Brand Simplicity, Stock Returns, and Firm Characteristics

Master Thesis

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Abstract

This thesis investigates the relationship between brand simplicity and stock returns. Firms that offer a "simple" product or service exhibit abnormal and superior returns during 2010-2015. High simplicity portfolios have higher alphas, 6-year raw returns and Sharpe ratios in comparison with low simplicity portfolios. In addition, the study connects brand simplicity with specific firm characteristics. Brand simplicity is associated with lower CAPEX ratios, lower leverage, and higher gross profitability. These traits of high simplicity firms, together with an under-reaction hypothesis, can potentially explain the superior stock market performance of high simplicity firms during 2010-2015.

Keywords: Brand Simplicity, Stock Returns, Factor Models, Corporate Governance

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1. Introduction

Each year since 2010, Siegel+Gale, a marketing consulting company, has been rating firms according to a key brand characteristic: simplicity. For example, in its 2015 report Siegel+Gale asked over 12,000 consumers in 8 different countries to rate the world's leading brands on the perceived simplicity of their products, services, interactions, and communications in relation to their industry peers. After analyzing the consumers' answers, the researchers construct a global simplicity index, and country specific simplicity indexes, which are ranking the firms that are included to their questionnaire from the simplest to the most complex. More specifically, they assign to its firm a BSI (Brand Simplicity Index) Score.[1] The "simple" firms have the following five characteristics: they are easy to understand, they are transparent and honest, they are making their customers to feel valued, they are innovative and fresh, and they are useful.

The starting point of my thesis is that, according to the index's creators, a portfolio of the publicly traded stocks of the Top-10 brands in the Global Simplicity Index has outperformed the S&P 500, from the beginning of 2009 until their 2015 report, by 188%. This claim seems quite intriguing from the investors' point of view. Are there arbitrage opportunities in brand simplicity? In addition to that, the topic is academically relevant. The finance scholar would like to know what kind of information is contained in brand simplicity. Why high simplicity firms outperform the market? Finally, since simplicity is a brand characteristic, marketing professionals would like to see how their actions can add value to their companies and affect shareholders' returns. It is therefore of considerable interest to determine whether the returns of high simplicity firms are abnormal, see if brand simplicity is associated with these superior returns, and investigate what kind of information might be contained in brand simplicity.

The thesis will address the empirical question of whether there is a meaningful relationship between brand simplicity and superior stock market performance. First, I will determine if the returns of high simplicity firms of the USA Simplicity Index between 2010 and 2015 are abnormal by constructing high simplicity portfolios and calculating Carhart (1997) model's alphas. Positive and statistically significant alphas will lead to the inference that high simplicity firms exhibit a

[1] Firms that are included in multiple simplicity indexes (e.g. global, USA, United Kingdom) have different BSI Scores in its index. During the thesis when I refer to BSI Score I mean USA's brand simplicity index score.

superior stock performance that cannot be explained by Carhart model's research factors, i.e., their returns are abnormal. In addition, I will compare the Carhart model's alphas between high and low simplicity portfolios. An economically and statistically significant difference will strengthen the association of brand simplicity with superior stock returns. Moreover, I will test whether other factor models can explain the cross-sectional variation of high simplicity firms' returns. More specifically, I will see if Fama-French's (2015) novel 5-Factor model, and Carhart's 4-Factor model augmented by the "Quality minus Junk" factor of Asness, Frazzini, and Pedersen (2014) can capture the variation of the returns. Economically and statistically significant alphas will strengthen the argument that the returns of high simplicity firms are abnormal.

Next, I will try to answer the question of what might be different about high simplicity firms, and develop a hypothesis that connects brand simplicity to firm characteristics. My hypothesis is that since the high simplicity firms offer a simple product or service they will have lower CAPEX, lower leverage, and higher profitability. The idea is that a simple product or service makes the operations of a firm "run" more efficiently and, therefore, the company has lower expenses in relation to its assets, less need to borrow, and higher gross profitability. I will test the hypothesis by using the sample of the publicly traded companies that are included in the USA Simplicity Index during 2010 - 2015 and "run" regressions of firms' traits (e.g., CAPEX) on BSI Score. Finally, I will develop a theory that could connect the above traits to superior stock returns and I will try to strengthen the theory by using examples of equivalent results from the asset pricing literature. My theory is that lower CAPEX, lower leverage, and higher gross profitability together with an under-reaction hypothesis from the part of investors, since these traits according to the efficient market hypothesis should have been priced in 2010, could explain the superior returns of high simplicity firms during 2010 - 2015. The under-reaction hypothesis is necessary because some firms are constantly in high simplicity levels during these period.

I find that the returns of high simplicity firms are abnormal. Carhart model's alphas are positive and statistically significant for high simplicity portfolios. Moreover, the alphas, 6-year raw returns, and Sharpe ratios of high simplicity portfolios are higher than those of low simplicity portfolios. This result leads to the inference that simplicity might play a role for the superior stock performance of high simplicity firms during 2010 - 2015. Also, I find that the two other factor models cannot capture the cross-sectional variation of the high simplicity firms' returns. Finally, I test the

hypothesis that the simplicity of the product/service could lead to lower CAPEX, lower leverage, and higher gross profitability. The results show that brand simplicity is associated with the above three characteristics.

Another interesting question is whether the quality of governance plays a role to the association of simplicity with lower CAPEX and lower leverage. High governance quality could limit managements spending for personal reasons (e.g., empire building, personal perks). Also, if a firm has proper governance does not need to adopt high debt levels for management discipline purposes. The reasoning behind this is that the debt reduces the free cash flows that self-service managers have in their disposal, and, therefore, effectively controls over-investment (e.g., Jensen (1986)). I investigate the role of corporate governance by dividing the sample into high and low governance quality firms, and "run" separately regressions of CAPEX and leverage on BSI Score and controls. The findings show that CAPEX and leverage are more sensitive to BSI Score at high governance quality firms. This is expected since their managers will spent and borrow exactly what is needed for their operations (less "noise" from private benefits spending and discipline borrowing).

My thesis contributes to the marketing research literature which studies the effect of product market to stock market. It adds to the research of Madden et al. (2006) who show that the power of the brand, i.e., how valuable a brand is according to Interbrand, affects stock returns. In addition, the thesis relates to the work of Srinivasan et al. (2009) that connect product innovation and advertising to stock returns. While their work focus on how the innovativeness of new products and the advertising support for pioneering innovations affect stock returns, my thesis focus on a product characteristic, i.e., brand simplicity, and its relationship with stock returns. The paper also contributes to the asset pricing literature and it is in favor of the group that believes that differences in stock returns derive for market over- or under-reactions to various events. Simplicity cannot in any way increase the risk of the stock and thus the superior returns of simple firms during 2010 - 2015 can maybe explained by under-reaction to the positive implications (i.e., lower CAPEX, lower leverage, higher profitability) of it. Finally, the thesis contributes indirectly to the cognitive psychology literature which shows that people prefer simpler decisions.

