
Are negative P/E ratio firms different than positive P/E firms? The case of interlisted vs. non-interlisted firms in Canada

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Abstract

Using separately interlisted and non-interlisted Canadian stock market data for the period 1985-2010, the main purpose of this paper is to examine whether negative P/E stocks are really different from positive P/E firms, and whether the former outperform, on average, the latter. The paper also purports to examine (a) whether interlisted and non-interlisted firms behave similarly or there are distinct differences between them and (b) whether there are differences in relation to this paper's key questions only in one group of stocks or whether differences are equally driven by both. We find that firms with negative multiples are indeed different from firms with positive multiples in that (a) a relatively small number of firms with negative multiples experience high forward stock returns, even though in the majority of cases there isn't a large difference between mean and median returns and (b) the value, size, liquidity and business risk premiums behave differently for negative P/E as opposed to positive P/E firms. This indicates that prior academic research was right in excluding negative multiple firms from their analyses. Moreover, the paper also shows that there are key differences between interlisted and non-interlisted firms both in the positive and negative P/E space. As a result, not only must negative P/E firms be segregated from positive multiple firms, but also interlisted firms ought to be segregated from non-interlisted firms in related research as aggregation would undermine the clarity and generality of findings, affect the homogeneity of the sample and dilute findings and tests of significance.

1. Introduction

Academic papers examining the performance of value versus growth firms (i.e., low versus high P/E ratio firms) and the so called value premium exclude from their analyses negative P/E firms as they are believed to behave differently from the positive multiple firms. To keep their sample homogenous, these studies segregated the negative multiple firms from the positive ones [see, for example, Basu (1977), Chan et al. (1991), Fama and French (1992, 1993, 1995) and Lakonishok et al. (1994)]. But is this the right thing to do? Moreover, empirical research in Finance has documented that the lowest P/E stocks tend to outperform [see, for example, Chan and Lakonishok (2004) and Athanassakos (2009, 2011, 2013)]. As negative P/E firms can be considered to belong to the lowest P/E group of stocks, it begs the question whether they will also have superior performance.

Additionally, research in finance has aggregated together Canadian interlisted and non-interlisted stocks. But is this right? First, interlisted stocks tend to be larger, more glamorous and well known than non-interlisted stocks and are followed by more analysts [Athanassakos et al. (2010)]. If we wish to keep our sample as homogeneous as possible, then interlisted must be segregated from non-interlisted stocks. Second, there is evidence that the marginal trader for Canadian interlisted stocks is an American investor [see Booth and Johnston (1984)]. If stocks that are most likely to be traded by Canadians behave differently than those that are not, then, again for homogeneity sake, interlisted must once more be segregated from non-interlisted stocks.

Separating interlisted from non-interlisted Canadian stock market data for the period 1985-2010, we will address the following two key questions in this paper.¹ First, are negative P/E stocks really different from positive P/E firms, and second, as one can view the negative P/E stocks as part of the lowest P/E stocks, do they outperform, on average, the universe of positive P/E stocks? Answering these questions will be of importance to both institutional and individual investors, particularly those who follow a value approach, as well as academics who need to have clear evidence justifying the exclusion of negative P/E stocks from studies of the value premium. We would additionally like to examine whether there are distinct differences in negative P/E

stocks depending on whether they are interlisted or not and how negative P/E firms differ from those that have a positive P/E, be they interlisted or not.

We will ask the following questions. Do interlisted and non-interlisted firms behave similarly or are there distinct differences between them that grouping them would bias results and produce unfounded generalizations and conclusions? And, are there differences in relation to this paper's key questions only in one group of stocks or are differences equally driven by both? Findings will have implications not only for the Canadian, but also for the U.S. markets.

While previous studies [see, for example, Fama and French (1992, 1993, 1995), Lakonishok et al. (1994), and Chan and Lakonishok (2004)] derive trailing price to earnings (P/E) ratios using price as at the end of June of year (t) and earnings per share as of fiscal end 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 includes firms that already have reported financials (for fiscal year (t-1)) 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.

