

Brand Value and Growth Options Value

Does brand value relate to fundamental or irrational firm value?

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Abstract:

This study analyses the relationship between firm growth options value and brand value. To date, it is commonly accepted that brands positively relate to a firm's future income. However, are brands positively related to firm's fundamental values or irrational perceptions on the capital market? With the help of a methodology developed by van Bekkum *et al.* (2011) it is possible to differentiate between future fundamental and irrational value. The results show that the relationship depends on the type of market where the brand operates in. Whereas in growth markets it seems to be that brand value has a stronger relationship with irrational value, in mature markets brand value has a stronger relationship with fundamental values.

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Introduction

In recent years, global economic indicators have shown highly volatile patterns. The financial and economic crisis has increased uncertainty about future incomes, and made the Standard & Poor's 500 index fall by more than 50% within a two year period¹. As consumer spending plunged and managers became more cautious, the business environment changed. Interbrand, a marketing consultant, argues that in this challenging environment brands are more important than ever; as brands can create choice, build trust and loyalty, and enable a price premium.

Interbrand's reasoning is supported by many scholars in the field of marketing. Pioneers like Murphy (1990) and Aaker (1991) first argued a positive influence of brands on firm value. Their arguments were of a qualitative nature and lacked empirical evidence. In 1998, however, Barth *et al.* found a positive relationship between brand value and firm's stock market value. Intuitively does this makes sense; strong brands act as an insurance for (future) earning streams as they offer greater loyalty from customers, larger margins, greater trade cooperation and support, and options for future brand extension (Keller and Aaker, 1992; Srivastava *et al.*, 1998). There is, however, one significant shortcoming with the Barth *et al.* (1998) study; it does not make a distinction between firm fundamental value and stock market values. According to behavioural theories in corporate finance, these two values do not always match with each other; the difference is called mispricing, and is caused by irrationality. Hence, it is not clear if brand value relates to mispricing or fundamental firm value creation. This difference, however, is important to make; as fundamental growth options value creates true firm value and mispricing does not.

When one tries to estimate the value of a firm, it is common to use numerical metrics and theories. Within corporate finance, for instance, there are two main theoretical approaches to choose from: traditional and behavioural theories. Traditional theories assume all agents to be rational, i.e. managers and investors show purely rational behaviour in the interests of the firm. In addition, the capital market is assumed to be efficient, e.g. market prices reflect all public information and future expectations regarding the company and the existence of arbitrage. In contrast, behavioural theories dispute those rigid assumptions of efficient capital markets and rational agents and replace these with

¹ Between October 2007 and March 2009

behavioural fundamentals. Two broad categories of behavioural theories exist (Baker *et al.*, 2012); first the 'rational managers theory' assumes that managers recognize mispricing of their own firm and take advantage of the situation (Seyhun, 1992; Muelbroek, 1992). Second, 'rational investors theory' assumes irrational managers operating in efficient capital markets. Prior studies on managerial irrationality have related it to overconfidence (Roll, 1986), leading to overinvestment (Malmendier and Tate, 2005), fear of competitor actions (Schenk, 2004), and myopic behaviour caused by wrong incentive pay structures (Srinivasan and Hansen, 2009).

Building on original work of Miller and Modigliani (1961), who divided firm value (P) into the value of the assets in place (V_{AIP}) and the growth option value (V_{GO}), van Bekkum *et al.* (2011) introduced a measure to divide the V_{GO} term into two distinctive parts; an rational part named 'fundamental growth option value', and a irrational part named 'mispricing'. This study combines their developed method with the field of marketing. Intangible assets, like brands, are arguably of increasing importance to a firm's market value (Ballou *et al.*, 2004). In their study on Standard & Poor's 500 companies they indicate that traditional (tangible) accounting assets only contributed 25% of the firm's total market value. A brand is a major source of intangible value (Simon and Sullivan, 1993), the value of a brand, though, is elusive and hard to estimate. In addition, there is still no generally accepted definition or metric of brand value. This study uses a brand value definition from the firm perspective, introduced by Raggio and Leone (2007); brand value is defined as the value a brand represents to the firm that operates the brand. Studies of Barth *et al.* (1998) and Kallapur and Kwan (2004) argue the existence of a positive relationship between firm market value and brand value. These studies, however, what they did not enquire into this relationship; is brand value related to fundamental values or to irrational behaviour of investors?

This explorative study tries to fill this gap in academic literature with the use of a method introduced by van Bekkum *et al.* dividing firm's future income streams (i.e. growth options value) into 'fundamental growth options value' and 'mispricing'. Therefore, the research question central in this paper is:

Is there a relationship between brand value and growth options value, and its two components: fundamental option value and mispricing?

This study explores the relationship between brand value and the size of the growth option value in the stock price; With the use of the 'Best Global Brands' list of Interbrand, the growth option value dataset of van Bekkum *et al.* (2011), and additional firm specific data from Worldscope. The studied dataset expands a time period of six years and includes 133 observations. The study uses correlation coefficients and t-tests to explore individual relationships and multiple equation models in a multivariate setting to test possible relationships.

The remainder of this paper proceeds as follows. In section 2, existing theories are discussed and the hypotheses are introduced, followed by a description of the data in section 3. In section 4, the individual elements of the study are presented. The next section presents the methodology, and in section 6 the results are exhibited. Section 7 outlines the conclusion, limitations and recommendations for further research, and a final remark.

2. Theoretical Background

2.1 Brand value

Research on intangible assets has surged in the 1980's largely due to a large merger wave. In particular scholars in marketing and finance have dominated the research on intangible assets, defined as the assets that are not physical by nature. There exist three basic elements of intangible assets: other firm-specific components like knowledge, market-specific factors, and brand value. According to Simon and Sullivan (1993) brand value is a major intangible asset. In the mid-1980's, acquiring firms paid large premiums in addition to their targets book value, sometimes representing a multiple of ten times book value (Kerin and Sethuraman, 1999). In their deal with Procter & Gamble Inc. (P&G), on P&G's product

lines 'Hires' and 'Crush', Cadbury Schweppes's executive Schlossberg (1990) indicated 90% of the total acquiring price to represent the brand values.

2.1.1 Estimation of brand value

To date there is no consensus about the precise definition of brand value nor is there a commonly accepted valuation method available. However, there are three generally used brand valuation methods (Keller and Lehman, 2001). First of all, 'customer mind-set' is a method that focuses on, among others; brand awareness and loyalty. This method is used by many scholars including Aaker (1991) and Lassar *et al.* (1995). With the use of consumer surveys the scholars tried to estimate the brand's current and future earnings stream potential. The use of purely qualitative measures makes it hard to construct and compute a financial value for the brand. The second method is product-market outcomes. This method focuses on the current performance of the brand on the market. Methods in this category include price premiums, market shares, relative prices, and revenue premiums methods. The rationale behind this method builds on the capability of branded products to gain a premium against their unbranded counterparts. Many scholars like Ailawadi *et al.* (2003) and Chaudhuri and Holbrook (2001) used both qualitative and quantitative measures, and therefore this method category is more elaborate. However, this category also relies on hypothetical payment behaviour of consumers as they use consumer surveys to construct the premium. The third method uses financial market outcomes, which treat the brand value as a common financial asset. Simon and Sullivan (1993) used 'Tobin's Q' to calculate the value of the intangible assets of a firm, and eliminated all other sources of intangible value to end up with a residual: brand value. The financial market outcome theories capture the current strength of the brand, and estimates future capitalisation potential. However, estimating the future potential of a brand is hard and relies on subjective measures. All methods have strengths and weaknesses; therefore it seems to be necessary to use a combination of at least two existing methods to capture all elements affecting brand value.

