

VENTURE CAPITAL VALUATION DRIVERS AND INSIGHT INTO ENSUING  
PERFORMANCE

by

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PERFORMANCE

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## ABSTRACT

An Initial Public Offering is the first time that companies offer individual shares to the general public. As such, there is much discussion as to the performance of IPO's, and ways to effectively value companies set to go public. Due to the complex, unique, and cloudy information available on privately held companies, effective valuation of said private company is extremely difficult. Therefore, initial returns from companies going public are often very volatile. However, while the initial performance of IPO's has been well studied, there have been less studies dealing with longer-term performance, and the causes of such performance. This study examines four selected factors inherent to companies at time of an Initial Public Offering, and seeks to find significant relationships between said factors and abnormal performance. The findings show no significant relationships between the selected factors, and abnormal total return performance. However, there was some significance found between a few of the selected factors and abnormal operating performance.

TABLE OF CONTENTS

<b>INTRODUCTION</b> .....	<b>1</b>
<b>REVIEW OF LITERATURE</b> .....	<b>4</b>
<b>Background Complications Inherent To Company Valuation</b> .....	<b>4</b>
<b>Staging</b> .....	<b>6</b>
<b>Components Of A Stock Price</b> .....	<b>7</b>
<b>Company Valuation Methodologies</b> .....	<b>8</b>
<b>The IPO</b> .....	<b>13</b>
<b>Track Records</b> .....	<b>16</b>
<b>METHODOLOGY</b> .....	<b>17</b>
<b>RESULTS</b> .....	<b>19</b>
<b>DISCUSSION &amp; IMPLICATION</b> .....	<b>22</b>
<b>CONCLUSION</b> .....	<b>25</b>
<b>REFERENCES</b> .....	<b>27</b>

## INTRODUCTION

As of October 2015, there were 124 privately held companies valued in excess of \$1 billion dollars with venture capital funding. The growth rate of new so-called “unicorns” has increased from approximately four a year from 2003-2013, to approximately eight a year since 2013 (Lee, 2015). The company lifecycle consists of: startup, growth, maturation, decline, and rebirth or closure. Along the way, there are multiple opportunities for companies to raise capital, seek valuations, and return wealth to shareholders. In the startup phase, where the majority if not all companies are private, entrepreneurs face obstacles in obtaining funding.

In order to connect with investors, entrepreneurs may choose to use venture capital firms. Venture capital firms serve to screen prospective startup companies, and invest in companies that they believe have high probabilities of success. In addition to seeking venture capital, entrepreneurs may face a merger or acquisition situation with another, more established company.

As a company matures and wishes to expand its investors to the general public, it may participate in an initial public offering of shares, in which all investors and institutions have the opportunity to buy stakes in the company. The initial public offering (IPO) is broadly considered by academics the ideal outcome for most companies in terms of credibility, transparency, and liquidity. There is much media attention and analyst scrutiny surrounding these IPO's. Oftentimes, IPO's are heralded as an opportunity for outsized returns. However, factors driving IPO outperformance have historically remained opaque.

There is a great deal of research surrounding the long term performance of new companies. In order to obtain timely, relevant, and comparable data, most of this long performance starts with the date of the IPO. Prior to going public, there is a lack of research that would be relevant, due to absence of reporting regulation that comes with publicly traded companies. A company's stock price, and ultimately performance, is a function of valuation. As such, there has been ample research in the world of company valuation. Research has shown that there are four main methods for valuing companies (Fernandez, 2014). All of these methods are predicated on the notion that there are historical financial statements to analyze. Given this, valuation in the private markets is much more blurry. It has also been shown that as companies mature, the relevance of financial statements in the valuation process increase (Hand 2015). Since private companies differ from public companies in terms of regulation, they do not require regular SEC filings to be made to the general investing public. This naturally complicates matters for analysts wishing to provide an accurate valuation.

Venture Capital firms have developed methods for overcoming the lack of systemized public information, and have developed integrative approaches to use when there is a lack of financial data available. (Gee, Mahoney, and Mahoney 2005). In addition to integrative approaches, the processes that venture capital firms use to evaluate prospects have also been studied (Friend and Hisrich 2014).

As previously noted, valuation drives performance. The IPO is the first time that information will be granted to the public, and the general public will be able to make investing decisions based upon this information. As such, there has been a great deal

studied in regards to subsequent performance of venture capital backed companies (Keuschnigg, 2004).

Most research until this point has been centralized around covering the process in which companies are valued, and how they perform over time. There has not been an overwhelming amount of research that has specifically focused on possible drivers of IPO performance. This lack of research is a key oversight because through the identification of the key drivers of new IPO performance, investors can make better informed decisions in the allocation of their capital. Furthermore, identification of such factors could assist in the valuation process, providing a greater opportunity to prevent permanent loss of capital. These two factors in particular are critical for building wealth and maintaining economic growth.

In this study, I will be examining five specific company factors, and their correlation with three year compounded performance. These five factors are:

- Company age at IPO
- Offering Size in Relation to Pre-IPO Sales
- Offering Size in Relation to Pre-IPO Assets
- The Presence of Multiple Share Classes Offered

The first three factors are grouped into historical factors. These factors provide insight into the prior performance of the company, and if their business model has proven sustainable over time. The presence of multiple share classes provides a selection for investors to choose from. Do to this selection, this factor demonstrates possible control exhibited by the company (i.e. voting vs non-voting shares, common vs preferred shares etc.)

I will use historical IPO data ranging from 1995-2012, and a three year performance timeline. Using this data, I will compare abnormal performance with the selected factors and look for significant relationships exhibited between the before mentioned factors and abnormal performance.