This paper shows that firms with negative multiples are indeed different from firms with positive multiples 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 value, size, liquidity and business risk premiums behave differently for negative, as opposed to positive, P/E firms. This indicates that prior academic research was correct in excluding negative multiple firms from their analyses. Moreover, the paper also shows that there are key differences between interlisted and non-interlisted firms both in the positive and negative P/E space. As a result, not only must negative P/E firms be segregated from positive multiple firms, but also interlisted firms ought to be segregated from non-interlisted firms in related research as aggregation would undermine the clarity and generality of findings, affect the homogeneity of the sample and dilute findings and tests of significance.

The rest of the paper is structured as follows. Section 2 discusses the data sources, sample selection and methodology. Section 3

1 The Toronto Stock Exchange refers to cross-listed stocks as interlisted.

reports the empirical results and compares the performance of positive and negative multiples stocks and that of interlisted and non-interlisted stocks and Section 4 concludes the paper and discusses the implications of findings.

2. Data and methodology

Our sample includes all interlisted and non-interlisted companies that traded on Canadian Stock Exchanges for the period May 1, 1985 - April 30, 2010, as well as their financials for the period 1984 - 2008.

The paper uses data from COMPUSTAT from which trailing price to earnings (P/E), total returns, stock liquidity, market cap and firm fundamentals are derived.² For the trailing P/E ratios, the price (P) is as of the end of April of year (t) and E is the fully diluted annual earnings per share for companies with fiscal year end in year (t-1), as reported in COMPUSTAT.

Firm fundamentals, derived from company financials, are defined as follows: CASH is cash plus marketable securities over assets. EBIT MARGIN is EBIT over revenues (i.e., operating margin). TURNOVER is revenues over assets. CURRENT RATIO is the ratio of cash plus short term investments, inventories and accounts receivable to current liabilities. 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 by 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). BUSINESS RISK is the industry code that captures an industry's business risk (1=low business risk, 2=medium business risk and 3=high business risk). BUSINESS RISK assigns industry groups from COMPUSTAT to business risk categories which are based on results reported by Athanassakos (1998).

The industries belonging to each of the three business risk categories referred to above are from Athanassakos (2013).

To eliminate likely data errors [see, for example, Griffin and

Lemmon (2002) and Cohen, Polk and Vuolteenaho (2003)], we have excluded firms with P/E values over |500|. Finally, to be included in our sample a stock had to have a price of at least \$1 and to have reported financials in COMPUSTAT.

After all aforementioned screenings, for the positive P/E stocks, we end up with 1,043 unique companies (6,479 firm-year observations) belonging to the non-interlisted sample and 219 unique companies (1,502 firm-year observations) belonging to the interlisted sample.

For the negative P/E stocks, the non-interlisted sample includes 8,059 firm-year observations for 1,322 unique firms, while the interlisted sample includes 864 firm-year observations for 124 unique firms.

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). In other words, total stock returns are calculated for the year following the formation of the P/E ratios (i.e., May year (t) to April year (t+1)). Equally weighted mean (and median) returns for each group of stocks are then derived [see, for example, Fama and French (1992), Lakonishok et al. (1994)].

Non-overlapping forward annual stock returns, which are adjusted for stock splits and stock dividends, are thus obtained over the period May 1, 1985-April 30, 2010. Trailing company fundamentals, as defined earlier, are for the period 1984 to 2008.

3. Empirical results

3.1 Summary statistics

Tables 1 and 2 report, respectively, the summary statistics for key variables of interlisted and non-interlisted firms with positive and negative P/E ratios. The tables include the mean, median and first and third quartile statistics for each variable.

In these tables, we observe that there is a significant discrepancy between mean and median values. This is particularly true for the negative P/E sample. As a result, we will focus our discussion on the median values.

