EQUITY MARKET TIMING AND SUBSEQUENT DELISTING LIKELIHOOD

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ABSTRACT

Timing the market for equity is an accepted practice by managers who in theory have the best interests of current shareholders in mind. It is clear that by using their superior information, managers can indeed successfully issue overvalued equity to the new shareholders. Recent research has determined that some firms do well after a market timed issue, while others underperform. The post-issue performance is linked to the investment opportunity set of the issuing firms as well as their choice of investments. In general, firms without good investment options will perform poorly. We extend this line of research by studying the post-issue delisting pattern of market timing firms and the two subsets. Specifically, we research whether firms that mistakenly time the market for equity are more likely to compromise their future and get delisted (through acquisitions, bankruptcies etc.) in the immediate future than those firms that have a use for the funds. Using logistic regression models, we show that firms that are market timing firms and that lack good investment opportunities are indeed more likely to get delisted; strengthening the growing argument that equity market timing does not always result in shareholder benefit.

JEL: G14, G32

KEYWORDS: equity market timing, delisting likelihood

INTRODUCTION

Seasoned equity offerings (SEOs) have been events of considerable interest in terms of financial research. The announcement period impacts of SEO as well as the long-run impact on the issuing firm's stock price have been studied. In general most researchers have observed a significantly negative announcement effect as well as significant long run underperformance for issuing firms.

Baker and Wurgler (2002) summarize the research conclusions documenting post-issue underperformance and offer the under-performance as evidence that managers are able to time the market for equity. The reasoning being, that by timing the market, these managers are presumed to be taking advantage of the new, entering shareholders and adding benefit to the current shareholders at the new shareholders' expense.

In the more recent past, however, there has been new research that challenges the statement made by Baker and Wurgler (2002) and these research papers make one crucial change to the way we view SEO research. In previous studies SEO issuing firms were typically studied as one sample. Hertzel and Li (2009), and D'Souza and Rao (2009) move away from that model and divide SEO firms into two subsets based on their ability to productively use the funds raised. Both papers make the startling find that not all SEO issuing firms underperform, just the ones that are not in the best position to use additional funds.

We further this new research by providing additional evidence on the SEO issuing firms. Most studies with regard to SEOs have spanned 3-5 years and have focused on performance. We felt that it was important to research the long term impact that equity market timing has on the survival of these firms. We thus use the methodology of D'Souza and Rao (2009) to create the two subsets of issuing firms. Using a time horizon of eight years, we provide evidence that besides simply underperforming, managers

of firms that issue additional stock (without having a viable use for it) compromise the very existence of their firms. We find that firms in the "overvalued" subset are significantly more likely to get delisted within eight years than their "growth" counterparts. Our results provide additional support for the argument that simply issuing additional equity does not result in benefit for the current shareholders.

LITERATURE

Equity market timing is also an area that has been studied extensively and there is strong support for the premise that managers are able to use their superior information to take advantage of new shareholders by issuing overvalued stock. The window of time that managers find themselves faced with this decision to issue relatively higher priced stock is called a window of opportunity. This phrase *window of opportunity* is used by Bayless and Chaplinsky (1996) to indicate a period where the information costs are reduced for all firms – typically during hot markets (high volume of equity issues).

SEOs have typically been accompanied by an announcement period drop in the stock price. Asquith and Mullins (1986), Mikkelson and Partch (1986), Bhagat and Hess(1986) and Eckbo and Masulis (1992) find a significant, average two-day announcement period return of between -3.0% and -3.6%. Long run studies by Ritter (1991) Loughran and Ritter (1995), Spiess and Affleck-Graves (1995), Brav and Gompers (1997) find evidence of post issue long-run (3-5 years) underperformance; the post-issue underperformance is generally viewed as a success for managers of market timing firms and as a benefit for the old shareholders. Fama (1998), the one of the few researchers who challenged the findings in this area, did so by questioning the validity of the research methodology. Fama (1998) offered that seasoned equity offerings (SEOs) may appear to perform poorly only because they are not evaluated against the correct benchmark. However, Jegadeesh (2000) addresses Fama's criticism by considering various benchmarks. Jegadeesh's findings indicate that the SEO firms underperform all of them. Thus, he concludes that the observed underperformance is indeed related to market over-optimism about their future prospects.