## REVIEW OF LITERATURE

### **Background Complications Inherent To Company Valuation**

Valuing a company is a very complex process that relies on assumptions about the future. Since it is impossible to 100% accurately predict the future, there is an inherent margin of error in these assumptions. This margin of error introduces the opportunity for dissenting opinions, and controversy surrounding stock market valuations. Despite the accuracy problems inherent in company valuation, there will always be a need to effectively value companies. The very nature of the allocation of capital in global financial markets is predicated on the assumption that companies are valued correctly. In public markets, thousands of analysts all have access to the same information, and each one of their opinions is priced into the company's valuation. This aspect implies that valuations of companies in public markets have a greater likelihood of being accurate, due to the impact of everyone's opinion being exerted on the price. In private markets however, not all analysts have access to the same information, and valuations could be skewed to the opinion of just a few individuals. There are multiple opportunities for private companies to seek a valuation throughout its company's lifecycle.

Companies traditionally start out as small ventures with a handful of employees, experience growth, mature and establish themselves as reputable industry players, and



then either continue to innovate or die. While there is a great deal that can happen along a company's life cycle, there will always be the need for capital to invest in new projects, conduct R&D, and to innovate in order to stay relevant. The valuations that take place are of crucial importance not just for determining how much capital these companies receive, but also in maintaining the fabric of global financial markets that hinge on accurate pricing.

There are many different ways that companies can raise capital. In private markets, companies can take out loans from banks, raise capital from private investors, or bootstrap the operation relying solely on the money that is flowing in. When private companies seek funding from private investors they often seek the help from venture capital companies. Venture capital companies raise money from accredited investors, and turn around and make investments in these private companies. Venture capital is often associated with high risk/high reward investing because the likelihood that investors' principal investment will be returned with an adequate return is low, but when the returns do happen they are often astronomical. One of the key distinctions of a venture capital investment is the lack of liquidity. Due to the nature that these companies are private, there is no readily available market for the equity stakes held by these companies. Venture capital firms are left to hope that the company they invested in either gets bought out, or goes public.

As previously discussed, there are a variety of other options for companies besides going public. However, the majority of these options hinge upon a valuation number. Valuation in private markets, especially venture capital, is faced with an additional hurdle, being that the companies seeking venture capital are often in the very early

stages of development and often times are not profitable or may even not have any revenue. Furthermore, there is a lack of track record available to reference for guidance since these companies inherently have not been around for a long time. Also, there is a lack of standardized reporting by the company's management to the SEC that can be used to develop forecasts. Despite of these hurdles, venture capital activity is incredibly active.

### **Staging**

An interesting aspect of venture capital investments are that there are different stages at which venture capital firms can seek equity stakes in private companies. Early stage venture capital is generally reserved to companies with little to no revenues, but with large growth prospects due to some sort of intellectual property. As companies mature, there are more and more opportunities (stages) in which valuation tends to be done. Middle stage valuation rounds are usually a result of needing more capital to be able to capitalize on a given market opportunity or speed development, while later stage funding is the opportunity for entrepreneurs to seek some liquidity as well as seek a more relevant valuation in preparation for possibly going public.

Syndication in the venture capital world takes place when more than one firm contributes to the company and receives an equity stake. Syndication also means that there are multiple firms conducting analysis of the company and valuing it. Lerner developed the thesis that syndication in early funding rounds leads to better investment decisions, while syndication of venture capital firms in later rounds more often leads to overpricing (Lerner, 2004). The reason for this difference in syndication is that in early rounds, it is more likely that analysts will approach the valuation process with more

skepticism and objectivity while in later rounds there is a greater tendency that analysts will be swayed by prior funding rounds and primarily seek to not miss out on the action. This study also drew comparisons between the sale of publicly traded securities, and those in private markets. Two such differences were highlighted in this study, “the process through which private firms sell securities is little regulated by the SEC... and that privately issued securities are purchased directly by the venture capital fund and must be held for two years” (Lerner, 1994, p. 2). These two distinctions are of critical importance because they provide an insight into the asymmetric flow of information present in the private funding space. A publicly traded company has certain regulations that are required by the SEC, which are available to all potential investors. The absence of this required information leads to drastically different assumptions being made by different covering analysts. These differing assumptions are why syndication is so critical, it allows venture capital firms to check their reasoning and ensure that false conclusions are not being made (Lerner, 1994).

### **Components Of A Stock Price**

There are different aspects that make up a stock’s current stock price. Stock prices can ultimately, “be decomposed into two elements, the value of the assets in place, and the value of growth opportunities” (Danbolt, Hirst, and Jones, 2002, p. 3). The higher proportion of the share price that can be found in the value of growth opportunities, the greater the likelihood that the stock will experience a substantial decline once these growth opportunities are revised. This proportion of the stock price is also the portion that can be drastically misstated, and lead to significant overvaluation. There are a great deal of assumptions that are made that comprise “growth opportunities.” Factors such

as market size, demand, pricing, competitors, and product offerings are all aspects that must be considered. It is very easy to lose a level head when evaluating these different assumptions, leading to an overstated company valuation. When venture capital firms value a company in the early stages, by nature of it being an early stage, there are little to no values for the “assets in place.” Therefore, the primary value of the company is found in the future growth opportunities. When you have a zealous entrepreneur with a product that he or she believes will be wanted by everyone, there is a great deal of irrational exuberance that takes place leading to an overstatement of these growth opportunities.

### **Company Valuation Methodologies**

An integrative approach has been used by venture capital firms in hopes of deriving a value despite of a lack of financial data (Gee, Mahoney, and Mahoney, 2005). This approach relies on the analyst being able to objectively evaluate the prospects of a firm based upon criteria established when looking at the type of company being valued. This approach could produce a greater likelihood of undervaluation by venture capital firms. This study also provided insight into the illiquidity present in the private capital markets. Their study concludes, “the venture capital market is not efficient and each investment deal is privately negotiated in a small numbers bargaining situation” (Gee et. al, 2005). Understanding the nature of this negotiation is the first step in understanding the key factors that influence company valuation. This research continues with, “the framework composed here essentially decomposes each investment deal into many components of input factors” (Gee et al., 2005 p. 33). This negotiation type valuation is drastically

different than valuation in public markets. Public valuation is fundamental in nature and often utilizes a very large quantitative valuation component.

