UNIVERSIDADE CATÓLICA PORTUGUESA

Do founder-CEO firms outperform the market?

João Pedro Madeira

Católica Porto Business School
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João Pedro Madeira

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Resumo

Estudos recentes relatam diferenças na performance de empresas com base no status do respetivo CEO. Este estudo examina empiricamente o desempenho das empresas cujo CEO é fundador. Utilizo uma amostra de 96 empresas americanas públicas cujo CEO é fundador ou cofundador para estimar os coeficientes das variáveis explicativas de Fama e French (1992) SMB, HML, WML, RMW e CMA usando o estimador de mínimos quadrados. Os resultados obtidos são emocionantes e esclarecedores. Ambas os portfólios produzem resultados robustos e com significância estatística global. Os portfólios *value-weighted* e *eqaual-weighted* obtêm retornos que variam de 1.51% a 2.01%. Isto sugere que existe um nexo de causalidade entre a existência de retornos anormais positivos e a performance de empresas cujo CEO é fundador e é de grande importância para os profissionais que trabalham no setor financeiro.

Palavras-chave: Performance; CEO fundador; Portfólio.

Abstract

Research has been conducted that finds differences in firm performance according to the CEO status. This dissertation empirically examines founder-CEO firm's performance. I use a sample of 96 listed US companies that are either founder or co-founder run to regress Fama and French's (1992) independent variables SMB, HML, WML, RMW and CMA on equal-weighted and value-weighted excess returns using the OLS regression model. The results obtained are exciting and clarifying. Both portfolios produce very robust results and global statistical significance throughout. I find that the value-weighted and equal-weighted portfolios earn abnormal monthly returns ranging from 1.51% to 2.01%. This finding suggests there is a causal link between the existence of positive abnormal returns and founder-CEO firms and is of high importance for practitioners working in the finance industry.

Keywords: Performance; Founder-CEO; Portfolio

Index

Acknowledgments vi
Resumo viii
Abstract x
Index xii
Table Index xv
Introduction 17

Literature Review 20
1. Portfolio theory 20
2. Traditional Measures of Portfolio Performance 20
   2.1 The Sharpe Ratio 21
   2.2 The Treynor Ratio 21
   2.3 Jensen's Alpha 22

3. The Capital Asset Pricing Model (CAPM) 23
4. Fama and French's Three-Factor Model 24
5. Carhart's Four-Factor Model 26
6. Fama and French's Five-Factor Model 27
7. Founder-CEO firm's performance 28

Theoretical Hypothesis and Econometric Model 30
1. Theoretical hypothesis 30
2. Econometric model 31

Data Description 33
1. Sample description 33
2. Variables 34
   2.1 Dependent Variables 34
   2.1 Independent Variables 35

3. Summary Statistics 37

Estimation Results and Discussion 39
1. Multicollinearity 39
2. Estimation Results 40
   2.1 Value-weighted portfolio 41

2.2 Equal-weighted portfolio 43

Conclusions and Limitations 45
Bibliography 48
Appendix 52

Table Index

Table 1: Descriptive statistics **37**
Table 2: Summary statistics **38**
Table 3: Correlation matrix **40**
Table 4: Value-weighted portfolio regressions' results **41**
Table 5: Equal-weighted portfolio regressions' results **43**

Introduction

Founder-CEO firms represent eleven percent of the U.S. listed companies. In this dissertation I set out to test the quantitative nature of the relationship between founder-CEOs and firm performance. I will look for abnormal returns based on the theory that founder-CEO firms are more profitable than firms that are not led by their founder or co-founder. The rationale lies on one major assumption: that the founder that holds the position of CEO is also a shareholder. By accumulating both positions they solve the principal-agent problem, i.e., the conflict of priorities and personal interests between shareholders and CEOs, by eliminating agency costs arising from the separation of ownership and control. This means that the personal interests of the CEO are perfectly aligned with those of shareholders. Thus, when the CEO adopts policies and behaviours that will benefit the companies' value, he is doing so to himself in a case of "profitable selfishness" (Maury, 2006).

There is research yet to be done regarding founder-led companies, especially when considering its relevance. In the first place, and even though this is an academic study the consequences of these results are by no means confined to this sphere. They are particularly important to practitioners and those that are in some way involved in the stock market, e.g., professionals in the investment banking sector because it identifies a particular characteristic of a firm that has the potential to make it more valuable – and that is what it all comes down to. Moreover, this topic has never been as relevant as now. Simply because it could not have been studied before since the average firm age at IPO was too high and that meant the CEO was no longer the founder. With a drastic decrease in firm

age at IPO and a fast-pacing economy founder-CEO firms are undoubtedly a matter of great interest[1].

Unlike various studies, e.g., Maury (2006), Barontini and Caprio (2006) and Barontini and Bozzi (2012), that have an approach based on Tobin's Q and ROA, I will look for positive abnormal returns using the OLS estimator to estimate equal-weighted and value-weighted portfolios of the three (Fama & French, 1992), four (Carhart, 1997a) and five-factor models (Fama & French, 2015). Using a sample composed of monthly returns of 96 founder-led firms that constitute the present holding of the Global X Founder-Run Companies ETF, I constructed an equal-weighted and value-weighted portfolio and obtained fascinating results that provide suggestive evidence that these firms do generate abnormal returns in excess of 1.5%.