Eckbo, Masulis and Norli (2000) proposed a risk-based explanation. They offer an explanation that issuing equity would result in a lower default risk and lower liquidity risk. A lower post-issue return would thus be expected. They claimed that the underperformance observed in matched-firm studies results from a failure of the methodology of the matched-firm technique to provide a proper control for risk. They showed that once appropriate control is applied, post-SEO underperformance is insignificant. However, Jegadeesh (2000) refuted their claim by showing that Eckbo, Masulis and Norli (2000) include IPOs in their benchmark, causing the level of underperformance to be significantly understated. In the recent past, this body of research is once again being reexamined in order to understand why post- issue underperformance occurs. Carlson, Fisher and Gimmarino (2006) offer a real-investment explanation of post-issue underperformance. They theorize that when firms with growth opportunities (options), finance and exercise those options (by investing in the opportunities), it causes a decline in returns. The reason for this being that the new assets (assets in place) are less risky than the growth options that they replace. This view is supported by Li, Livdan, and Zhang (2008).

The most recent papers however, take a different approach to studying the long run underperformance by SEO issuing firms. Unlike earlier research that examines all issuers as one set, these studies create subsets based on investment opportunities. Hertzel and Li (2009) use the method of Rhodes-Kropf, Robinson, and Vishwanathan (2005) to decompose the market-to-book value ratio (MB) into growth and misvaluation components. They use this to create their subsets. They find that firms with better growth opportunities invest more in capital expenditures and R&D than firms with greater mispricing. However, the firms that invest more heavily do not underperform, while the firms that invest less do significantly underperform. D'Souza and Rao (2009) also find that all issuing firms do not underperform. They use a behavioral methodology to segregate firms into *window of opportunity* and *window of temptation* subsets. They go

on to show that the *windows of temptation firms (ones without good investment opportunities) are* the ones that underperform and cause the overall sample of issuers to significantly underperform. The *window of opportunity firms* do not underperform.

In this paper, we extend the current body of research. The current literature focuses on the post-issue performance by either studying the return or the earnings of issuing firms. We ask a related, but different question - Does the act of equity market timing compromise the future of firms that mistakenly issue equity (without having a use for the funds)? We follow the methodology of D'Souza and Rao (2009) to obtain our sample set and the subsets of Growth firms (firms with investment options to use the new capital) and Overvalued firms (firms that issue equity without having a use for the funds). The rest of the paper is organized as follows: the hypothesis development is discussed in the next section, followed by the data and methodology section. The next section comprises of the empirical results and our conclusions are presented in the last section.

Hypotheses

There is increasing evidence showing that all firms do not underperform post-SEO and as such it casts serious doubt on the assertion that post-issue underperformance is good for the issuing firms. If a firm's managers put the firm's future in jeopardy by unnecessarily taking on additional equity capital, then we would expect that to manifest itself at the most basic level; the continued survival of the firm.

Palepu (1985) uses a logit model to test the likelihood of a firm being a takeover target. He tested six hypotheses that are frequently suggested in the academic and/or popular finance literature regarding firms that are likely to become acquisition targets. The two hypotheses that he found supported were: 1) The inefficient management hypothesis and 2) The growth-resource mismatch hypothesis.

Both the above are linked when it comes to equity market timing. If the firm's managers are inefficient in evaluating the need for additional capital and take on additional capital without having a use for those funds, it would lead to a growth-resource mismatch. The firm would have no avenues to use the new funds and would end up hoarding the funds. This would in turn make the firm an attractive takeover target since it is now cash (resource) rich. If on the other hand, the firm's managers decide to use the funds anyway, they would end up wasting the funds and leave the firm in a weakened state, making it increasingly likely that the firm might face bankruptcy or other financial problems that would cause it to be delisted.