2. Theoretical Framework

2.1 Current State of the Literature

Even though the question of how product market characteristics and stock market performance are related is quite central, the literature is scarce. Madden et al. (2006) show that strong brands, i.e., brands that were at least once among the most valuable brands of Interbrand lists, not only deliver greater returns to stockholders than does a relevant benchmark but also do so with less risk. Srinivasan et al. (2009) argue that investors react favorably to companies that launch pioneering innovations, have higher perceived quality, are backed by substantial advertising support, and are in large and growing categories. Cohen and Lou (2012) document a return predictability pattern from easy-to-analyze firms to their more complicated peers. A positive industry shock will be first incorporated in the stock price of a firm that does business only in the specific industry and afterwards to a conglomerate firm that does business in multiple industry segments.

On the other hand, the asset pricing literature is abundant. In their quest for the holy grail many academics and practitioners have tried to explain the cross-sectional variation in stock returns. Fama and French (1992) find that size and book-to-market ratio can capture the cross-sectional variation in stock returns. More specifically, firms with that are small or have high book-to-market ratios generate superior returns. Jegadeesh and Titman (1993) argue that momentum strategies generate significant positive returns, and Carhart (1997) adds the momentum factor to Fama and French 3-Factor model. The idea is that firms with high prior returns tend to exhibit high returns in the future. Pastor and Stambaugh (2001) describe the liquidity factor, and Titman et al. (2004) find that firms which substantially increase capital investments subsequently achieve negative benchmark-adjusted returns. Penman et al. (2007) argue that the leverage component of book-to-price ratio is negatively associated with future stock returns, and Novy-Marx (2013) finds that gross profits-to-assets can explain patterns in stock returns, i.e., firms with high profitability deliver higher returns. Fama and French (2015) propose a 5-Factor model directed to capture the size, value, profitability, and investment patterns in average stock returns.

Finally, in the cognitive psychology literature there are some examples suggesting that people like simplicity. Tversky and Shafir (1992) argue that the tendency to defer decision, search for new alternatives, or choose the default option can be increased when the offered set is enlarged. Iyengar

and Lepper (2000) show that people are more likely to purchase gourmet jams or chocolates when offered a limited array of 6 choices rather than a most extensive array of 24 choices. Sethi-Iyengar et al. (2004) found that participation in 401(k) plans is higher in plans offering a handful of funds, as compared to plans offering ten or more options.

2.2 Hypothesis Development

The key prediction of my thesis is that brand simplicity leads to operational efficiency. Since high simplicity firms offer a "simple" product or service, it is easier for them to find the resources that contribute more to their success and streamline their operations in a cost effective way. Therefore, "simple" companies will spend less money in their existing operations (lower CAPEX) and will have less need to borrow (lower leverage) in order to achieve their desirable business results. Another aspect of operational efficiency is that high simplicity firms can attract customers in a cost effective way, since people are looking for simpler experiences, and increase their revenues. In addition, Siegel+Gale (2015) report that according to their research 63% of consumers are willing to pay more for a simpler experience, and 69% are more likely to recommend a brand because it provides simpler experience. Therefore, these companies might have higher gross profitability. I summarize my hypothesis as follows:

H1: *A "simple" product or service will lead to more efficient operations, which means that the firms that offer it will have lower CAPEX ratios, lower leverage and higher gross profitability.*

The above characteristics of high simplicity firms could explain the superior returns. First, the lower CAPEX might be viewed favorably by investors since CAPEX can be used from managers in order to maximize their personal benefits (e.g., new offices, corporate jets). In addition, the lower leverage can be seen positive by investors since it can alleviate their financial distress considerations (e.g., troubles to repay the debt, loss of suppliers). Also, firms with high leverage are prone to the agency costs of debts (e.g., excessive risk taking). Finally, the higher profitability boosts investors' confidence to the management since it means that their investment in the firm is used efficiently. These traits of high simplicity firms make their stocks more attractive to investors. The combination of this, together with an under-reaction hypothesis from the part of investors, can potentially explain the superior performance of high simplicity firms during 2010 - 2015. I am making a pricing bias hypothesis since simplicity (i.e., low CAPEX, low leverage, and high

profitability) should have been priced in 2010, according to the efficient market hypothesis. It is necessary to make this hypothesis because some firms are constantly in high simplicity levels during 2010 - 2015. However, I must add that during the tests of portfolios' returns on factor models I change the construction of the high simplicity portfolios every year in order to include the firms that have reached high simplicity levels during this period. Therefore, new information that investors see positively could also play a role to the superior high simplicity portfolios' returns.

There are also other papers from asset pricing literature that document results close to the above theories by using different samples. For example, Titman et al. (2004) find a negative relationship between abnormal capital investment and return. In addition, they short portfolios on abnormal capital investment and book leverage, and find that the firms which are part of the lowest abnormal capital investment and the lowest book leverage portfolio exhibit the higher mean monthly excess return as well as the higher Carhart model's alpha during the period of their study. Also, Penman et al. (2007) document that leverage is negatively related to future returns, and Novy-Marx (2013) argues that profitable firms generate significantly higher returns than unprofitable firms. Finally, Haugen and Baker (1996) found that stocks with higher expected and realized rates of return are unambiguously lower in risk than stocks with lower return. In the above papers, investors' under-reactions are usually proposed as explanation for the superior returns. These examples strengthen my theory that low CAPEX, low leverage, and high profitability could be behind the 2010 - 2015 superior stock performance of high simplicity firms.

3. Data and Methodology

3.1 Data Sources

The data are retrieved for many sources. The BSI Score is taken from Siegel+Gale brand simplicity reports[2]. The stock returns are obtained from CRPS database, and they are dividend adjusted. The research factors are retrieved from professor's Kenneth R. French website,[3] expect from Quality minus Junk factor that has been downloaded from professor Andrea Frazzini's website.[4] Finally, the fundamentals are obtained from CRPS/Compustat Merged database and the governance indicators from MSCI ESG KLD Stats.

I select from the databases the public traded companies that are part of the Siegel+Gale simplicity reports during 2010 - 2015. I only choose firms that the connection between the product and the stock market is strong. For example, Comfort Inn hotels are part of the Choice Hotels International Inc., which is a publicly traded company. However, I do not include Choice Hotels International Inc. in the data since the company owns a lot of other hotels. The financial firms are dropped from the sample since the nature of their operations is intrinsically different. Moreover, these firms cannot achieve high simplicity levels since the financial products they offer are usually complex. Also, I exclude firms with negative book value from the panel dataset that I use for the BSI Score regressions but not from the returns dataset that I use for the factor models.