This dissertation is structured as follows: Chapter 1 provides a synthetic review of meaningful literature; Chapter 2 presents the theoretical hypothesis and econometric model used; in Chapter 3 I describe the sample data; in Chapter 4 I present the results attained and discuss their implications and, lastly, Chapter 5 draws conclusions.

[1] Sheetz, M. (2017, August 24). Technology killing off corporate America: Average life span of companies under 20 years. *CNBC*, p.1. Retrieved from http://www.cnbc.com

Chapter 1
Literature Review

1. Portfolio Theory

Portfolio theory concerning choice and performance has been for a long time a fundamental area in finance to which many have contributed. However this was not the case when Harry Markowitz (Markowitz, 1952) first put forward his findings. In 1952 Markowitz published his portfolio optimization model that relied on various investment behaviour assumptions such as the rationality of investors, their risk aversion, among others. The idea behind the model is a mathematical framework in which a portfolio's expected return is maximized for a given level of risk. Such result is attained through the inclusion of different types of financial assets with different risk-return profiles in said portfolio, i.e., diversification.

2. Traditional Measures of Portfolio Performance

Classical performance measures are simple and easily understandable since they consist in comparing the excess returns obtained by the portfolios to some measure of risk. In the following subsections I will analyse the three most

important risk-adjusted performance measures: The Sharpe Ratio, The Treynor Ratio and Jensen's Alpha.

2.1 The Sharpe Ratio

Initially called the reward-to-variability ratio (Sharpe, 1966), the Sharpe Ratio is perhaps the simplest of measures. It provides a mensuration of the excess return of a portfolio compared to its standard deviation or total risk. In other words, it is designed to measure the portfolio's ability to yield a return per unit of total risk. However, because it uses total risk the Sharpe Ratio is not fit to assess a particular security in an investor's portfolio but instead the portfolio as a whole since it ignores the correlation between that particular security and the remainder securities. Thus, applying this measure in the above-mentioned conditions will lead to misleading results that have no meaningful interpretation and will not represent the risk exposure of the investor's total position.

2.2 The Treynor Ratio

The Treynor Ratio is a measure comparable to the Sharpe Ratio in the sense that it also compares the portfolio's return in excess of the return on a riskless asset to a measure of risk. However, it compares said return to the systematic risk or portfolio beta and not total risk. This important difference makes it particularly appropriate to appreciate the performance of diversified portfolios considering that all the risk that is left is systematic risk. It is also for this reason that it can be used to assess the performance of an individual portfolio within the investor's assets. There is, however, a drawback in this measure. In order to compute the ratio, we will have to choose an efficient market index. According

to Richard Roll (1977) there is an impossibility to observe or recreate a portfolio so diversified that it could contain all the assets in the market which undoubtedly will limit its uses.

2.3 Jensen's Alpha

The measures I have thus far described do not do any work explaining a manager's success in adding value to its investors nor provide any insights into the value he creates or destroys. Jensen's Alpha (Jensen, 1968) addresses this issue. Conceivably, it is the most popular measure of portfolio performance and the most controversial as well (Aragon & Ferson, 2006). Notwithstanding, Jensen's Alpha is broadly used in academic empirical studies (Grinblatt & Titman, 1989). The model derives from the capital asset pricing model of Sharpe and Lintner that I will explain in detail in the following subsection. The reason that led Michael Jensen to create this measure was mainly the necessity for a measure of performance that was not a relative measure of performance but instead an absolute one. It is important, however, to clarify that performance refers strictly to the manager's forecast ability, i.e., his ability to earn higher returns than the ones predicted for a certain level of risk through the successful prediction of futures securities price movements. It is not to be mistaken with performance in terms of efficiency as in Markowitz (1952). He argued that in addition to knowing whether portfolio I performs better than portfolio II it would be important to understand how these portfolios do compared to an absolute standard.

Now let us examine the intuition behind Jensen's Alpha. The CAPM implies that the expected return of an asset is equal to the riskless rate and a risk premium times the beta or systematic risk of that given asset. This is true for all unmanaged

portfolios. However, given the manager's forecasting abilities he will earn returns that will be systematically superior to the portfolio's risk level, which is not a possibility in CAPM. Fortunately, we can allow the estimation regression not to pass through the origin and incorporate manager's skill in the model by introducing an intercept – alpha (α). Hence, if indeed the manager possesses the skill to positively predict future securities' prices, alpha (α) will be positive. If he does not, alpha (α) will be negative.

3. The Capital Asset Pricing Model (CAPM)

The capital asset pricing model (CAPM) has been the cornerstone of asset pricing models and the foundation on which more recent models build. It was created by William Sharpe (Sharpe, 1964) and John Lintner (Lintner, 1965) and it compares the return of an asset in excess of a riskless rate to its beta coefficient. This coefficient can be interpreted as a measure of the sensitivity of the asset's return to variation in the returns of the market. It derives from the division of the covariance between the asset and the market's returns by the variance of the latter or, as Fama and French (Fama & French, 2004) so simply put it, the beta coefficient is proportional to the risk each dollar invested in asset I contributes to the market portfolio.

The logic of the CAPM is that the return of a given asset equals the return of a riskless asset plus its beta coefficient times the market risk premium (given by the market's return in excess of the riskless asset's return).