Fried and Hisrich (1994) conducted research into what methodologies venture capital firms use in order to screen for, and ultimately invest in companies. This methodology was developed based on interviews of venture capitalists and observations of their investment strategies. They were able to determine that there are six key stages that an investment proposal goes through. These six stages are: Origination, VC Firm Specific Screen, Generic Screen, First Phase Evaluation, Second Phase Evaluation, and Closing. At each stage in this process, there is the opportunity for a company's proposal to be rejected (Fried et al., 1994, p. 32). What is interesting about their findings is that there appears to be a definitive lack of hard technical modeling to derive a value when compared to traditional company valuation. Instead, investment decisions are more based upon the venture capitalists having a strong understanding of the entrepreneur's track record and ability to effectively manage the emerging venture. This is in contrast to what has previously been explored in that venture capitalists primarily rely on modeling techniques to derive a valuation number. Furthermore, it appears that how much the venture capital firm is willing to invest is more related to how much the entrepreneur needs, than a set percentage of the firm. An example of this would be a venture capital firm financing two to three years of cash burn in exchange for a 40% equity stake in the company. Ultimately, the decision is made using a methodology involving multiple rounds of meeting with the entrepreneur and working together to develop an effective business plan.

No two companies have exactly the same value proposition or characteristics. Therefore, each new round of valuation for each company requires differing assumptions to be made about the state of affairs for that company. In terms of valuation, there are a variety of ways that firms can value private companies. Fernandez (2014) introduced a review of the four main methods that can be used to value companies. This study primarily deals with valuation methods inherent to the public equity markets, where information flow is much more ubiquitous. These methods are balance sheet-based methods, income-statement based methods, goodwill based methods, and cash flow discounting based methods. Balance sheet-based methods consist of using a company's balance sheet to derive a value that the company is worth, irrespective to any future growth prospects of industry conditions. Processes that analysts may use with these methods consist of using the company's book value liquidation value, substantial value, or adjusted book value as a number for how much the company is worth. Shortcomings with this method are due to its lack of flexibility in a dynamic world. For instance, a company could have a billion dollar contract set for the next year that would not be recognized on the balance sheet, but definitely would be something to consider when determining how valuable the company is. Income statement-based methods use the company's income statement and its earnings. Once a company's earnings are known, an analyst will then apply a reasonable multiple based upon his or her own analysis or industry averages. Goodwill-based methods seek to provide a value representing capital appreciation from future earnings on top of the adjusted book value. This hybrid approach leads to complications because estimating the capital appreciation inherent to the future earnings of the company is extremely

difficult. Cash Flow-based methods entail projecting out free cash flow to the firm and then discounting it back to find the present value of all future inflows of the company. This method is traditionally most used for companies in public markets since management has the opportunity to provide guidance as to what future growth prospects are most likely to be. Fernandez also argues that the best method for valuing companies is a decision based directly on the type of business being valued. Which, this sentiment is not the most helpful for the party interested in comparing valuation methods across industries. What makes matters even more difficult for venture capital firms, is that there is often a lack of presence of key financial statements that would traditionally use the before mentioned methods to value their business.

Hand (2005) discussed the importance of financial statements in the valuation process within the venture capital community. It is his belief that financial statements compared to qualitative information are less valuable in the venture capital space, while the opposite holds true for public equity markets. The lack of financial statement information directly results in there being a greater likelihood that valuation results will differ greater between firms than that of public equity markets. With less information, valuation is more at the discretion of the analyst, and less a direct result of a formulaic approach.

The entrepreneur's perspective on the valuation process is one that is often overlooked, yet incredibly important. It is not hard to imagine that most entrepreneurs lack the training in financial analysis to be able to determine the valuation of their company, yet their voice is incredibly important in determining the actual value assigned. Working closely with venture capital firms, entrepreneurs have the opportunity

sway predictions through altering assumptions such as growth rates, competitive advantage, market size, and demand for their product. The entrepreneur holds the keys to all the information that the analyst needs in a world lacking the long track record of financial statements that most publicly traded companies have to offer. More importantly for this study, the entrepreneur and the venture capitalist work closely together to structure the nature of the contract and relationship between the two firms. It has been found that venture capital returns are heavily dependent on the extent of control that the venture capital firm has over the private company (Gompers, 1995). The key to this control is the structuring of the contract between the venture capital firm and the entrepreneur. Due to the dynamic nature of the underlying assumptions that private valuations hinge on, it is essential that unless the entrepreneur has experience in managing ventures that the more experienced venture capitalists exhibit more control. This nature of control has the possibility to impact the valuation of the company. Venture capital firms are more willing to supply more money, and thus a higher valuation, if they have more control over the company (Gompers, 1995).

In addition to the structuring of the contract between the venture capital company and the emerging venture, it is critical that both the venture capital firm and the entrepreneur are on the same page in terms of exit strategy. At the end of the day, it is the venture capitalists job to provide a return on investment for its various funds. In order to do so there must be some liquidity, allowing equity stakes to be sold for cash. Schwienbacher (2008) conducted research on how both the emerging venture and the venture capitalist decide on exit opportunities. While there is traditionally two main ways that a venture capitalist can exit an investment, acquisition or IPO, the innovation



strategy selected is based upon the controlling party's preference for exit. In an IPO situation, the entrepreneur remains in control of his or her enterprise once the venture capitalists have exited. This is different from an acquisition where often times the company buying the emerging venture will exert its preference as to how the emerging company will be managed. These dual options effect how the entrepreneur runs his or her business. If they favor remaining in control, then it is more likely that they will run the company in such a manner that seeks to capitalize on further innovation and have the opportunity to stand on its own in public markets. If the entrepreneur favors an acquisition, then it is more likely that they will manage the venture in a way that will increase the probability of a different company buying it, whether it is due to operational synergies or some sort of proprietary technology. This could potentially factor into a company's valuation because there is often a premium associated with being acquired since an entrepreneur would not sell his or her company for the exact value that it is currently worth. Otherwise, they would just remain in control of it at that value.

