the price in May 1 of year (t).

¹There is no survivorship bias in the COMPUSTAT data employed in this paper as dead/merged companies are included in our sample.

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Firm fundamentals, derived from company financials, are defined as follows: CASH is cash over assets. EBIT MARGIN is EBIT over Revenues (i.e., operating margin). TURNOVER is assets over revenues (times). CURRENT RATIO is the ratio of cash plus short term investments, inventories and accounts receivable to current liabilities (times). DEBT is short and long term debt to equity. EPS GROWTH, EBIT GROWTH and REV GROWTH are the annual growth rates of EPS, EBIT and revenues, respectively for fiscal year (t-1). Market metrics are defined as follows: MARKET CAP is derived by multiplying price per share times shares outstanding at the end of April of year (t). LIQUIDITY is the annual stock trading volume of the year prior to May of year (t) over shares outstanding as at April of year (t) [11].

To eliminate likely data errors [12,13], we have excluded firms with P/E values over 500 and P/B values over 30. Finally, to be included in our sample a stock had to have a price over \$1 and to have reported financials in COMPUSTAT.

After all aforementioned screenings, the sample with the positive multiples ends up with 90,423 cross sectional-time series (firm-year) observations belonging to a cumulative number of 8,570 unique companies. Of those companies 1,217 are AMEX, 3,244 are NYSE and 4,109 are NASDAQ companies.

The negative multiples sample includes 6,232 firms or 22,133 observations with negative P/E ratios and 927 firms or 2,246 observations with negative P/B ratios over the sample period. For the negative P/E group, 3,564 unique companies (14,332 observations) are NASDAQ companies, 838 are AMEX (2,616 observations) and 1,830 are NYSE (5,185 observations). For the negative P/B group, 294 unique firms (834 observations) are NYSE, 134 are AMEX (339 observations) and 499 are NASDAQ (1,083 observations).

Non-overlapping forward annual stock returns (adjusted for stock splits and stock dividends) are obtained from May 1, 1969 to April 30, 2011. Trailing company fundamentals, as defined earlier, are for the period 1968 to 2009.

Empirical Results

Table 1 and 2 report the summary statistics for key variables of firms with positive multiples (Table 1) and those with negative multiples (Table 2). The tables include the mean, median, minimum and maximum of each variable.

In Table 1, we see that the EBIT margin and turnover for the median positive multiple firm are 9.88% and 0.857, respectively. The median annual growth rates of revenues, EPS and EBIT have all been positive over the sample period. The median firm is not overleveraged as indicated by the debt to equity ratio of .28 and has a market cap is US\$182.5 million. Median values for cash to assets and current ratio are 3.7% and 2.1, respectively. Moreover, the median firm trades about 48% of the shares outstanding over the previous year. Finally, the median stock return of firms with positive multiples is 8%.

Comparing Table 1 and 2, we see that firms with negative P/E or P/B have very low or negative median EBIT margin, and EPS, EBIT and revenue growth rates as opposed to a very positive one for firms with positive multiples. Negative P/E or P/B firms also have very low market cap and higher debt, turnover and liquidity (annual trading volume to shares outstanding) than firms with positive multiples. Median tests,

reported in Table 2 (Panel C) and based on CHI-SQUARE tests for testing the null hypothesis that median values for the variables of Tables 1 vs. Table 2 (i.e., of positive vs. negative multiple firms) are equal, show the following. Median values of Table 1 variables are statistically different from the median values of same variables in Table 2 (Panel A), with the exception of current ratio and debt, at conventional levels of significance. Moreover, all median values of Table 1 variables are statistically different from the median values of the same variables in Table 2 (Panel B), at conventional levels of significance. Finally, we see that firms with negative P/B also have negative P/E, but not the other way around.

More importantly, there is a very large difference between mean and median returns when firms have negative P/E (21.1% and 0%, respectively) or P/B ratios (30.6% and 6.8%, respectively) vis-à-vis corresponding numbers when firms have positive multiples (16.8% vs. 8%, respectively). Although, on average, returns are much higher for negative P/E (P/B) firms than positive ones, 50% of the negative P/E (P/B) firms experience a return of less than zero (6.81%) as opposed to positive P/E firms whereby 50% of the returns are less than 8%. Not shown here, this is also true when we look at individual exchanges. AMEX firms with negative P/E have a mean return of 9.14% and a median return of -6.98%, NASDAQ firms 21.54% and -3.31% and NYSE firms 25.87% and 9.37%. For negative P/B firms, the mean return for AMEX is 17.5%, for NASDAQ 34.44% and for NYSE 30.54%; the corresponding medians are -3.71%, 5.28% and 11.52%, respectively. Again, not shown here, the mean and median return figures by exchange for the positive multiples firms in the sample are: 12.7% vs. 2.42% for AMEX, 18.5% vs. 5.4% for NASDAQ and 16.7% vs. 10.4% for NYSE stocks.²