4. Fama and French's Three-Factor Model

Even though the CAPM is, as mentioned above, still used in some practical cases, e.g., to estimate the cost of capital of a firm, there have been plenty studies highlighting its empirical contradictions as pointed out by Fama and French (1992). One of them, and possibly the most relevant is the size effect of Banz (1981). He provides evidence that suggest smaller firms have higher risk-adjusted returns than larger firms. Although he does not attribute the size effect to the size of the firm per se, i.e., its market equity, he states that most likely the case is that size proxies for unknown factors and variables in some way related to it. Nonetheless, an indication of CAPM's misspecification.

Later, Bhandari (1988) provides a compelling case that leverage is a natural proxy for the risk of common equity of a firm. His results are mirrored in the regression results that include the debt-to-equity ratio of a firm as an independent variable showing that there is in fact a positive relation between leverage and common stock returns.

Other factors that could potentially explain returns have been substantially reviewed and intensively studied such as the ratio of a firm's book value of equity to its market value (BE/ME) and the earnings-price ratio. Rosenberg, Reid and Lanstein (1985) and Chan, Hamao and Lakanishok (1991) study the relation between stock returns, book-to-market ratio and size and find significant relationship between them. These results led to the confirmation of a size effect. However, Chan, Hamao and Lakonishok (1991) underline the firms' book-to-market ratios' performance both statistically and economically.

Basu (1983) examined the relation between earnings yield and returns. He confirms the existence of a positive effect of the E/P ratio in explaining returns and that effect is significant. High E/P firms, he states, outperform low E/P firms. However, Basu and Ball (1978) both argue that most likely this variable is a catch-

all proxy (Fama & French, 1992) for determinants that are more fundamentally related to expected returns on common stock.

Lastly, Fama and French argue that Ball's proxy argument for E/P can be extended to size, leverage and book-to-market equity and that they are transformations of stock prices or scaled stock prices and for that reason it may come as no surprise they are redundant for describing expected returns if used jointly. In other words, they are different ways of extracting information about stock prices.

They state that on the condition assets are priced rationally, their results suggest that stock risks are multidimensional and one of those dimensions are proxied by size (ME) and the other by BE/ME. Fama and French (1993) document that both these variables are related to economic fundamentals. Firms that have a low BE/ME (meaning that investors anticipate healthy future profits and are willing to pay a premium for that) have high earnings and firms who have high BE/ME usually have low earnings. Also, size is considered to be related with profitability. Larger firms tend to have higher earnings than smaller firms.

Hence, Fama and French build their model with three independent variables: the market, SMB (small minus big) and HML (high minus low). The market represents their proxy for the market factor measured as the excess market return. SMB (small minus big) is the difference between the returns on small stocks and big stocks. It is meant to mimic the risk factors related to size. Finally, HML (high minus low) is the difference between the returns on high BE/ME stocks and low BE/ME. This is meant to mimic the risk factors that relate to BE/ME. Their main result is that size and book-to-market equity capture the variation in average returns associated with size, earnings yield, book-to-market equity and leverage.

5. Carhart's Four-Factor Model

A very popular and very well documented debate is the one between contrarian and relative strength strategies. The contrarian strategy is based on the idea that agents generally tend to overreact to information. De Bondt and Thaler (1987) advocate that past losers outperform winners because of this phenomenon. The rationale is that stock price will either be overvalued or undervalued due to uninformed supply and demand and in the future will reverse making prior losers better investments than prior winners. However, Chan (1988) argues their results can be explained by systematic risk and the size effect.

Evidence of persistence in performance of mutual funds has been found by studies that follow a relative strength strategy. The strategy builds on the idea that past performers will be future performers. Hendricks, Patel and Zeckhauser (1993) assess the mutual funds' performance predictability over short periods of time and finds persistence of abnormal returns over the one-year horizon. He attributes the effect to "hot hands", referring to the notion that a string of successes is followed by more success. Titman and Jegadeesh (1993) also employ a strategy that buys past winners and sells past losers. They find it generates positive returns over a 3 to 12 month holding period – a phenomenon they call momentum – and that the returns in questions do not derive from exposure to systematic risk. Other than common factors in stock returns, Grinblatt and Titman (1992) find persistence over longer horizons of five to ten years that they attribute to the manager's ability to pick winning stocks. It seems, however, that performance persistence in mutual funds is dependent of the time period studied as documented by Brown and Goetzmann (1995).

Contrary to Grinblatt and Titman (1992), Carhart (1997a) argues that persistence in performance does not mirror the manager's stock-picking ability.

Rather, he argues that common stock factors, expenses and transactions cost explain mutual funds' predictability. He also deconstructs the "hot hands" effect and finds that funds that follow momentum strategies and do realize abnormal returns do so not because of the fundamentals of the strategy but because they hold large positions in last year's winning stocks. In order to measure performance Carhart (1997a) employs Fama and French's 3-factor model (1992) and his own model that includes an additional factor that captures Titman and Jegadeesh' (1993) momentum – PR1YR.

6. Fama and French's Five-Factor Model

Following Carhart's model studies reported the failure of Fama and French's three-factor model to account for a number of asset pricing anomalies (Hou, Xue, & Zhang, 2015) and capture a large portion of the variation between average returns, profitability and investment (Novy-Marx, 2013). In response, Fama and French (2015) decide to analyse the relevance of the profitability and investment factors in explaining average returns. They explain the relation between these variables and average returns using the dividend discount model. The model says that the price of a stock equals the present value of its future dividends.