### **The IPO**

If a company decides to go public, it will participate in an Initial Public Offering. An Initial Public Offering (IPO) is the first sale of company stock to the public. A company usually chooses to "go public" for a combination of four reasons. First there is the cash, once a company goes public, the initial sale of equity in the company generates a cash windfall for the company that it can then use to further expand its business. Second, there is an inherent credibility associated with a publicly traded company. Third, since there are now a market for the investors to buy/sell more shares of stock, the company can use these shares as a currency to buy other companies. Fourth, the access to

exchanges allows owners of shares liquidity in that it can buy or sell their shares whenever they so choose (Taulli, 2012).

Once a company is ready to go public, it will rely on a group of investment banks to value the company and issue a price per share for the initial offering. There are a host of biases that are present in this final round of valuation, one of them is the nature for investment banks to underprice the securities so that there is a greater likelihood they sell all the shares they are responsible for (Ljungvist, 2003). It is human nature to want to mitigate individual risk. When an investment bank underprices an initial offering, it is doing just that.

Once a company issues an initial public offering, the introduction of required SEC documentation and the ability for multiple analysts to have access to the same information, is a huge step forward in the pursuit of an accurate valuation. With more eyes and more opinions about a company, there is a greater likelihood that the mean is more representative of the true intrinsic value of the company. While it may be impossible to ever truly know what a company “should be” worth, the opportunity for other individuals in public markets to buy/sell stock acts as setting the price. However, there is much debate surrounding whether or not the initial pricing of shares to the public is not only accurate, but a cause of their long-term performance. The underpricing of firms at IPO date does allow the underwriting firms to not only mitigate the risk that they are not able to sell all of the shares that they are contractually obligated to. Underpricing also increases the likelihood that the shares will see a large increase in value after the shares initially become available. This trend is also why there is usually a huge increase in share price right after the IPO, and then a subsequent

sharp decline in stock value. This is just another behavioral bias that is present in the valuation process. It looks good for companies to have double-digit growth right out of the gates, so there is a greater likelihood that the investment banks will underprice these securities to allow for just that. There is no difference in the underlying business in the first initial days of going public, but the company can see huge swings in value right out of the gate.

So-called startups have often times been blamed for financial bubbles. In order to understand the true nature of valuations and performance in the venture capital space, it is important to briefly look at the relationship of IPO's and economic bubbles. The most recent bubble with roots in private valuations was in 2000-2001 and is known as the tech bubble. There were many factors at play during this bubble. One of these factors, underpricing at the initial sale, could be a main player. It has been previously discussed that investment banks tend to underprice initial public offerings to mitigate some of their risk. If it is assumed that IPO's tend to be underpriced, then they will experience disproportionate first day gains, which will then prompt further investment by the casual speculator. While this is great for venture capital firms hoping to exit an investment, it is not good for the overall stability of the financial markets. The more that "smart money" exits the investment and the more that "unsophisticated investors" enter the investment, the more likely there will be disproportionate gains followed by a sudden and substantial decline. While this bias is not a factor when considering the overvaluation of companies by venture capital firms, it is important to understand the relationships of the differing agents at the differing valuation stages.

## Track Records

There is some evidence that reinforces the notion that companies having received backing from venture capital firms have faster growth and a better track record (Keuschnigg, 2004). This model maintains the belief that valuation of companies by venture capital firms is inherently a metric of opportunity cost and effort for the entrepreneur, and the ability to add value by way of managerial experience by the venture capital firm. (Keuschnigg, 2004) The added value by the venture capital firm results in more reputable companies with a greater probability of success. Despite this research, Gage (2012) determined that the rate at which startups fail is drastically underreported by industry metrics and that, “three out of four venture backed firms in the U.S. don’t return investor’s capital.” Furthermore, Ritter (1991) demonstrated that IPO’s drastically underperform a sample of their non-IPO peers over a three year time horizon. The contradictions between these two bodies of research are not unique. It appears that there is not a solid consensus surrounding whether or not venture capital backed firms tend to underperform or outperform their non-venture capital financed peers over a given time period. It is plausible that this discrepancy is a nature in and of itself related to the initial valuation of companies. The way that venture capital firms raise investor capital and invest, displays their understanding that there is a great likelihood the majority of the companies they invest in will underperform. If venture capitalists were absolutely certain that a single investment would yield a high return on capital, there would be no need to diversify amongst multiple companies. Diversification isn’t useful if there is no chance in being wrong. However, as previously discussed, there is a lot of opportunity to be wrong, hence it is advantageous to invest in say 20

companies, opposed to just one. With this knowledge, it is not surprising that 75% of companies fail to return investor capital, if the other 25% not only return the invested capital, but provide huge upside as well.

### METHODOLOGY

Throughout this study, regression analysis was used to determine the significance of relationships between four selected factors, and the abnormal total return/operating performance of post-IPO companies the three years following each company's respective IPO date. The following four factors were used throughout the study: 1) IPO offering size in relation to pre-IPO sales, 2) IPO offering size in relation to pre-IPO assets, 3) company age at time of IPO, and 4) the presence of dual share classes.