In Table 1, Panel A, we see that, for interlisted firms, the median

² There 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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Variable	Panel A: Positive P/E firms				Panel B: Negative P/E firms				Panel C: Median tests (p-values)
	Mean	Median	25%	75%	Mean	Median	25%	75%	Panel A ≠ Panel B metrics
EBIT margin	0.17	0.15	0.08	0.24	-0.19	-0.01	-0.30	0.07	0.0001
Current ratio	2.65	1.66	1.09	2.71	5.97	2.33	1.26	5.42	0.0001
Cash	0.12	0.06	0.01	0.16	0.21	0.12	0.03	0.31	0.0001
Debt	0.79	0.43	0.14	0.96	0.47	0.12	0.00	0.54	0.0001
Turnover	0.66	0.5	0.29	0.86	0.44	0.27	0.02	0.62	0.0001
EPS growth	0.43	-0.02	-0.56	0.36	0.19	-0.28	-1.00	0.49	0.0001
EBIT growth	0.6	0.11	-0.21	0.46	0.13	-0.04	-0.70	0.58	0.0001
Rev growth	0.43	0.13	0.01	0.3	0.42	0.05	-0.11	0.28	0.0001
Liquidity	0.77	0.27	0.06	0.89	1.02	0.58	0.20	1.28	0.0001
Market cap	6389.9	1895.3	376.7	6807.2	839.6	208.4	78.1	567.5	0.0001
Return	0.15	0.1	-0.15	0.36	0.09	-0.02	-0.33	0.38	0.0001
P/E	35.5	19.7	13.1	36.1	-53.3	-14.7	-42.8	-5.2	0.0001

Table 1: Summary Statistics of interlisted firms for May 1, 1985-April 30, 2010

Variable	Panel A: Positive P/E firms				Panel B: Negative P/E firms				Panel C: Median tests (p-values)
	Mean	Median	25%	75%	Mean	Median	25%	75%	Panel A ≠ Panel B metrics
EBIT margin	0.18	0.12	0.06	0.24	-0.06	-0.01	-0.17	0.06	0.0001
Current ratio	2.77	1.59	1.06	2.39	6.08	1.87	1.02	4.69	0.0001
Cash	0.09	0.03	0.00	0.13	0.19	0.08	0.01	0.29	0.0001
Debt	0.67	0.38	0.09	0.84	0.66	0.16	0.00	0.74	0.0001
Turnover	0.97	0.75	0.30	1.37	0.60	0.29	0.01	0.91	0.0001
EPS growth	0.13	0.01	-0.47	0.38	-0.25	-0.41	-1.17	0.33	0.0001
EBIT growth	0.23	0.10	-0.16	0.45	0.13	-0.15	-0.78	0.43	0.0001
Rev growth	0.47	0.11	0.02	0.31	0.41	0.01	-0.16	0.23	0.0001
Liquidity	0.34	0.19	0.06	0.44	0.48	0.28	0.11	0.62	0.0001
Market cap	760.0	154.7	54.1	512.2	182.8	35.8	12.1	103.0	0.0001
Return	0.12	0.06	-0.16	0.32	0.06	-0.02	-0.34	0.33	0.0001
P/E	27.9	15.7	10.3	26.7	-44.0	-9.0	-27.9	-2.7	0.0001

Table 2: Summary statistics of non-interlisted firms for May 1, 1985-April 30, 2010

EBIT margin and turnover for the positive P/E firms are 15% and 0.50, respectively. The median annual growth rates of revenues and EBIT have all been positive over the sample period, but not that of EPS. The median firm is not overleveraged as indicated by the debt to equity ratio of .43 and has a market cap is CAD\$1895.3 million. Median values for cash (and marketable securities) to assets and current ratio are 6% and 1.66, respectively. Moreover, the median firm trades about 27% of the shares outstanding over the previous year. Finally, the median stock return of firms with positive P/Es is 10%.

Comparing Panels A and B of Table 1, we see that firms with negative P/Es have negative median EBIT margin and EBIT growth rate as opposed to positive ones for firms with positive P/Es. Negative P/E firms also have lower market cap, debt to equity and turnover, but higher liquidity than firms with positive multiples. Median tests, reported in Table 1 (Panel C) and based on CHI-SQUARE tests for testing the null hypothesis that median values for the variables of Panels A and B (i.e., of positive vs. negative multiple firms) are equal, show that median values of Panel A variables are statistically different from the median values of same variables in Panel B, at conventional levels of significance.