3.2 Research Plan and Methodology

As a first step, I will determine whether the returns of high simplicity firms are positive and abnormal. More specifically, I will regress monthly excess returns of high simplicity portfolios, both equal-weighted and value-weighted,[5] on Carhart model's research factors and see if the alphas are economically and statistically significant different from zero. In addition, I will try to establish a connection between brand simplicity and superior stock returns by forming portfolios of high and low simplicity firms (Top and Bottom Quintile, Top and Bottom Quartile, Top and Bottom Tercile),

[2] The 2011-2015 brand simplicity reports are downloaded from www.rankingthebrands.com, and the 2010 report is retrieved from www.siegelgale.com/wp-content/uploads/2011/04/Global_Brand_Simplicity_Survey_2010_US.pdf.
[3] http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html
[4] http://www.econ.yale.edu/~af227/data_library.htm
[5] The market capitalizations of the firms will be Winsorized at the 10th and 90th percentiles to limit the impact of outliers.

and compare the Carhart model's alpha. The composition of the portfolios will change each year in order to include the new firms that reached high simplicity levels between reports.[6] I use heteroscedasticity and autocorrelation consistent Newey-West standard errors.[7] The model that I will use is the following:

$$R_{pt} - R_{ft} = a_p + \beta^m MKT + \beta^{smb} SMB + \beta^{hml} HML + \beta^m MOM + \varepsilon_t, \quad (1)$$

where R_{pt} are the monthly returns of the portfolios, and R_{ft} are the monthly risk-free rates during 2010 - 2015. The MKT factor is the market excess return, and β^m shows how much the portfolios' excess returns covary with market's excess returns. The SMB factor is designed to capture the size premium of stock returns. Small firms deliver superior returns because they are riskier. The HML factor was constructed in order to capture the value premium. Firms that have high book value of equity to market value of equity tend to exhibit superior performance. Finally, MOM was designed in order to capture the momentum effect, which states that the past performance of stock is positively correlated with its future performance. All research factors are described in detail in the Appendix.

Then, I will do a robustness test in order to see if other factor models can capture the cross-sectional variation of the high simplicity firms' returns. In greater detail, I will "run" monthly time-series regressions of the Top Quartile (BSI Score) portfolio's excess returns on different factor models. For this purpose, I will use the following models:

$$R_{pt} - R_{ft} = a_p + \beta^m MKT + \beta^{smb} SMB + \beta^{hml} HML + \beta^{rmw} RMW + \beta^{cma} CMA + \varepsilon_t, \quad (2)$$

$$R_{pt} - R_{ft} = a_p + \beta^m MKT + \beta^{smb} SMB + \beta^{hml} HML + \beta^m MOM + \beta^{qmj} QMJ + \varepsilon_t, \quad (3)$$

where R_{pt} are the monthly returns of the portfolios, and R_{ft} are the monthly risk-free rates during 2010 - 2015. Model (2) is the novel Fama-French's 5-Factor model. The model includes two new

[6] The research of Siegel+Gale usually is conducted in the middle of each year while the portfolios are formed in the beginning of the year.

[7] The lag length will be equal to 3 and was chosen according to the following rule of thumb: $L = \sqrt[4]{N}$, where L is the lag length and N is the total number of observations (Baum 2006).

research factors, i.e., RMW and CMA, which are designed to capture profitability and investment patterns in stock returns. According to Fama and French (2015) firms with higher profitability and firms with lower investment deliver superior returns. Model (3) is the Carhart's 4-Factor model plus the "Quality minus Junk" (QMJ) factor of Asness, Frazzini, and Pedersen. The QMJ factor is designed to capture the superior returns that high quality firms exhibit. Asness et al. (2014) describe the high quality firms as firms which are safe, profitable, growing, and well managed. I will use heteroscedasticity and autocorrelation consistent Newey-West standard errors. All research factors are described in detail in the Appendix.

Finally, I will test the hypothesis that high simplicity firms have lower CAPEX, lower leverage and higher gross profitability. I expect simplicity to be associated with the above traits since a simple product or service could lead to more efficient operations. For this test, I will use the following models:

$$CAPEX_{it} = \beta_1 + \beta_2 BSI_{it} + \beta_3 X_{it} + \varepsilon_{it}, \quad (4)$$

$$LEV_{it} = \beta_1 + \beta_2 BSI_{it} + \beta_3 X_{it} + \varepsilon_{it}, \quad (5)$$

$$PROF_{it} = \beta_1 + \beta_2 BSI_{it} + \beta_3 X_{it} + \varepsilon_{it}, \quad (6)$$

where $CAPEX_{it}$ is the ratio of capital expenditures to lagged assets of firm i in year t, LEV_{it} is the ratio of total debt to assets of firm i in year t, $PROF_{it}$ is the ratio of gross profits to lagged assets of firm i in year t, and BSI_{it} is the BSI Score of firm i in year t divided by 1000. In addition, all models include different vectors of control variables X_{it}, which will be changing according to the specification. In model (4), I will use as controls size, book leverage, and book-to-market. In model (5), I will use as controls gross profitability, size, and book-to-market. In model (6), the control variables will be size, book leverage, and book-to-market. The size, book leverage, and book-to-market are chosen as controls because they are the most salient firm characteristics that can differentiate companies, and therefore they might play a role for differences in CAPEX, leverage and profitability. In model (5) I also control for gross profitability because, according to pecking order, firms will first use profits and then debt for financing purposes. Therefore, I expect a negative and statistically significant coefficient on this control. I provide a complete list of variable definitions in

the Appendix. Also, in some of the specifications, the vectors of controls variables will also include industry fixed effects. [8] Finally, standard errors will be robust in order to correct for heteroscedasticity.

4. Empirical Results

This chapter presents the main findings of the thesis. First, I investigate the relationship between brand simplicity and stock returns. Then, I do a robustness test in order to see if other factor models can capture the cross-sectional variation of high simplicity firms' returns. Finally, I try to connect brand simplicity with specific firm characteristics.

4.1 Brand Simplicity and Stock Returns

This section discusses the results of model (1), which are presented in Table 2. First, I want to see whether the returns of high simplicity firms are abnormal. For this purpose, I "run" regressions of different equal-weighted and value-weighted high simplicity portfolios' returns on Carhart's 4-Factor model. More specifically, I form portfolios according to their BSI Score, i.e., Top Quantile, Top Quartile, and Top Tercile. The results show that, in both equal-weighted and value-weighted terms, the alphas are positive and statistically significant. Therefore, we can say that the returns of high simplicity firms during 2010 - 2015 are abnormal. Their superior performance cannot be explained from Carhart's 4-Factor model.