The initial IPO Company data used in this study is based on the prior works of Loughran and Ritter (1995) and Barry and Mihov (2015). The IPO sample used throughout this project consists of 2565 firms that conducted an IPO between January 1<sup>st</sup> 1995, and December 31<sup>st</sup> 2015. The four tested factors were calculated based upon the prior data collection of previous studies. (Barry and Mihov, 2015)

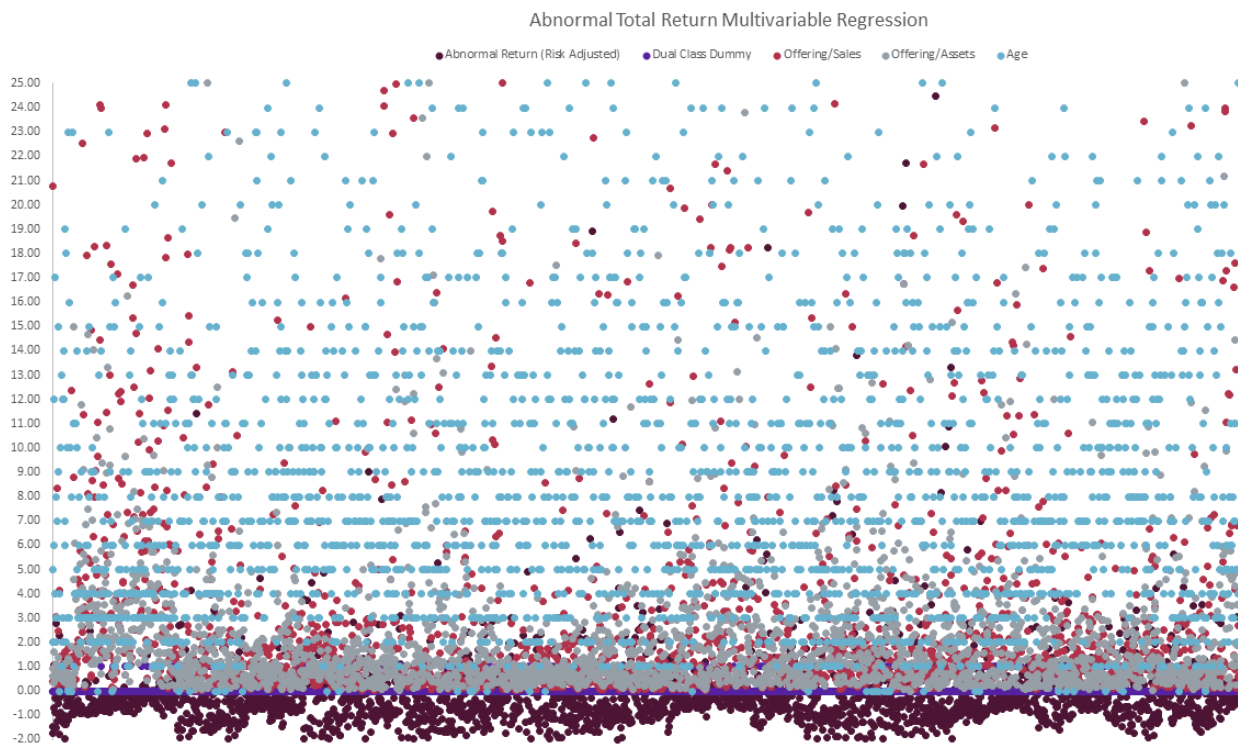
The dependent variables consisted of abnormal total return, and abnormal ROE. Abnormal total performance returns were calculated by first, risk-adjusting the overall market's return to match the risk of the company by using each company's beta calculated previously by Barry and Mihov (2005), and second, subtracting this market return from the company's return. The market return used in this study corresponds to the CRSP value-weighted index which is a representation of every firm traded on a particular day weighted by market value. Return data was derived from the Wharton

Research Data Services CRSP database. Abnormal ROE was calculated by first finding the ROE of each company, and then comparing that to the overall ROE of the industry over the same time period. ROE data was collected via the Wharton Research data Services CRSP Compustat Merged database. Industry was derived from matching each company's SIC code, with that of the industry on a first unit basis.

The first multivariable regression used the risk adjusted abnormal returns of the firm in relation to the market as the dependent variable, and the previously listed four factors as the independent variables. Additionally, single variable regressions were run using the same dependent variable, and switching out each independent variables. The second multivariable regression used the abnormal cumulative ROE of the firm in relation to the cumulative ROE of the industry as the dependent variable, and the previously listed four factors as independent variables. . Additionally, single variable regressions were run using the same dependent variable, and switching out the independent variables.