We hypothesize that from the set of equity market timing firms, the firms without viable investment opportunities (Overvalued firms) are more likely to get delisted in the near future (we study the firms for eight years post-issue) than firms that had a viable use for the funds (Growth firms).

DATA AND METHODOLOGY

The data for the market-to-book value ratio (MB) is obtained from the Compustat database. Market equity is defined as common shares outstanding (item 25) times price (item 199). Book equity is defined as total assets less total liabilities (item 181) less preferred stock (item 10) plus deferred taxes (item 35) plus convertible debt (item 79). When preferred stock is missing, it is replaced with the redemption value of preferred stock (item 56). MB is computed as the end of quarter MB_{t-1} where t = the quarter of the equity issue announcement. To select the sample of firms for this study, we use the method of D'Souza and Rao (2009), as detailed below.

We start with all firms that undertake a seasoned equity issue between the years 1981 and 2000. From these, financial firms and regulated utilities are dropped from the sample. If a firm has more than one

SEO within a five year span, the second issue is not included. To ensure that these firms are truly equity market timing firms, only those with a debt-to-equity ratio below their industry median, as well as a market-to-book ratio above their industry median are retained. We now have the overall sample of firms and they are further broken down into the two subsets (growth & overvalued) using information on the direction of insider trades. For the firms where insiders were net buyers (or had a low level of net sales), the firm is considered a growth firm (with viable investment opportunities). For the firms where insiders had a higher level of net sales, the firm is considered an overvalued firm (with no viable investment opportunities). The firms are studied for a period of eight years post-SEO.

The delisting data for this study is obtained from the CRSP database. We use three classifications for delisting. The first of these is "Acquisitions / Mergers" (CRSP delisting codes 200 – 300). The second classification is "Liquidations" (delisting codes 400 – 490) and the last classification is "Dropped from Exchange" (delisting codes 500 – 591). The reasons for dropped from exchange include, but are not limited to: insufficient number of shareholders, bankruptcy, declared insolvent, delinquent in filing, price fell to below acceptable level, etc.

To test the hypothesis, the following logit model is used (a probit model is also used for robustness). We use it to ascertain if there is a significant difference in the likelihood of one of the two subsets of firms (Growth firms vs. Overvalued firms) getting delisted by either being acquired, going out of business, or being dropped from an exchange due to subsequent problems.

$$Delisting = \beta_0 + \beta_1(Firm\ Type_{t-1}) + \beta_2(Debt_{t-1}) + \beta_3\ (Proceeds_{t-1})$$
$$+ \beta_4\ (M/B_{t-1}) + \beta_5\ (Size_{t-1}) + \beta_6\ (ROA_{t-1}) + \beta_7\ (Cash_{t-1}) + \beta_8(Z\ Score_{t-1}) \qquad (1)$$

In the above equation, *Delisting* is a binary variable that takes on the value 1 if the firm is delisted within eight years of the market timed SEO, 0 if the firm is still a going concern. *Firm type* is also a binary variable that takes on the value 1, if the firm is a Growth firm and 0 if the firm is an Overvalued firm. *Debt* constitutes the long term debt of the firm and it is scaled by the value of the firms' total assets. The *Proceeds* variable represents the dollar value of capital raised through the market-timed SEO. This variable is also scaled by total assets. *M/B* is the firms market-to-book ratio prior to the market timed SEO. Higher levels of MB would indicate either overvaluation or strong growth opportunities. *Size* (of the firm) is given by the natural log of the market capitalization of the firm prior to the market timed SEO. *ROA* is the return on assets ratio prior to the market timed SEO and is included to control for the prior performance of the sample firms. *Cash* is represented by the cash & marketable securities holding of the firm prior to the SEO. The last control variable is the *Z- Score*. This variable is computed based on the methodology of Altman, 1968 and is used to control for the bankruptcy risk of the sample firms. A Z-Score value of less than 1.81 indicates a high probability of bankruptcy while a value greater than 2.99 indicates a low probability of bankruptcy.