As a next step, I investigate if simplicity could be responsible for the abnormal performance of high simplicity firms. For this purpose, I form Bottom Quantile, Bottom Quartile, and Bottom Tercile portfolios and compare their alphas, 6-year raw returns and Sharpe ratios with that of the respectively Top portfolios. As we see from Table 2, the results reveal that the high simplicity portfolios have higher alphas, 6-year raw returns and Sharpe ratios in comparison with the low simplicity portfolios (except for the Top Tercile vs Bottom Tercile in value weighted terms). Also, we can say that the economic effect weakens as we move from Top Quantile to Top Tercile, and from equal-weighted to value-weighted terms. In addition, the difference between the alphas is

[8] I define the industries by using two-digit NAICS (North American Industry Classification System) codes. The results with one-digit SIC (Standard Industrial Classification) codes are not promising.

statistically significant only for the Top Quintile vs Bottom Quintile equal weighted portfolios, and for the Top Quartile vs Bottom Quartile equal weighted portfolios.[9] Moreover, the results show that the economic effect is big for the statistically significant differences. The Top Quintile equal weighted portfolio has 0.56% higher monthly alpha than the Bottom Quintile equal weighted portfolio, and the Top Quartile equal weighted portfolio has 0.46% higher monthly alpha than the Bottom Quartile equal weighted portfolio.

In sum, high brand simplicity firms' returns during 2010 - 2015 are abnormal. High simplicity portfolios' alphas are positive and statistically significant, and brand simplicity could be behind this superior performance.

4.2 Robustness Test

Next, I test whether other factor models can capture the cross-sectional variation of high simplicity firms' returns. For this purpose, I use models (2)-(3), and I "run" regressions of an equal-weighted and a value-weighted Top Quartile (BSI Score) portfolio's excess returns on the models' research factors. Model (2) is the novel Fama-French's 5-Factor model which includes two new research factors, i.e., RMW, and CMA, that maybe can capture a proportion of the cross-sectional variation of high simplicity firms' returns. According to Fama and French (2015) firms with higher profitability and firms with lower investment deliver superior returns. The RMW factor has been constructed to capture the profitability premium, and the CMA factor the investment premium. I expect positive loadings on both factors. Model (3) is the Carhart's 4-Factor model plus the QMJ factor of Asness, Frazzini, and Pedersen. The QMJ factor is constructed in order to capture the superior returns that high quality firms deliver. Asness et al. (2014) describe the high quality firms as firms which are safe, profitable, growing, and well managed. This factor also seems promising in capturing a proportion of the variation of high simplicity firm' returns and I expect a positive loading on it. The factors are explained in detail in the Appendix.

Table 3 presents the results of models (1)-(3). The table shows regressions of Top Quartile (BSI Score) portfolios' excess returns on the models' research factors. In Panel A, we see the alphas and the factor loadings of the equal-weighted Top Quartile (BSI Score) portfolio, and in Panel B that of

[9] Comparison of the alphas by using 'suest' command in Stata.

the Top Quartile (BSI Score) value-weighted portfolio. First, the results show that the two new models cannot capture the cross-sectional variation of the high simplicity firms' returns. The three models' alphas are roughly the same for both the equal-weighted and the value-weighted portfolios. In addition, we see that the factors work better for the value-weighted portfolio. The loading in RMW factor is positive for both portfolios, and therefore we can say that the Fama-French 5-Factor model captures the profitability premium. However, the loading on CMA factor is negative for both portfolios. This is happening probably because Fama and French "proxy" investment with asset growth (not CAPEX). Finally, the QMJ factor has different signs for the two portfolios. It is negative and statistically significant at 10% for the equal-weighted portfolio, and positive and statistically insignificant for the value-weighted portfolio. This tell us that simplicity is not associated with the definition of high quality firms of Asness et al. (2014).

In sum, other well-known factor models cannot capture the cross-sectional variation of high simplicity firms' returns. The new models' alphas are also positive and statistically significant. This result strengthens the argument that high simplicity firms' returns are abnormal.

4.3 Brand Simplicity and Firm Characteristics

In this section, I will test the hypothesis that brand simplicity is associated with lower CAPEX, lower leverage, and higher gross profitability. The reasoning behind the hypothesis is that a simple product or service leads to operational efficiency, which lowers the "simple" firms' spending expenses and the extent of their borrowing. Moreover, I expect high simplicity companies to have higher gross profitability because they can attract customers in a cost effective way since people are looking for simpler experiences.

Tables 4-6 present the results of models (4)-(6). The tables show that, during 2010-2015, brand simplicity is associated with lower CAPEX, lower leverage, and higher gross profitability. As expected, the models in which the set of controls includes industry fixed effects explain a lot more of the variation of the depended variables than the models without industry fixed effects (higher R-squared). This is happening because different industries have different expected CAPEX, leverage and gross profitability. In addition, the coefficients on BSI Score are more statistically and economically significant when industry fixed effects are included in the models (except for the Profitability – BSI Score regression). This tell us that the BSI Score explains more of the variation of

CAPEX and leverage within industries. In greater detail, a firm that has 100 points higher BSI Score will have on average 12.1% lower CAPEX, and a firm that has 100 points higher BSI Score will have on average 11.2% lower leverage. Also, a company that has 100 points higher BSI Score will have on average 7% higher gross profitability.

Finally, I would like to add some comments on regressions of cash holdings, cost of goods sold, and payout without presenting tables. First, BSI Score is also associated with higher cash holdings. The fact that high simplicity firms have the discretion to spend more strengthens the negative association of CAPEX with BSI Score. Second, high simplicity firms have neither lower nor higher cost of goods sold than low simplicity firms (statistically and economically insignificant coefficient on BSI Score). This finding presents a limitation for my hypothesis that brand simplicity could lead to operational efficiency. It would be expected high simplicity firms to have lower cost of goods sold since they can streamline their operations and minimize these costs. However, the fact that the high simplicity firms have higher gross profitability shows that these firms make more expensive products more efficient. Third, high simplicity firms have neither higher nor lower payout than low simplicity firms (statistically and economically insignificant coefficient on BSI Score).

In sum, the hypothesis that brand simplicity is associated with lower CAPEX, lower leverage, and higher gross profitability seems to be true for the period 2010 - 2015. The above firm characteristics, together with an under-reaction hypothesis, can potentially explain the superior stock performance of high simplicity firms during the sample period.

5. The Role of Corporate Governance

In this section, I will investigate the role that the quality of governance might play for the association of brand simplicity with CAPEX and leverage. Without proper monitoring managers might pursue their personal goals at shareholders' expense. CAPEX can be used from managers in order to maximize their personal benefits. For example, a manager might want to renovate her office or buy a corporate jet in order to achieve a higher status. These kind of expenses are going to be reported as capital expenditures. Harford et al. (2012) found that the combination of excess cash and weak shareholders' rights, which can be consider a proxy of low governance quality, leads to increases in capital expenditures. In addition to that, leverage also could be affected by the quality of governance. Debt is more valuable for low governance quality firms since it can serve as a managers' discipline mechanism, and shareholders might push management to adopt high debt levels when they believe that other monitoring devices are ineffective (e.g. board of directors, managerial incentives). Harvey et al. (2004) argue that shareholders benefit from intensively monitored debt in circumstances in which managers are most likely to exploit them.[10] The idea is that the managers will not over-invest the free cash flows because they will need to repay the debt. The above theories are expected to introduce "noise" in the low governance quality firms' data, and weaken the association of BSI Score with CAPEX and leverage.