Interbrand, an important player in the marketing consultancy, therefore uses a mixture of metrics to capture all elements affecting the brand. Established in 1974, Interbrand has been a pioneer and assisted numerous firms to put their (acquired) brand values on their balance sheet. In their long history Interbrand has developed their initial

metric into a multi-angle methodology that uses a combination of financial, product and consumer metrics. Interbrand's methodology is explained in more detail in section 4.

2.2 Firm value

As indicated above, tangible assets account for only 25% of firm's market capitalisation. This, though, does not mean that intangible assets like brand value account for the remaining 75%. Miller and Modigliani (1961) argue that firms market value (P) is composed of two distinctive terms; the book value of the (net) assets in place (V_{AIP}) and the present value of future investments in growth opportunities (V_{GO}):

$$P = V_{AIP} + V_{GO} \tag{1}$$

Where V_{AIP} is a perpetual stream of earnings from the tangible as well as intangible assets in place, discounted to present value. One important assumption is no future growth, which seems to be restrictive and impossible to fulfil; no firm has exactly the same earnings year in year out. However, since the V_{GO} term captures all future growth this assumption has no restrictive consequences. The V_{AIP} term is calculated with the use of the publicly available financial data, enabling the V_{GO} term to be extracted from the equation (1).

Growth options value has been related to among others R&D, uncertainty and skewness of returns (Smit and van Bakkum, 2010), systematic risk (Chung and Charoenwong, 1991), international joint ventures (Tong *et al.*, 2008), and market timing and overpricing (van Bakkum *et al.*, 2011). These studies share common ground: (perceived) uncertainty. Growth option value is elusive as it represents a future income stream, and nobody is able to look into the future. It could be argued that brands act as an insurance for future income streams. Keller (1993) argued that strong brands offer greater loyalty from customers, larger margins, greater trade cooperation and support, and options for future brand extension (Keller and Aaker, 1992).

The rationale of linking brand value and growth option value has its roots in the resource-based theories introduced by Penrose in 1959. The resource based theory points at the internal firm specific resources and capabilities as the main fundamental determinants for the creation of firm value. Studies by both Wernerfelt (1984) and Keller (1993) indicate

that the positive associations affiliates with the brand increased the capabilities of the firm to yield future earnings. Strong brand entails leverage power, which can be used in future product line extensions, as the positive associations with the brand would leverage to the new product (Wernerfelt, 1988). Building on prior research, addressed above, follows the first hypothesis;

Hypothesis 1:

There is a positive relationship between growth option value and brand value.

2.3 Real options analysis

The previous paragraph mentioned uncertainty. Every economic agent has to deal with this uncertainty in their decision-making process, hence introduce flexibility. For investors, target firms represent nothing more than a bundle of options. When evaluating these option bundles, using the right valuation method is crucial, especially in times of high uncertainty. Traditionally a discounted cash flow (DCF) analysis is used for evaluations. A DCF analysis uses projections of the firms' future earning streams and discounts the earning streams to get a present value. The discount rate used in a DCF depends on risk accounted to the firm; generally the weighted cost of capital (WACC) is used to calculate the discount rate. However, in times of uncertainty, a DCF is not the best method; it underestimates firm value these times (Luerhman, 1998), and can only be used in now or never decisions (Trigeorgis and Smit, 2004), as it does not incorporate the option to defer.

The real options method, however, does incorporate flexibility into the traditional DCF analysis, and was introduced by Myers in 1977. The real options analysis treats real assets (e.g. brand value or machinery) as financial call options. A call option gives its owner the right to exercise the option for a predetermined price. The real option is therefore no obligation and gives the owner the opportunity to defer or even abandon the project.

Using the real options method, the firm's growth options value is calculated. Which can be either valued bottom up by estimating the options individually, or top-down by capitalizing on the capital market information to calculate the growth option value enclosed in the stock price. In order to avoid estimating option and interaction parameters at the same time, this study chooses to go with the more superficial top-down approach.

2.4 Inefficient capital markets

Market prices (P) in equation (1) do not always reflect fundamental values, possibly due to inefficient capital markets, i.e. mispricing. In their review of behavioural corporate finance theories Baker *et al.* (2012) indicate two fundamental assumptions for mispricing to occur. First, arbitrage may be limited. If markets would allow perfect arbitrage to exist, then competition among investors would lead to an elimination of mispricing. Furthermore, there are some cost and risks attached to arbitrage: liquidity risk (Acharya and Pedersen, 2004), fundamental risk (Pontiff, 1996), and research and transaction costs. Second, categorisation. Investors tend to simplify decision making by categorising firms (Morck and Yang, 2002), which can lead to the creation of bubbles and hence crashes.

With respect to the role of brand value on market inefficiencies, Kamakura *et al.* (1988) provide partial evidence of an interfering power of brands on consumer market efficiency. In addition, Kimbrough and McAlister (2009) indicate that marketing efforts do not immediately transform into financial outcomes (i.e. a lag exists); expenditures are made in advance and its financial outcomes evolve gradually, causing mispricing.

2.4.1 Mispricing and fundamental growth option value

Although the explanations for mispricing, presented in the previous subsection, are rather simple and easy to understand, the calculation of the value of mispricing is harder. Like brand value, is mispricing an elusive value, and do many scholars use a proxy. The most commonly used proxy for mispricing is the market-to-book ratio (M/B) (Rhodes-Kropf *et al.*, 2005). However, M/B is also used as a proxy for growth opportunities and information asymmetries. In addition; Baker *et al.* (2012) argued: "Book value is not a precise estimate of fundamental value, but rather a summary of accounting performance." Hence, the M/B is not a suitable mispricing proxy for this study. This study uses a methodology introduced by van Bakkum *et al.* (2011), which is able to make a distinction between firm fundamental growth option value and mispricing. Fundamental (growth option) value is estimated with the use of firm fundamentals like book value, net income, and leverage. The residual is called mispricing, as it has no relationship with the firm fundamentals.

As indicated above, there are numerous claims of firm value contributions by brand value (Murphy, 1990; Keller and Aaker 1992; Barth *et al.* 1998). Brand value affects the firm value by increasing the firm's capacity to collect future earnings, therefore decreasing risk for the investors. Hence, the brand has a positive relationship with fundamental growth option value. This leads to the following hypothesis;

Hypothesis 2:

There is a positive relationship between fundamental growth option value and brand value.