In Panel B, we also notice that there is a much larger difference between mean and median returns when firms have negative P/E (9% and -2%, respectively) vis-à-vis corresponding numbers when firms have positive multiples (15% versus 10%, respectively (see Table 1, Panel A)). This may indicate that there are relatively more high positive outlier return stocks within the negative P/E firms than among the positive P/E firms. In other words, while the majority of negative P/E firms have negative returns, many high positive return stocks can still be found within the negative P/E stocks. Interlisted firms with negative multiples are thus different than interlisted firms with positive multiples.

In Table 2, Panel A, we see that, for non-interlisted stocks, the median EBIT margin and turnover for the positive P/E firm are 12% and 0.75, 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 .38 and has a market cap is CAD\$154.7 million. Median values for cash (and marketable securities) to assets and current ratio are 3% and 1.59, respectively. Moreover,

the median firm trades about 19% of the shares outstanding over the previous year. Finally, the median stock return of firms with positive P/Es is 6%.

Comparing Panels A and B of Table 2, we see that firms with negative P/Es have negative median EBIT margin and EPS and EBIT growth rate as opposed to positive ones for firms with positive P/Es. Negative P/E firms also have lower market cap, debt to equity and turnover, but higher liquidity than firms with positive multiples. Median tests, reported in Panel C, show that median values of Table 2, Panel A variables are statistically different from the median values of the same variables in Table 2, Panel B, at conventional levels of significance.

In Panel B, we also see that there is a larger difference between mean and median returns when firms have negative P/E (6% and -2%, respectively) vis-à-vis corresponding numbers when firms have positive multiples (12% versus 6%, respectively (see Panel A)). Similar to the evidence from the interlisted stocks, this may indicate that there are relatively more high positive return outliers for the negative P/E sample than there are in the positive P/E sample and that while the majority of negative P/E firms have negative returns, many high positive return stocks can still be found within the negative P/E stocks. Non-interlisted firms with negative multiples are thus also different than non-interlisted firms with positive multiples.

3.1.2 Univariate Analysis

A. Low versus high P/E ratios - is there a value premium in negative P/E stocks?

Tables 3 and 4 show, respectively, that negative P/E interlisted and non-interlisted firms are different than positive P/E firms in another dimension.

In Table 3, Panel A, we see that interlisted firms with below median positive P/E values outperform those with above median P/E values (median return of 13% vs. 5%) - that is, there is a value premium consistent with prior research (see, for example, Athanassakos (2009, 2011)). However, in Panel B, we see that the below median negative P/E firms have a median return of -3% vs. -2% for the above median P/E firms. Unlike positive P/E firms there is no value premium in negative P/E interlisted firms.

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Variable	Panel A: Positive P/E firms					Panel B: Negative P/E firms				
	Above Median		Below Median		Median tests (p-values)	Above Median		Below Median		Median tests (p-values)
	Mean	Median	Mean	Median		Mean	Median	25%	75%	
Return	0.11	0.05	0.18	0.13	0.002	0.13	-0.02	0.06	-0.03	0.782
Liquidity	1.04	0.43	0.51	0.15	0.0001	0.90	0.57	1.09	0.60	0.646
Market cap	5060.3	1680.4	7733.9	2311.1	0.004	560.60	118.2	1088.1	308.3	0.0001
P/E	58.3	36.1	12.7	13.1	0.0001	-6.3	-5.2	-100.6	-42.8	0.0001

Table 3: Annual returns of low P/E versus high P/E firms for May 1, 1985-April 30, 2010: interlisted firms

Variable	Panel A: Positive P/E firms					Panel B: Negative P/E firms				
	Above Median		Below Median		Median tests (p-values)	Above Median		Below Median		Median tests (p-values)
	Mean	Median	Mean	Median		Mean	Median	25%	75%	
Return	0.08	0.02	0.15	0.10	0.0001	0.06	-0.06	0.06	-0.01	0.0001
Liquidity	0.37	0.22	0.31	0.16	0.0001	0.48	0.28	0.49	0.28	0.0001
Market cap	834.3	202.1	681.9	110.9	0.0001	72.6	27.6	217.1	39.3	0.0001
P/E	46.0	26.7	9.9	10.3	0.0001	-3.3	-2.7	-84.7	-27.9	0.0001

Table 4: Annual returns of low P/E versus high P/E firms for May 1, 1985-April 30, 2010: non-interlisted firms