First, I construct a governance indicator with which I will divide my sample to high and low quality of governance firms. For this purpose, I download from MSCI ESG KLD Stats two negative governance performance indicators, i.e., Governance Structures and Business Ethics for 2010 to 2015. Both indicators are described in detail in the Appendix. The construction of my governance indicator happens as follows: If a company in any year have met the criteria of the negative indicators is classified as low quality of governance firm. The remaining firms are classified as high quality of governance companies.

Next, I test whether CAPEX and leverage are more sensitive to BSI among high quality of governance firms. For this purpose, I divide the sample in high and low governance quality firms and "run" regressions of CAPEX/leverage on BSI Score and controls for both. For this purpose, I use

[10] It is worth mentioning that there is a debate in the literature. Some researchers (e.g. Berger et al. (1997)) find that leverage levels are lower when managers do not face active monitoring.

the models (4) and (5). In model (4), the dependent variable is $CAPEX_{it}$ representing the ratio of capital expenditures to lagged assets of firm i in year t, and the variable of interest is the BSI_{it} , which is the BSI Score of firm i in year t divided by 1000. Also, I use as controls size, book leverage, and book-to-market. In model (5), the dependent variable is LEV_{it} representing the ratio of total debt to assets of firm i in year t, and the variable of interest is the BSI_{it}. Moreover, I use as controls gross profitability, size, and book-to-market. All the variables are described in detail in the Appendix. Finally, the models include industry fixed effects.[11]

Tables 7-8 present the results. We see from the tables that CAPEX and leverage are more sensitive to BSI Score at high quality governance firms. The comparison of the coefficients on BSI Score reveals that their differences are statistical significant.[12] Moreover, in low quality of governance regressions the controls and the constants lose statistical significance. In addition, the R-squared are higher for the high quality of governance sample. It seems that the spending and borrowing of low governance quality firms exhibit patterns that cannot be explained from the models with statistical significance. This result adds to my hypothesis that the simplicity of the product or service is responsible for the lower CAPEX and lower leverage. We expect CAPEX and leverage to be more sensitive to BSI Score at high governance quality firms since their managers will spent and borrow exactly what is needed for their operations (less "noise" from private benefits spending and discipline borrowing).

In sum, CAPEX and leverage are more sensitive to BSI Score among high quality of governance firms.

[11] I define the industries by using two-digit NAICS (North American Industry Classification System) codes.
[12] Comparison of the coefficients by using 'suest' command in Stata.

6. Conclusion

This thesis investigates the relationship between brand simplicity and stock returns. It documents that the returns of high simplicity firms are abnormal, and exhibit a superior performance during the period 2010 - 2015. Existing factor models cannot capture the cross-sectional variation of the high simplicity firms' returns. In addition, the paper connects brand simplicity with superior stock returns by comparing the Carhart model's alphas of high simplicity portfolios with that of low simplicity portfolios. The results show that high simplicity portfolios' returns exhibit superior alphas, and therefore brand simplicity could be associated with superior stock performance.

Moreover, I find that high brand simplicity firms have on average lower CAPEX, lower leverage, and higher gross profitability. The reason behind this might be the fact that these firms have more efficient operations, and therefore less need to invest, less need to lever, and higher profits in relation to their assets. The above traits, together with an under-reaction hypothesis from the part of investors, could explain the superior returns of the high brand simplicity firms during 2010 - 2015.

The findings have potentially important implications for the relation between product characteristics and stock returns in USA. A research on other markets is possible since the BSI Scores are available for a wide range of countries. Results identical to mine will strengthen the association between brand simplicity and stock returns. Another interesting aspect of simplicity is that it could represent the overall culture of the management. A research in the management characteristics (e.g., educational background, MBA School, age) might reveal similarities among high simplicity firms.

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Siegel+Gale (2013), *Global Brand Simplicity Index 2013.*
Siegel+Gale (2014), *Global Brand Simplicity Index 2014.*
Siegel+Gale (2015), *Global Brand Simplicity Index 2015.*

Table1: Summary Statistics

The table presents summary statistics for the full sample (fundamentals plus BSI Score). The sample consists of all the non-financial, publicly traded firms that are part of the USA Simplicity Index over the period 2010 – 2015. A firm must have a BSI Score at the specific year in order to be included in the sample. Also, observations with negative book value are excluded from the sample. The fundamentals are retrieved from CRPS/Compustat Merged database, and the BSI score from Siegel+Gale brand simplicity reports. A complete list of definitions of the variables is provided in the Appendix.

	(1)	(2)	(3)	(4)	(5)
Variable	**N**	**Mean**	**Standard Deviation**	**Min**	**Max**
Book-to-Market	315	0.393	0.323	0.000	2.062
Size	318	10.02	1.542	4.924	13.09
Book Leverage	314	0.261	0.178	0.000	0.684
Capital Expenditures (% of lagged assets)	310	0.069	0.076	0.005	0.562
Gross Profitability (% of lagged assets)	310	0.438	0.280	0.021	2.041
Cost Of Goods Sold (% of lagged assets)	310	0.751	0.664	0.023	4.153
Cash Holdings (% of total assets)	318	0.188	0.166	0.005	0.790
Payout	307	0.018	0.026	0.000	0.207
BSI Score	318	622	136	211	916

Table 2: Brand Simplicity and Stock Returns

The table reports results of monthly time-series regressions of different portfolios excess returns on Fama-French factors, and momentum. The model is Carhart's 4-Factor model: $R_{pt} - R_{ft} = a_p + \beta^m MKT + \beta^{smb} SMB + \beta^{hml} HML + \beta^m MOM + \varepsilon_t$, where R_{pt} are the monthly returns of the portfolios and R_{ft} are the monthly risk-free rates during 2010-2015. The factors are described in detail in the Appendix. The portfolios are sorted on BSI Score (Panel A: Top-Bottom Quintile, Panel B: Top-Bottom Quartile, and Panel C: Top-Bottom tercile). Every year (2010-2015) the composition of the portfolios changes in order to include the new Top or Bottom simplicity firms. At the value-weighted portfolios the market capitalizations of the firms are Winsorized at the 10th and 90th percentiles in order to avoid extreme weights. The table also shows two performance statistics of the portfolios: the 6-year raw excess return and the Sharpe ratio. The sample consists of all the non-financial, publicly traded firms that are part of the USA Simplicity Index over the period 2010 – 2015. The returns are retrieved from CRPS database, the factors from professor's Kenneth R. French website and the BSI score from Siegel+Gale brand simplicity reports. Newey-West t-statistics are reported in square brackets. The lag length is equal to 3 and was chosen according to the following rule of thumb: $L = \sqrt[4]{N}$, where L is the lag length and N is the total number of observations (Baum 2006). The table also reports chi square statistics of the differences between the Top and Bottom portfolios alphas.