2.4.2 Market types

Firms operating in growth markets, like the healthcare and business equipment sector, have to deal with higher volatility and tend to have higher growth options values (Smit and Trigeorgis, 2004). The growth markets tend to be populated by young, R&D driven, highly competitive, and smaller firms. The value of the young firms depends heavily on innovation, rather than on the brands they operate. The dependence on innovation makes these firms particularly hard to value, as the R&D projects are unique to the developing firm resulting in lacking information about the projects future earning capacity. As a consequence, these firms values incorporate a lot of (compound) growth option value. Furthermore, to ensure future firm growth R&D demands large capital investments and profits, if any, are not large. From the firm perspective, brands seem to be of secondary importance. For investors, however, brands may play a more important role in their investment decision-making process. Frieder and Subrahmanyam (2005) provide evidence supporting this rationale. As brands increases familiarity, they decrease the investor's information gathering cost. Hence, investors tend to invest in well-known firms. Summarising; brand value is correlated with mispricing rather than with fundamental growth options value, and results in the following hypothesis;

Hypothesis 3a:

For growth markets; a higher correlation exists between brand value and mispricing than between brand value and fundamental growth option value.

In contrary to growth markets, are mature markets (e.g. the consumer durables and non-durables sector) are mostly populated with several large, powerful and well-established firms; as depressed margins increased the role of economies of scale. These large firms tend to have a lot of market power. With the use of signalling, the competitive advantage (i.e. market power) can be expanded or at least maintained (Wood, 1999; Aaker 1991). Michael Spence introduced the behavioural signalling theory in his research of the job market in 1973, where 'good' types can separate themselves from 'bad' types. Kotler (1994), a scholar in the field of marketing defined a brand as: "a name, term, sign, symbol, or design, or a combination of them, intended to differentiate the goods or services of one seller or group of sellers and to differentiate them from those competitors." Hence a brand is used to send signals to separate a good product from a bad product. Intuitively, this makes sense and in their research Erdem and Swait (2000) showed proof of the existence of a signalling effect.

Additionally, strong brands can be leveraged in future product line extensions, acting as a warranty for quality (Wernerfelt, 1988). The brand could develop into an umbrella brand, sticking all its positive associations to the newly added product. Concluding, in mature markets strong brands increase the (future) earning capacity, hence relates to fundamental growth option value rather than mispricing. This has led to the following hypothesis;

Hypothesis 3b:

For mature markets; a higher correlation exists between brand value and fundamental growth option value than between brand value and mispricing.

3. Data

The dataset, which is used to test these hypotheses, was collected from two original databases; Interbrand's 'Best Global Brands' list provided the annual brand values and van Bakkum *et al.* (2011) provided the annual growth options values. The brand value estimates of Interbrand are published annually in the first week of August, whereas the growth options values are at year's end.

The dataset contains 133 observations in a six-year period between 2001 and 2006. Additional data regarding market capitalisation, (the log of) net sales and employees are collected with the use of both Worldscope and firm annual reports. While collecting data, some problems came up: First, the two initial datasets were not entirely compatible. As a result, the number of observations is low and not constant over years. Second, although the majority of firms end their fiscal year at the 31st of December, some do not. This caused some problem regarding the gathering of sales and employment data. To control for this problem, a linear relation over time is assumed.

To construct comparable brand value data, the brand value estimates of Interbrand were divided by the market capitalisation of the firm operating the brand (Knowle, 2007). The market capitalisation data was adjusted by the proportion of sales contributed by the brand, called 'Sales contribution', to account for firms operating multiple brands. The brand's sales representation was estimated using Worldscope data and annual reports. The majority of the firms, however, do not provide data regarding the sales per brand or product segment and were reluctant to provide this information; as they considered the data to be classified. With the help of publicly available information, educated guesses were made to get usable 'sales contribution' values.

In this study, firms were grouped into sectors and market types using SIC codes and the Fama and French 12-sector classifications. Due to data availability the dataset is composed of four sectors: healthcare², business equipment³, durables⁴ and nondurables⁵. To test hypothesis 3a and 3b, the four sectors are grouped in two mutually exclusive market type groups; growth markets (healthcare and business equipment) and mature markets (durables and nondurables).

² includes medical equipment and drugs

³ includes computers, software, and electronic equipment

⁴ include cars, TV's furniture, household equipment

⁵ includes food, tobacco, textiles, and toys

4. Capturing value

This fourth section describes the process behind the different values used in to study the hypotheses, and is divided into two subsections. The first subsections focuses on brand value and all the elements affecting it. In the second subsection the process of calculating both fundamental growth options value and mispricing is described.

4.1 Brand value

Ever since Interbrand launched its 'Best Global Brands' list in 2001, one firm claimed the top position; the Coca Cola brand. In 2006, its brand was estimated to be of \$67 billion. This is more than the whole economy of Croatia produced in 2006, which accumulated to a GDP of \$60,380⁶ million. The brands captured in the baseline dataset had an average value of more than \$15 Billion and represented, when adjusted for multiple brands, almost half of the firm's market capitalisation.

4.1.1. Brand value: 'Best Global Brands'

This study chooses estimates published by marketing consultancy firm Interbrand for the brand value, and did so for several reasons. First of all, the brand valuation methodology of Interbrand is published since 2001 and publicly accessible. A second reason was that Interbrand pioneered with regard to brand value estimation and has been developing its methodology since 1974. Interbrand, for instance, has guided one of the first incorporations of brand values on the balance sheet by Rank Hovis McDougall PLC. in 1988 (Murphy, 1990). Third, the valuation method has proven to be a reliable source of firm value (Barth *et al.*, 1998). Fourth, the brand values are estimated in the same way as analysts and bankers would value other (tangible) assets (Haigh and Perrier, 1997).

The brand value estimates used in this study are taken from the 'Best Global Brands' that Interbrand publishes annually in the beginning of August. Interbrand uses a number of conditions to distinct between global brands and other brands. In order to be considered a 'global brand', the brand needs to receive at least thirty percent of revenue from outside its base country and should have a presence on at least three major continents. The financial data needs to be publicly accessible and the firm has to have a positive economic profit. Also

⁶ CIA World Factbooks 2006

the brand should have a public profile and awareness above and beyond the market in which it operates.

4.1.2. The valuation process

Analysts of Interbrand use a multi-step methodology for the estimation of brand value, based upon fundamental marketing and finance⁷. First of all they segment the brand's markets. Brands affect the consumers' choice; the magnitude depends on the market segment. The different market segments are divided into mutually exclusive segments, using criteria like product, geography, and consumption patterns. The brand is valued for each segment separately and these values are accumulated to get the total value of the brand. Then a financial analysis identifies and predicts the earnings created by the brand in each segment. These intangible earnings are defined as the branded revenues less operating costs, tax and capital costs. Next, Interbrand needs to evaluate the role of the brand in driving demand within its market segment(s), and assesses the proportion of intangible earnings accounted for by the brand, called 'the role of branding index'. The intangible earnings are then multiplied by 'the role of branding index', in order to calculate the brand earnings. The business environment in which a brand operates is very important for the estimation of the brand value. Analysts therefore perform a competitive benchmark to determine the brand's discount rate that represents the risk profile of future earnings. The competitive benchmarking controls for seven brand strength principals: market segment, leadership position, growth trend, stability, geographic footprint, support, and legal protectability. 'The brand strength score' ranges from 0 to 100. Finally, brand value is calculated using a DCF analysis; calculating the net present value (NPV) of the forecasted brand earnings, discounted by the brand's discount rate. The NPV calculation contains a five-year forecast as well as a terminal value, reflecting the future earnings potential of the brand. For an example of their valuation process, see appendix A.