The challenge then was to find some variable that could effectively proxy for profitability and investment. Novy-Marx (2013) finds that profitable firms earn significantly higher returns than unprofitable firms and suggests that gross profit-to-assets is the purest way to measure profit. He argues that it is highly related to stock returns comparing its explanatory power to the book-to-market ratio factor of Fama and French (1992). Aharoni (2013) present a statistically significant relation between investment and average returns building on the idea that aggressive investment firms earn higher abnormal returns than conservative

firms.. Hence, Fama and French (2015) add the profitability and investment factor to their three-factor model. The Fama and French five-factor model comprises of the market factor, SMB (small minus big), HML (high minus low), RMW (robust minus weak) – that captures the difference between returns of stocks with robust and weak profitability – and CMA (conservative minus aggressive) – that captures the difference between returns of low and high investment firms.

7. Founder-CEO firm's performance

The relevance of founder-CEO firms' studies is indisputable. 11% of the largest public U.S. firms are led by founder-CEOS (Fahlenbrach, 2009) and 60% of GDP is generated by family controlled private businesses (McConaughy, Matthews, & Fialko, 2001). While this study focuses on publicly traded companies, the characteristics that drive performance in founder-CEO firms can be assumed to exist in private firms. This is a good indicator of the importance of the matter.

What also motivates this study is the concept that founder-CEO firms will have better performance than firms in which the CEO is not a founder due to reduction of agency costs. The agency theory postulates that significant costs will arise from the misalignment of shareholders and managers interests (McConaughy et al., 2001) and from monitoring costs related to firm size and ownership structure. If the firm's CEO is a founder it is reasonable to assume, however, that his interests are perfectly aligned with those of shareholders. Whether it is because he considers the firm to be his life achievement, he values their reputational stake or because of his equity stake (having a substantial amount of their fortune in the firm can lead to diligent and cautious behaviour) (Jayaraman, Khorana, Nelling, & Covin, 2000). In addition, one can argue that the costs related to firm size can be eliminated by increased managerial control.

Still, answers remains to be found as various authors arrive to ambiguous and dissimilar results. Adams, Almeida, and Ferreira (2009) find a causal relation between founder-CEO and firm performance concerning market valuation and operating performance. Fahlenbrach (2009) reports that an equal weighted portfolio composed by founder-CEO firms would have earned a return of 8.3% during 1993-2002. On the other hand, Jayaraman et al. (2000) found no significant relation and Fama (1980) suggests that the separation of ownership and control is an efficient form of economic organization.

Finally, most of the studies conducted look for a relation between founder-CEO firms and performance use Tobin's Q and ROA (return on assets) to measure the latter and use instrumental variables methods to disentangle the effect of founder-CEOs on performance from the effect of performance on founder-CEO status. This study will focus only on stock market performance.

Chapter 2
Theoretical Hypothesis and Econometric Model

1. Theoretical Hypothesis

Agency costs are of the utmost importance in the corporate world. These are internal costs that represent misaligning interests between shareholders and the management team, specifically, the CEO. The fundamental point is that these costs arise from the separation of ownership and control. While shareholders want to maximize their value, the managers might sometimes take actions that benefit themselves rather than the shareholders. In addition to considering their firms as their life's achievement and having a different attitude towards risk (Fahlenbrach, 2009), the founder-CEO has a very considerable amount of equity of his firm. Thus, actions that may be taken to benefit himself are also benefiting shareholders, reducing agency costs and therefore increasing the firm's value.

Hypothesis: the presence of a founder-CEO positively relates to the creation of value for a firm.

2. Econometric Method

In order to find the answer to my research question I will use the performance evaluation models covered before in the literature review. Specifically, the three-factor model by Fama and French (1992), the four-factor model by Carhart (1997a) and the five-factor model by Fama and French (2015).

Founder-CEO firms is the criterion by which I will form two stock portfolios: a value-weighted and an equal-weighted portfolio.

Value-weighted Portfolio:

$$VXSRet_t = VWRet_t - RF_t = \alpha_{1t} + b_t(RM_t - RF_t) + s_{1t}SMB_t + h_{1t}HML_t + \varepsilon_{1t} \quad (1)$$

$$VXSRet_t = VWRet_t - RF_t = \alpha_{2t} + b_{2t}(RM_t - RF_t) + s_{2t}SMB_t + h_{2t}HML_t + w_{2t}WML_t + \varepsilon_{2t} \quad (2)$$

$$VXSRet_t = VWRet_t - RF_t = \alpha_{3t} + b_{3t}(RM_t - RF_t) + s_{3t}SMB_t + h_{3t}HML_t + r_{3t}RMW_t + c_{3t}CMA_t + \varepsilon_{3t} \quad (3)$$