Variable	Median	Mean	Maximum	Minimum
EBIT margin	0.0988	0.1207	1.334	-22.82
Current Ratio	2.10355	2.676	113.37	0
Cash	0.037	0.0824	0.9968	-0.09928
Debt	0.28	0.2921	1.17	-0.06
Turnover	0.8569	1.2787	864.222	0.0582
EPS growth	0.05	0.1557	823	-3212.43
EBIT growth	0.14	0.1668	3372	-1993
REV growth	0.13	0.3512	6500.8	-199.29
Liquidity	0.479	0.9473	272.905	0
Market Cap	182.477	2430.306	596475.75	0.02724
Return	0.0799	0.16899	22.8745	-0.9907
P/E	15.8655	25.679	500	0.00636
P/B	1.8252	2.6067	29.824	0.0000921

Table 1: Positive P/E or P/B ratios

The table reports summary information for 90,423 firm-year observations of 8,570 unique firms that are listed in AMEX, NASDAQ and NYSE exchanges. Of those companies 1,217 companies are AMEX, 3,244 are NYSE and 4,109 are NASDAQ. All data are from COMPUSTAT and are available from 1968-2011. P/E is price as at April of year (t) over earnings per share as fiscal year end (t-1). P/B is price as at April of year (t) over book value per share as fiscal year end (t-1). Return is the annual return for the year following the sorting into portfolios. Cash is cash over assets. EBIT Margin is EBIT over Revenues. Turnover is assets over revenues (times). Liquidity is trading volume for the year prior to May of year (t) as a percentage of shares outstanding. Current Ratio is the ratio of cash plus short term investments and accounts receivable to current liabilities (times). Market Cap is market cap in millions of US dollars determined by multiplying shares outstanding by price per share as at April of year (t). Debt is short and long term debt to equity. REV, EBIT and EPS growth are the annual growth rates of revenues, EBIT and EPS, respectively for the fiscal year (t-1).

²We also repeated the analysis by excluding the upper 10% and bottom 10% of the ranked data and found that the results were not materially different for all variables examined both in terms of mean and median values.

Panel A: Negative P/E ratios

Variable	Median	Mean	Maximum	Minimum
EBIT Margin	-0.0553	-0.0161	3.083	-69.99
Current Ratio	2.117	3.5846	100.192	0
Cash	0.0829	0.159	0.9988	-0.0357
Debt	0.27	0.3611	113.24	-62.4
Turnover	1.3557	4.5587	1206.73	-0.4524
EPS growth	-0.66	-1.4631	1341	-1021
EBIT growth	-0.33	1.1615	28985	-2364.5
REV growth	0.04	2.319	11651	-20.24
Liquidity	0.8454	1.484	139.37	0
Market Cap	96.66	819.38	232826	0.0157
Return	0	0.2109	36.1316	-0.9942
P/E	-10.9375	-42.3236	-0.0015	-4120.83
P/B	1.7	4.6973	8100	-2345.68

Panel B: Negative P/B ratios

Variable	Median	Mean	Maximum	Minimum
EBIT Margin	0.0299	-0.6924	0.9338	-63.8813
Current Ratio	1.1709	1.5236	45.4358	0
Cash	0.0586	0.1221	0.8961	-0.0139
Debt	1.14	1.3611	470	-73.17
Turnover	0.9519	2.4956	409.024	0.0055
EPS growth	-0.215	-0.733	391	-796
EBIT growth	-0.01	0.5733	810.32	-291.06
REV growth	0.06	7.3656	11651	-0.98
Liquidity	0.7262	1.2613	23.37	0
Market Cap	109.12	837.3	40181.5	0.0157
Return	0.0681	0.3056	17	-0.9942
P/E	-1.461	5.3509	3975	-2082
P/B	-4.8407	-35.8924	-0.0003	-2345.68

Panel C: Median Tests (p-values)

Variable	Table 1 ≠ Table 2 (Panel A) Metrics	Table 1 ≠ Table 2 (Panel B) Metrics
EBIT Margin	0.0001	0.0232
Current Ratio	0.431	0.0001
Cash	0.0221	0.043
Debt	0.576	0.0001
Turnover	0.0001	0.017
EPS growth	0.0001	0.0001
EBIT growth	0.0001	0.0001
REV growth	0.014	0.0366
Liquidity	0.0001	0.0001
Market Cap	0.0001	0.0001
Return	0.0001	0.049