⁷ Collected from brandchannel.com, attained on the 29th of January 2012 21:25.

4.1.2 Brand value comparison: book values and market capitalisation

In the field of marketing it is commonly accepted that brands are positively related to future earnings, as positive associations affiliated with the brand result in a competitive advantage. Brands are a basis for future earnings and, therefore, their value should be incorporated into the market value of the firm. In their research Barth *et al.* (1998) provide evidence supporting this argument; brand value estimations of Interbrand positively relate to firm market capitalisation.

Accountants, however, are more reluctant to accept intangible assets like brand value as accounting assets. Their more conservative approach is represented by the U.S. Accounting Standards Board (FSAB), which sets the U.S. general accepted accounting principles (GAAP); which do not acknowledge brand values as an accounting asset. Since the introduction of statement 142 in 2001, the GAAP accommodates firms to put acquired brand values on the balance sheet. Acquired brands have special rules attached to them; brands have an infinite useful lifespan, and are neither subject to depreciation nor amortisation. The FASB, though, do require all firms to do a re-evaluation of their brand value bookings annually, or after an unforeseen incident (e.g. BP's oil spill in 2010), for any impairments.

As said in the previous paragraph, the FSAB does not accept all brands as accounting assets. For instance, acquired brands are allowed to be put into the books, self developed brands are not. Although this seems to be odd, it is not; as acquired brands have demonstrated their monetary value and self developed have not. This makes comparing firms and their intangible assets with the help of book values impossible. For example; Mac Donalds' balance sheet does not acknowledge its brand value, although it represents 71 percent (in 2002) of the firm's market capitalisation⁸. Its main competitor Burger King's balance sheet acknowledges its brand value, as it was bought by a consortium led by TPG Capital in July 2002. A more meaningful comparison method is to compare brand value over market capitalisation ratios of firms (Knowles, 2007). The brand value over market capitalisation ratio (BV) needs to be adjusted for multiple operating brands, as many firms operate more than just one brand. This study does so by dividing the original BV by 'sales

⁸ number of outstanding stocks times the stock price, at year end (31st of December)

contribution'. 'Sales contribution' represents the proportion of firm sales for which the brand is responsible.

4.1.3 Lagged brand value transformation

Due to market inefficiencies, short run market prices are able to differ from fundamental value, adapting to the fundamental value in the long run (Brav and Heaton, 2002; Kimbrough and McAllister, 2009). When brand value estimates are published, investors initially respond in an incomplete manner. The reaction will be completed after the brand value announcement were be materialised. In this study, a lag of five months is incorporated into the model. As the brand value estimates of Interbrand are published annually in the first week of August and all other data, like market capitalisation and net sales, are at year's end, giving a lag period of five months.

4.2 Growth options value

Recall firm market value equation (1):

$$P = V_{AIP} + V_{GO} \quad (1)$$

In order to extract the growth option term (V_{GO}) out of equation (1), this study uses the definition of assets in place (V_{AIP}) introduced by Tong (2008) and used in van Bakkum *et al.* (2011):

$$V_{AIP} = CI + PV(EP) \quad (2)$$

CI represents capital invested and $PV(EP)$ represents the present value of current as well as future economic profit, see appendix B. This economic profit model assumes the absence of growth and a constant discount rate for each year's V_{AIP} , which enables direct estimation of the CI out of the annual financial reports, and decreases the annuity of $PV(EP)$. As a consequence, $VAIP$ is less sensitive to discount rate volatility. With the use of the firm market capitalisation as P , calculated by multiplying the stock price by the number of firms stock outstanding, it is possible to extract V_{GO} out of equation (1). The absolute value of V_{GO} is scaled to equity value to prepare the element for comparison.

4.2.1. Fundamental growth option value and mispricing

As mentioned earlier in this paper, inefficient capital markets can cause observed firm market capitalisation values (P^M) to not always reflect fundamental firm values (P^F), thus mispricing occurs. The extracted V_{GO} of the previous paragraph, therefore, is reclassified as the observed market growth option value V_{GO}^M . Leading to a revised equation 1* ;

$$P^M = V_{AIP} + V_{GO}^M \quad (1^*)$$

To account for the difference between the observed market capitalisation and the fundamental value of the firm van Bekkum *et al.* (2011) re-write the equation (1) as:

$$P^M = V_{AIP} + (P^F - V_{GO}^F) + (P^M - P^F) = V_{AIP} + V_{GO}^F + XSP \quad (3)$$

V_{GO}^F represent the fundamental growth option value, calculated by subtracting V_{AIP} from P^F . The fundamental firm value (P^F) is calculated with the use of a series of simple ordinary least squares (OLS) regressions, estimated by year and sector. This builds upon methods used in among others accounting literature. The OLS regression function consists of several building blocks; the natural logarithms of book value, net income, and leverage ratio. Using the assumption that argues that equal assets sell at equal prices, it is possible to define mispricing (XSP) as the difference between the calculated P^F and the observed P^M :

$$XSP = \frac{PM - PF}{PF}$$

As XSP is calculated at a sector level, no claims can be made about mispricing between sectors. The XSP , however, can be used as a measure of excess pricing at firm level. Therefore, XSP is referred to as excess pricing. For a more elaborate explanation, see van Bekkum *et al.* (2011).

5. Methodology

The analysed dataset has panel data characteristics; it has both cross-sectional as well as time series characteristics. The multiple characteristics increase the complexity of fit econometric models. There exist three main models to deal with panel data; Fixed effects, Random effect, or an OLS model. This study uses an ordinary least squares (OLS) model with added control variables; market effect dummies, year effect dummies, and the size (net sales).

Baseline model:

$$DEP = \alpha_0 + \alpha_1 BV + \alpha_2 SIZE + \alpha_3 SECTOR \text{ dummies} + \alpha_4 YEAR \text{ dummies}$$

Growth and Mature market types model:

$$DEP = \alpha_0 + \alpha_1 BV + \alpha_2 NET SALES + \alpha_3 MATURE + \alpha_4 GROWTH + \alpha_5 YEAR DUMMIES$$

Where DEP is the dependent variable of interest; growth options value, fundamental growth options value, or mispricing. The BV represents the brand value over market capitalisation variable (adjusted for multiple brands) and is dated five months before year's end, SIZE for firm size and is equal to the logarithm of net sales, SECTOR dummies controls for unobserved sector effects, and the YEAR dummies control for unobserved YEAR effects.

