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Master Thesis

The Role of Brand Value as a Buffer During Financial Shocks

— Final Version —

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Abstract

Intangible assets such as brand value have been a widely discussed subject within the academic literature. The difficulty with objectively and accurately estimating brand values have caused it not to be reported on the balance sheet, even though it is often agreed upon that brands hold significant value for firms. To further assess the value-relevance and reliability of brand value estimates, this study uses data from three separate brand valuation methodologies and evaluates the sustainability and durability of brand value. The aim of this study is to examine if brand value can protect and help firms sustain through difficult economic times, such as large financial shocks. The results suggest that brand value helps reduce the amount of volatility in stock returns that firms experience; this holds even during times of extreme volatility, such as a financial crisis. These results support the notion that brand value can play a protective role during economic downturns. Additionally, all three brand value estimates are consistent in their direction and significance, which provides evidence for the value-relevance of brand value estimates. However, the brand value estimates differ in their effect sizes, leaving the question of reliability open for future research.

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1 Introduction

> *"A product is something that is made in a factory; a brand is something that is bought by a customer. A product can be copied by a competitor; a brand is unique. A product can be quickly outdated; a successful brand is timeless."*
>
> – Stephen King, WPP Group, London

Brands are all around us and almost everyone interacts with them on a daily basis. Their effects can be considerable, and with the ever-increasing globalization of the economy they are barely limited by borders, in fact, a more global presence adds value to the brand (Steenkamp et al., 2003). Brands are considered to be a valuable asset for firms as they play a crucial role in connecting their products and services with customers (Keller et al., 2011). A strong brand identity can set a company apart from its competition and has the ability to affect consumer behavior (Keller, 1993). Individuals face many choices every day and are often time-constrained. Therefore, a strong brand that is known for delivering on its promises and thus manages to set clear expectations is invaluable to the consumer and organization alike as it simplifies the decision-making process and creates a connection between the two. The aim of this research is to evaluate whether this bond between consumer and organization—measured by brand value—provides resistance against financial shocks and changes in the market.

Brand value is an example of an intangible asset as it is ultimately dependent on the consumer's perception of the brand and subsequently determined by the added financial value to the firm. Intangible assets have been a much discussed subject in academia (e.g., Barth and Clinch, 1998; Kaplan and Norton, 2004a,b; Kaufmann and Schneider, 2004), mainly due to the combination of its complexity and importance, this is no different for brand value in specific (e.g., Eng and Keh, 2007; Keller, 1993; Madden et al., 2006; Schiuma et al., 2008). Although brand value has been approached academically from different perspectives, research into its sustainability and ability to withstand changes in the market is still lacking. Johansson et al. (2012) try to address this gap by evaluating how the strongest brands in the U.S. market fared against the financial crisis in 2008. They find that when using a financially based measure of brand value (Interbrand), the top brands did not outperform the market as a whole. Whereas when using a consumer-based brand equity measure (EquiTrend), the top brands did outperform the market. However, Johansson et al. (2012) evaluate the

performance of only 50 brands during a period of merely 4 months. Furthermore, they do not take into account changes in the brand values, and instead only use static brand value as a ranking mechanism.

This research addresses these limitations, builds upon prior research and contributes to the literature in several ways. First, the time period is expanded to 2007–2016, as comparing data over a period of around 10 years is likely to provide more insight into the issue compared to a 4 month period analysis. This not only captures the direct effect of the global financial crisis on brand value but also incorporates how brands react in the years following a large financial shock. Second, brand value is taken from multiple sources and their measurement styles are compared. For each of the brand value estimation methodologies, the impact on stock price performance is evaluated, the impact of the global economy and financial crisis is assessed, and finally, the impact on stock return volatility during a downturn is also evaluated. Third, instead of focusing on the U.S. market, the top global brands are all compared with a global benchmark, namely the MSCI World Index. Finally, a panel data analysis is conducted as both the changes in brand value as well as the corresponding firm performance is compared with the overall market movements during the aforementioned time period.

Taking these issues into account, this research aims to answer the following question: *"How does brand value help firms sustain through economic downturns?"* By evaluating and finding an answer to this question, the literature would gain a deeper understanding of brand value, as well as an improved ability of predicting the effect of financial shocks on firms with high brand value. It provides much needed insights into the potential sustainability and durability produced by brand value. The results may also open up several paths for future research, for example, research into which component of brand value adds the most sustainability to the firm.

Besides the added value to the academic literature, this study also has implications for society. First of all, for firms themselves, the knowledge regarding whether brand value can act as a buffer and has the ability to retain value during economic downturns is very important. With this knowledge an organization might want to put more or less effort into building and cultivating their brand value, and the firm will also gain a better understanding of the asset's value in itself. Secondly, it also has relevant implications for investors as it increases their understanding of firm value and may improve their ability to accurately

value firms. When deciding whether or not to invest into a certain company, investors can consider the firm's brand value. With the added knowledge of its ability to act as a buffer and potentially retain sustainable results throughout market developments, they can form a better risk assessment of the company and identify investment opportunities in an improved fashion. Finally, there are also implications from the consumer perspective as they may increase their trust and subsequently consumption in high brand value firms with the knowledge that they can continue to meet their expectations during economic downturns due to the increased sustainability of the firms.

In short, the research contributes to both the relevant literature as well as society in a considerable manner. The remainder of this study is structured as follows. Section 2 discusses the relevant literature and develops several hypotheses. Section 3 discusses the research method; it presents the measures and data used in this study, and also delves into the applied methodology. Section 4 follows up with the corresponding results, section 5 discusses the implications of those results as well as the limitations of the study and avenues for future research, and finally, section 6 concludes.

2 Literature and Hypothesis Development

This section first reviews the relevant prior literature and discusses the characteristics of brand value which may contain the ability to retain value during economic downturns. Next, the existing understanding of the relation between brand value and firm financial performance is also addressed. Following that, brand value's relation with financial shocks is discussed. Finally, this study's hypotheses are developed and a theoretical model is created.

2.1 Brand Value

'Brand value' is a concept which does not have one specific clear and widely accepted definition, in fact, it is argued it will never have one as it is a concept that will continuously evolve along with theoretical developments and advancements in the academic literature (Davcik et al., 2015). Nonetheless, a lot of research has already been conducted on the subject, and as such, a large amount of knowledge on brand value already exists, even so, a need for further research on the subject is still heavily warranted (Keller, 2016). The definition used in this proposal stems from Aaker (2009), who has defined brand equity as a set of brand assets and liabilities—linked to the brand's name and symbol—that add to or subtract from the value provided by a product or service to a firm and/or to that firm's consumers. The sum of these assets and liabilities are what form brand value, which is considered to be the net present value of the estimated future cash flows attributable to the brand (Kumar and Hansted Blomqvist, 2004).

These assets and liabilities of brands come in many different forms, but have been grouped into several categories. These categories form the 'building blocks' of brand value and consist of Aaker's (2009) five dimensions of brand equity; brand loyalty, brand awareness, perceived quality, brand associations, and other proprietary brand assets. These dimensions of brand equity have been broadly accepted and employed by many researchers (Keller, 1993; Kim et al., 2003; Kim and Kim, 2005; Low and Lamb Jr, 2000; Motameni and Shahrokhi, 1998; Yoo and Donthu, 2001). The five dimensions of brand equity have a collective effect on the firm's financial performance; they are what allow for price premiums and excess market share over the (non-branded) competition and thus create brand value. Note that whilst these dimensions can be large assets for firms, they can also be liabilities if

they put the brand in a negative light, for example, if a brand is perceived as low quality or not to be trusted it can reduce the value of the firm's products and services (Keller et al., 2011). Each of the five mentioned dimensions are explained individually further on within this section. Even though it is difficult to assess the specific effect of each of the mentioned categories, it is still important to cover the theory behind them as they contain the very characteristics that would make it theoretically possible for brand value to act as a buffer during economic downturns.

2.1.1 Brand Loyalty

Brand loyalty is a core factor of brand value; a customer base with high loyalty towards the brand can have immense value as it indicates a more reliable future revenue stream (Aaker, 2009). Higher brand loyalty can be associated with increased customer life time value as the likelihood of repeat purchases would be higher (Berger and Nasr, 1998). Not to mention, brand loyalty reduces marketing costs in two ways; (1) retaining customers is usually less costly than obtaining new ones and (2) a satisfied customer base is likely to attract new customers on its own (Aaker, 2009). Furthermore, it provides the firm with some breathing room regarding market developments. Loyal customers are less likely to switch very quickly, allowing the organization to catch up on recent developments and rising competitors (Aaker, 2009). Brand loyalty is not just determined by customer satisfaction based upon previous experiences, but is also affected by 'brand trust'. Brand trust is the feeling of security that the brand will meet the consumer's expectations and has been found to be positively related with brand loyalty (Delgado-Ballester and Munuera-Alemán, 2001; Delgado-Ballester et al., 2003). However, if a brand is well trusted it does not necessarily imply that they have high customer loyalty as this is dependent upon other factors as well (e.g. satisfaction, customer engagement etc.). Brand trust helps reduce uncertainty, which, whilst helpful for cultivating loyalty, is not enough on its own as it does not consider the feelings and affect elicited by the brand (Chaudhuri and Holbrook, 2001). Chaudhuri and Holbrook (2001) find that both brand trust and brand affect are crucial constructs of brand loyalty, which in turn has positive effects on brand performance.

2.1.2 Brand Awareness

Brand awareness is an important and sometimes undervalued component of brand value as it can affect perceptions and attitudes (Aaker, 1996). It is defined as the ability of a potential buyer to recognize or recall a brand as a member of a particular product category (Aaker, 2009). Empirical studies have found brand awareness to have a considerable effect on consumption decisions; when deciding between a set of brands, an overwhelming preference for the high awareness brand was shown (Hoyer and Brown, 1990; Macdonald and Sharp, 2000). Brand awareness tends to be used as a decision making heuristic, often in an attempt to save the time and energy otherwise required to compare several brands (Hoyer and Brown, 1990). Finally, brand awareness has also been found to be both positively related with, and a significant driver of, market performance (Homburg et al., 2010; Huang and Sarigöllü, 2014).

2.1.3 Perceived Quality

Perceived quality can be defined as the consumer's judgment towards the overall quality or superiority of a product or service (Aaker, 2009; Zeithaml, 1988). It does not necessarily represent the actual quality of the product or service, but is instead based upon the users' subjective evaluations (Yoo and Donthu, 2001). Remarkably, unlike perceived quality, objective quality does not necessarily contribute to brand value (Anselmsson et al., 2007). Even if a product or service is of extremely high quality, so long as the consumer does not actually perceive it to be of high value, it would not improve the brand value.

Perceived quality generally depends upon the product's reliability, durability, serviceability, style and design. Consumer beliefs regarding these characteristics often define quality, and in turn, affect their attitudes and behavior towards the brand (Keller et al., 2011). Perceived quality is also affected by the track-record or history of the supplying organization (Davcik et al., 2015). Furthermore, perceived quality has been shown to be associated with price premiums, price elasticities, brand usage, and even stock returns (Aaker, 1996).