Variable	Panel A: Positive P/E firms					Panel B: Negative P/E firms				
	Above Median		Below Median		Median tests (p-values)	Above Median		Below Median		Median tests (p-values)
	Mean	Median	Mean	Median		Mean	Median	25%	75%	
Return	0.144	0.13	0.15	0.09	0.09	0.064	-0.04	0.10	-0.01	0.46
Liquidity	0.98	0.32	0.65	0.26	0.16	1.27	0.35	0.88	0.47	0.0001
Market cap	12218.9	6807.3	573.5	376.7	0.0001	1594.6	661.0	84.5	78.1	0.0001
P/E	30.5	18.5	37.7	20.3	0.12	-77.9	-26.2	-37.9	-10.6	0.0001

Table 5: Annual returns of small versus large cap firms for May 1, 1985-April 30, 2010: interlisted firms

In Table 4, Panel A, we see that non-interlisted firms with below median positive P/E values outperform those with above median P/E values (median return of 10% versus 2%). In Table 4, Panel B, however, we see that while there is a value premium when comparing median returns (below median negative P/E firms have a median return of -1% versus -6% for the above median P/E firms), there is no value premium in mean returns - both groups

of stocks have a mean return of 6%. This is unlike the case of positive P/E non-interlisted stocks where there is a value premium no matter how one measures it.

B. Small cap versus large cap firms: is there a size premium for negative P/E stocks?

This section shows that there is another difference between

Variable	Panel A: Positive P/E firms					Panel B: Negative P/E firms				
	Above Median		Below Median		Median tests (p-values)	Above Median		Below Median		Median tests (p-values)
	Mean	Median	Mean	Median		Mean	Median	25%	75%	
Return	0.08	0.04	0.14	0.07	0.004	-0.02	-0.07	0.08	0	0.0001
Liquidity	0.52	0.37	0.25	0.14	0.0001	0.61	0.41	0.41	0.22	0.0001
Market cap	1457.6	515.2	62.0	53.9	0.0001	351.6	103.0	14.0	12.1	0.0001
P/E	30.5	17.4	26.8	14.7	0.0001	-70.3	-16.4	-22.0	-5.3	0.0001

Table 6: Annual returns of small versus large cap firms for May 1, 1985-April 30, 2010: non-interlisted firms

Variable	Panel A: Positive P/E firms					Panel B: Negative P/E firms				
	Above Median		Below Median		Median tests (p-values)	Above Median		Below Median		Median tests (p-values)
	Mean	Median	Mean	Median		Mean	Median	25%	75%	
Return	0.16	0.10	0.14	0.10	0.78	0.07	-0.05	0.09	-0.01	0.04
Liquidity	1.47	0.89	0.08	0.06	0.0001	1.78	1.27	0.22	0.20	0.0001
Market cap	6199.4	2147.1	6576.5	1552.1	0.08	1221.9	333.7	641.6	173.1	0.0001
P/E	39.0	24.0	33.1	17.7	0.0001	-58.8	-14.1	-50.8	-14.8	0.94

Table 7: Annual returns of low liquidity versus high liquidity firms for May 1, 1985-April 30, 2010: interlisted firms

Variable	Panel A: Positive P/E firms					Panel B: Negative P/E firms				
	Above Median		Below Median		Median tests (p-values)	Above Median		Below Median		Median tests (p-values)
	Mean	Median	Mean	Median		Mean	Median	25%	75%	
Return	0.11	0.04	0.13	0.08	0.001	-0.01	-0.10	0.07	0.00	0.0001
Liquidity	0.6	0.44	0.07	0.06	0.0001	0.85	0.62	0.12	0.11	0.0001
Market cap	914.8	243.8	536.3	92.1	0.0001	212.4	62.0	170.6	28.3	0.0001
P/E	31.3	17.1	24.6	14.5	0.0001	-52.7	-9.3	-35.2	-9.0	0.52

Table 8: Annual returns of low liquidity versus high liquidity firms for May 1, 1985-April 30, 2010: non-interlisted firms

positive and negative P/E stocks in our sample of interlisted and non-interlisted companies that relates to the size premium.