There are several issues regarding clustering that affect the regression analyses used in this explorative study. First, the OLS model assumes clustering to be a random process. This, however, is not the case. Firms are allocated by the sector they operate in, hence sector clusters are independent of each other but the firms within a cluster are dependent. As a result the standard errors tend to be inflated (Kish, 1995). To correct for these biased standard errors, the Huber-White standard errors are used.

Table 2. The correlation table of clusters

	BV	Net sales	Mature	Growth
BV	1			
Net sales	0.1751	1		
Mature	0.4236	0.1349	1	
Growth	-0.4236	-0.1349	-1.0000	1

Second, the existence of a ‘dummy variable’ trap. The dummy variables in the regression model are mutually exclusive and cover all firms, causing perfect multicollinearity (see table 2). To cope with this issue, the healthcare sector dummy is omitted from the model and picked to be the base sector, against which the other dummies are evaluated. In case of the analysis of the mature and growth markets, the mature market dummy was omitted to act as the base market type.

6. Results

The results are divided into two subsections. The first results subsection contains the results regarding the individual relationships. In the second subsection, the individual relationships of the first results subsection are further studied in multivariate models.

6.1. Individual relations analysis: Correlation

Correlation coefficients provide initial information about the possible individual relationships of the different parameters. Due to the explorative character of this study, lower confidence levels are accepted to provide significant coefficients. The significance levels are determined with the use of simple one and two tailed student’s t-tests.

Table 3. Correlations			
	Baseline	Growth	Mature
	BV	BV	BV
V_{GO}^M	-0.1202**	0.0105	-0.1335
XSP	0.0638	0.1197	-0.0007
V_{GO}^F	-0.076	0.0381	-0.0869
SIZE	0.1751***	0.2255**	0.1141
Observations	133	58	75
Confidence levels: *85%, **90%, ***95%			

For the baseline dataset, the calculated correlations in table 3 show no significant relationships whatsoever. Within growth markets, the results partially support hypothesis 3a; in growth markets, brands are more related to overpricing than fundamental growth option value. It is only partial, and lacks explanatory power, as the results are insignificant. Similar to the insignificant baseline and the growth sector results are the mature market results. The results provide some partial evidence for hypothesis 3b, although very weak, it seems to be that in mature markets brands are more related to fundamental growth option

value than to mispricing. The direction of the coefficient, however, is odd. A negative correlation coefficient for growth options value and both its components indicates that strong brands harm future income streams, i.e. harm firm value.

6.1.1. Robustness checks: Outliers

Outliers in the studied dataset can affect the size and direction of the correlation coefficients shown in the prior subsection. To check for the existence of such an outlier effect, outliers are omitted from the dataset. The outliers are selected based upon firm size and brand value. It is common practice to treat both large as well as small values as outliers, however this dataset is constructed with the help of the Interbrand's 'Best Global Brands' list, which is a top 100 brand value list. Therefore it makes no sense to omit the smallest firms or lowest brand values, as you cannot label these firms as small firms or brands with a low brand value. To put it into figures; the smallest firm was Yahoo! (2001) which had net sales figure of \$ 1,6 billion, and the brand with the lowest value was Barbie (2001) which still represented a value of over \$2.3 billion. Recapitulating, only the top ten percent are treated as outliers.

Table 4. Outliers effects, correlations						
	Baseline outlier (Size)	Baseline outlier (BV)	Growth outlier (Size)	Growth outlier (BV)	Mature outlier (Size)	Mature outlier (BV)
	<i>BV</i>	<i>BV</i>	<i>BV</i>	<i>BV</i>	<i>BV</i>	<i>BV</i>
V_{GO}^M	-0.0587	-0.1474*	-0.0372	-0.0188	-0.0912	-0.0668
XSP	0.2074***	0.1641**	0.0635	0.1408	0.0775	0.1743
V_{GO}^F	-0.1562**	-0.2236***	0.0737	-0.1230	-0.1427	-0.2239**
$SIZE$	-0.1043	-0.2627***	0.2180*	0.3560***	0.0123	-0.2495***
Observations	120	120	52	52	68	68
Confidence levels: *85%, **90%, ***95%						

The outlier analysis provide some interesting results, see table 4. The baseline correlation coefficients and significance levels have increased dramatically, both when for larger firms and brand value outliers are dropped. Whereas the correlation, including outliers, between brand value and growth option value is significant, it is not without the outliers. The opposite holds for the correlation coefficients between brand value and the two growth options value components; fundamental growth options value and mispricing.

When the outliers are excluded from the dataset, correlation coefficients increase and more relationships turn out to be significant. Although the number of significant relations has increased, the direction of the relationship in general has not changed. Therefore it seems to be that large firms and especially strong brands diffuse the relationship between brand value and the growth option value elements. In particular in the baseline analysis outliers affect the relationship between brand value and both fundamental growth option value and excess pricing. Another interesting observation is the surge in correlation coefficients in mature markets. In the original subsample, no relationship between brand value and both fundamental growth option value as well as excess pricing was found and insignificant. Within the growth markets subsample no correlations coefficients are significant, as it was in the original subsample analysis. In general, there seems to be a diffusing outlier effect present in the dataset.

6.2 The multivariate model

In the previous section, individual relationship between brand value and growth option value were analysed by calculating correlation coefficients. These correlation coefficients, however, neglect all other elements which could affect the measured coefficients. As a result, these results do not tell the entire story, and it could be that the relationship was affected by exogenous elements. In order to find the real correlation coefficient, an OLS regression is run which enables introducing control variables. To study the relationship between brand value, growth options value, fundamental growth options value and excess pricing three types of control variables are added. These variables control for firm size, sector or market effects and year effects.

Table 5. Regression outcomes, Baseline			
	Baseline	Baseline	Baseline
	V_{GO}^M	XSP	V_{GO}^F
BV	-0.1773	-0.0153	-0.1327
	(0.17026)	(0.21662)	(0.14695)
SIZE	0.0569	0.1584	0.0013
	(0.10147)	(0.10548)	(0.08572)
INDUSTRY dummies:			
Non-durables	-0.1056	0.5556	-0.4458
	(0.26258)	(0.47281)	(0.35262)
Durables	-0.0642	0.0585	0.1027
	(0.23703)	(0.40646)	(0.29252)
Business Equipment	0.0103	0.2026	-0.1510
	(0.20881)	(0.39103)	(0.23428)
YEAR dummies	YES	YES	YES
Observations	133	133	133
Confidence levels: *85%, **90%, ***95%			

The baseline regression, see table 5, indicates the inexistence of significant relationships between brand value and the three studied growth options value elements. This was not expected. According to the hypotheses 1 and 2, there would be a relationship between brand value and both growth options value and fundamental growth option value, as prior research would suggest that strong brands increase the firm's future earning potential.