2.1.4 Brand Associations

A brand association is anything 'linked' in memory to a brand; additionally, this link with the brand becomes stronger when it is based on many experiences rather than few (Aaker,

2009). Following this, a set of brand associations together form the 'brand image', which, if positive, facilitates a higher brand value (Aaker, 2009; Keller, 1993). Brand associations consist of all brand-related thoughts, feelings, perceptions, images, experiences, beliefs and attitudes (Fayrene and Lee, 2011; Kotler and Keller, 2006). As can be imagined, brand associations are affected by a large number of items, a few key examples of these would be; social image, trustworthiness, distinctiveness, organizational associations and even country of origin (Fayrene and Lee, 2011). Brand associations are used by marketers to differentiate, position, and extend their brands, to put their brand in a positive spotlight by suggesting attributes and benefits of purchasing or using their specific brand. Whereas consumers use brand associations to aid them in making purchase decisions, by helping process, organize, and retrieve information within their memories (Aaker, 2009; Low and Lamb Jr, 2000).

2.1.5 Other Proprietary Brand Assets

The previous four categories of brand value were mostly from the customer perspective, unlike those, this final category represents other proprietary brand assets from the firm's perspective, such as; patents, trademarks and channel relationships. Brands are more valuable if they can restrict or prevent competitors from mimicking or filling the same exact role as them, and as a result keep standing out from their competition (Aaker, 2009). The use of trademarks could, for example, prevent competitors from using a similar name, symbol or package, which could confuse consumers and reduce brand value. Similarly, patents and control over distribution channels could prevent direct competition and keep brand value high (Aaker, 2009).

2.2 Brand Value and Financial Performance

A lot of research has been conducted on brand value's relevance and relation with firm financial performance. Its difficulty in measuring properly and accurately has caused it to be excluded from generalized financial statements. However, that is not to say that brand value has no relevance for the financial performance of a firm. On the contrary, much of the prior literature has found evidence for brand value having a positive relation with financial performance. This holds for accounting performance (e.g. Aaker and Jacobson, 2001; Eng and Keh, 2007; Verbeeten and Vijn, 2010) as well as market performance (e.g. Barth et al.,

1998; Erdem and Swait, 1998; Madden et al., 2006). This section evaluates the existing literature on brand value's connection with both types of performance measures.

Brand value has been found to improve customer preferences towards the offered products and services, and greatly increase purchase intentions (Cobb-Walgren et al., 1995). Similarly, Simon and Sullivan (1993) state that a firm with an established and successful brand name can generate higher future cash flows and earnings relative to firms with unbranded (e.g. generic or commodity) products. Therefore, following from this, firms with higher brand value should experience increased future financial performance, at least in the form of higher sales, relative to firms with less brand value that are otherwise similar. Assuming that this relation is known, or at least perceived to be the case by investors, then this should also have a positive effect on the current market performance for the same firms with relatively higher brand value.

Two studies, conducted by Kim et al. (2003) and Kim and Kim (2005) respectively, empirically evaluated the direct effect of customer-based brand value on sales. They use sales as the financial performance measure as opposed to more commonly used measures so as to exclude any notion of the manager's ability from potentially affecting the results. Both studies use data on luxury hotels, with Kim and Kim (2005) also using data on chain restaurants. The results of both studies indicate that brand value significantly and positively affects the financial performance of firms. Furthermore, they also find that the dimensions of brand value discussed earlier are important and significant indicators of brand value, and subsequently also affect financial performance individually (Kim et al., 2003; Kim and Kim, 2005).

Barth et al. (1998) evaluate the contemporaneous relationship between brand value and stock price, while controlling for equity book value and net income. They use brand value data from Financial World (which uses the Interbrand methodology) and find that brand value is positively and significantly related to stock prices and returns, even after controlling for a potential simultaneity bias. They conclude that brand value estimates are relevant and important for investors as they hold value for the firm. Madden et al. (2006) also use Interbrand data to further assess brand value's relationship with stock performance as well as the book-to-market ratio. They provide empirical evidence that strong brands create greater shareholder value through yielding higher returns on average, and that they do so with less risk.

Unlike the previous studies, which look purely at a contemporaneous relation, Eng and Keh (2007) evaluate the lagged effects of brand value on operating and market performance, using data obtained from Financial World. They find that brand value positively and significantly affects accounting performance (ROA) for up to four years, though the effect on future stock returns is minimal. Verbeeten and Vijn (2010) use data on brand value obtained from Young & Rubicam to investigate the relationship between certain brand value measures and financial performance. The results indicate that brand differentiation, which is a type of brand measure, is positively associated with both contemporaneous as well as future financial performance (ROI and CFROI) of business-units. Also using brand data from Young & Rubicam, Mizik (2014) finds that brand value positively impacts current financial performance, and to a much greater extent also significantly affects the future financial performance of a firm. In fact, looking at the aggregate, only a small portion of the impact of brand value is reflected in the current year's profits, whereas the majority of the profitability impact is realized in the future. Because of this, companies that rely on short-term performance measures may not be allocating adequate resources for the accumulation of their brand value (Mizik, 2014).

In summary, brand value has—in multiple environments—been found to positively impact firm financial performance. Its effect appears most often to be contemporaneous in relation with market performance and lagged with regards to accounting performance measures. Intuitively this makes sense; accounting performance measures are generally seen as backward-looking due to the focus on historical results, whilst market performance measures are considered to be forward-looking due to the incorporation of potential future growth (Bharadwaj et al., 1999). A study by Aaker and Jacobson (2001) looking at brand attitude, a component and key indicator of brand value, also provides similar evidence in support of this relation with the two types of performance measures. They find that the effects of brand attitude lead firm accounting performance (ROE) by one or two quarters, whilst its effect on stock returns is contemporaneous. They argue that stock market participants incorporate the future effects of brand attitude on accounting performance into the current stock price. Therefore, it can be said that brand value is more of a long-term asset than a short-term one, considering its relation with firm value. Not only that, but it also takes time to properly build a brand from the ground up, it requires continuous investments and effort to maintain, and its effects have been proven to be able to withstand the test of time

by many longstanding and successful brands. Together, these results provide an indication towards how brand value can be important for firms, investors and consumers alike.

2.3 Brand Value and Financial Shocks

Although brand value has been researched a fair amount, not a lot of research has been conducted on its relation with external economic conditions—or more specifically, with shocks in the financial market. Many authors have claimed support of brand value's potential as a cushion during economic downturns in a theoretical context (e.g. Farquhar, 1989; Keller et al., 2011), but they have not yet been able to properly evaluate this empirically. Farquhar (1989) states that a strong brand has the resiliency to endure periods of crisis, citing, among others, the example of Budweiser. Following the prohibition of all breweries in America in 1920, Budweiser still managed to return to its number one position as the "King of Beers" after the repeal in 1933, something that a lesser brand would likely not have been able to manage (Farquhar, 1989). Brand value can offer resilience to survive difficult times, it might also smooth earnings in cyclical industries. During economic downturns, where consumers tend to spend less, sales of high brand value products may not drop as much due to consumer comfort with strong brands (Fehle et al., 2008).

On the other hand, high value branded products are often priced at a premium relatively to their unbranded counterparts, a premium which consumers may no longer be willing to spend during a financial recession. Lamey et al. (2007) evaluate the performance of national- and private-label products in the grocery store industry during business-cycle swings. They find that consumers switch more quickly towards store brands during bad economic times, than that they switch back towards national brands following the recovery, damaging the long-term performance of the national brand. This may, however, be a symptom of the industry as Rego et al. (2009) actually find that brand equity reduces systematic risk. Rego et al. (2009) use consumer-based brand value data from EquiTrend covering 252 firms and find that brand value plays a significant role in protecting the firm from both firm-specific as well as market risk. Both Lamey et al. (2007) and Rego et al. (2009) argue, and agree, that firms should not be lowering their investments and marketing expenditures into their brands during economic downturns—which most firms tend to do—but instead, should undertake a proactive strategy and increase, or at the very lease sustain, their brand marketing and investment expenditures.

As also briefly mentioned in the introduction, Johansson et al. (2012) evaluate the performance of global brands during the 2008 financial crisis. They used brand value data from Interbrand as well as EquiTrend on a total of 50 brands, and find that during the 2008 crisis, the highest scoring brands from EquiTrend outperformed the market on average, whereas the highest valued brands from Interbrand did not. They explain their results by stating that the consumer-based methodology of EquiTrend is largely exogeneous to the stock market, whereas the financial-based Interbrand methodology is not. Though the limited time period of four months does not provide any information on how the brands performed following the recession.

2.4 Hypothesis Development

Brands fulfill many roles for the firm; they act as a signal to the consumer (Erdem and Swait, 1998), they may allow for price premiums (Aaker, 1996), they can create a loyal customer base (Chaudhuri and Holbrook, 2001), they can increase customer purchase intentions (Cobb-Walgren et al., 1995), and many others. To list all of the roles that a brand fulfills for a firm would simply take up too much space, it should come naturally then, to say that brands can be highly valuable for firms. Though it requires much effort, time and investments in order to properly build value for a new brand, the contribution that it can add to the financial wellbeing of the company is significant (Fischer and Himme, 2017).

Brand value has previously been connected to stock performance (Barth et al., 1998; Madden et al., 2006), suggesting that the market at least recognizes some of the value added of a brand. Similar to the stock price, brand value can be considered as a long-term, forward-looking measure as they both contain information on future potential cash flows. Acknowledging that in an efficient market, the stock price should incorporate all available information (Fama et al., 1969), it should also include the information that the value of a brand provides about its future financial wellbeing. Altogether, and considering that providing information and signaling are key roles of brands (Erdem and Swait, 1998), the following hypothesis is formed:

H_1: *Positive (negative) changes in a firm's brand value are positively (negatively) associated with changes in the firm's stock price.*

Even though, as mentioned, brand value has already been found to be connected with

stock performance, it is both useful and pertinent to once more evaluate this relationship within this specific dataset. The expectations are in line with prior literature, in that they hold a positive relationship. Prior literature has also examined the co-movement of international stock markets, and correlations are especially high now as the economy is more globalized than ever (Arshanapalli and Doukas, 1993; Goetzmann et al., 2005). Furthermore, in general, individual stock performance is positively and significantly related with industry and overall stock market movements (Opler and Titman, 1994). Thus, if brand value is positively related with the stock price, then it should also be positively related with the stock market, especially considering that firms with high brand value are likely to operate on a very global scale (Steenkamp et al., 2003).

In order to fully understand brand value's role as a buffer during financial shocks, it is crucial to evaluate the relationship between brand value and the global stock market, where again, a positive relationship is anticipated. It can be argued that brand value is likely in some extent to move along with fluctuations in the market, at least on average. During economic downturns the value of a brand might decrease since, on average, consumption would fall. Likewise, during financial booms, the value of a brand might increase, since an increased level of consumption would highlight the financial role of a strong brand.

An important aspect of brands to consider here is brand differentiation. Brand differentiation is related with the brand's ability to stand out from the competition and has been found to be positively associated with both current and future financial performance for business-units (Verbeeten and Vijn, 2010). Additionally, during bad economic conditions consumers may simply not be able to afford premium brands (Lamey et al., 2007). Therefore, the value added from a brand being able to stand out from the crowd is likely higher (lower) when market demand is high (low). Strictly speaking, during a strong economy a brand can ask for higher price premiums and get larger market shares relative to when the economy is in a bad condition. This implies that the present value of future cash flows attributable to the brand would be higher (lower) during a healthy (weak) economy. Of course this does not mean that having a strong brand during an economic downturn is somehow less desirable. A brand being able to stand out from its competition when the economy is weak is still very valuable as it may help the firm sustain through the downturn. However, it stands that on average, the financial value of a brand increases and decreases along with the state of the economy. This is due to the relative potential future cash flows attributable to the brand

being affected by the condition of the market. Hence the following hypothesis is formed:

H_2: *Positive (negative) changes in the global stock market are positively (negatively) associated with changes in brand values.*

Although brand value may fluctuate along with market conditions, it can be argued that it does so to a lower extent compared with general (financial) firm performance measures. This is where brand value's potential ability to act as a buffer would lie. A brand acts as a signal to the consumer, it sets expectations, sets itself apart from the competition, and provides crucial information in an area where asymmetric information regarding quality and performance is present (Davcik et al., 2015). This signaling role of the brand and the information it delivers do not suddenly just disappear during economic downturns. The main dimensions of brand value discussed earlier, such as; brand- loyalty, awareness, perceived quality, and associations, once properly cultivated by the firm, should be able to withstand external effects to a certain degree.