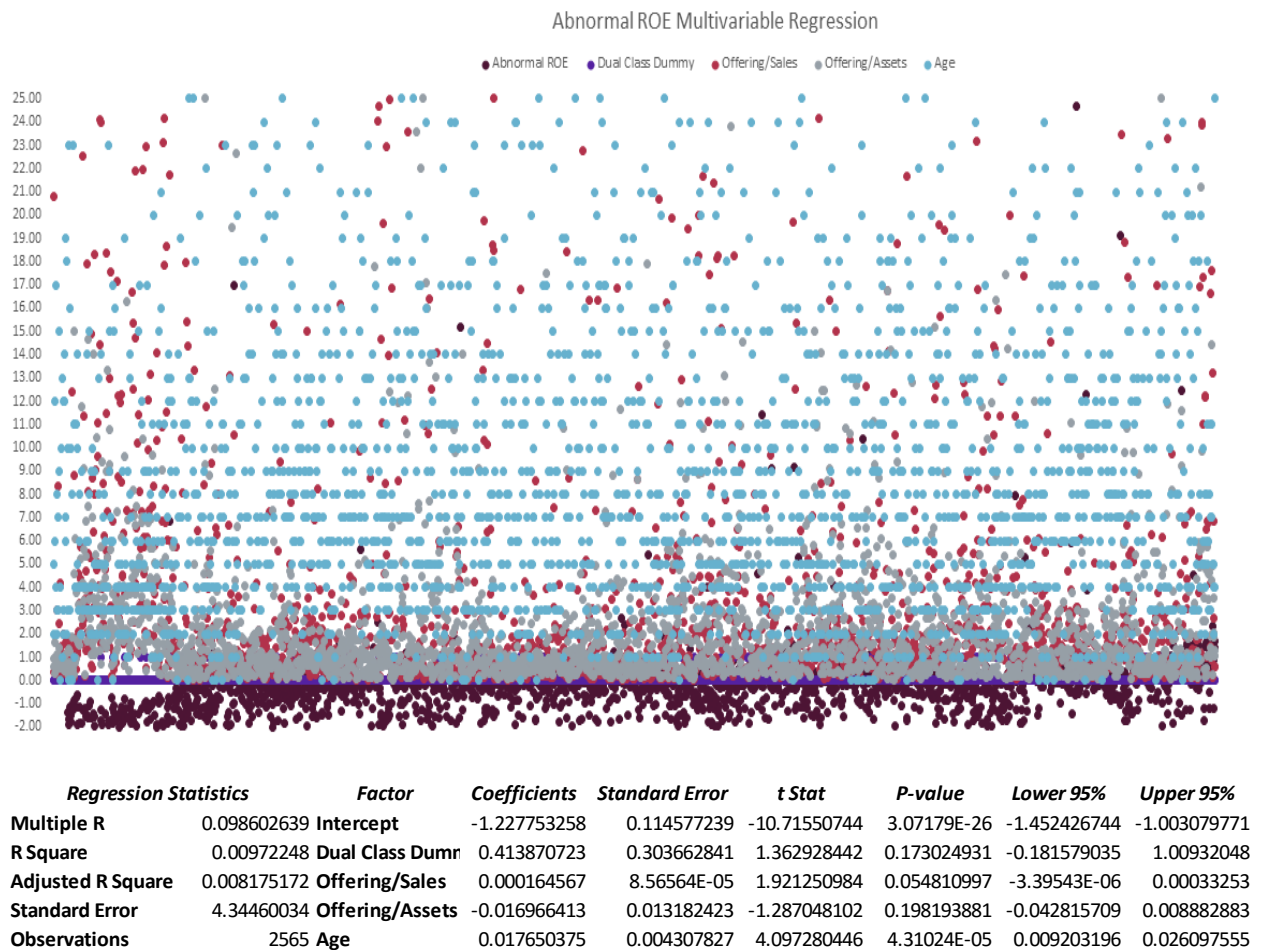
## RESULTS

The findings of the multivariable regression with abnormal total return as the dependent variable indicate that there is no statistically significant correlation between the chosen variables and performance. This is consistent with the findings of the single variable regressions. Of the findings regarding total price performance, no single factor is within the range needed to be determined remotely significant. The below scatter plot and regression output correspond to this abnormal total return regression.



Regression Statistics		Factor	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
<b>Multiple R</b>	0.02967819	Intercept	-0.165501328	0.072001764	-2.298573233	0.0216094	-0.306688945	-0.024313711
<b>R Square</b>	0.00088079	Dual Class Dummy	0.189002617	0.190825512	0.990447322	0.32204913	-0.185185427	0.563190662
<b>Adjusted R Square</b>	-0.00068033	Offering/Sales	1.02468E-05	5.38276E-05	0.190362793	0.84903995	-9.53032E-05	0.000115797
<b>Standard Error</b>	2.73020097	Offering/Assets	-0.007063261	0.008283999	-0.852639047	0.39393926	-0.02330728	0.009180759
<b>Observations</b>	2565	Age @ IPO	0.001154722	0.002707092	0.426554515	0.6697397	-0.00415359	0.006463035

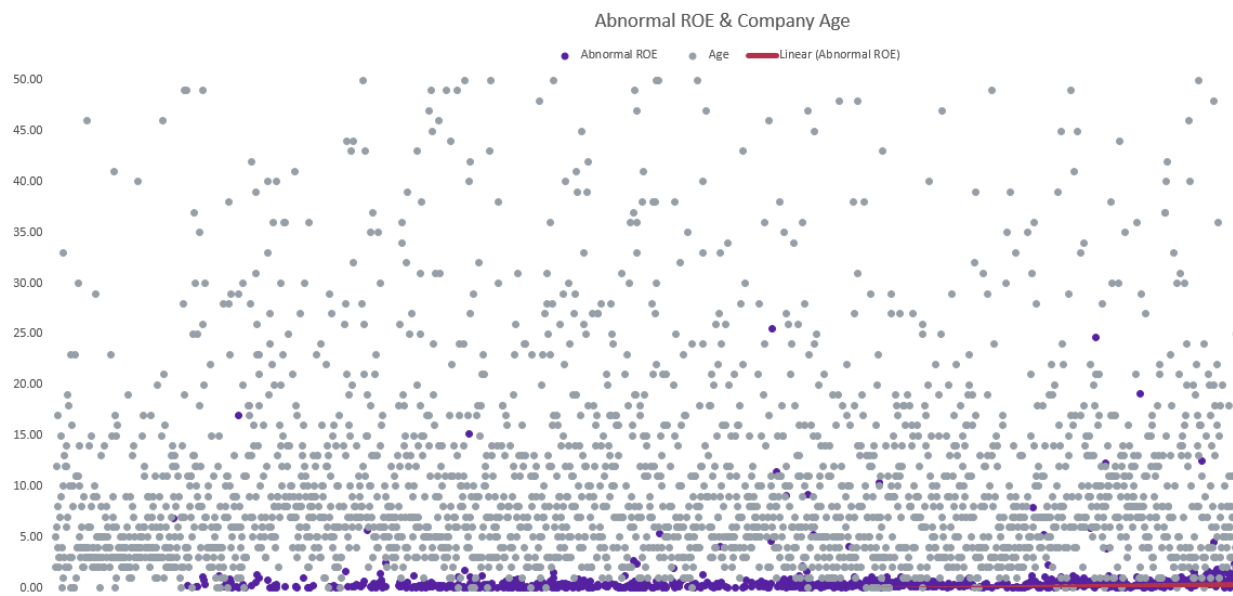
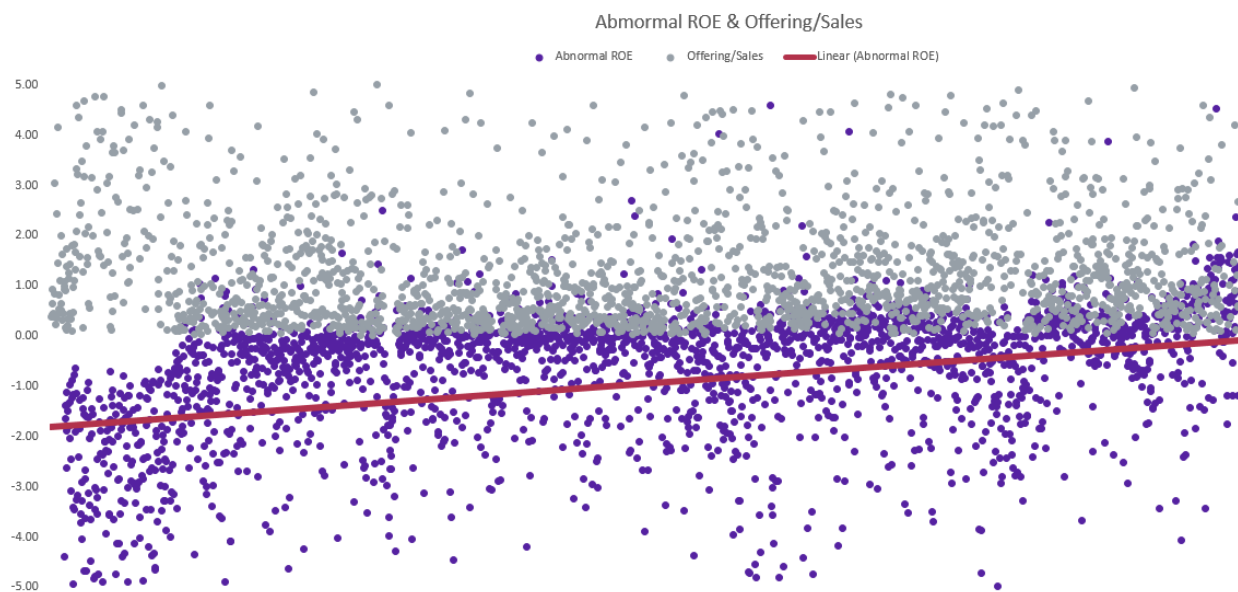
The multivariable regression findings of operating performance and the selected independent variables indicate a statistically significant relationship between the dependent variable and age, and possibly offering size in relation to pre-IPO sales. As seen in the multivariable scatter