EMPIRICAL RESULTS

We begin by reviewing the full sample of market timing firms and the two subsets. From Table 1, we observe that although on average the firms are small cap firms, the overvalued firm's subset is comprised of slightly smaller firms than the growth firm's subset. The MB ratio is also, on average, higher for the overvalued firms than the growth firms. The two other observations that we highlight are the Z score and the ratio of Proceeds/Total Assets. The overvalued firms, pre-issue, have a higher Z score than the growth firms, which would indicate a lower default/bankruptcy risk. The overvalued firms also issue a greater proportion of new equity in relation to their current level of total assets than the growth firms. At first glance, this supports our hypothesis, since these firms mistakenly believe that issuing overvalued equity without a use for the funds is good for the shareholders. Thus, we would expect these firms to issue as much equity as they can.

Table 1 and 2 present the univariate statistics and the covariance matrix for the full sample of 448 market timing firms, and the two subsets. We observe that on average, these firms are micro-cap firms with an average market capitalization of 155.4 (ln 5.046) million. The growth firms are on average slightly larger than the overvalued firms. The overvalued subset has a slightly higher market-to-book ratio, on average. It is also interesting to note that the overvalued firms raised more capital as a percentage of total assets than the growth firms did. This could indicate that the managers of these firms were simply looking to issue as much new stock as they could. From the covariance matrix we see that for the two subsets, there is a strong positive correlation between the cash on hand, the creditworthiness of a firm (Z score) and the amount of new capital raised. We also see a strong positive correlation between the market-to-book ratio for overvalued firms and the amount of new capital raised, indicating that that these firms capitalized on the *window of opportunity* to raise new funds.

Table 1: Univariate Statistics of the Full Sample and Subsets

Variable	N	Mean	Std. Dev	Sum	Minimum	Maximum
Panel A: Full Sample of Equity Market Timing Firms						
Debt/TA	448	0.004	0.008	1.586	0.000	0.061
Proceeds/TA	448	0.767	0.908	343.798	0.004	10.268
MB ratio	448	10.639	15.007	4809.000	0.670	76.450
Ln Size	448	5.046	1.589	2281.000	1.151	11.216
ROA	448	0.095	0.228	42.270	-1.162	0.554
Cash/TA	448	0.007	0.014	3.085	0.000	0.119
Z-Score	448	5.855	6.458	2647.000	0.070	25.280
Panel B: Growth Firms Subset						
Debt/TA	225	0.004	0.007	0.785	0.000	0.053
Proceeds/TA	225	0.670	0.824	150.759	0.004	4.963
MB ratio	225	9.365	13.631	2145.000	0.670	72.310
Ln Size	225	5.251	1.791	1202.000	1.151	11.216
ROA	225	0.096	0.239	21.577	-1.162	0.554
Cash/TA	225	0.006	0.014	1.257	0.000	0.119
Z-Score	225	5.150	5.934	1179.000	0.070	24.380
Panel C: Overvalued Firms Subset						
Debt/TA	223	0.004	0.008	0.802	0.000	0.061
Proceeds/TA	223	0.866	0.978	193.039	0.005	10.268
MB Ratio	223	11.948	16.226	2664.000	0.770	76.450
Ln Size	223	4.836	1.323	1079.000	1.577	9.269
ROA	223	0.093	0.217	20.693	-0.875	0.432
Cash/TA	223	0.008	0.013	1.828	0.000	0.094
Z-Score	223	6.579	6.893	1467.000	0.074	25.280

This table shows the univariate statistics of the full sample and subsets.

To evaluate the post-issue performance, we first look at the data in Figures 1 and 2. Figure 1 graphs the number of delistings by year. Our sample consists of 448 firms with 223 firms in the Overvalued subset and 225 in the Growth subset. From Figure 1, we note that the over the eight years, post-issue, more Overvalued firms are delisted than Growth firms. The two subsets display very little difference over the first three years, but from year 4 onwards more of the Overvalued firms face problems than Growth firms.