Some may consider the value of brands to be fragile due to the widespread nature of the internet and social media in this day and age, which allows for any negative bad press to quickly spread globally and is near impossible to remove. However, this is only relevant for internal brand issues, also called product-harm crises, which can do severe damage to the value of a specific brand (Dawar and Pillutla, 2000). In the case of external factors, such as market conditions and financial shocks—which are non-specific to the brand itself—the core perception and understanding of the brand's ability and quality are likely not as affected. Thus, although brand value does not remain entirely unaffected during financial shocks, it is likely that a lot of its value can be retained due to its characteristics, which brings us to the following three hypotheses:

H_{3a}: *Financial shocks have a negative impact on the financial performance of a firm.*

H_{3b}: *Financial shocks have a negative impact on the brand value of a firm.*

H_{3c}: *Financial shocks have a lower negative impact on brand value relative to the firm's financial performance.*

The financial shocks can be as large as the recent global financial crisis, or as small as a slight overreaction to an unsubstantiated rumor in the market. Either way, both the

financial performance and brand value of firms are expected to be affected negatively due to the financial shock. However, the brand value of these firms is expected to be able to better withstand the shock as opposed to financial measures due to its large proportion of long-term value. For example, a well respected brand name is expected to be better shielded against external factors in the market relative to a lesser known/respected brand, ceteris paribus.

As mentioned previously, loyal customers are less likely, or at least slower to change brand (Aaker, 2009). This implies that a high amount of brand loyalty—which increases brand value—indicates sustainable value throughout negative market developments. A brand with a strong and positive brand image, especially one with high credibility and trustworthiness, is more likely to be able to weather a downturn in the economy (Keller et al., 2011). Furthermore, brand value is argued to be able to smooth earnings during cyclical business conditions (Fehle et al., 2008). This can be the case due to the aforementioned credibility and trustworthiness that can be assigned to successful brands. It would create reassurances for consumers, such that even when market conditions are "not as bright as they were yesterday", they may still believe that these brands will deliver up to their needs and expectations. Therefore, unless it is out of necessity (e.g. the inability to afford) the average consumer might not drop a high value brand as fast compared to lower valued brands. This implies that high brand value can result in higher and more stable cash flows for firms. If investors are aware of this relation, they are less likely to sell the stock of firms that have high brand value during a dip, thus reducing the volatility of the stock prices. As such, the final hypothesis is formulated:

H_4: *High brand value firms have less volatile stock returns during economic downturns than low brand value firms.*

All of the previously hypothesized relationships are represented in the theoretical framework in figure Figure 2.1 below. In summary, high brand value is expected to improve the firm's financial performance and reduce its volatility. The global economy is expected to positively affect brand value, and financial shocks are expected to negatively affect both financial performance and brand value, albeit to a lesser extent for the latter.

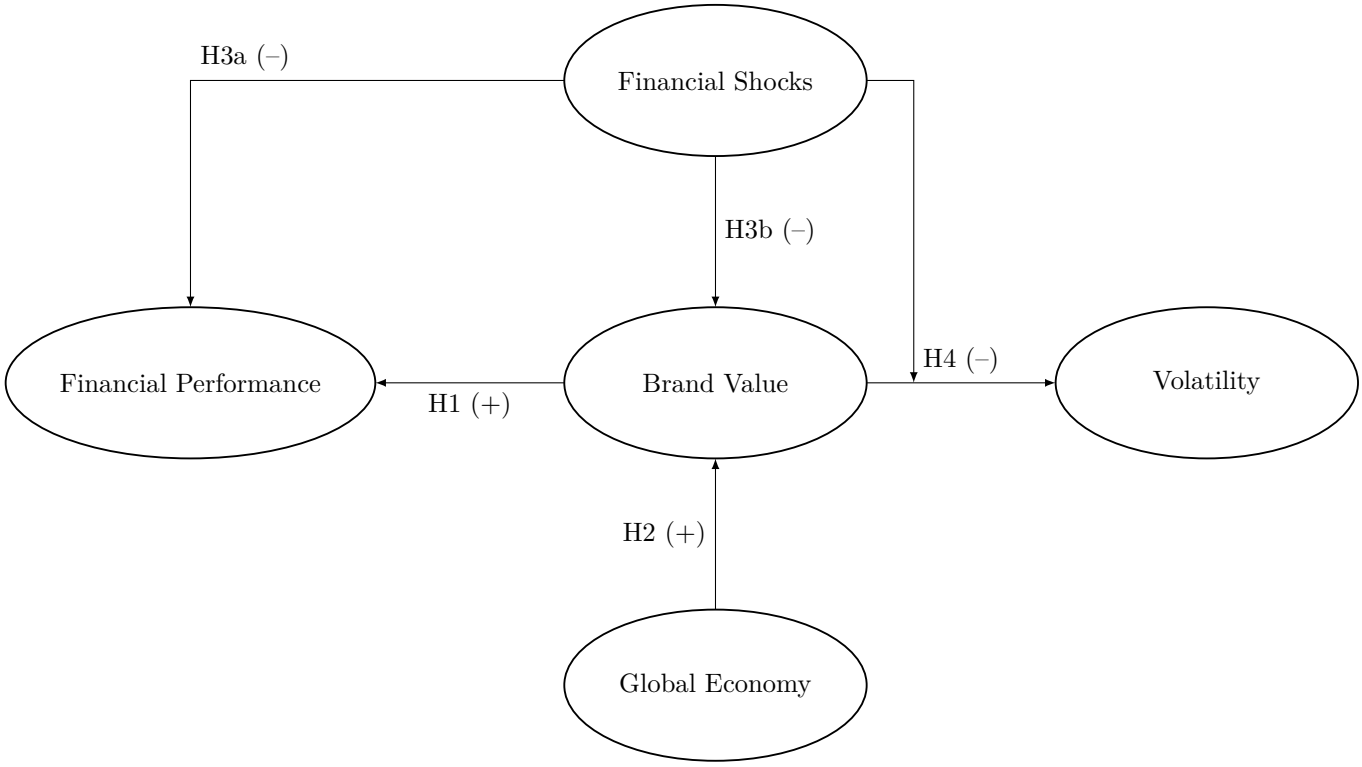

Figure 2.1: Theoretical Model

3 Research Method

The used dataset covers a time period of 10 years, specifically from 2007 up to and including 2016. This time frame includes one of the largest global financial crisis in recent history, often considered to have been the worst crisis since the Great Depression during the 1930s (Eigner and Umlauft, 2015). Evaluating how brand value reacts to such an event and the years following it can provide significant insight into its potential ability to act as a buffer.

The dataset is compiled using several sources; data on brand values are collected from Millward Brown Brandz, Interbrand and BrandFinance. As the notion of brand value—and specifically how it is measured—can be quite ambiguous, the inclusion of multiple sources should help account for some individual measurement errors. Financial data, on both firm level as well as market level, are obtained from Thomson Reuters.

3.1 Brand Value Measures

Millward Brown Brandz, Interbrand and BrandFinance each report their estimates for the top 100 global brands on an annual basis. Due to differences in measurement styles brands are often appointed slightly different values and rankings, other times a brand is completely omitted from one list but present elsewhere. The general outline of each of the used methodologies is described below, followed by Table 3.1, which summarizes the different brand value methodologies in a single table. Ending with one final brand value measure that consists of the average across all three methodologies.

3.1.1 Millward Brown Brandz[1]

Out of the three, Millward Brown's methodology, BrandZ^{TM}, is the most consumer-oriented, although they too incorporate financial information. They first start with the corporate earnings and evaluate an attribution rate for the specific brand through analysis. With this attribution rate they move from corporate earnings towards brand specific earnings. However, this financial value is still backward-looking as it incorporates mostly historic data. They consider future earnings as an important part of brand value, thus they forecast future earnings using information supplied by Bloomberg data in order to determine the 'Brand Multiple'. This is done in a similar fashion to how financial analysts determine the

[1] Information taken from the Millward Brown Brandz methodology

market value of stocks. Finally, the brand earnings are multiplied with the brand multiple to arrive at the financial value of the specific brand.

The next step is to evaluate 'Brand Contribution' which looks at the consumer's brand association and willingness to pay a premium. This measure is focused on three categories; meaningfulness, differentiation and salience. Meaningfulness represents the brand's appeal and ability to meet the individual's expectations and needs. Differentiation measures the extent to which the brand stands out from the crowd and is able to set new trends. Salience refers to how quickly consumers think of the brand when making choices within its category. These factors are all measured through the consumer's perspective and is done with the use of extensive worldwide quantitative consumer research, both online and face-to-face. This global study of consumer behavior has grown over the years and currently covers over 3 million consumers and more than 100,000 unique brands. According to Millward Brown this is what uniquely distinguishes their valuation methodology from the competition.

The final step is to take the financial value and multiply it with the brand contribution, which is expressed as a percentage of financial value. This results in the final value of the brand; brand value, which is the dollar amount that the brand contributes to the overall value of the organization.

3.1.2 Interbrand[2]

Interbrand's valuation methodology relies more on financial analysis but still incorporates some consumer information through the evaluation of the brand's role in purchase decisions, albeit to a lesser extent than BrandZ^{TM}. Interbrand starts with a financial analysis of the organization and measures the economic profit of the brand, using Thomson Reuters and company annual reports. Their financial forecasts form the foundation of their brand value estimation.

Next, they evaluate the role of the brand, which measures the extent to which the brand is responsible for the purchase decision as opposed to other factors (e.g. price, convenience and product features). This is quantified into a percentage, called the 'Role of Brand Index' (RBI). Depending on the brand, the RBI is derived from either; primary research, an industry comparison of historical brand roles, or an assessment from an expert panel.

Afterwards, the brand's strength is measured, this reflects the brand's ability to create

[2] Information taken from the Interbrand methodology

and sustain loyalty, which in turn is an indication for future demand and profit. Brand strength is based on 10 factors that are considered to be growth drivers, such as; responsiveness, differentiation, engagement, and others.

In order to assess both the RBI and brand strength, data from Canadean is used for consumer goods data and market research. Furthermore, social media analysis by Infegy and Twitter is also applied. Finally, all the elements are combined to arrive at a measure for a brand's contribution to the business; brand value, quantified in US dollars.

However, in order to be included on Interbrand's list of the best global brands, there are several criteria that have to be met by the brands. Most notably, at least 30% of the company's revenues must come from outside the brand's home region, they have to have a significant global presence and require sufficient financial transparency. These requirements explain why some brands are missing from Interbrand's lists relative to others, for example, Wal-Mart is excluded as over 70% of its revenues are from its home region (Wal-Mart Stores, Inc., 2017). Even though, it consistently ranks at the top of the Fortune 500, even globally (Forbes, Inc., 2017), and is also ranked highly each year at both Millward Brown BrandZ and BrandFinance.