Table 7. Regression outcomes, only MATURE Markets results			
	Mature	Mature	Mature
	V_{GO}^M	XSP	V_{GO}^F
BV	-0.1604	0.1157	-0.2986**
	(0.18200)	(0.2184)	(0.16982)
SIZE	0.0646	-0.038	0.2207**
	(0.08231)	(0.1167)	(0.11433)
MARKET dummies	YES	YES	YES
YEAR dummies	YES	YES	YES
Observations	75	75	75
Confidence levels: *85%, **90%, ***95%			

Within growth markets, see table 6 in appendix C, it is interesting to observe a large difference in the parameters for fundamental growth options value and excess pricing. The parameter for excess pricing is a lot greater than the parameter for fundamental growth options value. As both the parameters are insignificant for drawing any conclusions, the results do partially support hypothesis 3a. Contrary to the baseline and growth market results, the results for the mature markets are significant and do support hypothesis 3b (see table 7), providing proof of a stronger relationship between brand value and fundamental growth options value than between brand value and excess pricing. The negative direction of the relationship, however, between brand value and fundamental growth options value was not expected.

6.2.1. Robustness checks: Outliers

In table 8, see appendix C, the outcomes of the outlier analysis are displayed. The exclusion of outliers, based upon both size and brand strength, from the dataset altered the excess pricing parameters to some extent. When the largest firms are excluded all other parameters remain equal, the excess pricing parameter increases dramatically indicating a significant and positive relationship between brand value and excess pricing. A possible explanation for this phenomenon is categorisation. Investors categorise to simplify their investment decisions. If they do so (stock) prices within a group move together while

fundamental values do not. If the largest and best performing firms are excluded, this results into a surge of the excess pricing-brand value parameter.

In both growth and mature markets, no significant relationships are found, see tables 9 and 10. Within the mature markets brand are expected to have a stronger relationship with fundamental growth options value than with excess pricing. The results in table 8 provide evidence supporting this rationale (hypothesis 3b). When the strongest brands are omitted, however, results in an increase in the excess pricing parameter. As said above, this may be caused by categorising.

6.2.2. Alternative definitions

To check whether or not net sales are a good proxy for firm size, an alternative proxy for size is used analysing the baseline regression. The results, see table 11, do not significantly differ from the results with net sales as size proxy. This indicates that net sales are a usable proxy for firm size.

7. Conclusion and limitations

7.1 Conclusion

Pioneer scholars in the field of marketing like Murphy (1990) and Aaker (1991), argue in a qualitative reasoning the existence of a positive relationship between brand value and a firm's financial performance. In 1998, Bath *et al.*, also found empirical evidence of such a positive relationship between brand value and a firm's market capitalisation. Barth *et al.* (1998), however, do not distinguish between fundamental firm value and market capitalisation. The positive relationship between brand value and market capitalisation, therefore, could be driven by either fundamental growth firm value or investor's irrational behaviour. Using a recently developed method by van Bekkum *et al.* (2011), this study tried to provide clearance on the relationships.

Based on the outcomes, this study does not offer any evidence of the existence of a significant relationship between brand value and growth options value for the baseline dataset. Unlike Barth *et al.* (1998), this study did provide interesting insights into the relationships between brand value and the two distinct components of growth option pricing. For instance, with respect to excess pricing; in both the baseline dataset and the mature market subsample, investors seem to categorise firms into groups to simplify investment decisions. This would explain the surge in the excess pricing parameter if the largest ten percent of the firms were omitted from the dataset.

In growth markets, no significant relationships were found to support the hypothesis (3a) arguing a stronger relationship between brand value and excess pricing than with fundamental growth options value. The lack of significant results can be found in the low number of 58 observations the subsample accommodates, caused by the lack of data availability. As the results do provide the expected distribution of the relationships, is it rather plausible that hypothesis 3a holds for larger datasets. In the process of checking for outlier effects, a rather interesting phenomenon came to surface. When the strongest brands were omitted from the dataset, the excess pricing parameter plunged. Hence, in growth markets, investors prefer strong and familiar brands.

The strongest and clearest results were found in the mature markets subsample. A significant moderate effect was found for the relationship between brand value and

fundamental growth option value, as was expected from hypothesis 3b. The direction of the relationship, however, is counter-intuitive. The found negative relationship indicates that strong brands actually hurt firm value. This result is intriguing as it contradicts all prior research. A possible explanation may be found in two of the building blocks used to calculate fundamental growth options value; book value and net income. As indicated in subsection 4.2.2., does current GAAP not accept self developed brands as accounting assets. Hence, brands are not part of a firm's book value. Another explanation can be found in the fact that brand value data is collected from a top 100 brands list. Stronger brands, i.e. higher brand values, require larger marketing budgets. It is plausible that when brand value goes beyond a threshold, marketing becomes inefficient. Hence, 'the law of diminishing returns', higher marketing expenditures yield progressively lower net income impact. This would explain the negative relationship. Further research, however, is needed to deepen the knowledge about the relationship between brands and the two growth options value components.

7.2 Limitations and recommendations for future research

There are several limitations to this study. Brand value is elusive by nature and, therefore, hard to measure. As a results, are the used brand value estimates ambiguous. Consultancy firms like Interbrand and Millward Brown, for example, use different methodologies and both proclaim different brands to be the strongest. An additional problem with Interbrand's brand value estimates is that it requires access to firm insiders, who have a tendency to be more privy about circumstances affecting brand value (Simon and Sullivan, 1993).

Furthermore, as indicated above, the lack of significant effects in this explorative study has a lot to do with data availability. Firms and marketing consultancy agencies like Interbrand treat brand value data as commercially sensitive information and were not willing to share this. Therefore, this research had to make use of publicly available information. The Interbrand 'Best Global Brands' list is publicly available. The list contains the 100 most valuable brands and therefore it is questionable if the dataset is representative for the studied market types. In addition, it had a restrictive influence on the size of the studied dataset. The small dataset contained only 133 observations, which forced a focus on just four of the thirteen broad (Fama and Fench) sector definitions; healthcare, business equipment, durables and non-durables. These broad sectors are composed of several

industries that can differ on various characteristics, and therefore diffuse possible relationships. For example consumer electronics are clustered into the durables sector. The durables sector as a whole is labelled as a mature market, although, consumer electronics is a growth market on itself (Trigeorgis and Smit, 2004). Therefore it would be better to use individual industries or even individual characteristic dummies as controls. Future research should use a larger and more representative dataset. This is possible when scholars are able to find a partner like Interbrand or other brand value consultants.

Another possibility to increase the relationship parameters and the significance levels is by running an event study. This study, with a lag of five months, leaves a lot of room for noise to diffuse the studied relationships. In an event study it would be able to study the relationship using a lag of a couple of days. The diffusing noise would then (almost) be deleted; however, this would require alterations in the growth options value data, which is at year's end.

7.3 Final remark

To conclude, this explorative study has provided an insight in the relationship between brand value and growth options value. In contrary to the expected positive relationship, a negative relationship became apparent from the tests, although not significant. The relationship between brand value and fundamental growth options value or excess pricing largely depends on the market type. In growth markets, do brands seem to relate more to excess pricing, as was expected in hypothesis 3a. The expected higher correlation of brand value with fundamental growth options value was proven to exist. Summarising, the results in this study indicate that brand values do not relate to growth options value, and whether or not brands relate to fundamental firm value or irrational investor's behaviour depends on the market type in which the brand operates.