Equal-weighted Portfolio:

$$EXSRet_t = EWRet_t - RF_t = \alpha_{4t} + b_{4t}(RM_t - RF_t) + s_{4t}SMB_t + h_{4t}HML_t + \varepsilon_{4t} \quad (4)$$

$$EXSRet_t = EWRet_t - RF_t = \alpha_{5t} + b_{5t}(RM_t - RF_t) + s_{5t}SMB_t + h_{5t}HML_t + w_{5t}WML + \varepsilon_{5t} \quad (5)$$

$$EXSRet_t = EWRet_t - RF_t = \alpha_{6t} + b_{6t}(RM_t - RF_t) + s_{6t}SMB_t + h_{6t}HML_t + r_{6t}RMW_t + c_{6t}CMA_t + \varepsilon_{6t} \quad (6)$$

where $EXSRet_t$ and $VXSRet_t$ are the excess returns of the equal-weighted and value-weighted portfolios for period t given by $EWRet_t$ and $VWRet_t$ deducted of the risk-free rate, respectively. $VWRet_t$ is the value-weighted return on the portfolio for period t, $EWRet_t$ is the equal-weighted return on the portfolio for

period t, RF_t is the risk-free return for period t, RM_t is the return on a value-weighted market portfolio for period t, SMB_t is the difference in returns between a portfolio of small stocks and portfolio of big stocks for period t, HML_t is the difference in returns between a portfolio of high and low BE/ME stocks for period t, WML_t is the return on portfolios of one-year momentum stocks for period t, RMW_t is the difference in returns between a portfolio of robust and weak profitability for period, CMA_t is the difference in returns between a portfolio of stocks of conservative and aggressive firms for period t and ε_t is the error term for period t.

I will employ the same econometric estimator proposed by Fama and French (1992) to obtain estimates of the models' coefficients – the OLS (Ordinary Least Squares) estimator. Finally, if the dependent variables used are indeed capturing the risk that investors are exposed to and therefore the return they demand the intercept should be equal to zero. Thus, in order to answer my research question, I will test if the intercept is different from zero. Meaning that there is some other factor that is not being accounted for in the regression equations.

The time-series nature of the data can cause a variety of issues in what regards the OLS regression estimator's assumptions, specifically error heteroskedasticity, i.e., when the variance of the error is different between observations or groups of observations, and correlation between the errors of different observations. The latter is particularly important because it will be present on any time-series study of stock performance assuming that today's return will impact tomorrow's and thereafter. Nonetheless, using the Newey-West estimator will allow to circumvent the assumptions mentioned, i.e., it will correct the variance formula by obtaining correct coefficient estimates' variances that allow to test for their significance and thus answer the research question.

Chapter 3
Data description

In this chapter I will explain the data retrieval and manipulation process characterizing the sample and the dependent and independent variables constructed to conduct this study.

1. Sample description

One of the greatest challenges the conduction of this study posed was the time-consuming process of finding firms in which the CEO was also founder. Given this, I decided to use a different approach. Instead of looking up CEO-founder firms one by one, I have decided that my sample would be composed of the firms present in The Global X Founder-Run Companies ETF. This exchange-traded fund is traded on the New York Stock Exchange (NYSE), has $4 million under management and is composed of 96 US companies[2] that have one specific characteristic in common: they are co-founder or founder led.

It is important to note that the fund mentioned above is an active fund. Meaning that it has positions in active firms. This creates a selection bias issue in the form of survivorship bias. Presently dead firms that were founder-run were not included in the sample. One can then forecast the existence of a percentage

[2] Companies are listed on Appendix 1.

of abnormal returns on the portfolios that can be explained by successful business models or good quality management of the firms involved but not necessarily for being run by founders.

Then, using the Thomson Reuters Eikon Datastream database, I downloaded monthly prices of each firms' stock for the period between 2010 and 2019 using the variable RI (Total Return Index) and the market capitalization values for each of the firms that constitute the above-mentioned fund which were then used to construct the dependent variables, as I will explain below.

The independent variables were extracted from Professor Kenneth R. French's data library at Tuck School of Business of Dartmouth College. The data is time-series and comprises of monthly information also for the period between 2010 to 2019 totalling 120 months.

2. Variables

2.1 Dependent Variable

The equal-weighted portfolio returns were initially constructed by calculating the individual stock returns and averaging them by the number of firms. The value-weighted portfolio returns were constructed using the same method with the difference, however, that they were weighted by their respective market capitalization. Finally, these returns were deducted of the risk-free rate to calculate both dependent variables, the excess returns, measured in percentage points: EXSRet and VSXRet.

2.2 Independent Variables

As already mentioned, the independent variables were obtained from Professor's Kenneth French website. These were used in the estimation regressions with the goal of providing faithful estimates of the intercept and thus presenting an answer to this study. The rationale is that these variables, that are based on firms' characteristics, proxy for exposure to systematic risk that must be remunerated.

i. Market risk premium (RM-RF):

The market risk premium was the sole predictor in Sharpe's CAPM (Sharpe, 1964) of efficient market portfolios and it is the slope on the security market line (SML). The efficiency ensured that expected returns on securities are a positive function of their market βs (Fama & French, 1992). It provides a quantitative measure of the return demanded by investor for exposure to market risk and is calculated by deducting the return of a market portfolio of the risk-free rate, in this case given by U.S. Treasury bond yields.

ii. Small minus Big (SMB):

Banz (1981) finds that the firms' market equity (ME) adds to the explanation of average returns and that these returns are too high on small (low ME) stocks and to low on big (high ME) stocks. The SMB variable is therefore computed as the difference in returns on a portfolio of small (low ME) stocks and a portfolio of big stocks (high ME).

iii. High minus Low (HML):

High minus Low concerns the book-to-market equity ratio (BE/ME) of a firm. Chan, Hamao and Lakonishok (1991) find positive evidence on Japanese stocks that supports Rosenberg, Reid and Lanstein's (1985)'s findings that average returns are positively related to a firms' BE/ME. Thus, Fama and French (1992) add this variable to their three-factor model.

iv. Winners minus Losers (WML):

Initially proposed by Titman and Jegadeesh (1993) and applied by Carhart (1997) this variable captures excess returns that are contributed by stocks' momentum, i.e., the tendency for stocks that are performing well to continue performing.

v. Robust minus Weak (RMW):

The variable in question represents the returns of firms with robust profitability in excess of weak profitability firms as proposed by Fama and French (2015). It captures investors' return demand for exposure to this specific firm characteristic.

vi. Conservative minus Aggressive (CMA):

The CMA variable, along with RMW, was proposed by Fama and French (2015) to remunerate exposure to firms' investment policies. It represents the

spread between a portfolio of conservative investment firms and one of aggressive investment firms.