3.1.3 BrandFinance[3]

BrandFinance's method of valuation for brand value is the most financially oriented methodology, as adequately represented by its name. BrandFinance uses the 'Royalty Relief approach', which means that they estimate the future sales that the brand would be responsible for and calculate a royalty rate that a third party would have to pay for the use of said brand. They start with determining the brand strength, and appoint each brand with a score out of 100 on the 'Brand Strength Index' (BSI). Next, they determine the range of the royalty rate applicable to the brand's respective sector by reviewing comparable licensing agreements. Multiplying this royalty rate range with the brand strength provides the royalty rate applicable to the respective brand.

Afterwards, they determine the brand specific revenues by evaluating the relevant proportion of the parent company's revenues. Next, they forecast future revenues attributable to the brand, using a function of its historic revenues, analyst forecasts and economic growth factors. Then the royalty rate is applied to these forecast values to derive the relevant brand

[3] Information taken from the BrandFinance methodology

revenues. These brand revenues are subsequently discounted post tax to obtain a net present value, representing the final brand value, measured in US dollars.

Table 3.1: Brand Value methodologies' measurement descriptions

Methodology	**Focus**	**Measures**	**Measure description**
Millward Brown BrandZ	Consumer oriented	Financial	A forecast of the brand's future financial returns
		Brand contribution	The brand's effect on consumer behavior
		Meaningfulness	Ability to generate customer favor and meet expectations
		Differentiation	Brand's ability to stay ahead of the curve and be seen as unique within the market
		Salience	The speed and spontaneity by which the brand name comes to the consumer's mind
Interbrand	Both financial and consumer	Financial	A forecast of the brand's future financial returns
		Role of Brand	The extent to which the brand is capable of swaying consumer's purchasing decisions
		Brand Strength	Ability to generate and sustain consumer loyalty
BrandFinance	Financial oriented	Financial	A forecast of the brand's future financial returns
		Brand Strength	The extent to which a brand is well marketed and managed
		Royalty rate	The rate that a third party would have to pay for the use of the brand

3.1.4 Average

Table 3.1 above summarizes the three different brand valuation methodologies. As there are three different sources for brand value—each of which has its own way of measuring brand value—they are evaluated separately as individual variables as well as together in one combined variable. The individual variables allow for the comparison of reliability and accuracy between the different valuation methodologies. The combined variable institutes the average[4] of all three variables and provides a more complete variable with the least missing values. This combined variable highlights any complementing elements between the

[4] In the case that a source does not have the brand value of a particular brand it is not considered when computing the average. This means that, for example, if a particular brand is only reported on Interbrand, then the average will reflect only the (full) value from Interbrand.

different methodologies and helps control for individual measurement errors amongst the different measuring styles as the weight of these errors are reduced.

3.2 Financial Measures

The relevant financial measures, both for the individual firm as well as the economy as a whole, are described below. The data for all of the financial measures have been obtained from Thomson Reuters and cover the period of 2007–2016 in an annual format.

3.2.1 Firm Financial Performance

There are many measures of firm financial performance, though usually they fall into two broad categories; accounting performance and market performance. The former being a backward-looking performance measure and the latter a forward-looking performance measure. In order to evaluate brand value's relation with both backward- as well as forward-looking financial performance measures, multiple measures of performance from both categories are used.

As an indication of the firm's market performance, the historic stock prices, stock returns, and Tobin's Q ratios are applied. Stock prices are believed to fully represent all relevant aspects of a firm's performance and any anticipation on future performance, that is, they reflect any available information (Lubatkin and Shrieves, 1986). The stock returns represent the change (in this case annually) in stock price, and therefore firm value. A positive change can reflect growth and a better future outlook, whereas a negative return may reflect the opposite. Tobin's Q ratio, indicates the firm's total market value divided by the replacement costs of its assets. The Q ratio is a widely used measure of expected long-run performance, where a high Q ratio implies that the firm is performing well and signals a good investment opportunity (Bharadwaj et al., 1999).

To properly reflect the firm's accounting performance, two widely applied measures are used, namely, Return on Assets (ROA) and Return on Equity (ROE). ROA, defined as net income over total assets, is a traditional accounting measure that shows the extent to which the firm's invested capital has generated earnings. ROE, defined as net income over total shareholder's equity, is another traditional accounting measure that indicates the firm's profitability. Both measures are based on historical data, and provide objectivity.

Finally, stock return volatility, a measure of firm risk, is also evaluated in relation with brand value. The volatility provides a sense of how smooth and stable performance is at different levels of brand value. This provides some much needed context alongside the brand value and financial performance relationship. A small bump in performance would not be as attractive if it came at the price of significantly increased risk.

3.2.2 Market Conditions

As the sample consists of some of the largest brands that are highly active on a global scale, it would be appropriate to evaluate the market performance on a global scale as well. To this end, data on the MSCI World Index—which is a benchmark for the global stock market—is obtained and applied. This data reflects the state of the economy during that time. Evaluating brand value's movement alongside the MSCI World Index provides an indication of how brand value reacts towards a thriving or a failing economy. Additionally, as the time period includes one of the largest financial crisis of the past decades, its effects on brand value are specifically looked into by using an indicator for the crisis.

3.3 Control Variables

In order to control for external as well as individual effects several control variables are included into the model. First, the home region is controlled for as certain regional effects may have had an impact on brand value during the past few years. This is done by creating a few dummy variables which reflect the brand's home region. Almost half of the firms are from the United States as can be seen in Table 3.2. Next, a set of dummy variables representing the brand's respective industry are also included, this is done in order to control for industry specific effects. The industries used are categorized by the 'Industry Classification Benchmark' (ICB). The size of the firm is also controlled for as it could be argued that larger firms are relatively less affected by an equal change. The variable 'Size' is based on the natural logarithm of the historic (lagged by 1 period) annual sales of each firm. Finally, in line with prior literature, net income and book value of equity are also controlled for when considering the relationship between stock price and brand value (Barth et al., 1998).

3.4 Sample

The sample used consists of a combined set of brands presented on the annual global top 100 brands lists from each of the three sources. In total there were 275 unique brands presented over this 10 year period across all three sources. However, in order to avoid too many missing values, which could lead to limited results, all brands that are reported a total of 7 times or fewer are excluded. A single brand can at most be reported 30 times across all lists; if out of this total a brand is only reported a handful times, the changes in brand value can not be measured appropriately, which could skew the results.

Next, all private firms have been excluded from the sample as insufficient financial data would be available. Furthermore, the brands where their parent companies own multiple large brands have also been excluded as their financial results may not be an appropriate representation of the specific brand's performance. This leaves a sample of 118 unique brands, this sample can be observed in Table 3.4, and its region and industry distribution in Table 3.2 below. Furthermore, Table 3.3 below describes the summary statistics of the sample data.

Overall, the sample consists of fairly diverse brands, spread out on a global scale. Though not all industries are equally represented, there is still a decent amount of diversity amongst their specializations. The selected sample represents the most highly valued global brands over the past decade, and thus should, on average, be properly indicative of its population; high brand value firms. The number of brand-year observations are more than large enough for a proper statistical analysis. As also discussed previously, Table 3.3 shows that the average brand value variable clearly has a much larger total number of observations available, additionally, the values on financial measures are plenty. Altogether, the sample should allow for meaningful results, although the results can't be generalized to very low valued brands. Specifically, the marginal effects of increases in brand value may differ when brand value is already high compared to at its starting point.

Table 3.2: Distributions

	Freq.	Percent	Cum.
Region			
China	90	7.63	7.63
France	70	5.93	13.56
Germany	100	8.47	22.03
Japan	100	8.47	30.51
Other	60	5.08	35.59
Rest Of Europe	130	11.02	46.61
United Kingdom	70	5.93	52.54
United States	560	47.46	100.00
Total	1180	100.00	
Industry			
Basic Materials	20	1.69	1.69
Consumer Goods	280	23.73	25.42
Consumer Services	180	15.25	40.68
Financials	280	23.73	64.41
Health Care	20	1.69	66.10
Industrials	100	8.47	74.58
Oil & Gas	50	4.24	78.81
Technology	160	13.56	92.37
Telecommunications	90	7.63	100.00
Total	1180	100.00	

Note that each brand has ten frequencies.

Table 3.3: Descriptive Statistics

	N	mean	sd	min	max
bv1	709	28,114.93	28,772.77	5931.00	246,992.00
bv2	705	16,466.72	19,758.05	3072.00	178,119.00
bv3	761	20,282.03	13,865.59	3519.00	145,918.00
bv_avg	1094	18,624.80	17,478.77	3095.00	184,165.67
price	1160	66.39	127.12	0.41	1421.67
msci	1180	1384.47	249.52	906.92	1717.00
income	1158	5952.98	7845.51	-29,416.00	53,394.00
equity	1155	47,453.88	52,290.95	-93,221.73	288,439.84
sdreturn	1160	0.29	0.16	0.08	1.65
sales	1159	74,112.55	78,218.78	107.61	485,873.00
employees	1122	169,475.46	223,732.33	305.00	$2.30\times10^{+06}$

Where bv1 represents Brand Value from Millward Brown BrandZ, bv2 represents Brand Value from Interbrand, bv3 represents Brand Value from BrandFinance, bv_avg presents the average Brand Value of all three sources. All Brand Values are in millions of US dollars. Price indicates the stock price of the firm in US dollars, msci stands for the MSCI World Index, also in US dollars. Income and equity represent net income and shareholder's equity respectively, both in million US dollars. Sdreturn is the annualized standard deviation or volatility of the stock return. Sales is the annual sales of the firm in millions of US dollars and finally, employees indicates the number of employees in real numbers.