The P-values of company Age is .000043 while the P-value of Offering/Sales is 0.0548. The P-value of age is within the .05 confidence needed to be determined that this relationship was not caused by random error. Therefore, this relationship is deemed significant. The P-value of offering/sales is just above the requirement needed to determine with validity that this relationship was not caused by randomness. Below are



the scatterplots of both the Abnormal ROE & Offering/Sales and Abnormal ROE & Company Age.



## DISCUSSION & IMPLICATION

While none of the selected factors show a significant relationship with abnormal total return that does not necessarily mean that there are not factors that can be used when assessing a company's health and intrinsic value. In actuality, this research serves as a stepping stone for exploring additional factors that may or may not have long run implications on price total performance. Moving forward, there may be opportunities for further research surrounding aspects of private companies, which could lead to outperformance once they participate in an IPO.

The findings regarding the impact of the selected factors on post-IPO operational performance are more interesting. As previously mentioned, there appears to be statistical significance between the age of the firm at time of IPO, and the post-IPO three year operating performance as measured by cumulative ROE. The question could be asked, "why does something that has nothing to do with the actual performance of the company seem to lead to a higher operational performance metric?" I believe the answer to be that the age of the firm seeking an IPO confirms the previous track record of the company. There is an inherent difference between a company that has been around for 100+ years and a company that has been in existence for less than a single year. While this does not mean, or seek to prove that historical information leads to future performance, age does signify a certain success that the company has experienced prior to an IPO. An older firm has proven that it can survive through various economic environments and remain successful. The same cannot be said for newer firms with less of a substantial track record. A company that is older also has a greater

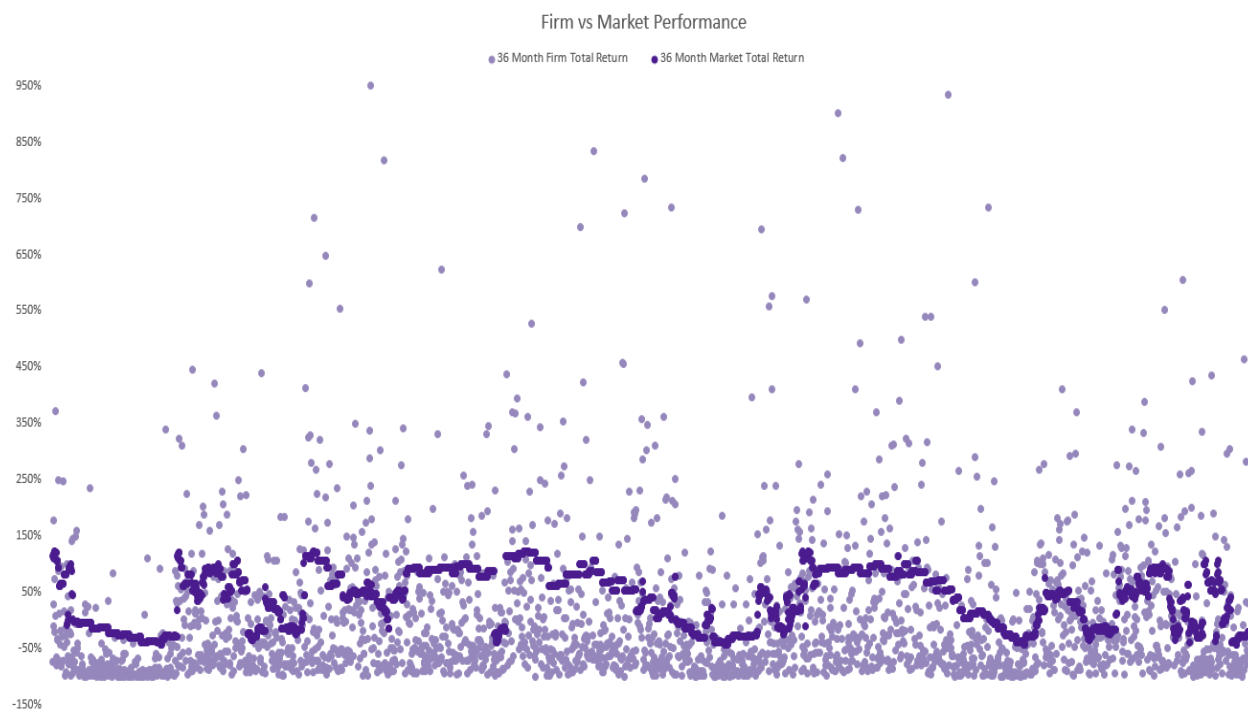
probability of already having strong operational performance; otherwise they would not have been around for so long. It is important to note once again, that age was not a contributing factor to price total return performance. So, while it may seem that older firms at time of IPO have a greater likelihood of having strong operational performance numbers, shareholders do not get paid on a function on operating performance, just price.