Table 2: Covariance Matrix for the Full Sample and the 2 Subsets

Panel A:	Full Sample = 448 Firms						
	Debt	**Size**	**Proceeds**	**MB**	**ROA**	**Cash**	**Z Score**
Debt	1						
Size	-0.1365	1					
Proceeds	-0.1973	-0.0204	1				
MB	-0.0487	0.1971	0.5161	1			
ROA	0.037	0.0377	-0.4167	-0.0091	1		
Cash	-0.1465	-0.2751	0.3744	0.032	-0.5493	1	
Z Score	-0.154	0.2478	0.5977	0.8005	-0.1245	0.0435	1

Panel B:	Overvalued Firms Subset = 223 Firms						
	Debt	**Size**	**Proceeds**	**MB**	**ROA**	**Cash**	**Z Score**
Debt	1						
Size	-0.2057	1					
Proceeds	-0.1207	0.1243	1				
MB	-0.0628	0.2694	0.6973	1			
ROA	0	-0.0586	-0.386	-0.0735	1		
Cash	-0.1093	-0.2667	0.3257	0.0468	-0.5467	1	
Z Score	-0.1492	0.3432	0.6878	0.9298	-0.0965	0.0317	1

Panel C:	Growth Firms Subset = 225 Firms						
	Debt	**Size**	**Proceeds**	**MB**	**ROA**	**Cash**	**Z Score**
Debt	1						
Size	-0.1166	1					
Proceeds	-0.2653	-0.1236	1				
MB	-0.0436	0.1373	0.1981	1			
ROA	0.0695	0.1026	-0.4615	0.0888	1		
Cash	-0.1627	-0.2709	0.4201	0.0216	-0.5561	1	
Z Score	-0.2383	0.2795	0.5066	0.2532	-0.3034	0.0808	1

This table shows the covariance matrix for the full sample and the 2 subsets

The graph on Figure 2 takes into account the percentage of firms that end up getting delisted and we again see the clean break from the fourth year onwards. It seems that from these graphs that it take about 3 years for the mistake (of raising additional capital without having a use for it) to catch up with the overvalued firms.

Figure 1: Number of Firm Delisting by Year
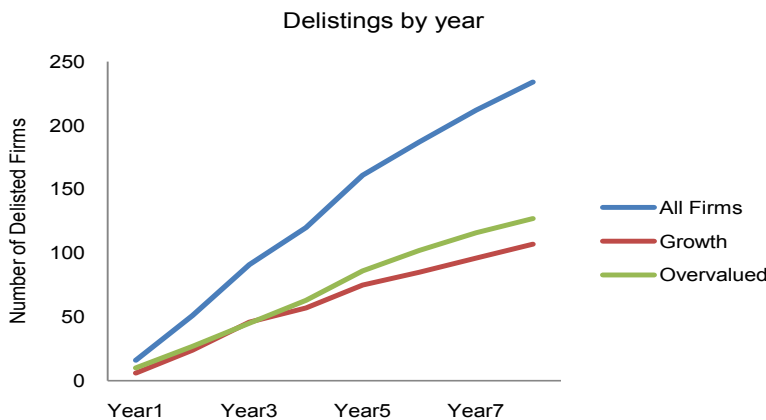
This table shows the number of firm delisted by year.

Figure 2: The Percentage of Firms Delisted by Year
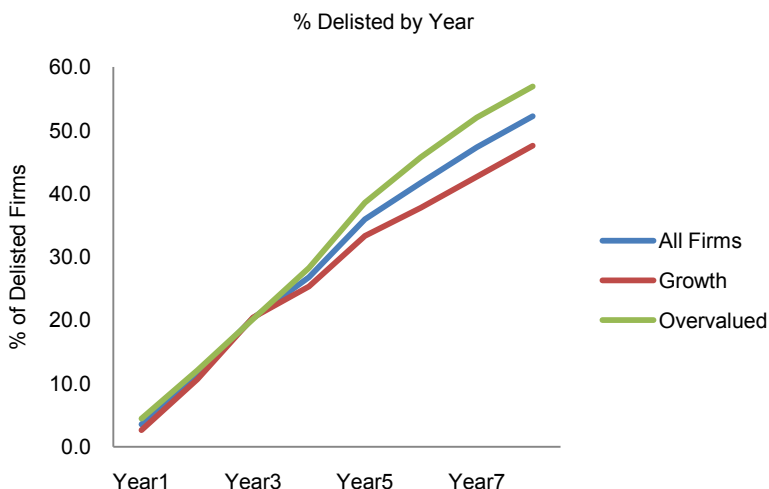
This figure shows the percentage of firms delisted by year.