Table 3.4: Sample of 118 brands

Brand	Average Brand Value	Average Rank	Occurrences	Brand	Average Brand Value	Average Rank	Occurrences
3M	7723	78	12	Hitachi	12,856	65	10
Accenture	12,492	48	21	Home Depot	19,301	38	20
Adidas	6319	62	10	Honda	16,550	41	30
Adobe	5127	81	9	HSBC	20,475	26	30
Agricultural Bank of China	18,121	53	12	Hyundai	9775	56	15
Allianz	10,294	60	20	IBM	62,439	5	30
Amazon	30,053	30	29	ICBC	27,692	29	19
American Express	19,470	31	30	ING	10,317	79	12
Apple	91,408	9	30	Intel	24,239	27	30
AT&T	44,387	18	19	Johnson & Johnson	5386	82	13
Audi	7449	57	11	JP Morgan	11,413	60	27
Avon	6716	76	16	Kellogg's	10,918	46	15
AXA	11,504	52	21	L'Oréal	14,160	44	26
Baidu	22,262	41	9	Lowe's	10,229	86	12
Banco Santander	13,386	55	26	Mastercard	15,431	65	14
Bank of America	22,016	34	18	McDonald's	44,847	11	30
Bank of China	16,016	52	18	Microsoft	64,044	3	30
Barclays	11,647	71	17	Morgan Stanley	7449	63	16
BlackBerry	12,751	54	9	Nestle	11,077	54	19
BMW	25,461	20	30	Nike	18,214	34	30
BNP Paribas	15,304	49	10	Nintendo	8834	57	13
BP	11,235	71	20	Nissan	10,569	70	26
Bradesco	12,139	71	9	Nokia	21,167	34	17
BT	12,224	77	10	NTT	22,264	50	8
Burberry	4391	86	9	NTT DoCoMo	12,788	67	13
Canon	10,828	48	17	Oracle	19,061	34	30
Carrefour	11,625	63	11	Orange	16,302	46	20
Caterpillar	5730	67	10	Panasonic	6009	73	13
Chase	15,166	54	20	Pepsi	16,204	40	30
Chevron	13,660	62	12	PetroChina	14,240	67	12
China Construction Bank	19,971	38	18	Philips	9171	49	13
China Life Insurance Company	15,746	61	8	Porsche	8401	63	17
China Mobile	39,432	17	20	Prada	5236	84	10
Cisco	19,420	37	30	Royal Bank of Canada	17,414	45	12
Citi	17,327	38	30	Samsung	30,045	25	29
Coca-Cola	59,779	5	30	SAP	20,348	33	24
Colgate	10,948	55	20	Shell	13,751	53	27
Comcast	12,817	61	9	Siemens	12,164	54	30
Credit Suisse	8575	75	9	Sinopec	15,306	64	9
CVS Health	13,402	69	9	Sony	10,385	56	22
Danone	7119	56	10	Starbucks	11,658	67	21
Deutsche Bank	11,909	69	10	Target	14,180	57	17
DHL	9430	84	12	TD	15,497	56	9
Disney	26,471	22	30	Tesco	18,608	40	17
eBay	11,259	58	25	Thomson Reuters	7687	51	10
ExxonMobil	15,809	46	17	Tiffany & Co.	4944	74	10
Facebook	28,910	30	13	T-Mobile	19,853	50	20
FedEx	10,393	78	24	Toyota	31,009	14	30
Ford	12,329	49	25	UBS	8528	75	13
Gap	4342	88	9	UPS	22,124	29	30
General Electric	46,146	8	30	Verizon	40,688	15	20
Generali	10,935	77	9	Visa	26,969	50	17
Goldman Sachs	9443	56	20	Vodafone	33,676	14	20
Google	82,547	3	30	Volkswagen	12,614	53	24
H&M	14,070	53	24	Walgreens	11,850	72	10
Harley-Davidson	5297	82	12	Wal-Mart	38,780	11	20
Heineken	6924	82	13	Wells Fargo	31,594	20	20
Hermès	10,691	60	20	Xerox	6285	63	10
Hewlett-Packard	24,337	24	30	Yahoo!	7715	74	12

The reported brand values and rankings are the 10-year averages created from the combined dataset of Millward Brown Brandz, Interbrand and BrandFinance. Brand Values are stated in millions of U.S. dollars. Occurrences count the number of times the brand has been listed in the top 100 over all three of the sources covering the 10 year period.

3.5 Methodology

In order to properly evaluate the hypothesized relationships involving brand value, firm performance, risk, and market conditions, several models are set up. This section goes into detail and describes each of the applied models. The used method of estimation is the widely applied pooled ordinary least squares (OLS) method of approximation[5], and the models are specified as level models. Pooled OLS is an appropriate estimation method for the applied panel data set (Wooldridge, 2015) and is also assumed to be sufficient for testing each of the hypotheses. The models are not differenced because, even though differencing can help reduce bias (Wooldridge, 2015), it could be argued to be an inaccurate estimation in this specific case due to the large time intervals in observations. Data analysis is conducted using the statistical program Stata (StataCorp, 2011).

Similar to Barth et al. (1998) brand value is considered to be relevant for firm equity valuations. Finding a positive and significant relation between brand value and share price—especially over a period of 10 years and across 3 different brand value estimators—would provide substantial evidence for this. Additionally, evidence regarding the reliability of Mill-Ward Brown BrandZ, Interbrand and BrandFinance's brand value estimates would become available. To test whether brand value is positively associated with the firm's stock price, the following panel regression equation is estimated:

$$\begin{aligned} log(PRICE_{i,t}) =& \beta_0 + \beta_1 log(BRANDV_{i,t}) + \beta_2 log(MSCI_t) + \beta_3 log(NI_{i,t}) \\ &+ \beta_4 log(BVE_{i,t}) + \beta_5 SIZE_{i,t} + \beta_6 REGION_i + \beta_7 INDUSTRY_i \\ &+ \alpha_i + u_{i,t} \end{aligned} \quad (1)$$

Where PRICE stands for the price per share of the individual firm, in plain US dollars. BRANDV equals the firm's estimated brand value during the year, this variable is divided into four variables; one for each estimator and one that represents the average, all taken in million US dollars. MSCI stands for the MSCI World Index, taken in plain US dollars, it

[5] Additionally, in order to eliminate all possible unobserved fixed effects, all regressions are repeated using a fixed effects (FE) estimator. The subsequent results (untabulated) do not differ significantly, thus remaining consistent in their interpretation. This suggests that the applied pooled OLS models sufficiently control for time-invariant effects. Furthermore, heteroskedasticity and serial correlation have been checked for. The results are stable across methods (OLS, robust errors, FGLS and FE), suggesting that no significant problems arise due to method specification.

represents the state of the global economy and also acts as a time trend as it is consistent across all firms. NI and BVE represent the net income and book value of equity respectively, both in million US dollars. SIZE indicates the respective size of the firm, measured by the natural logarithm of the previous year's annual sales. REGION represents the respective country or region in which the firm is headquartered, measured as a set of 8 dummy variables. INDUSTRY is to reflect the relevant industry in which the individual firm operates, denoted by 9 dummy variables. i Indicates the individual firm, and t indicates the year. All non-dummy variables are taken in natural logarithms as this allows for better interpretation of the results.

A positive and significant β_1 would provide evidence for a positive relation between a firm's brand value and its share price, and thus confirm the first hypothesis. Additionally, in line with prior research, the coefficients on the global stock market, net income and book value of equity are all also expected to be positive.

When evaluating the relationship between brand value and the global economy, brand value becomes the dependent variable. Though this relation has not yet been properly evaluated in prior literature, the underlying idea is that the value of a firm's brand is also affected by external factors in the global economy. A prosperous economy on a global scale should result in brands being valued higher on average compared to when an economy is in a less favorable condition. To test whether the global economy indeed positively affects brand value, the following regression equation is estimated:

$$\begin{aligned} log(BRANDV_{i,t}) =& \beta_0 + \beta_1 log(MSCI_{i,t}) + \beta_2 SIZE_{i,t} + \beta_3 REGION_i \\ &+ \beta_4 INDUSTRY_i + \alpha_i + u_{i,t} \end{aligned} \tag{2}$$

A positive and significant β_1 would confirm the second hypothesis and provide evidence that the global economy positively affects brand value. Following these first two tests, a better understanding of brand value, and its relation with both the firm's individual stock price and the global economy, is formed. Next, in order to assess brand value's capability to act as a buffer, the relative impact of financial shocks need to be evaluated. As a perfect example of a large financial shock, the 2008 financial crisis is used as an indicator to how brand value and firm financial performance are affected by financial shocks. To test

whether financial shocks have a lower impact on brand value relative to the firm's financial performance, the following regression equation is estimated:

$$\begin{aligned} Y_{i,t} =& \beta_0 + \beta_1 CRISIS_i + \beta_2 log(NI_{i,t}) + \beta_3 log(BVE_{i,t}) + \beta_4 SIZE_{i,t} \\ &+ \beta_5 REGION_i + \beta_6 INDUSTRY_i + \alpha_i + u_{i,t} \end{aligned} \tag{3}$$

Where the dependent variable, Y, is either the brand value of the firm or a measure of financial performance. These measures consist of both traditional backward-looking accounting measures (i.e. ROA and ROE) as well as forward-looking market measures (i.e. stock price, stock return and Tobin's Q ratio). The inclusion of both types of performance measures allows for a clear distinction to be made when comparing the results. Forward-looking market measures are likely to react very quickly to financial shocks as the new information is almost immediately incorporated, whereas the impact on backward-looking accounting measures is likely to require more time until it becomes prevalent. CRISIS is a dummy variable that reflects the year 2009, when the effects of the global financial crisis have just taken place. Other variables are as previously defined.

Equation 3 is ran a total of six times, once for every performance measure and once for brand value. A negative and significant β_1 for brand value and firm performance would confirm hypothesis 3a and 3b respectively. As for hypothesis 3c, in order to evaluate the relative impact of a financial shock, the coefficient for CRISIS, β_1, is compared between the regression on brand value and the regressions on financial performance on an individual basis. However, before the effects of the coefficients can properly be compared between each other the variables first need to be standardized. As the regressions consist of different dependent variables with differing scales of measurement, the resulting coefficients cannot be directly compared amongst each other. Standardizing the dependent variables equalizes the scales across the regressions, which allows for the relative contribution of the independent variable, crisis, to be properly compared between the different regression equations (Afifi et al., 2003). Standardizing a variable is a fairly simple procedure, and can be done with the use of the following expression:

$$Y^*_{i,t} = \frac{Y_{i,t} - \overline{Y_{i,t}}}{sd(Y_{i,t})} \tag{4}$$

Where Y^* represents the standardized variable of Y, the original variable; and $\overline{Y}$ and sd(Y) are, respectively, the mean and standard deviation of the original variable. This results in every variable becoming equal of scale; each with a mean of (close to) 0 and a standard deviation of 1. The units of measurement become the standard deviation, which makes interpretation more difficult, this is why the standardized coefficients are only used for the purpose of comparisons across models. After the dependent variables are all normalized and the same regression equations are estimated again, the new coefficients are ready to be compared in their relative effects.

The differences in the normalized coefficient values indicate the direction of the relative effect; specifically, whether the effect of crisis on brand value is smaller or larger relative to the firm financial performance. To test whether this difference across models is significant, a Wald chi-square test is conducted (Williams, 2015). This process is easily automated with the use of *suest* (seemingly unrelated estimation); the two models that are to be compared are first stacked, allowing for the testing of cross-model hypotheses, regardless of differences in sample sizes (Weesie et al., 2000). Finding a significant difference within the effect of CRISIS, with specifically a lower effect on brand value, would provide support for hypothesis 3c.

For the next and final hypothesis, H_4, the relationship of brand value and firm volatility during times of crises needs to be evaluated. To that end, the volatility of the firm's stock market return is assessed as the dependent variable (Johansson et al., 2012). In order to derive the volatility the following equation is applied:

$$Volatility = \sqrt{\frac{\sum_1^n (r - \bar{r})^2}{n-1}} * \sqrt{12} \quad \text{with} \quad r = \frac{ln(p_t)}{ln(p_{t-1})} \tag{5}$$

Where r is the stock return which in turn is derived from p, the monthly stock price, and n is the sample size, which in this case is almost always 12 as it is based on monthly values. The standard deviations of monthly returns are annualized to form the annual standard deviation of stock returns, labeled as volatility. To test whether high brand value leads to

lower volatility, the following regression equation is estimated:

$$\begin{aligned} VOLATILITY_{i,t} =& \beta_0 + \beta_1 log(BRANDV_{i,t}) + \beta_2 CRISIS_i \\ &+ \beta_3 CRISIS_i * BRANDV_{i,t} \ (+\beta_4 log(NI_{i,t}) + \beta_5 log(BVE_{i,t})) \\ &+ \beta_6 SIZE_{i,t} + \beta_7 REGION_i + \beta_8 INDUSTRY_i + \beta_9 YEAR_i \\ &+ \alpha_i + u_{i,t} \end{aligned} \tag{6}$$

A negative and significant β_3 coefficient would imply that during the crisis (reflecting an economic downturn) firms that have a higher brand value will have lower volatility, thus providing evidence for hypothesis 4. Additionally, β_1 and β_2 showcase what effect brand value and the crisis respectively have on volatility in general. The regression is ran both with the inclusion of net income and book value of equity as well as without as this may highlight some differences between the financial and consumer oriented methodologies.