Portfolios Sorted on BSI Score

	Carhart's model factor loadings					Performance Statistics	
Panel A: Quintiles							
	α	MKT	SMB	HML	MOM	6-year Return	Sharpe Ratio
Equal-Weighted Portfolio							
Top Quintile	0.0104	0.8340	0.0865	-0.3161	0.0657	1.4892	0.4754
	[3.05]	[9.38]	[0.39]	[-1.43]	[0.42]		
Bottom Quintile	0.0048	1.0017	0.0927	0.0323	-0.0284	1.1188	0.2792
	[1.14]	[7.33]	[0.46]	[0.13]	[-0.15]		
Chi Square Statistic	11.32						
Value-Weighted Portfolio							
Top Quintile	0.0072	0.9246	-0.3946	-0.5352	0.1772	1.3935	0.4539
	[2.17]	[11.88]	[-2.42]	[-2.75]	[1.72]		
Bottom Quintile	0.0054	0.7762	-0.4546	-0.0757	0.0744	1.0256	0.4035
	[2.13]	[10.49]	[-3.73]	[-0.68]	[0.61]		
Chi Square Statistic	1.69						

Panel B: Quartiles

	α	MKT	SMB	HML	MOM	6-year Returns	Sharpe Ratio
Equal-Weighted Portfolio							
Top Quartile	0.0091	0.9081	-0.0364	-0.2657	0.0862	1.4486	0.4701
	[3.03]	[11.13]	[-0.21]	[-1.24]	[0.72]		
Bottom Quartile	0.0045	0.9896	0.1345	0.0886	-0.0058	1.0909	0.2839
	[1.15]	[7.44]	[0.70]	[0.40]	[-0.03]		
Chi Square Statistic	9.69						
Value-Weighted Portfolio							
Top Quartile	0.0067	0.9533	-0.4595	-0.5000	0.1582	1.3629	0.4572
	[2.34]	[13.57]	[-3.64]	[-2.68]	[1.67]		
Bottom Quartile	0.0056	0.8334	-0.4088	-0.2042	0.0115	1.0805	0.4195
	[2.33]	[12.32]	[-3.69]	[-2.55]	[0.13]		
Chi Square Statistic	1.13						

Panel C: Terciles

	α	MKT	SMB	HML	MOM	6-year Returns	Sharpe Ratio
Equal-Weighted Portfolio							
Top Tercile	0.0056	0.9518	0.0062	-0.1876	0.1304	1.2401	0.3987
	[1.96]	[12.15]	[0.04]	[-0.87]	[1.21]		
Bottom Tercile	0.0043	1.0401	0.1544	0.0227	-0.0091	1.1247	0.3029
	[1.21]	[10.20]	[1.01]	[0.11]	[-0.06]		
Chi Square Statistic	1.45						
Value-Weighted Portfolio							
Top Tercile	0.0048	0.9048	-0.3406	-0.3465	0.2307	1.1949	0.4365
	[1.91]	[14.62]	[-3.57]	[-2.19]	[2.79]		
Bottom Tercile	0.0068	0.8852	-0.2790	-0.1139	0.0449	1.2117	0.4519
	[2.64]	[13.11]	[-2.44]	[-1.07]	[0.47]		
Chi Square Statistic	3.41						

Table 3: Top Quartile (BSI Score) Portfolio's Returns on Different Factor Models

The table presents results of monthly time-series regressions of the equal-weighted (Panel A) and value-weighted (Panel B) Top Quartile (BSI Score) portfolios excess returns on research factors. Every year (2010-2015) the composition of the portfolio changes in order to include the new Top Quartile (BSI Score) firms. Column (1) reports the estimates of the Carhart's 4-Factor model: $R_{pt} - R_{ft} = a_p + \beta^m MKT + \beta^{smb} SMB + \beta^{hml} HML + \beta^m MOM + \varepsilon_t$, where R_{pt} are the monthly returns of the Top Quartile (BSI Score) portfolio and R_{ft} are the monthly risk-free rates during 2010-2015. Column (2) reports the estimates of the novel Fama-French's 5-Factor model: $R_{pt} - R_{ft} = a_p + \beta^m MKT + \beta^{smb} SMB + \beta^{hml} HML + \beta^{rmw} RMW + \beta^{cma} CMA + \varepsilon_t$. Column (3) reports the estimates of the Carhart's 4-Factor model plus the "Quality minus Junk" factor of Asness, Frazzini, and Pedersen. The factors are described in detail in the Appendix. The sample consists of all the non-financial, publicly traded firms that are part of the USA Simplicity Index over the period 2010 – 2015. The returns are retrieved from CRPS database, the factors from professor's Kenneth R. French website (except QMJ factor that has been downloaded from professor Andrea Frazzini's website) and the BSI score from Siegel+Gale brand simplicity reports. Newey-West standard errors are reported in parentheses. The lag length is equal to 3 and was chosen according to the following rule of thumb: $L = \sqrt[4]{N}$, where L is the lag length and N is the total number of observations (Baum 2006).

Panel A: Equal-Weighted Top Quartile (BSI Score) Portfolio

	(1) Carhart 4-Factor Model	(2) Fama-French 5-Factor Model	(3) Quality minus Junk Model
MKT	0.9081***	0.9362***	0.8289***
	(0.0816)	(0.0824)	(0.1039)
SMB	-0.0364	0.0788	-0.1210
	(0.1694)	(0.2210)	(0.1833)
HML	-0.2657	-0.1361	-0.3431
	(0.2137)	(0.2393)	(0.2109)
MOM	0.0862		0.1136
	(0.1190)		(0.1089)
RMW		0.4034	
		(0.2711)	
CMA		-0.2684	
		(0.2327)	
QMJ			-0.2982*
			(0.1741)
alpha	0.0091***	0.0094***	0.0106***
	(0.0030)	(0.0028)	(0.0033)

Panel B: Value-Weighted Top Quartile (BSI Score) Portfolio

	(1) Carhart 4-Factor Model	(2) Fama-French 5-Factor Model	(3) Quality minus Junk Model
MKT	0.9533***	1.0063***	0.9926***
	(0.0702)	(0.0680)	(0.0997)
SMB	-0.4595***	-0.2602	-0.4176***
	(0.1264)	(0.1565)	(0.1488)
HML	-0.5000***	-0.2497	-0.4617**
	(0.1863)	(0.2069)	(0.1955)
MOM	0.1582*		0.1447
	(0.0946)		(0.1003)
RMW		0.7322***	
		(0.2163)	
CMA		-0.4593**	
		(0.2179)	
QMJ			0.1476
			(0.2056)
alpha	0.0067**	0.0071***	0.0060*
	(0.0029)	(0.0025)	(0.0032)