Table 3 presents the comparisons of delistings by number and percentage and these are graphed in Figures 1 and 2. We formally test our hypothesis by using a logistic regression as detailed previously. The results of the logistic regression are presented in Table 4. We check to see if there is a significantly higher likelihood of the Overvalued firms failing (post-SEO) than the Growth firms. The probability modeled is that delisting = 1. From the results in Table 4, we see that sign on the coefficient for Growth firms is negative and significant (at the 5% level) indicating that Growth firms are significantly less likely to get delisted post-SEO than the Overvalued firms which are significantly more likely to get delisted; thereby confirming our hypothesis. Another interesting observation is the fact that the variable for the size of the new equity offering (Proceeds/TA) is also significantly positive. This indicates that managers of firms which take on more capital than they possibly need also put their firms' future at risk.

Table 3: Comparisons of Delistings by Number and Percentage

Panel A: Comparison of Delistings by Year - Number of Firms Delisted

Delisted in	Year1	Year2	Year3	Year4	Year5	Year6	Year7	Year8
All Firms	16	51	91	120	161	187	212	234
Growth	6	24	46	57	75	85	96	107
Overvalued	10	27	45	63	86	102	116	127

Panel B: Comparison of Delistings by Year - % of Firms Delisted

Delisted in	Year1	Year2	Year3	Year4	Year5	Year6	Year7	Year8
All Firms	3.6	11.4	20.3	26.8	35.9	41.7	47.3	52.2
Growth	2.7	10.7	20.4	25.3	33.3	37.8	42.7	47.6
Overvalued	4.5	12.1	20.2	28.3	38.6	45.7	52.0	57.0

This table shows the comparisons of delistings by number and percentage of firms.

Table 4: Logistic Regression Results

Parameter	Estimate		Std. Error	Wald	P-Value
Growth Firms	-0.409	**	0.198	4.261	0.039
Debt/TA	19.868		16.507	1.449	0.229
Proceeds/TA	0.319	*	0.174	3.341	0.068
MB	0.008		0.020	0.164	0.686
LnSize	-0.002		0.076	0.001	0.980
ROA	-1.256	**	0.579	4.701	0.030
Cash/TA	-10.810		9.601	1.268	0.260
Z-Score	-0.019		0.034	0.325	0.568
Intercept	0.250		0.463	0.290	0.590
N	445				
Pseudo R-Square	0.0609				
Likelihood Ratio	20.7892	***			

This table presents the results of the logistic regression. The binary dependent variable is the delisting event. It takes on the value of 1 if delisted and 0 otherwise. The probability modeled is Delisting = 1. The exogenous variables are listed below. The "Growth Firms" variable is a binary variable which takes on value of 1 if the firm is a growth firm and 0 if it is a no growth / overvalued firm.*** Indicates statistical significance at the 0.01 level, ** Indicates statistical significance at the 0.05 level.