This concludes the tests of all hypotheses, however, as an additional analysis, the effects between all of the different brand value methodologies, including the average measure, are also compared. This provides insight into the reliability and accuracy of each measure, individually as well as combined. As this time around the models are specified similarly across each other and are measured in equal units and scale, the comparison becomes much easier. There is no need to standardize any variables, thus retaining their original values and interpretation during comparisons. Furthermore, all variables, both explanatory and explained, are the same across models. Only the values and observations differ for the variable on brand value. To test for a significant difference between the coefficients in such a case, a t-test is conducted according to equation 7 below (Hartmann and Slapničar, 2012; Keil et al., 2000; Sanchez-Franco, 2006). This equation also controls for different sample sizes across the regressions.

$$t = \frac{\beta_{1a} - \beta_{1b}}{\sqrt{\frac{(m-1)}{(m+n-2)} * SE_a^2 + \frac{(n-1)}{(m+n-2)} * SE_b^2} * \sqrt{\frac{1}{m} + \frac{1}{n}}} \tag{7}$$

Where SE is the standard error of the respective coefficient, m is the sample size of the first model and n is the sample size for the second model, following a t-distribution with $m + n - 2$ degrees of freedom. This test provides evidence on whether the differences in

results between the brand value methodologies are statistically significant. The knowledge on the amount and magnitude of these differences amongst all of the proposed models, may provide significant additional value to the brand value estimation literature.

4 Results

This section reviews the results following from the hypothesis tests and additional analysis. The most important results are tabulated and discussed. Sometimes not all results can be shown due to the many measures for brand value and financial performance, in such cases only the average brand value measure is tabulated. Nevertheless, the differences across methodologies are sufficiently discussed for every case near the end of this section.

4.1 Hypothesis Tests

There are a total of four hypotheses (not counting any sub-hypotheses). The results of all hypothesis tests are divided over three subsections. The first subsection (4.1.1) covers both the first and second hypotheses, where brand value's relation with both firm stock price and the global economy is evaluated. The second subsection (4.1.2) goes over the three sub-hypotheses of H3, where the impact of financial shocks is evaluated. Finally, the third subsection covers the fourth and final hypothesis, where brand value's relation with stock return volatility is addressed.

4.1.1 Brand Value, Stock Price Performance and the Global Economy

Table 4.1 below contains the results of model 1 and 2, which pertain to hypotheses 1 and 2 respectively. The results are all in support of the stated hypotheses, providing evidence for the relationship between brand value and the firm's stock price as well as the relationship between the global economy and brand value. The results suggest that brand value is a relevant measure for equity valuations of firms, and that brand value estimates from Mill-Ward Brown Brandz, Interbrand and BrandFinance are all reliable enough to be reflected in the stock prices. Furthermore, both stock prices and brand values are evidently affected by movements in the global stock market.

The coefficients on brand value and MSCI are all positive and significant, regardless of the brand value methodology that was applied. Although the magnitude of the observed effects do differ slightly across methodologies. Relative to the other methodologies, BrandFinance's estimates appear much higher related with global stock market movements. This makes sense considering that BrandFinance heavily considers the financial contribution of brands into its estimates. Interestingly, net income and book value of equity are only insignificant

explanatory variables for the firm's stock price when the MillWard Brown Brandz values are applied. Even though, this is the most consumer-oriented methodology where the net income and book value of equity of firms should not be as incorporated into their brand value data relative to the other methodologies. Additionally, firm size appears to have a positive relationship with brand value, but is negatively associated with stock price.

Table 4.1: Relationship of a firm's brand value with either the firm's stock price or the global stock market

	MillWard Brown Brandz		Interbrand		BrandFinance		Average	
	(1) log(Price)	(2) log(BV1)	(3) log(Price)	(4) log(BV2)	(5) log(Price)	(6) log(BV3)	(7) log(Price)	(8) log(BV_avg)
log(BV1)	0.440***							
	(0.064)							
log(BV2)			0.303***					
			(0.063)					
log(BV3)					0.458***			
					(0.093)			
log(BV_avg)							0.339***	
							(0.058)	
log(MSCI)	0.936***	0.502***	0.862***	0.462***	0.465**	0.840***	0.799***	0.587***
	(0.182)	(0.117)	(0.175)	(0.115)	(0.180)	(0.073)	(0.150)	(0.083)
log(NI)	0.044		0.252***		0.150***		0.154***	
	(0.047)		(0.050)		(0.044)		(0.039)	
log(BVE)	−0.061		−0.125**		−0.099*		−0.107**	
	(0.058)		(0.056)		(0.055)		(0.048)	
Size	−0.113*	0.154***	−0.177***	0.476***	−0.142**	0.308***	−0.133***	0.309***
	(0.059)	(0.023)	(0.062)	(0.024)	(0.065)	(0.020)	(0.049)	(0.016)
Constant	−5.424***	4.281***	−3.124**	0.848	−1.580	−0.146	−3.108***	1.677***
	(1.350)	(0.857)	(1.290)	(0.854)	(1.256)	(0.555)	(1.093)	(0.615)
Region	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	591	639	578	636	631	690	896	991
R^2	0.65	0.34	0.42	0.54	0.67	0.49	0.58	0.45

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

4.1.2 Brand value, Financial Performance and Financial shocks

Table 4.2 shows the effects of the financial crisis on a firm's brand value and financial performance. The results indicate that the financial crisis had a negative and significant effect on brand value as well as on all of the financial performance measures except for ROA, which gives an insignificant result. It is unclear why the observed effect on ROA differs from the other financial performance measures. Apparently no significant relation is observed between the crisis and ROA within this specific sample and model. Nonetheless, evidence in support of hypothesis 3a can be observed as there is a clear negative and significant relation between the crisis and brand value. Additionally, hypothesis 3b is also mostly supported, except for when ROA is used as the measure of financial performance as mentioned earlier. Nevertheless, four out of the five firm financial performance measures, containing both market and accounting performance measures, provide evidence in support of the hypothesis.

Table 4.2: Relative effect of a financial shock on a firm's financial performance and brand value

	(1) log(BV_avg)	(2) log(Price)	(3) D.log(Price)	(4) RoA	(5) RoE	(6) log(TobinQ)
Crisis	−0.171***	−0.372***	−0.614***	0.000	−0.031***	−0.168**
	(0.056)	(0.095)	(0.030)	(0.004)	(0.010)	(0.070)
log(NI)	0.155***	0.196***	0.048***	0.041***	0.121***	0.386***
	(0.022)	(0.039)	(0.012)	(0.002)	(0.004)	(0.029)
log(BVE)	0.042	−0.074	−0.002	−0.025***	−0.204***	−0.368***
	(0.028)	(0.049)	(0.016)	(0.002)	(0.005)	(0.036)
Size	0.187***	−0.097**	−0.067***	−0.027***	0.060***	−0.383***
	(0.028)	(0.048)	(0.015)	(0.002)	(0.005)	(0.035)
Constant	5.597***	4.704***	0.511***	0.303***	0.534***	4.276***
	(0.209)	(0.353)	(0.113)	(0.014)	(0.037)	(0.261)
Region	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Observations	899	938	931	946	947	937
R^2	0.49	0.56	0.35	0.67	0.73	0.79

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

According to the results, a financial crisis not only negatively affects the financial performance of firms, a notion that is widely considered to hold true, but also negatively affects

the values of brands. Though the theory behind this may seem straightforward, it is something that had not yet been proven previously. This finding suggests that brands lose some of the additional value that they add to the firm and its products during a financial shock. However, to further evaluate the impact of financial shocks on brands, the relative effect needs to be considered.

As discussed earlier, in order to compare the relative impact of the results amongst each other and test hypothesis 3c, the dependent variables first require to be standardized. This standardization process provides 'new' variables that all have a mean of 0 and a standard deviation of 1, implying that the scales have been equalized across the variables. This allows for the appropriate test to be conducted.

Table 4.3 presents the standardized coefficients' values[6] along with their difference with the standardized coefficient for brand value. The coefficient for ROA is, again, not significant and thus does not require any additional tests on the difference as the results would be meaningless regardless. The differences in magnitude are calculated by (individually) subtracting the standardized coefficient of each financial performance measure from the standardized coefficient for brand value. Thus if the calculated difference is positive, then it suggests that the crisis had a larger negative impact on that particular firm financial performance measure than on brand value, as was hypothesized.

Table 4.3: Test results of variable effect differences

				Test			
	Crisis [Standardized]	Significant	Difference ($\beta_{BV} - \beta_Y$)	χ^2-value	p-value	Hypothesized	Significant
Brand Value	−0.248	✓					
Stock Price	−0.275	✓	0.027	0.07	0.7862	✓	✗
Stock Return	−1.652	✓	1.404	134.61	0.0000	✓	✓
ROA	0.002	✗					
ROE	−0.146	✓	−0.103	2.01	0.1566	✗	✗
Tobin's Q	−0.117	✓	−0.131	2.96	0.0855	✗	✗

Note that CRISIS, and all of the other independent variables remain unstandardized. Only the dependent variables are standardized as those are the only differences across the regressions. Additionally, standardizing does not work well with dummy variables.

[6] These represent the standardized versions of β_1 presented in Table 4.2 earlier.

The impact of the crisis appears larger on the stock price and return relative to brand value, and smaller on ROE and Tobin's Q relative to brand value. However, after testing the significance of the differences, only the difference with stock return is significant. This can be explained by the fact that stock returns are very vulnerable to short-term effects. Whereas brand value, stock prices and Tobin's Q often reflect relatively more long-term prospects. ROA and ROE are backward-looking measures which may not yet have had sufficient time to reflect the full extent of the crisis and its impact, or since they are also objective measures they may simply not have been subjected to potential market overreactions. Thus, the crisis had a larger effect on the stock return of firms relative to their brand value, but there is no evidence to support the claim in the case of any of the other performance measures. Therefore, as only one out of the five measures support the hypothesis, there is insufficient evidence in favor of the hypothesis.

4.1.3 Brand Value and the Variability of Stock Returns

Table 4.4 shows the results for the fourth and final hypothesis regarding the relationship between brand value and volatility during a financial shock. The coefficients for brand value, crisis and the interaction term between the two are mostly significant and also in the hypothesized direction. There are however a few occasions where significance is missing, but even in these cases they are consistent in direction and are just a tiny bit off from being significant[7]. Interestingly, controlling for net income and book value of equity reduces significance for the MillWard Brown Brandz variables but increases significance for the BrandFinance variables. It appears that these variables complement the BrandFinance estimates in reflecting the volatility, but subtract from the predicting ability of the MillWard Brown Brandz estimates.

The results point towards multiple insights. During a crisis firms experience increased volatility, however, firms with higher brand value do so to a lesser extent. This suggests that brand value provides a safety cushion against risk during potential economic downturns. Moreover, brand value reduces volatility not just during a financial shock, but also in general. This relationship between brand value and a firm's exposure to (systemic) risk is important information. It indicates that investing in the brand can help firms to reduce risk, both

[7] The p-values are at most only off by around 0.02 from being significant. Nevertheless, they remain insignificant and thus should not be interpreted.

during good and bad economic conditions. Thus, suggesting that brand value can play a role in protecting a firm from the harmful effects of a financial shock.