Table 4: Capital Expenditures and BSI Score

The table reports coefficient estimates of the association between Capital Expenditures and BSI Score: $CAPEX_{it} = \beta_1 + \beta_2 BSI_{it} + \beta_3 X_{it} + \varepsilon_{it}$. The dependent variable is $CAPEX_{it}$, representing the ratio of Capital Expenditures to Lagged Assets of firm i in year t. The variable of interest is the BSI_{it}, which is the BSI Score of firm i in year t divided by 1000. Columns (3) and (4) include a vector X_{it} of control variables: firm size, book leverage, and book-to-market, all described in detail in the Appendix. In columns (2) and (4), the models include industry fixed effects (two-digit NAICS). Robust standard errors are reported in parentheses. The sample consists of all the non-financial, publicly traded firms that are part of the USA Simplicity Index over the period 2010 – 2015. Also, observations with negative book value are excluded from the sample. The fundamentals are retrieved from CRPS/Compustat Merged database, and the BSI score from Siegel+Gale brand simplicity reports. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

	(1) **OLS**	(2) **Industry Fixed Effects**	(3) **OLS**	(4) **Industry Fixed Effects**
BSI Score	-0.0435	-0.1091***	-0.0168	-0.0832**
	(0.0329)	(0.0404)	(0.0276)	(0.0364)
Size			-0.0048*	0.0021
			(0.0029)	(0.0021)
Book Leverage			0.1092**	0.0568**
			(0.0461)	(0.0259)
Book-to-Market			-0.0131*	0.0059
			(0.0069)	(0.0081)
Constant	0.0956***	0.1366***	0.1042***	0.0820**
	(0.0233)	(0.0253)	(0.0307)	(0.0340)
Observations	310	310	303	303
R-squared	0.0060	0.4270	0.0790	0.4460
Number of industries	-	11	-	11
Industry FE	NO	YES	NO	YES

Table 5: Book Leverage and BSI Score

The table reports coefficient estimates of the association between Book Leverage and BSI Score: $LEV_{it} = \beta_1 + \beta_2 BSI_{it} + \beta_3 X_{it} + \varepsilon_{it}$. The dependent variable is LEV_{it}, representing the ratio of Total Debt to Assets of firm i in year t. The variable of interest is the BSI_{it}, which is the BSI Score of firm i in year t divided by 1000. Columns (3) and (4) include a vector X_{it} of control variables: firm size, book leverage, and book-to-market, all described in detail in the Appendix. In columns (2) and (4), the models include industry fixed effects (two-digit NAICS). Robust standard errors are reported in parentheses. The sample consists of all the non-financial, publicly traded firms that are part of the USA Simplicity Index over the period 2010 – 2015. Also, observations with negative book value are excluded from the sample. The fundamentals are retrieved from CRPS/Compustat Merged database, and the BSI score from Siegel+Gale brand simplicity reports. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

	(1) **OLS**	(2) **Industry Fixed Effects**	(3) **OLS**	(4) **Industry Fixed Effects**
BSI Score	-0.2547*** (0.0709)	-0.4467*** (0.0765)	-0.1640** (0.0722)	-0.2917*** (0.0786)
Gross Profitability			-0.2354*** (0.0486)	-0.3047*** (0.0636)
Size			-0.0052 (0.0066)	0.0084 (0.0071)
Book-to-Market			-0.1147*** (0.0318)	-0.0870** (0.0362)
Constant	0.4187*** (0.0460)	0.5378*** (0.0493)	0.4609*** (0.0805)	0.5274*** (0.0961)
Observations	314	314	303	303
R-squared	0.0376	0.2150	0.1722	0.3429
Number of industries	-	11	-	11
Industry FE	NO	YES	NO	YES

Table 6: Profitability and BSI Score

The table reports coefficient estimates of the association between Profitability and BSI Score: $PROF_{it} = \beta_1 + \beta_2 BSI_{it} + \beta_3 X_{it} + \varepsilon_{it}$. The dependent variable is $PROF_{it}$, representing the ratio of Gross Profits to Lagged Assets of firm i in year t. The variable of interest is the BSI_{it}, which is the BSI Score of firm i in year t divided by 1000. Columns (3) and (4) include a vector X_{it} of control variables: firm size, book leverage, and book-to-market, all described in detail in the Appendix. In columns (2) and (4), the models include industry fixed effects (two-digit NAICS). Robust standard errors are reported in parentheses. The sample consists of all the non-financial, publicly traded firms that are part of the USA Simplicity Index over the period 2010 – 2015. Also, observations with negative book value are excluded from the sample. The fundamentals are retrieved from CRPS/Compustat Merged database, and the BSI score from Siegel+Gale brand simplicity reports. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

	(1) **OLS**	(2) **Industry Fixed Effects**	(3) **OLS**	(4) **Industry Fixed Effects**
BSI Score	0.6007*** (0.1163)	0.5248*** (0.1297)	0.4231*** (0.1131)	0.3040*** (0.1071)
Size			-0.0245** (0.0102)	-0.0410*** (0.0081)
Book Leverage			-0.4952*** (0.0798)	-0.4306*** (0.0696)
Book-to-Market			-0.2871*** (0.0377)	-0.2330*** (0.0338)
Constant	0.0627 (0.0680)	0.1101 (0.0785)	0.6683*** (0.1038)	0.8707*** (0.1062)
Observations	310	310	303	303
R-squared	0.0840	0.4709	0.3119	0.6331
Number of industries	-	11	-	11
Industry FE	NO	YES	NO	YES

Table 7: Capital Expenditures, BSI Score and Governance Quality

The table reports coefficient estimates of the association between Capital Expenditures and BSI Score for different levels of Governance Quality. The model is the following: $CAPEX_{it} = \beta_1 + \beta_2 BSI_{it} + \beta_3 X_{it} + \varepsilon_{it}$. The dependent variable is $CAPEX_{it}$, representing the ratio of Capital Expenditures to Lagged Assets of firm i in year t. The variable of interest is the BSI_{it}, which is the BSI Score of firm i in year t divided by 1000. The model includes a vector X_{it} of control variables: firm size, and book leverage, both described in detail in the Appendix. The set of controls also includes industry fixed effects (two-digit NAICS). Robust standard errors are reported in parentheses. Column (1) presents coefficient estimates for high governance quality firms, and column (2) for low governance quality firms. The sample consists of all the non-financial, publicly traded firms that are part of the USA Simplicity Index over the period 2010 – 2015. Also, observations with negative book value are excluded from the sample. The fundamentals are retrieved from CRPS/Compustat Merged database, the BSI score from Siegel+Gale brand simplicity reports and the governance indicators from MSCI ESG KLD Stats. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