Appendices

Appendix A

Source: copied from brandchannel.com. Attained at 09-03-2012 01.46 PM

Example brand value calculation by Interbrand						
	Year 1	Year 2	Year 3	Year 4	Year5	
Market (Units)	250,000,000	258,750,000	267,906,250	277,179,469	296,880,750	
Market growth rate		4%	4%	4%	4%	
Market share (vol)	15%	17%	19%	21%	20%	
Volume	37,500,000	43,987,500	50,883,188	58,207,688	57,376,150	
Price (\$)	10	10	10	11	11	
Price change		3%	2%	2%	2%	
Branded Revenues	375,000,000	450,871,875	531,983,725	621,341,172	625,326,631	
Cost of sales	150,000,000	180,348,750	212,793,490	248,536,469	250,130,663	
Gross margin	225,000,000	270,523,125	319,190,235	372,904,235	375,195,979	
Marketing costs	67,500,000	81,156,938	95,757,071	111,941,411	112,558,794	
Depreciation	2,812,500	3,381,539	3,989,878	4,660,059	4,689,950	
Other overheads	18,750,000	22,543,594	26,599,186	31,067,059	31,266,332	
Central cost allocation	3,750,000	4,508,719	5,319,837	6,213,412	6,253,266	
EBITA	132,187,500	158,932,336	187,524,263	219,022,763	220,427,638	
Applicable taxes	35%	46,265,625	55,626,318	66,633,492	77,149,673	
NOPAT	85,921,875	103,306,018	121,890,771	142,364,796	143,277,964	
Capital Employed	131,250,000	157,805,156	186,194,304	217,469,410	218,864,321	
Working capital	112,500,000	135,261,563	159,595,118	196,402,351	187,597,989	
Net PPE	18,750,000	22,543,594	26,599,186	31,067,059	31,266,332	
Capital Charge	8%	10,500,000	12,624,413	14,895,544	17,397,553	17,509,146
Intangible Earnings	75,421,875	90,681,606	106,995,227	124,967,243	125,768,819	
Role of Branding Index	79%					
Brand Earnings	59,583,281	71,638,469	94,526,229	98,724,122	99,357,367	
Brand Strength Score	66					
Brand Discount Rate	7.4%					
Discounted Brand Earnings	55,477,916	62,106,597	68,230,515	74,200,384	69,531,031	
NPV of Discounted Brand Earnings (1-5 years)	329,546,442					
Long term growth rate	25%					
NPV of terminal Brand value (beyond 5 years)	1,454,475,639 +					
BRAND VALUE	1,784,022,082					

Appendix B

Source: copied from van Bakkum et al. (2011)

Economic Profit

The equity value of the firm can be expressed as the sum of: 1) invested capital that creditors and shareholders have entrusted to the firm over the years (CI), defined as:

$$\text{total assets} - (\text{accounts payable} + \text{other current liabilities})$$

and 2) the present value (PV) of all of the firm's expected economic profit (EP):

$$P = CI + PV(EP)$$

where $PV(EP)$ consists of a current level EP component, as well as an EP growth component that depends upon the firm's investments in future growth opportunities:

$$PV(EP) = PV(\text{Current } EP) + PV(\text{EP Growth}).$$

Combining these equations, firm equity value (P) can be rewritten as:

$$P = CI + PV(\text{Current } EP) + PV(\text{EP Growth})$$

where CI and $PV(\text{Current } EP)$ are the value of assets in place (i.e., V_{AIP}).

Growth Options Value

Growth measures the value of growth options (i.e., V_{GO}), calculated by solving and scaling by P :

$$V_{GO} = [P - CI - PV(\text{Current } EP)] / P,$$

where $PV(\text{Current } EP)$ is current economic profit, perpetually discounted by the cost of capital. For a single year, $\text{Current } EP$ can be expressed as:⁹

$$EP = \text{NOPLAT} - CI \times WACC$$

where NOPLAT is the firm's net operating profits less adjusted taxes. It is calculated by deducting all income taxes from net operating profit and adjusting for increases/decreases in deferred taxes (from the balance sheet), which is a source of cash. If deferred taxes from the previous year are not known, no adjustment is made. $WACC$ is the weighted average cost of capital, defined as:

$$WACC = \frac{D}{D + E} (1 - T)k_d + \frac{E}{D + E} k_e$$

where total debt (D) is the sum of long- and short-term debt, the market value of equity (E) equals the share price \times the total common shares outstanding, and the income tax (T) is set at 30%.

The cost of debt (k_d) is calculated iteratively using interest coverage ratios and default spreads as in Damodaran (2002). If the earnings are negative, we average earnings over the past five years. When companies are small (i.e., assets worth less than \$10 million), we use different spreads. For financial firms, we also use different spreads.

The cost of equity (k_e) is found using a standard capital asset pricing model using five-year adjusted betas.¹⁰ The most recent date is the same as that used for determining market value (see Section IV.A). The index used is the S&P 500 Composite Index. The market risk premium is assumed to be 8%. For each year, the corresponding average 10-year Treasury Bill rate is added to the spreads.

⁹ EP can be negative if capital $CI \times WACC$ is larger than NOPLAT . In economic terms, this means that the invested capital (or retained earnings invested in capital) will cost a shareholder money, and that this investment should be paid out as a dividend. The present value of current level EP is an annuity and value destruction (i.e., negative EP) will lead to a negative present value. As a consequence, value destruction will lead to growth options that exceed firm value.

¹⁰ Beta is the slope of regressing the security returns on the index. Therefore, we estimate beta over a rolling window of the current year and the four preceding years. Using weekly data, we have approximately 250 observations per estimate, while daily volatility does not affect the estimates. If less than four years are available, a one-to-three year estimate of β or k_e is used. We use Bloomberg's adjusted betas, which yield the most realistic k_e s of about 10-20%, and estimates future instead of historical betas. Adjusted betas equal $0.67 \times \text{Raw Beta} + 0.33 \times 1$ to adjust for their long-term tendency to converge toward one.

Appendix C

Tables 1 - 11

Table.1 Descriptives		
Variable name (N= 133)		
	Mean	Standard deviation
V_{GO}^M	1.1128	0.75804
V_{GO}^F	0.4527	0.85973
XSP	1.0452	0.94963
Controls:		
Net Sales (size), in millions	\$54,439.47	\$48,264.68
Employees (size alternative)	143,283	110,410
Non-durables sector	0.2556	0.43787
Durables sector	0.3083	0.46352
Healthcare sector	0.0827	0.27648
Business Equipment sector	0.3534	0.47983
Mature markets	0.5639	0.49777
Growth markets	0.4361	0.49777

Table 2. The correlation table of clusters

	BV	Net sales	Mature	Growth
BV	1			
Net sales	0.1751	1		
Mature	0.4236	0.1349	1	
Growth	-0.4236	-0.1349	-1.0000	1

Table 3. Correlations

	Baseline	Growth	Mature
	BV	BV	BV
V_{GO}^M	-0.1202**	0.0105	-0.1335
XSP	0.0638	0.1197	-0.0007
V_{GO}^F	-0.076	0.0381	-0.0869
SIZE	0.1751***	0.2255**	0.1141
Observations	133	58	75
Confidence levels: *85%, **90%, ***95%			