In Table 5, Panel A, we see that, when comparing below and above median size firms, there is no size premium in the positive P/E interlisted firms (below median market cap firms have a return of 9% versus a return of 13% for the above median market

cap firms). But there is one for the negative P/E stocks, as shown in Panel B. Above median market cap firms with negative P/Es have a median return of -4% while the below median firms with negative P/Es have a median return of -1%. Although the difference is not statistically significant, it is in the right direction, as opposed to the case of positive P/E interlisted firms, where the direction is opposite (and statistically significant) from the

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Business Risk	Panel A: Positive P/E firms								Panel B: Negative P/E firms							
	Returns		P/E		Market cap (\$Mil)		Liquidity		Returns		P/E		Market cap (\$Mil)		Liquidity	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Low	0.09	0.08	39.50	18.70	7705.90	2520.60	0.53	0.15	0.14	0.08	-27.20	-10.90	1257.90	224.00	0.99	0.43
Medium	0.17	0.12	29.00	17.10	12560.30	2866.00	0.45	0.15	0.06	0.01	-54.90	-12.60	1235.20	277.20	0.83	0.45
High	0.14	0.08	40.20	23.20	3754.50	1121.10	1.07	0.44	0.09	-0.05	-55.40	-15.80	740.70	200.50	1.08	0.71
Median tests low versus high (p-values)	-	0.93	-	0.01	-	0.0001	-	0.01	-	0.02	-	0.03	-	0.17	-	0.009

Table 9: Annual returns of low versus high business risk firms for May 1, 1985-April 30, 2010: interlisted firms

Business Risk	Panel A: Positive P/E firms								Panel B: Negative P/E firms							
	Returns		P/E		Market cap (\$Mil)		Liquidity		Returns		P/E		Market cap (\$Mil)		Liquidity	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Low	0.12	0.09	22.60	14.60	1169.00	293.2	0.27	0.15	0.09	0.04	-34.80	-8.00	482.70	64.10	0.41	0.20
Medium	0.13	0.06	30.70	16.60	863.90	155.60	0.37	0.23	0.08	0.00	-65.30	-9.30	170.90	38.90	0.46	0.26
High	0.10	0.04	27.30	15.30	441.10	118.80	0.33	0.16	0.04	-0.06	-35.50	-9.30	112.50	33.60	0.52	0.31
Median tests low versus high (p-values)	-	0.0007	-	0.09	-	0.0001	-	0.11	-	0.0001	-	0.18	-	0.0001	-	0.0001

Table 10: Annual returns of low versus high business risk firms for May 1, 1985-April 30, 2010: non-interlisted firms

one documented in the literature [see, for example, Kothari et al. (1995)].

In Table 6, Panels A and B, we see that there are size premiums in both the positive and negative P/E non-interlisted firms with a stronger size premium for the latter firms. Above median market cap firms have a median return of 4% while the below median firms have a median return of 7% for the positive P/E firms, with the corresponding numbers being -7% and 0.0% for the negative P/E firms. We see that segregating interlisted from non-interlisted stocks brings to life important differences in the behavior of the size premium between positive and negative P/E firms.³

³ Kothari et al. (1995) find that smaller firms tend to perform unequivocally economically and statistically better than larger firms. But they did not segregate the positive from the negative P/E firms and the interlisted from the non-interlisted firms. Segregation allows us to zero in and find more finite differences between the various groups of stocks and avoid generalizations that may be unwarranted or not applicable in all cases.

C. Low liquidity versus high liquidity firms: is there a liquidity premium for negative P/E stocks?

This section highlights yet another difference between positive and negative P/E stocks in our sample of interlisted and non-interlisted companies that relates to the liquidity premium. In Table 7, Panel A, we see that, when comparing below and above median liquidity firms, there is no liquidity premium in the positive P/E interlisted firms. But there is one in for the negative P/E stocks as shown in Panel B. Above median liquidity firms with negative P/Es have a median return of -5% while the below median firms with negative P/Es have a median return of -1%.