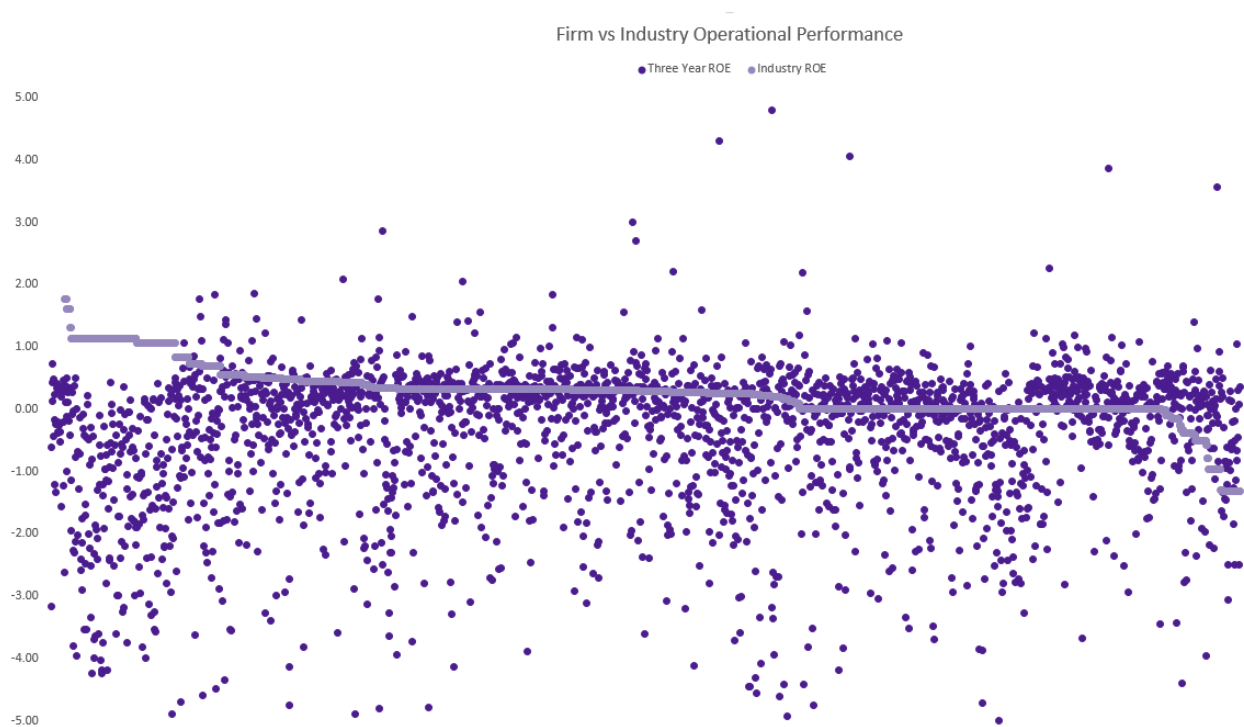
It is always the hope that strong operating performance could lead to strong abnormal returns, but it does not appear that way in actuality. This is confirmed for this particular sample size by performing a regression of the abnormal total price returns and the abnormal operating returns. There is no statistical significance between the two for this sample.

The implications of this study are three-fold. First, these studies imply that investors should not seek to find outperformance by way of looking at historical pre-IPO data points. The lack of statistical significance of the selected factors and post-IPO price performance indicates that there is not an effective trading strategy to be found using them. While this does not mean that companies with higher/lower factors do not experience abnormal returns, it simply means that for this sample size, there does not appear to be a correlation. It is entirely possible that one or more of these factors could be found in companies that exhibit strong performance, but they should not be included as the sole source of fundamental analysis.

Secondly, IPO Three Year performance is not good. Out of the 2,565 companies studied, only 27% of firms exhibited risk-adjusted abnormal returns in excess of 0. Furthermore, the median IPO Three Year risk adjusted abnormal return was -48%, with

the mean being -15%. There is of course a set of outliers that exhibited incredibly strong performance, but there was not a central theme found exhibited in them. The charts bellows visually show just how poorly the average IPO performs. The first chart shows the Firm vs. Market Performance with the dark purple representing the three year return of the market, and the light purple representing the three year return of the firms over the same time period. The second chart shows the Firm vs Industry Operational Performance with the light purple representing the three year cumulative ROE of the industry, and the dark purple representing the three year cumulative ROE over the same time period.





### CONCLUSION

In conclusion, I found that the factors studied do not have any statistical significance when determining abnormal total return performance. However, there does appear to be a statistically significant relationship between company Age, and possibly Offering/Sales and abnormal operating performance.

This project examined whether or not certain pre-IPO factors, had an impact on post-IPO performance. While this study provided valuable insight into the implications of certain factors, its primary benefit could be its ability to distinguish other factors that could be further explored. One specific area for further studies could be the impact of founders as management. If it were to be determined that there was an impact on performance due to the presence of a Founding CEO, which would be incredibly significant to both Venture Capitalists and investors. Another area of further study could

be surrounding the impact of experienced management team on performance. This study could measure the role that seasoned entrepreneurs play in terms of performance when compared to their first time peers.

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