Table 4. Outliers effects, correlations

	Baseline outlier (Size)	Baseline outlier (BV)	Growth outlier (Size)	Growth outlier (BV)	Mature outlier (Size)	Mature outlier (BV)
	BV	BV	BV	BV	BV	BV
V_{GO}^M	-0.0587	-0.1474*	-0.0372	-0.0188	-0.0912	-0.0668
XSP	0.2074***	0.1641**	0.0635	0.1408	0.0775	0.1743
V_{GO}^F	-0.1562**	-0.2236***	0.0737	-0.1230	-0.1427	-0.2239**
SIZE	-0.1043	-0.2627***	0.2180*	0.3560***	0.0123	-0.2495***
Observations	120	120	52	52	68	68
Confidence levels: *85%, **90%, ***95%						

Table 5. Regression outcomes, Baseline

	Baseline	Baseline	Baseline
	V_{GO}^M	XSP	V_{GO}^F
BV	-0.1773	-0.0153	-0.1327
	(0.17026)	(0.21662)	(0.14695)
SIZE	0.0569	0.1584	0.0013
	(0.10147)	(0.10548)	(0.08572)
INDUSTRY dummies:			
Non-durables	-0.1056	0.5556	-0.4458
	(0.26258)	(0.47281)	(0.35262)
Durables	-0.0642	0.0585	0.1027
	(0.23703)	(0.40646)	(0.29252)
Business Equipment	0.0103	0.2026	-0.1510
	(0.20881)	(0.39103)	(0.23428)
YEAR dummies	YES	YES	YES
Observations	133	133	133
Confidence levels: *85%, **90%, ***95%			

Table 6. Regression outcomes, GROWTH Markets

	Growth	Growth	Growth
	V_{GO}^M	XSP	V_{GO}^F
BV	-0.0966	0.5555	-0.0289
	(0.37727)	(0.53666)	(0.34329)
SIZE	0.0395	0.1435	-0.0528
	(0.13856)	(0.16539)	(0.08290)
MARKET dummies	YES	YES	YES
YEAR dummies	YES	YES	YES
Observations	58	58	58
Confidence levels: *85%, **90%, ***95%			

Table 7. Regression outcomes, MATURE Markets

	Mature	Mature	Mature
	V_{GO}^M	XSP	V_{GO}^F
BV	-0.1604	0.1157	-0.2986**
	(0.18200)	(0.2184)	(0.16982)
SIZE	0.0646	-0.038	0.2207**
	(0.08231)	(0.1167)	(0.11433)
MARKET dummies	YES	YES	YES
YEAR dummies	YES	YES	YES
Observations	75	75	75
Confidence levels: *85%, **90%, ***95%			

Table 8. The regression results BASELINE, outliers

	Baseline outlier (Size)	Baseline outlier (Size)	Baseline outlier (Size)	Baseline outlier (BV)	Baseline outlier (BV)	Baseline outlier (BV)
	V_{GO}^M	XSP	V_{GO}^F	V_{GO}^M	XSP	V_{GO}^F
BV	0.0817	0.6058**	-0.1122	-0.3437	0.5276	-0.3171
	(0.28370)	(0.32016)	(0.29416)	(0.37696)	(0.41384)	(0.38784)
SIZE	0.0432	0.1110	0.001	0.0321	0.1698*	-0.0473
	(0.10771)	(0.10844)	(0.09268)	(0.10296)	(0.11304)	(0.08258)
INDUSTRY dummies						
Non-Durables	-0.2781	0.1201	-0.4303	-0.0529	0.2625	-0.4199
	(0.30443)	(0.50694)	(0.39255)	(0.31944)	(0.53081)	(0.40132)
Durables	-0.0793	-0.0425	0.1107	0.0218	-0.0512	0.2324
	(0.25029)	(0.42098)	(0.30601)	(0.25171)	(0.42655)	(0.31119)
Business Equipment	-0.0434	0.0576	-0.1431	0.0780	0.0638	-0.0740
	(0.22802)	(0.40213)	(0.31168)	(0.23937)	(0.41232)	(0.33134)
YEAR dummies	YES	YES	YES*	YES	YES	YES
Observations	120	120	120	120	120	120
Confidence levels: *85%, **90%, ***95%						

Table 9. The regression results GROWTH MARKETS, outliers

	Growth outlier (Size)	Growth outlier (Size)	Growth outlier (Size)	Growth outlier (BV)	Growth outlier (BV)	Growth outlier (BV)
	V_{GO}^M	XSP	V_{GO}^F	V_{GO}^M	XSP	V_{GO}^F
BV	-0.2408	0.3285	0.0856	0.0591	0.7838	-0.5811
	(0.38102)	(0.5187)	(0.34209)	(0.81590)	(1.03782)	(0.73276)
SIZE	-0.0985	-0.0369	-0.0675	0.0003	0.1196	-0.0134
	(0.12975)	(0.15025)	(0.08802)	(0.14759)	(0.16930)	(0.09216)
MARKET dummies	YES	YES	YES	YES	YES	YES
YEAR dummies	YES	YES	YES	YES	YES	YES
Observations	52	52	52	52	52	52
Confidence levels: *85%, **90%, ***95%						

Table 10. The regression results MATURE MARKETS, outliers

	Mature outlier (Size)	Mature outlier (Size)	Mature outlier (Size)	Mature outlier (BV)	Mature outlier (BV)	Mature outlier (BV)
	V_{GO}^M	XSP	V_{GO}^F	V_{GO}^M	XSP	V_{GO}^F
BV	-0.0972	0.3626	-0.4884***	-0.0688	0.5819***	-0.5410**
	(0.23908)	(0.26947)	(0.20650)	(0.31250)	(0.27325)	(0.29102)
SIZE	-0.0528	-0.0576	0.2026**	0.0762	-0.0418	0.1728
	(0.08941)	(0.12269)	(0.11798)	(0.09379)	(0.12685)	(0.12410)
MARKET dummies	YES	YES	YES	YES	YES	YES
Industry dummies	YES	YES	YES	YES	YES	YES
observations	68	68	68	68	68	68
Confidence levels: *85%, **90%, ***95%						

Table 11. Regression outcomes, Baseline EMPLOYEES size proxy

	Baseline	Baseline	Baseline
	V_{GO}^M	XSP	V_{GO}^F
BV	-0.2251	-0.0463	-0.0856
	(0.16452)	(0.20176)	(0.14111)
SIZE	0.1396	0.2325***	0.0253
	(0.09899)	(0.10325)	(0.08577)
INDUSTRY dummies:			
Non-durables	-0.0121	0.6552	-0.4731
	(0.264393)	(0.46249)	(0.34883)
Durables	-0.0653	0.1062	0.1134
	(0.21826)	(0.41983)	(0.29991)
Business Equipment	0.0413	0.2624	-0.1551
	(0.20637)	(0.39911)	(0.29706)
YEAR dummies	YES	YES	YES
Observations	133	133	133
Confidence levels: *85%, **90%, ***95%			

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