3. Summary Statistics

Table 1 presents descriptive statistics of the data in the sample. This study involved 96 firms' information throughout 120 months. The average number of firms per month is 74 e and the average number of months per firm is 99. The average market capitalization for the firms involved is $19 641 772.

Table 1: Descriptive Statistics

Nr. of firms	Nr. of months	Avg. nr. of firms per period	Avg. nr. of months per firm	Avg. mkt. cap. per period
96	120	74	99	19 641 772

1. The statistics presented are computed across 120 observations.
2. The average market capitalization per period is shown in USD.

Table 2 presents summary statistics for all the variables used: dependent variables and independent variables. The summary statistics table below suggests that, in the median month, the equal-weight portfolio has obtained an excess return of 2.59% and the value-weighted portfolio has obtained a 2.74% excess return. In this month, the market risk premium equals 1.15%, the size premium equals 0.43%, the value premium equals 0.19%, the momentum premium equals 0.78% and the profitability and investment premium equal to 0.44% and 0.45%, respectively.

Table 2: Summary statistics

Variable	Mean	Median	Minimum	Maximum	Std. Dev.
EXSRet	0.0209	0.0259	-0.1828	0.1341	0.0486
VXSRet	0.0210	0.0274	-0.1831	0.1484	0.0525
RM-RF	0.0105	0.0115	-0.0952	0.1156	0.0376
SMB	0.0008	0.0043	-0.0492	0.0529	0.0202
HML	-0.0017	0.0019	-0.0577	0.0678	0.0228
WML	0.0049	0.0078	-0.0685	0.0750	0.0274
RMW	0.0032	0.0044	-0.0363	0.0302	0.0134
CMA	0.0022	0.0045	-0.0348	0.0329	0.0144
RF	0.0004	0.0001	0.0000	0.0021	0.0007

1. The statistics presented are computed across 120 observations.

Chapter 4
Estimation Results and Discussion

I will start by presenting a correlation matrix of the variables used to test for multicollinearity among the explanatory variables and proceed to demonstrate the estimation results of the three-factor, four-factor and five-factor models (described in Chapter 3) obtained for both the value-weighted portfolio and the equal-weighted portfolio. In what follows I will describe their global as well as individual significance and adequacy to answer the research matter in hand.

1. Multicollinearity

The assumption of no perfect multicollinearity is one of the cornerstones of the OLS estimator and as such should be accounted for. Multicollinearity occurs when the independent variables in a regression are perfectly or almost perfectly colinear with each other. In other words, no variable can be expressed as a linear combination of the other. The correlation matrix presented in Table 3 was used to evaluate the presence of multicollinearity.

Table 3: Correlation matrix

Variables	MktRF	SMB	HML	RMW	CMA	WML
MktRF	1.000					
SMB	0.3955	1.000				
HML	0.0147	0.1862	1.000			
RMW	-0.2854	-0.4449	-0.1965	1.000		
CMA	-0.0894	0.0913	0.6991	-0.0563	1.000	
WML	-0.1512	-0.1089	-0.4108	0.1156	-0.2333	1.000

Table 3 presents the correlation values between independent variables. Except for a correlation of 0.6991 between the CMA and HML's variables, the absence of highly positive or negative correlations in the above results suggests that there is no presence of multicollinearity.

2. Estimation Results

The results of the three, four and five factor models are presented below for the value-weighted and equal-weighted portfolios, respectively.

2.1 Value-weighted portfolio

Table 4 presents the estimation results for the value-weighted portfolio. In equation (1), the three-factor model, I estimated a positive intercept of 1.58%, a market risk premium of 41.73%, a size premium of 22.69% and a value premium of -37.13%. The results suggest that all coefficients are significantly different from zero at the 1% level except for the SMB factor.

Table 4: Value-weighted portfolio regressions' results.

Coefficients\Equation		**(1)**		**(2)**		**(3)**
α		0.0158***		0.0171***		0.0201***
		(0.0030)		(0.0032)		(0.0036)
RM-RF		0.4173***		0.2372***		0.3420***
		(0,1143)		(0.1167)		(0.1169)
SMB		0.2269		-0.4973		0.0833
		(0.2118)		(0.211)		(0.2023)
HML		-0.3713***		-0.2535**		0.1172
		(0.1513)		(0.14603)		(0.2957)
WML				-0.3514***		
				(0.1463)		
RMW						-0.5909*
						(0.3156)
CMA						-1.2035*
						(0.4848)
Overall F-test		6.8400**		13.6100***		8.7500***
Adjusted R-squared		0.2627		0.2952		0.3142

1.All specifications include a constant term and are based on 120 observations;
2. Newey-west standard errors in brackets;
3. *** denotes p-values inferior to 1%; ** denotes p-values inferior to 5% and * denotes p-values inferior to 10%.