Table 2: Negative P/E or P/B ratios

The table reports summary information for 22,133 firm-year observations belonging to 6,232 unique firms that have negative P/E ratios and 2,246 firm-year observations belonging to 927 unique firms that have a negative P/B ratios for the total sample. For the negative P/E group, 3,564 unique companies (14,332 observations) are NASDAQ companies, 838 AMEX (2,616 observations) and 1,830 NYSE (5,185 observations). For the negative P/B group, 294 unique firms (834 observations) are NYSE, 134 AMEX (339 observations) and 499 NASDAQ (1,083 observations). All data are from COMPUSTAT and are available from 1968-2011. P/E is price as at April of year (t) over earnings per share as fiscal year end (t-1). P/B is price as at April of year (t) over book value per share as fiscal year end (t-1). Return is the annual return for the year following the sorting into portfolios. Cash is cash over assets. EBIT Margin is EBIT over Revenues. Turnover is assets over revenues (times). Liquidity is trading volume for the year prior to May of year (t) as a percentage of shares outstanding. Current Ratio is the ratio of cash plus short term investments and accounts receivable to current liabilities (times). Market Cap is market cap in millions of US dollars determined by multiplying shares outstanding by price per share as at April of year (t). Debt is short and long term debt to equity. REV, EBIT and EPS growth are the annual growth rates of revenues, EBIT and EPS, respectively for the fiscal year (t-1). Median tests are based on CHI-SQUARE tests for testing the null hypothesis that median values for the variables of Tables 1 vs. Table 2 (i.e., of positive vs. negative multiple firms) are equal.

Firms with negative multiples are thus different than firms with positive multiples and hence our null hypothesis is rejected. As we see in Table 2, negative P/E or P/B firms experience, on average, high stock returns even though their medians are relatively low. This indicates that while some low P/E or P/B value firms have high returns the majority of such firms do not, resulting in much larger differences between mean and median returns than firms with positive multiples, both for the total sample and by exchange. The implication of this is that one can find real gems within negative P/E or P/B firms but he/she needs to be extremely cautious as the majority of such firms are anything but. In other words, prior academic research was right in excluding negative multiple firms from their analysis as inclusion would have affected the homogeneity of their sample.

Further analysis also shows that negative P/E (P/B) firms are different than positive P/E (P/B) firms in another dimension as is shown in Table 3 (Panels A and B). While smaller and less liquid positive P/E (P/B) firms tend to perform unequivocally economically and statistically better than larger/more liquid firms [14-16], for negative P/E (P/B) firms the evidence is not as clear cut as the bigger and more liquid firms seem to earn median annual returns comparable to the smaller and less liquid firms. The markets seem to reward liquidity and size more when it comes to negative P/E (P/B) firms than when it comes to positive multiple firms. Market participants may view negative P/E or P/B firms as riskier thus preferring to focus on the safer larger/more liquid firms among them, which enable them to exit quickly if the need arises, resulting in higher than normal returns for these vs. equivalent positive multiple firms. This further exemplifies the importance of segregating negative from positive multiple firms in related research as inclusion would undermine the clarity and generality of findings and dilute the significance of empirical evidence.

Conclusions

Using separately AMEX, NASDAQ and NYSE stock market data for the period 1968-2011, the purpose of this paper was to examine whether negative multiple firms were different from positive ones by examining the performance of negative P/E or P/B firms and how this performance compared with the most widely examined positive

Panel A: Negative P/E ratios

No of OBS	Small cap/low liquidity		Large cap/high liquidity	
	Median	Mean	Median	Mean
2706	0.069	0.3001	0.0498	0.131

Panel B: Negative P/B ratios

No of OBS	Small cap/low liquidity		Large cap/high liquidity	
	Median	Mean	Median	Mean
266	0.0817	0.435	0.096	0.232

Table 3: Returns of Small - Low liquidity Firms vs. Returns of Large - High Liquidity Firms: Negative P/E or P/B firms

The table reports the mean and median returns of firms with small cap/low liquidity vs. large cap/high liquidity firms within the negative P/E or P/B sample for the period 1968-2011. For the negative P/E sample, low market cap are firms with market value of less than US\$28.5 million, while large cap firms are those with a market value of over US\$342.2 million. At the same time, low liquidity (annual trading volume to shares outstanding) firms are those with liquidity of less than 0.37 and high liquidity firms are those with liquidity of over 1.80. For the negative P/B sample, low market cap are firms with market value of less than US\$27 million, while large cap firms are those with a market value of over US\$533.8 million. At the same time, low liquidity firms are those with liquidity of less than 0.34 and high liquidity firms are those with liquidity of over 1.51.

multiples firms. We found that firms with negative multiples are indeed different than firms with positive in that (a) a relatively small number of firms with negative multiples experience high forward stock returns even though the majority of them does not resulting in a large difference between mean and median returns and (b) the small firm-low liquidity effect observed in positive multiple firms is not as clearly observed in the case of negative multiple firms. This indicates that prior academic research was right in excluding negative multiple firms from their analysis as inclusion would have affected the homogeneity of their sample and would have diluted their findings and tests of significance.

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