Table 4.4: Relationship between firm brand value and volatility

	MillWard Brown Brandz		Interbrand		BrandFinance		Average	
	(1) Volatility	(2) Volatility	(3) Volatility	(4) Volatility	(5) Volatility	(6) Volatility	(7) Volatility	(8) Volatility
log(BV1)	−0.055***	−0.036***						
	(0.010)	(0.009)						
log(BV2)			−0.048***	−0.019**				
			(0.009)	(0.008)				
log(BV3)					−0.077***	−0.041***		
					(0.014)	(0.012)		
log(BV_avg)							−0.058***	−0.034***
							(0.008)	(0.007)
Crisis	0.620**	0.338	0.473**	0.333**	0.550*	0.679**	0.561***	0.527***
	(0.255)	(0.214)	(0.188)	(0.159)	(0.329)	(0.282)	(0.193)	(0.173)
Crisis*BV1	−0.053**	−0.028						
	(0.026)	(0.022)						
Crisis*BV2			−0.038*	−0.027				
			(0.020)	(0.017)				
Crisis*BV3					−0.049	−0.064**		
					(0.035)	(0.030)		
Crisis*BV_avg							−0.047**	−0.047***
							(0.021)	(0.018)
log(NI)		−0.041***		−0.043***		−0.044***		−0.040***
		(0.006)		(0.006)		(0.006)		(0.005)
log(BVE)		0.015*		0.010		0.017**		0.014**
		(0.008)		(0.007)		(0.007)		(0.006)
Size	0.006	0.011	0.017**	0.020**	0.031***	0.030***	0.013***	0.018***
	(0.006)	(0.008)	(0.007)	(0.008)	(0.008)	(0.008)	(0.005)	(0.006)
Constant	0.826***	0.743***	0.624***	0.556***	0.741***	0.573***	0.757***	0.639***
	(0.107)	(0.091)	(0.074)	(0.062)	(0.119)	(0.101)	(0.073)	(0.064)
Region	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	637	591	634	578	690	631	988	896
R^2	0.33	0.39	0.35	0.44	0.39	0.45	0.35	0.41

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure 4.1 summarizes the results within the conceptual model. The results reflect the average brand value measure and reflect stock price as the financial performance measure. All of the hypotheses have been substantiated by the results, both in the expected direction and significance. Only hypothesis 3c (not drawn) remains unsupported by the results.

In short, it can be concluded that brand value is positively related with financial performance and that this is reflected in the stock price. Additionally, changes in the global economy are positively associated with changes in brand value. Financial shocks have a negative effect on both financial performance and brand value, but no evidence is found regarding their relative effect. Perhaps the most important finding is that brand value has a negative effect on firm volatility, even during an economic downturn.

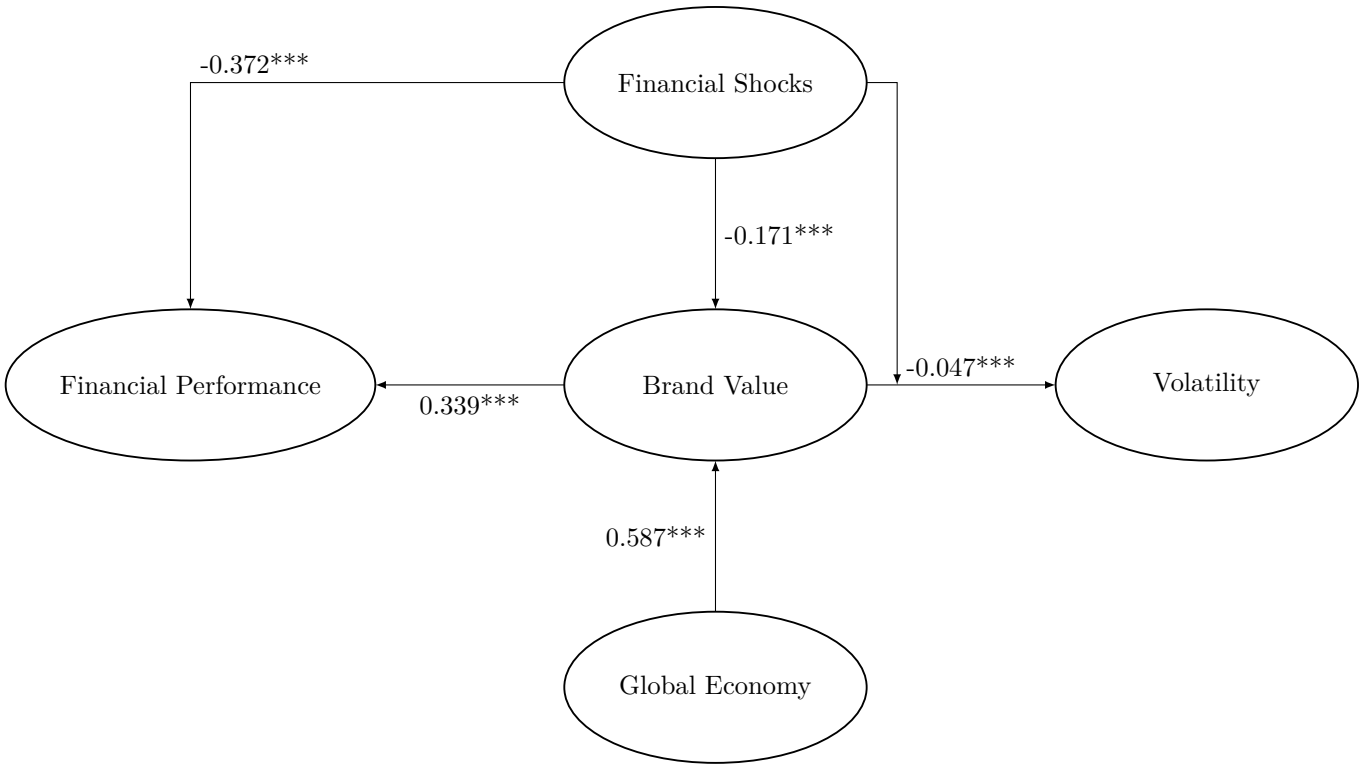

Figure 4.1: Summarized results (for average brand value)

4.2 Additional Analysis

The difficulty of properly measuring brand value is a much discussed subject in academia. It is also the main reason why brand value is not reported on the balance sheet. However, because of the fact that brand value is often considered to still be value relevant for firms, this has created several large external consultancy bureaus, specifically focused on brands, that take up the difficult process of brand valuation. They have spent years working on perfecting their brand valuation methodologies and are widely used in academic research. As this study uses estimates from three such methodologies, it is both highly relevant and useful to evaluate the differences between the results of these estimates.

The previous results all relate to the hypothesis tests where their interpretations are similar across the several brand value methodologies. The coefficients' signs and significance as well as the conclusions drawn from the regression results are are mostly consistent for all estimations. Therefore, there is sufficient evidence to claim that these methodologies—ranging from heavily consumer-oriented to heavily financially-oriented—are reliable enough to hold consistent interpretive abilities. There are however, as one would expect, some differences in the effect size between the different brand value estimates.

Table A.1 in the appendix provides additional analysis results into the differences of the three brand value methodologies. Importantly, almost all of the differences across all measures and models are statistically significant. This implies that the value relevance of brand value estimates varies and depends on the methodology applied. It reinforces the notion that reporting brand value on the balance sheet would be subjective, as not only the estimates but also their predictive abilities are contingent on the methodology applied. However, the results thus far have clearly shown strong support for the value-relevance of brand value.

The differences in effect size are often small, sometimes large, but almost always significant; there are only three cases where the difference is insignificant. Due to the difficulty in measuring brand value, it could be said that such differences should be expected. However, as a result, the three methodologies evaluated cannot all be 'correct' with their estimates. It is difficult to assess which of the methodologies is closer to the 'true value' of the brands as there is no particular benchmark to compare it against. If all three methodologies are assumed to be imperfect, then the average measure might smooth out those imperfections.

5 Discussion

Previous literature (e.g. Farquhar, 1989; Keller et al., 2011) has discussed brand value's ability to potentially help firms withstand times of crises. This study investigates this aspect of brand value empirically, building upon Johansson et al.'s (2012) work. While brand value has been shown to be positively associated with firm performance (e.g. Aaker and Jacobson, 2001; Barth et al., 1998), research into its sustainability and durability has been scarce.

This study provides new insights into brand value, its relation with firm financial performance and its relation with the global economy. An important aspect that is considered is brand value's role during economic downturns and its relation with external risks. Furthermore, multiple brand value methodologies are applied and evaluated within this research, adding insights to the brand valuation literature.

Most of the hypothesized relations have been supported by the results. In short, brand value is positivity associated with both stock price and the global economy. Financial shocks have a negative impact on both firm financial performance and brand value, where the relative effect between the two were mostly non-significant. Finally, firms with higher brand value experience reduced stock return volatility, both during good and bad economic conditions. This section discusses the implications of these results, which are valuable for firms, the marketing and accounting literature, investors, and perhaps even consumers. Afterwards, the limitations of this study are also discussed as these limitations should be kept in mind when interpreting the results.

5.1 Implications

The observed results on the positive relationship between brand value and the firm's stock price are in line with prior literature (e.g. Barth et al., 1998; Madden et al., 2006). Brand value can thus be considered to be value-relevant for the equity valuations of firms. Investors appear to incorporate at least some of the added value of brands into their valuations of companies and their future potential, providing additional evidence for the branding-shareholder value creation link (Madden et al., 2006). Finding similar results in their paper, Barth et al. (1998) conclude that the brand value estimates following Interbrand's methodology are reliable enough as they are reflected in share prices. The results of this study support this

claim, but also add in that the brand value estimates from MillWard Brown Brandz and BrandFinance are also reliable enough to be reflected in the share price.

New empirical evidence in support of the positive relationship between the state of the global economy and brand value is attained. Thus, it can be said that the value of brands fluctuate alongside external market conditions to a certain extent. Prior literature has discussed this relationship (e.g. Keller et al., 2011), yet it had not yet been proven empirically. Furthermore, when looking specifically at the effect of a large financial shock, both brand value and firm financial performance are negatively affected. Although, no significant evidence could be found in support of brand value being affected to a lesser extent relatively, except for when compared with stock return. This may be due to stock returns being the most vulnerable to short-term effects, whereas the other firm financial performance measures are not as susceptible to such effects. For the accounting performance measures, considering that they are backward-looking they may not yet have had enough time to reflect the full extent of the crisis. Stock prices and Tobin's Q are also far more long-term oriented compared with stock returns and therefore show more similarities with brand value.

The findings do, however, suggest that brands recover along with the economy following a financial crisis due to the value of a brand being positively related with the global economy. Historically, financial crises are followed by a recovery of the economy (Borio, 2014), thus this improvement in the economy results on average in the increase of brand value. This is slightly in contrast to Lamey et al.'s (2007) findings, where they find that branded products have trouble recovering after bad economic times as consumers are less inclined to switch back to national-label products. Although, they asses the consumer-specific relation rather than a financial performance relation. As also mentioned previously, Lamey et al.'s (2007) findings may have been a result of industry-specific effects, whereas this study's findings represent brands regardless of industry. Nevertheless, the positive relationship found between the global market and brand value suggests that brands, following the negative effect of a financial shock, do in fact recover along with improving market conditions.