Table 5: Comparison of Firm Delistings by Size Quartiles

Quartile 1	Firms	Year 1 Num (%)	Year 2 Num (%)	Year 3 Num (%)	Year 4 Num (%)	Year 5 Num (%)	Year 6 Num (%)	Year 7 Num (%)	Year 8 Num (%)
Overall	112	3 (2.7%)	10 (8.9%)	25 (22.3%)	31 (27.7%)	40 (35.7%)	50 (44.6%)	53 (47.3%)	55 (49.1%)
Growth	72	2 (2.8%)	7 (9.7%)	16 (22.2%)	19 (26.4%)	24 (33.3%)	30 (41.7%)	31 (43.1%)	33 (45.8%)
Overvalued	40	1 (2.5%)	3 (7.5%)	9 (22.5%)	12 (30.0%)	16 (40.0%)	20 (50.0%)	22 (55.0%)	22 (55.0%)
Quartile 2									
Overall	112	4 (3.6%)	13 (11.6%)	23 (20.5%)	31 (27.7%)	40 (35.7%)	47 (42.0%)	52 (46.4%)	59 (52.7%)
Growth	54	1 (1.9%)	6 (11.1%)	12 (22.2%)	16 (29.6%)	20 (37.0%)	21 (38.9%)	23 (42.6%)	27 (50.0%)
Overvalued	58	3 (5.2%)	7 (12.1%)	11 (19.0%)	15 (25.9%)	20 (34.5%)	26 (44.8%)	29 (50.0%)	32 (55.2%)
Quartile 3									
Overall	112	4 (3.6%)	16 (14.3%)	24 (21.4%)	31 (27.7%)	42 (37.5%)	48 (42.9%)	56 (50.0%)	61 (54.5%)
Growth	39	1 (2.6%)	6 (15.4%)	10 (25.6%)	12 (30.8%)	13 (33.3%)	14 (35.9%)	16 (41.0%)	17 (43.6%)
Overvalued	73	3 (4.1%)	10 (13.7%)	14 (19.2%)	19 (26.0%)	29 (39.7%)	34 (46.6%)	40 (54.8%)	44 (60.3%)
Quartile 4									
Overall	112	5 (4.5%)	12 (10.7%)	19 (17.0%)	27 (24.1%)	39 (34.8%)	42 (37.5%)	51 (45.5%)	59 (52.7%)
Growth	60	2 (3.3%)	5 (8.3%)	8 (13.3%)	10 (16.7%)	18 (30.0%)	20 (33.3%)	26 (43.3%)	30 (50.0%)
Overvalued	52	3 (5.8%)	7 (13.5%)	11 (21.2%)	17 (32.7%)	21 (40.4%)	22 (42.3%)	25 (48.1%)	29 (55.8%)

Table 5 is a robustness check to ensure that the results observed using the logistic regression is not a size effect. Small firms are considered more susceptible to financial problems than larger firms and as such larger firms in general are more stable. In the table below, we first separate the overall sample into four size quartiles and then study these as the overall sample and the two (growth / overvalued subsets). We focus on the percentage of firms delisted for each category/subcategory. What we observe is that for equity market timing firms, the size of the firm is not really much of a factor. No discernable pattern can be drawn from the (overall) delisting percentages for the four size quartiles. In terms of the growth and overvalued firm subsets, our results are robust – no matter what the size quartile, the overvalued subset has a higher percentage of delisted firms than the growth subset.

CONCLUSION

In prior research on equity market timing, managers have received credit for the observed underperformance post-SEO. More recently, however, researchers have created subsets of the overall sample of equity market timing firms and found that not all firms underperform. The goal of our paper is to extend this line of research to explore the impact of equity market timing on the long term survival of these firms. If equity market timing is not always good, we should be able to observe that in the post-issue survival of the firm. We use the methodology of D'Souza and Rao to populate our sample of equity market timers and our growth / overvalued subsets. We study the delisting pattern of the sample and subsets over eight years and use a logistic regression methodology to determine if one subset is more likely to get delisted over this period than the other.

Our results show that the overvalued firms are more likely to get delisted post-SEO than the growth firms, the ones with viable investment opportunities. Firms that take on a higher proportion of capital (in relation to total assets) are also more likely to get delisted. This further confirms that not all equity market timing is good for the current shareholders. This research adds on to the new body of literature which shows that post-issue underperformance is not a phenomenon that affects all firms that issue stock through a market-timed SEO, just the ones that do not have a viable use for the funds. Our results further those results and show that not only do the Overvalued firms underperform post-SEO, but that the managers of the Overvalued firms also jeopardize the future of their firms by making them more susceptible to a takeover and/or financial problems. The findings in this paper can be used to further the literature on mergers and acquisitions in general and on takeover targets in particular.

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