	(1) **High Governance Quality**	(2) **Low Governance Quality**
BSI Score	-0.2068***	0.0075
	(0.0677)	(0.0200)
Size	0.0019	0.0015
	(0.0049)	(0.0030)
Book Leverage	0.1081**	-0.0473*
	(0.0423)	(0.0274)
Book-to-Market	0.0436*	0.0065
	(0.0224)	(0.0095)
Constant	0.1771**	0.0494
	(0.0710)	(0.0350)
Observations	148	126
R-squared	0.5596	0.4146
Number of industries	8	10
Industry FE	YES	YES

Table 8: Book Leverage, BSI Score and Governance Quality

The table reports coefficient estimates of the association between Book Leverage and BSI Score for different levels of Governance Quality. The model is the following: $LEV_{it} = \beta_1 + \beta_2 BSI_{it} + \beta_3 X_{it} + \varepsilon_{it}$. The dependent variable is LEV_{it}, representing the ratio of Total Debt to Assets of firm i in year t. The variable of interest is the BSI_{it}, which is the BSI Score of firm i in year t divided by 1000. The model includes a vector of control variables: gross profitability, and firm size, both described in detail in the Appendix. The set of controls also includes industry fixed effects (two-digit NAICS). Robust standard errors are reported in parentheses. Column (1) presents coefficient estimates for high governance quality firms, and column (2) for low governance quality firms. The sample consists of all the non-financial, publicly traded firms that are part of the USA Simplicity Index over the period 2010 – 2015. Also, observations with negative book value are excluded from the sample. The fundamentals are retrieved from CRPS/Compustat Merged database, the BSI score from Siegel+Gale brand simplicity reports and the governance indicators from MSCI ESG KLD Stats. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels.

	(1) **High Governance Quality**	(2) **Low Governance Quality**
BSI Score	-0.5558*** (0.1088)	-0.1942* (0.1059)
Gross Profitability	-0.1931** (0.0786)	-0.1267 (0.0797)
Size	0.0401*** (0.0148)	0.0157 (0.0142)
Book-to-Market	-0.1359** (0.0564)	0.0376 (0.0527)
Constant	0.4063** (0.1633)	0.2223 (0.1756)
Observations	148	126
R-squared	0.4695	0.4406
Number of industries	8	10
Industry FE	YES	YES

A Appendix

Table A.1: Factor descriptions

The descriptions of factors are taken from professor's Kenneth R. French website, expect from QMJ factor which are taken from professor Andrea Frazzini's website.

Factor	Description
MKT	Excess market return: $R_{mt} - r_{ft}$, where R_{mt} is the monthly value-weighted return of all CRSP firms incorporated in the USA and listed on the NYSE, AMEX, or NASDAQ that have a CRSP share code of 10 or 11 at the beginning of month t, good shares and price data at the beginning of t, and good return data for t minus the one-month Treasury bill rate (From Ibbotson Associates).
SMB (Small minus Big)	<u>On Carhart's 4-factor model</u> The average return on three small portfolios minus the average return on three big portfolios: $SMB = 1/3(Small\ Value + Small\ Neutral + Small\ Growth) - 1/3(Big\ Value + Big\ Neutral + Big\ Growth)$ <u>On Fama-French 5-factor model</u> The average return on nine small stock portfolios minus the average return on nine big stock portfolios: $SMB_{(B/M)} = 1/3(Small\ Value + Small\ Neutral + Small\ Growth) - 1/3(Big\ Value + Big\ Neutral + Big\ Growth)$ $SMB_{(OP)} = 1/3(Small\ Robust + Small\ Neutral + Small\ Weak) - 1/3(Big\ Robust + Big\ Neautral + Big\ Weak)$ $SMB_{(INV)} = 1/3(Small\ Conservative + Small\ Neutral + Small\ Agressive) - 1/3(Big\ Conservative + Big\ Neautral + Big\ Aggressive)$ $SMB = 1/3(SMB_{(B/M)} + SMB_{(OP)} + SMB_{(INV)})$
HML (High minus Low)	The average return on two value portfolios minus the average return on two growth portfolios: $HML = 1/2(Small\ Value + Big\ Value) - 1/2(Small\ Growth + Big\ Growth)$
MOM (Momentum)	The average return on two high portfolios minus the average return on two low prior return portfolios: $HML = 1/2(Small\ Value + Big\ Value) - 1/2(Small\ Growth + Big\ Growth)$
RMW (Robust minus Weak)	The average return on two robust operating profitability portfolios minus the average return on two weak operating profitability portfolios:

	$RMW = 1/2(Small\ Robust + Big\ Robust) - 1/2(Small\ Weak + Big\ Weak)$
CMA (Conservative minus Aggressive)	The average return on two conservative investment portfolios minus the average return on two aggressive investment portfolios: $RMW = 1/2(Small\ Conservative + Big\ Conservative) -$ $-1/2(Small\ Aggressive + Big\ Aggressive)$
QMJ (Quality minus Junk)	The average return on two high-quality portfolios minus the average return on two low-quality (junk) portfolios: $QMJ = 1/2(Small\ Quality + Big\ Quality) - 1/2(Small\ Junk + Big\ Junk)$

Table A.2: Variable descriptions

Definitions of the variables that used thorough the thesis.

Variable	Description
Book Value of Equity	Book value per share multiplied by common shares outstanding as of current year end.
Market Value of Equity	Annual close price multiplied by common shares outstanding.
Book-to-Market	Book value of equity divided by market value of equity.
Size	Natural logarithm of sales.
Total Debt	Long-term debt plus debt in current liabilities.
Book Leverage	Total debt divided by assets.
Capital Expenditures	Capital expenditures divided by lagged assets.
Gross Profitability	Gross profit divided by lagged assets.
Cost Of Goods Sold	Cost of goods sold divided by lagged assets.
Cash Holdings	Cash and short-term investments divided by assets.
Payout	Dividends to common divided by lagged assets.
BSI Score	USA's brand simplicity index score from 2010 to 2015 for each year. It has been taken from Siegel+Gale annual reports.

Table A.3: Governance indicators descriptions

The definitions of the indicators are taken from MSCI ESG KLD STATS Methodology – 1991-2014 manual. The Business Ethics indicator is the same as the Bribery & Fraud indicator in the manual (same variable code, i.e., CGOV-CON-M).

Indicator	Description
Governance Structures (CGOV-CON-K)	This indicator is designed to assess the severity of controversies related to a firm's executive compensation and governance practices. Factors affecting this evaluation include, but are not limited to, a history of involvement in compensation-related legal cases, widespread or egregious instances of shareholder or board-level objections to pay practices and governance structures, resistance to improved practices, and criticism by NGOs and/or other third-party observers.
Business Ethics (CGOV-CON-M)	This indicator is designed to assess the severity of controversies related to a firm's business ethics practices. Factors affecting this evaluation include, but are not limited to, a history of involvement in widespread or egregious instances of bribery, tax evasion, insider trading, accounting irregularities, resistance to improved practices, and criticism by NGOs and/or other third-party observers.