One of the most important findings of this study, however, comes from testing brand value's relationship with firm volatility, in- and outside of periods of crises. The results substantiate Rego et al.'s (2009) findings and provide evidence that stronger brands face less risk. Brand value reduces both systematic and firm-specific risk as the results show

that an increase in brand value reduces volatility, even during times of high volatility such as a large crisis. This implies that brand value offers protection to firms and allows strong brand to be better able to withstand difficult economic times as argued by Keller et al. (2011). This key consequence of brand value is likely attributable to its core characteristics (Aaker, 2009), where strong brands increase consumer comfort in their products and services. This increased consumer comfort results in improved brand loyalty, where even during bad economic conditions sales do not fall as much compared with weaker brands within the same industry (Fehle et al., 2008). The lower risk experienced by strong brands may increase their resilience against not just financial shocks, but also against competition and shifts in consumer tastes (Farquhar, 1989).

The knowledge that strong brands are less exposed to risk has implications for multiple parties. For investors it improves their ability to value firms by evaluating the strength of the brands they own. Investors and hedge funds can set up safer investment portfolios by selecting firms with high brand value. The increased resilience against financial shocks make these firms a more attractive option for investors as they are less exposed to the negative effects of large unforeseen financial shocks. For firms, the findings highlight the importance of investing in marketing efforts to increase brand value. This supports earlier claims by Yoo et al. (2000), where brand value is also argued to be a durable and sustainable competitive advantage and hence warrants the appropriate investment from firms. Additionally, it also supports the arguments by Lamey et al. (2007) and Rego et al. (2009) that when the economy turns bad, continued investments by firms into their brands is preferable as it helps reduce volatility. Firms may even be able to better generate smooth earnings by investing in their brand as argued by Fehle et al. (2008) since the reduced volatility may limit the cyclical effects of the market. On the other side, consumers may be able to put more trust into strong brands with the knowledge that these brands are less volatile during weak economic periods. It would mean that these high value brands are more likely to still be able to fulfill their needs and expectations during these times compared with lower valued brands. Zeithaml (1988) states that the brand name is an extrinsic cue for quality as it provides the consumer with a bundle of information about the product. If this information perceived by the customer can be trusted and remains consistent even during bad economic periods, then the consumer has less reasons to switch to a product or service from a different firm.

Johansson et al. (2012) find large differences between financial and consumer based

brand valuation methodologies, with only the latter being able to outperform the market during the financial crisis. This study, however, does not find large differences between three brand valuation methodologies, ranging from a consumer to a financially focused method of estimation. Outside of a few cases, the interpretative abilities are consistent across all methodologies. Also the results indicate that strong brands are better able to sustain through a financial crisis as they experience less volatility, regardless of the estimation methodology.

These findings have valuable implications for the branding literature. They show that all three major brand valuation methodologies are each reliable enough to show consistent predictive abilities on multiple measures covering financial performance, risk, and external market conditions. This provides support for the literature claiming the value-relevance of brand value and its need to be reported on balance sheets (e.g. Farquhar et al., 1992). However, the observed effect sizes do differ across estimation methods and additional analysis reveals these differences to be statistically significant. This suggests that there are still issues in brand value estimations, such as possibly; subjectivity, uncertainty, and the ability to predict future potential. This provides support for the other side of the branding literature where it is argued that brand value estimations are not accurate or objective enough to be reported (e.g. Murphy, 1990). Similar to Kallapur and Kwan (2004) this study finds evidence suggesting both value relevance and a possible lack of reliability in brand value estimation methods; therefore, it does not draw a conclusion on the policy debate regarding the inclusion of brand values in financial statements.

5.2 Limitations and Future Research

As is usually the case, there are also some limitations associated with this research project. Acknowledging and overcoming these limitations might be a feasible direction for future research. An often mentioned limitation for empirical studies within the brand literature is the dependency on the quality of data on brand value estimates which due to their difficulty in measuring may affect the findings (Eng and Keh, 2007). However, this effect is limited in this study as three different methodologies are applied, which crowds out the individual measurement errors. This is especially the case considering that they are not only evaluated on an individual basis but also as a combined average and results appear fairly consistent across the estimation methods.

One issue with the data that is prevalent is the large gaps of time in-between the brand value estimates. The reports on brand value are released on an annual basis for each methodology. This means that the effects between brand value, risk, financial performance and most notably the effect of a financial shock, could only be assessed on an annual basis. The main issue here is that the effect of a financial shock may be a very large one in the short-term but is quickly dissipated by the next year, and the estimations on brand value and other variables could fall anywhere in-between. If it were possible to apply at least monthly data on brand value, then no doubt would future research be able to benefit greatly from this as the results could be better interpreted. 'Luckily', to the benefit of this study, one of the largest financial crisis in the past decades occurred within the estimated time-frame and could be used as an indicator for financial shocks. The magnitude of this crisis implies that its effects could still be evaluated appropriately anywhere within a year's time.

Another issue is that the estimations are only on the top 100 global brands. The sample only consists of strong brands and as a result does not allow for a clear cut comparison between strong and weak brands. Although the brands that are on the lower end of the list can be argued to be relatively weaker compared to the top, even these brands are still very strong brands when compared to all of the unlisted brands. Especially the marginal effect of an increase in brand value could have significant differences for a low value brand compared to a high value brand. It would be very interesting to evaluate this effect. It could be that brand value exhibits diminishing returns to marketing expenses because after a while consumers may decide that they know enough about the quality and capabilities of the brand. Thus, they may not be as affected by an incremental change in brand value relative to when the brand still has a lot of room for improvement. On the other hand, the opposite could also be possible where instead brand value enjoys economies of scale. Consumers may be more willing to see the positive change and marketing efforts of already strong brands and ignore weaker or less likable brands in their effort to improve. Furthermore, weak brands may have permanently hurt their reputation and trustworthiness. Whereas favored strong brands may enjoy a multiplicative effect on their branding efforts due to the presence of their positive standing and history in the consumer's mind. Additionally, firms with multiple large brands have been excluded from this study, these types of firms may also experience different results. The value of an individual brand of such a firm may have smaller effects relatively due to the firm being more diversified on brands. Nevertheless, whilst these two

issues form an interesting direction for future research, the limitations themselves are mainly an issue of generalization, but do not affect the validity of the results.

Next, there are potentially some model-specific issues. The first model that evaluates the relation between brand value and share price may be affected by the issue of causality. This study argues that brand value affects the stock price as investors incorporate information on the added value of a brand. However, it can also be argued that brand value is (partially) driven by the stock price, especially for the more financially-oriented methodologies. Though this does not seem to be a large issue considering that prior literature (e.g. Barth et al., 1998; Madden et al., 2006) has substantiated the direction of effects to be similar to the models used in this research. The second model, assessing the effect of the global stock market on brand value, is not as substantiated by prior literature since it has not examined this relation previously. Nevertheless, causality does not seem a likely problem here as the global economy is driven by other aspects than the brand value of firms. The third model evaluates the effect of the financial crisis on brand value and several financial performance measurues. However, it could also be said that a financial crisis is the results of crashing financial performance. Fortunately, it is not the exact effect that is of interest to this study, but the relative effect. Finally, the fourth model seems unlikely to be affected by causality as it does not make a lot of sense for volatility to be a main driver of brand value.

6 Conclusion

The aim of this study was to further evaluate the concept of brand value, specifically with how it helps firms sustain through external economic conditions such as financial shocks. The added value of a strong brand is an often discussed subject in academia but, even though brand value has been stated to be durable and sustainable (Yoo et al., 2000), empirical research into its sustainability during financial shocks is scarce. Johansson et al. (2012) evaluate the performance of high brand value firms during the financial crisis of 2008 but faced several limitations and left an interesting path open for future research. This study addressed and followed up on Johansson et al.'s (2012) limitations and insights respectively.

Not only does this study reaffirm the value-relevance of brand value but the findings also suggest that brand value can play an important role in protecting firms from financial shocks. The main observation that can be made is that stronger brands have less volatile stock returns. Critically, this also holds during periods of extreme uncertainty such as large financial shocks where stock returns are often very volatile. This provides empirical support for claims made in prior literature (e.g. Farquhar, 1989; Keller et al., 2011) and presents evidence for brand value's capability to act as a buffer during financial shocks. Firm's marketing expenditures into their brand are further justified and recommended as it can help the firm survive difficult times. Investors and consumers are advocated to consider brand value into their valuation of a firm's risk. Finally, academics should consider the effect on volatility when evaluating brand value; the brand's ability to improve the firm's resilience against financial shocks should be considered an important component of brand value. Additionally, three different brand valuation methodologies have been assessed and appear consistent in their interpretive abilities, but show statistically significant differences in effect sizes. On the one hand the reliability of brand valuation models has been substantiated due to the consistency of the direction and significance across all estimates, but on the other hand, they do not yet appear reliable enough to be reported on the balance sheet due to the differences in effect sizes.

There are a few limitations to the data and methodology applied that should be kept in mind, notwithstanding these limitations, the implications are of interest and open up several interesting avenues for future research. If it were to become possible in the future, it would be useful to re-evaluate the interpretations made in this study using at least monthly

data for brand value. Additionally, it would be very interesting to examine the differences in effects when compared with low brand value firms or firms with many brands.

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Appendix A - Additional Analysis Results

Table A.1: Brand value methodology differences

	Difference with			
	MillWard Brown Brandz	Interbrand	BrandFinance	Average
MillWard Brown Brandz				
Model 1 (BV>Price):		0.137***	−0.018***	0.101***
		(37.876)	(−3.916)	(31.527)
Model 2 (MSCI>BV):		0.040***	−0.338***	−0.085***
		(6.156)	(−63.674)	(−17.141)
Model 3 (CRISIS>BV):		−0.071***	−0.239***	0.043***
		(−15.893)	(66.188)	(12.565)
Model 4a (BV>VOLATILITY):		−0.015***	−0.004**	0.006***
		(−11.524)	(−2.348)	(−5.114)
Model 4b (BV>VOLATILITY):		−0.001	0.036***	0.019***
		(−0.868)	(23.790)	(18.213)
Interbrand				
Model 1 (BV>Price):	0.137***		−0.155***	−0.036***
	(37.876)		(−33.621)	(−11.245)
Model 2 (MSCI>BV):	0.040***		−0.378***	−0.125***
	(6.156)		(−72.023)	(−25.423)
Model 3 (CRISIS>BV):	−0.071***		0.310***	0.114***
	(−15.893)		(84.786)	(32.908)
Model 4a (BV>VOLATILITY):	−0.015***		0.011***	0.009***
	(−11.524)		(6.940)	(8.579)
Model 4b (BV>VOLATILITY):	−0.001		0.037***	0.020***
	(−0.868)		(26.064)	(21.282)
BrandFinance				
Model 1 (BV>Price):	−0.018***	−0.155***		0.119***
	(−3.916)	(−33.621)		(30.744)
Model 2 (MSCI>BV):	−0.338***	−0.378***		0.253***
	(−63.674)	(−72.023)		(64.550)
Model 3 (CRISIS>BV):	−0.239***	0.310***		−0.196***
	(66.188)	(84.786		(−71.412)
Model 4a (BV>VOLATILITY):	−0.004**	0.011***		−0.002
	(−2.348)	(6.940)		(−1.459)
Model 4b (BV>VOLATILITY):	0.036***	0.037***		−0.017***
	(23.790)	(26.064)		(−13.799)

T-test statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

All tests have their degrees of freedom at over 1000, this means that the critical t-value is 3.291 at a confidence level of 99.9% for all two-sided tests. Model 4a does not control for NI and BVE, whereas model 4b does.