In equation (2), the four-factor model, I estimated a positive intercept of 1.71%, a market risk premium of 23.72%, a size premium of -49.73%, a value premium of -25.35% and a momentum premium of -35.14%. These results are similar to the ones in equation (1). In equation (3), the five-factor model, I estimated a positive intercept of 2.01%, a market risk premium of 34.20%, a size premium of 8.33%, a value premium of 11.72%, a profitability premium of -59.09% and an investment premium of -120.35%. The results obtained by this model are quite different from the other two in what magnitude, direction and significance are concerned. In the five-factor model, the first two coefficients are significantly different from zero at the 1% level, unlike the following two, the SMB and HML's coefficient estimates, that present no statistical significance at all, and the last two, the RMW and CMA's coefficient estimates, that are significant at the 10% level only.

Furthermore, the analysis shows the models above are well specified meaning that they were correctly constructed by observation of the global significance test.

The remaining results are fascinating. It is clear to see that in all models the intercepts are statistically significant from zero at the 1% level and with estimates of tremendous magnitude coming at 1.58%, 1.71% and 2.01%, respectively. This means that an unmanaged value-weighted portfolio of founder-CEO firms generates an abnormal return that is in all ways surprising.

2.2 Equal-weighted portfolio

Table 5 presents the estimation results for the equal-weighted portfolio. In equation (4), the three-factor model, I estimated a positive intercept of 1.51%, a market risk premium of 44.59%, a size premium of 68.60% and a value premium of -35.79%. In equation (5), the four-factor model, I estimated an intercept of 1.70%, a market risk premium of 40.57%, a size premium of 70.04%, a value premium of -53.25% and a momentum premium of -35.14%.

Table 5: Equal-weighted portfolio regressions' results.

Coefficients\Estimates		**(4)**		**(5)**		**(6)**
α		0.0151***		0.0170***		0.0201***
		(0.0025)		(0,0027)		(0.0027)
RM-RF		0.4459***		0.4057***		0.3839***
		(0.1299)		(0.1182)		(0.1265)
SMB		0.6860***		0.7004***		0.5147***
		(0.18467)		(0.1825)		(0.1762)
HML		-0.3579***		-0.5325***		-0.0960***
		(0.1222)		(0.1342)		(0.2205)
WML				-0.3514***		
				(0.1179)		
RMW						-0.7042***
						(0.2368)
CMA						-0.7105***
						(0.3578)
Overall F-test		13.0000***		24.4200***		12.2600***
Adjusted R-squared		0.1146		0.1215		0.1801

1.All specifications include a constant term and are based on 120 observations;
2.Newey-west standard errors in brackets;
3. *** denotes p-values inferior to 1%; ** denotes p-values inferior to 5% and * denotes p-values inferior to 10%.

A comparison of the fourth and fifth equation shows no major differences. In equation (6), the five-factor model, I estimated an intercept of 2.01%, a market risk premium of 38.39%, a size premium of 8.33%, a value premium of 11.72%, a profitability premium of -70.42% and an investment premium of -71.05%. There is once more a very satisfying positive global significance test at the 1% level. There is 1% level statistical significance across all variables and models.

The intercepts' estimates are in general of the same magnitude with the exception of the four-factor model's estimate which slightly decreases to an excess return of 1.70%.

Chapter 5
Conclusions and Limitations

In a fast-moving economy in which entrepreneurship plays an important role, founder-CEO firms' performance is a topic that certainly deserves more attention in academic literature. The existing studies suggest that there are key differences in the various aspects of managerial strategies and directions that lead to improved efficiency and performance. As already mentioned, this study will address the performance problem from a stock market performance standpoint as opposed to most studies that take an approach based on Tobin's Q and ROA (return on assets).

The first step into understanding how to effectively measure was to conduct a comprehensive and exhaustive literature review on a variety of topics ranging from traditional measures of performance to more recent and complex asset pricing models. Three models were chosen: the three-factor model by Fama and French (1992); the four-factor model by Carhart (1997) and the more recent five-factor model by Fama and French (2015). These models where then used to regress independent variables that proxy for firm characteristics on excess returns on equal and value-weighted portfolios formed using 96 firms that are either founder or co-founder led. Before moving to the conclusions withdrawn from the results obtained it is important to review the intuition behind these models. They are empirical models that were created in a search for firm's characteristics that could proxy for underlying features and measures of performance as determinants of excess returns obtained. As such, in a well

specified model, the intercept will not be, in a statistical sense, significantly different from zero. Meaning that those returns were completely explained by the proxies in question. While important in understanding the predictive power of the models, the focus of this study is not to interpret or in any way establish relations between independent and the dependent variables. Instead, it looks for intercepts that are significantly different from zero as a measure of the creation or destruction of the company's value.

The results obtained by following the above-mentioned process are exciting and very clear. Both value-weighted and equal-weighted regressions are robust, well specified and globally significant at the 1% level. In both models the intercepts are different from zero at the 1% level with coefficient estimates ranging from 1.51% to 2.01%. This implies that a very significant percentage of the monthly excess returns obtained by these founder-CEO firms are explained by something other than the size and value premium or the momentum and profitability factor. In accordance with Fahlenbrach (2009) these results provide suggestive evidence that some characteristics of the firms used to compose the portfolios allows them to create additional value. I firmly believe that the additional value originates mainly in the reduction of agency costs but also in the augmented skills and strategy of founder ownership and managerial control.