In Table 8, Panels A and B, we see that there is a liquidity premium in both positive and negative P/E non-interlisted firms with a stronger liquidity premium for the latter non-interlisted P/E firms. Above median liquidity firms have a median return of 4% while the below median firms have a median return of 8% for the positive P/E firms, while the corresponding numbers are -10%

Independent variables	Panel A: Positive P/E firms		Panel B: Negative P/E firms	
	Pooled OLS	Fixed effects	Pooled OLS	Fixed effects
Intercept	0.14 (4.20) ^a	-0.44 (7.31) ^a	0.11 (2.08) ^b	-0.21 (1.67)
EBIT margin	0.29 (2.21) ^b	0.35 (3.04) ^a	0.04 (0.60)	0.01 (0.16)
Cash	-0.33 (2.51) ^b	-0.23 (1.98) ^b	-0.16 (0.92)	-0.26 (1.50)
Liquidity	0.03 (2.23) ^b	-0.01 (0.99)	-0.01 (0.61)	-0.009 (0.43)
Market cap	-0.000003 (1.97) ^b	-0.000001 (0.94)	-0.000002 (0.97)	-0.000001 (1.12)
Adjusted R ²	2%	34%	1%	22%

Table 11: Estimation results for regressing forward stock returns for positive and negative P/E interlisted firms against a number of dependent variables from company financials

The t-statistic is reported below each coefficient estimate in parentheses. a and b indicates significance at the 1% and 5% levels

Independent variables	Panel A: Positive P/E firms		Panel B: Negative P/E firms	
	Pooled OLS	Fixed effects	Pooled OLS	Fixed effects
Intercept	0.13 (8.23) ^a	-0.30 (10.30) ^a	0.04 (1.39)	-0.43 (8.58) ^a
EBIT margin	0.087 (1.58)	0.058 (1.17)	-0.005 (0.60)	-0.004 (2.04) ^b
PE	-0.0005 (2.41) ^b	-0.0003 (1.68)	-0.0002 (1.20)	-0.0003 (1.87)
Liquidity	-0.027 (1.99) ^b	-0.04 (2.81) ^a	-0.09 (3.08) ^a	-0.08 (2.99) ^a
Market cap	-0.000006 (1.57)	-0.000004 (1.03)	-0.000005 (1.60)	-0.000003 (1.19)
Turnover	-0.008 (3.26) ^a	-0.002 (1.66)	0.045 (1.87)	0.05 (2.26) ^b
Adjusted R ²	1%	23%	2%	22%

Table 12: Estimation results for regressing forward stock returns for positive and negative P/E non-interlisted firms against a number of dependent variables from company financials

The t-statistic is reported below each coefficient estimate in parentheses. a and b indicates significance at the 1% and 5% levels

and 0.0% for the negative P/E ratio firms. This is another proof of the need to segregate interlisted from non-interlisted stocks as important differences in the behavior of the liquidity premium between positive and negative P/E firms are discovered.⁴

D. Low business risk versus high business risk firms: is there a risk premium for negative P/E stocks?

⁴ Baker and Stein (2004) and Fang, et al. (2008), among others, find that less liquid firms tend to perform better than more liquid firms. But again they did not segregate the positive from the negative P/E firms and the interlisted from the non-interlisted firms. This further exemplifies the importance of segregating negative from positive multiple firms and interlisted from non-interlisted firms in related research as inclusion would undermine the clarity and generality of findings and dilute the significance of empirical evidence.

In Tables 9 and 10, we observe more differences between positive and negative P/E stocks in our sample of interlisted and non-interlisted companies that relate to the business risk premium. In Table 9, Panel A, we see that the high business risk stocks have the same median return as the low business risk group for the positive P/E interlisted firms. For the negative P/E stocks, as shown in Panel B, the high business risk group has clearly lower median return than the low business risk group. For example, the median return for the high business risk negative P/E group is -5%, while that for the low business risk negative P/E group is 8%.

In Table 10, Panels A and B, we see that the high business risk non-interlisted stocks have lower median return than the low

business risk group for both the positive and negative P/E non-interlisted firms. For the negative P/E stocks, as shown in Panel B, the median return for the high business risk group is -6%, while that for the low business risk group is 4%. For the positive P/E firms shown in Panel A, the corresponding numbers are 4% and 9%. Here too, we see that there are differences in the behavior of positive and negative P/E firms when it comes to the business risk premium.

3.1.3 Regression analysis

In this section, we further examine differences between positive and negative P/E firms in our sample of interlisted and non-interlisted stocks looking, more formally, at the relationship between forward stock returns and historical firm fundamentals and market metrics by estimating the following regressions:

Interlisted

$$R_{i,t} = a_0 + a_1 * CASH_{i,t-1} + a_2 * EBITMARGIN_{i,t-1} + a_3 * MARKETCAP_{i,t-1} + a_5 * LIQUIDITY_{i,t-1} + e_{i,t} \quad (1)$$



Non-interlisted

$$R_{i,t} = a_0 + a_1 * PE_{i,t-1} + a_2 * EBITMARGIN_{i,t-1} + a_3 * MARKETCAP_{i,t-1} + a_4 * LIQUIDITY_{i,t-1} + a_5 * TURNOVER_{i,t-1} + e_{i,t} \quad (2)$$

where the dependent variable, $R_{i,t}$, is the annual return for firm i at time t . The independent variables include the stock liquidity (LIQUIDITY), firm size (MARKET CAP), EBIT/Sales (EBIT MARGIN), cash plus marketable securities to assets (CASH), P/E ratio (PE) and revenues/assets (TURNOVER). All independent variables are as at time $t-1$.

Diagnostic tests showed no evidence of multicollinearity in regressions (1) and (2).⁵

Tables 11 and 12 report, respectively, estimates of the coefficients of models (1) and (2) using two estimation techniques and annual data from May 1, 1985 through April 30, 2010. The first column reports estimates of the model using pooled ordinary least squares (OLS). The second column reports estimates of a "fixed effects" model.⁶

A. Explaining returns

The coefficient estimates of model (1) for positive and negative P/E interlisted firms are reported respectively in Table 11, Panels A and B. Panels A and B show that while most of the variables are significant for the positive P/E firms, none of the fundamental variables are significant for the negative P/E firms, irrespective of the estimation procedure. This seems to indicate that the negative P/E firms move to their own tune and behave in a way different than that of the positive P/E firms.

The coefficient estimates of model (2) for positive and negative P/E non-interlisted firms are reported respectively in Table 12, Panels A and B. Panels A and B show that while liquidity is significant for the positive and negative P/E firms, the PE ratio is significant only in the positive P/E firms. Typically the P/E ratio is negatively related to forward returns, but here this is only the case for positive P/E firms. Moreover, while the P/E ratio is significant for the positive P/E non-interlisted firms, it is not significant at all for the positive P/E interlisted firms. Finally, EBIT margin and turnover have diagrammatically opposite signs for positive and negative P/E firms. The above findings seem to provide further evidence that negative P/E firms behave differently than positive P/E firms and that interlisted stocks behave differently than non-interlisted stocks.

4. Conclusions

Using separately interlisted and non-interlisted Canadian stock market data for the period 1985-2010, the main purpose of this paper was to examine whether negative P/E stocks were really different than positive P/E firms, and whether negative P/E stocks outperformed, on average, the universe of positive P/E stocks.

The paper additionally purported to examine (a) whether interlisted and non-interlisted firms behaved similarly or there were distinct differences between them and (b) whether there were differences in relation to this paper's key questions only in one group of stocks or differences were equally driven by both.

We found that firms with negative multiples are indeed different from firms with positive multiples 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 result in a large difference between mean and median returns and (b) the value, size, liquidity and business risk premiums behave

⁵ We employed the VIF option in the REG SAS procedures to carry out diagnostic tests.

⁶ To estimate a fixed effects model, year and industry dummies were added to regressions (1) and (2).

differently for negative and positive P/E firms. This indicates that prior academic research was right in excluding negative multiple firms from their analysis. Moreover, the paper also shows that there are key differences between interlisted and non-interlisted firms both in the positive and negative P/E space. As a result, not only must negative P/E firms be segregated from positive multiple firms, but also interlisted firms ought to be segregated from non-interlisted firms in related research as aggregation would undermine the clarity and generality of findings, affect the homogeneity of the sample and dilute findings and tests of significance.

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