There are however some limitations that may have restrained or that could possibly have led to different results. The first concerns the limited number of firms in the sample. Finding firms that are founder-run is an exhaustive procedure and poses a great challenge for further research. One can speculate that results can be different or in some way more valid if a larger sample were used.

Secondly, other reasons for the obtainment of positive excess returns were left out of scope. It is reasonable to wonder to what extent are these stock returns

related to growth strategies and solid business models and not founder-CEO managerial skills.

The third limitation is the presence of survivorship bias. Given that my sample is composed of the holdings of an active exchange-traded fund it obviously excludes dead firms that were founder-led from the analysis which could have led to upwards biased results.

Finally, the last limitation has to do with transaction costs. The analysis conducted does not consider transaction costs that arise from transactions, i.e., buying and selling stocks, that are needed to adjust portfolio weights according to market capitalization moves. This is not the case for the value-weighted portfolio since it adjusts itself automatically, but it is particularly relevant for the equal-weighted portfolio given the need for constant balance readjustments.

Either way, further research on the topic should allow us to answer these questions and shed light on this phenomenon.

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Appendix

Appendix 1: Firms in the sample.

Firm	Ticker
INTERCONTINENTAL	U:ICE
TESLA INC	@TSLA
ROKU INC	@ROKU
RINGCENTRAL INC	U:RNG
SP INC	U:SP
PAYCOM SOFTWARE INC	U:PAYC
SEATTLE GENETICS	@SGEN
COSTAR GROUP CO	CN:LOE
NVIDIA CORPORATION	@NVDA
MEDICAL PROPERTIES	U:MPW
MARKETAXESS HLDGS	@MKTX
KKR & CO INC	D:KR5X
MASIMO CORPORATION	@MASI
ALTERYX INC	U:AYX
EPAM SYSTE	U:EPAM
NEUROCRINE	@NBIX
PENUMBRA	U:PEN
TRADE DESK INC	@TTD
FORTINET INC	@FTNT
OKTA INC	@OKTA
SEI INVESTMENTS	@SEIC
SKECHERS U.S.A., INC	U:SKX
AKAMAI TECHNOLOGIES	@AKAM
STARWOOD PROPERTY	U:STWD
HEALTHCARE TRUST OF	U:HTA
PEGASYSTEMS INC	@PEGA
AMERICAN HOM	U:AMH
CAMDEN PROPERTY	U:CPT
STAG INDUSTRIAL	U:STAG
GUARDANT HEALTH INC	@GH
BLACKROCK INC	U:BLK

MONOLITHIC POWER SYS	@MPWR
ALPHABET INC	@GOOGL
CLEAN HARBORS, INC.	U:CLH
SALESFORCE.COM, INC.	U:CRM
JAZZ PHA	@JAZZ
ZAYO GROUP	U:ZAYO
SIGTURE BANK	@SBNY
CAPITAL ONE FIN'L	U:COF
ESSENT GROUP	U:ESNT
UNIVERSAL HEALTH SVC	U:UHS
EURONET WORLDWIDE	@EEFT
DISH NETWORK	@DISH
FACEBOOK INC	@FB
VEEVA SYSTEMS INC	U:VEEV
VERISIGN, INC.	@VRSN
TEXAS ROADHOUSE, INC	@TXRH
SQUARE	U:SQ
NEXSTAR MEDIA GROUP	@NXST
BRANDYWINE REALTY	U:BDN
AVALARA INC	U:AVLR
HUBSPOT INC	U:HUBS
ZENDESK INC	U:ZEN
LAS VEGAS SANDS CORP	U:LVS
AMAZON.COM INC	@AMZN
UBIQUITI INC	U:UI
VORDO REALTY TRUST	U:VNO
REGENERON PHARMA	@REGN
AMERICAN CAMPUS COMM	U:ACC
ATHENE HOLDING LTD	U:ATH
STEEL DYMICS, INC.	@STLD
SS&C TECHNOLOGIES	@SSNC
UNITED THERAPEUTICS	@UTHR
L BRANDS INC	U:LB
NETFLIX INC	@NFLX
TWILIO INC	U:TWLO
CARGURUS INC	@CARG
REALPAGE INC	@RP

WORKDAY	@WDAY
UNDER ARMOUR, INC.	U:UAA
URBAN OUTFITTERS	@URBN
TWITTER INC	U:TWTR
WINTRUST FINCIAL	@WTFC
ZSCALER	@ZS
LYFT INC	@LYFT
GRUBHUB	U:GRUB
FEDEX CORP	U:FDX
LENDINGTREE INC	@TREE
IONIS PHARMACEUT	@IONS
ULTRAGENYX	@RARE
PEBBLEBROOK	U:PEB
NUTANIX INC	@NTNX
TIOL BEVERAGE	@FIZZ
DELL TECH	U:DELL
ALLOGENE THERAPE	@ALLO
IPG PHOTONICS CORP	@IPGP
INSPERITY INC	U:NSP
VIASAT, INC.	@VSAT
DROPBOX	@DBX
NEW RELIC	U:NEWR
WAYFAIR INC	U:W
WORLD WRESTLING ENT	U:WWE
TRIPADVISO	@TRIP
OLLIE'S BARGAIN	@OLLI
GREEN DOT CORP	U:GDOT
2U INC	@TWOU