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The effect of Significant Macroeconomic Fluctuations on the Capital Structures of Firms in Emerging Markets

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Abstract

A firm's capital structure decision is guided by factors both internal and external to the organisation. This paper tests the extent to which international macroeconomic factors, particularly a considerable market shift, affect firms' capital structures by using the global financial crisis of 2008 as a reference point. The study investigates the degree to which firms' capital structures are changed in a variety of countries and industries within emerging markets, hypothesising that firms' capital structures have changed post-financial crisis.

The research is conducted by means of a quasi-experimental event-based time-series study, with the financial crisis of 2008 considered the fulcrum. Data from five years before, and five years after the event provided the basis for statistical analysis.

The study found that leverage in emerging market firms is counter-cyclical and that country specific and industry specific factors influenced the degree of effect that the financial crisis of 2008 had on capital structures of firms over the studied period.

Key Words

Capital structure; macroeconomic factors; emerging markets; financial crisis

Declaration

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

JM Lingenfelder

11 November 2013

Date

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Chapter 1: Introduction

1.1. Research Title

The effect of Significant Macroeconomic Fluctuations on the Capital Structures of Firms in Emerging Markets.

1.2. Research Problem

Firms are funded through a combination of debt and equity; the mix of these sources is referred to as the firms' capital structure. The field of capital structure theory is of importance to managers who wish to maximise the returns of shareholders by leveraging their equity to borrow funds. Understanding the drivers of capital structure decisions provides managers with the insight required to manage the risk and reward associated with their debt position.

Firms' capital structures are influenced by factors both internal and external to the organisation, with the majority of academic research aimed at determining the company-specific factors that affect manager's decisions.

This report, considers the environment external to the firm, as it seeks to investigate the influence of exceptional macroeconomic fluctuations on firms' capital structures by analysing these decisions as they were made before and after the global financial crisis of 2008.

The impact that the financial crisis had on world markets can be seen in figure 1 below which has been adapted from The World Bank (2013), providing visual confirmation of the effect, particularly from 2007 to 2008, on market capitalisation of the world markets.

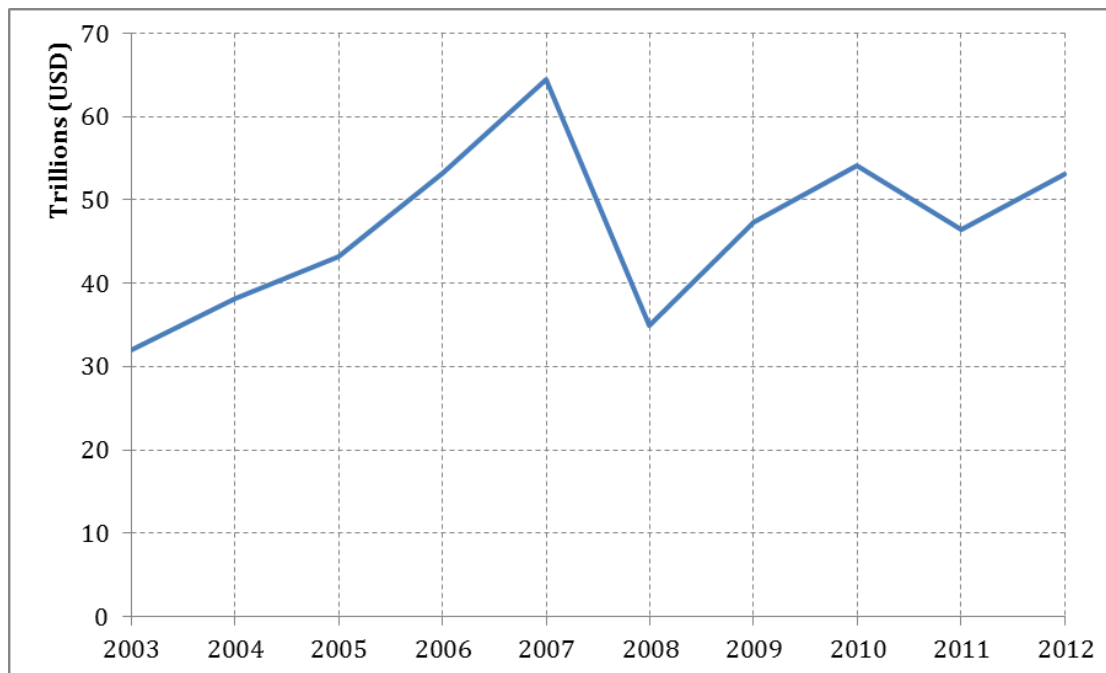


Figure 1: World Market Capitalisation (2003 – 2012), adapted from *The World Bank (2013)*

The financial crisis has affected markets and businesses around the world in a number of ways; the source of funding for firms is one such aspect that can be expected to have been influenced by the recession.

The objective of this paper is to determine the effect of the 2008 financial crisis on capital structures of firms in emerging markets by analysing the aggregate change of these from pre- to post-financial crisis for firms as well as the countries and industries in which they operate.

This paper tests the assumption that during times of heightened global economic uncertainty, firms' capital structures are to a greater degree affected by external factors rather than factors specific to the organisation.

Hackbarth, Miao, & Morellec (2006) note in the introduction to their paper that “Despite the substantial development of [capital structure] literature, little

attention has been paid to the effects of macroeconomic conditions on credit risk and capital structure choices” (p. 1).

Of the research conducted on the effect of macroeconomic conditions on firms’ capital structure decisions, the most common objective is to identify the effect that macroeconomic conditions have on the relative importance of firm-specific factors as determinants of capital structure decisions (e.g. Hackbarth et al. (2006), Korajczyk & Levy (2003), Levy & Hennessy (2007), Bhamra, Kuehn, & Strebulaev (2010)).

This paper, however, does not seek to establish the effect of macroeconomic factors on the firm-specific factors that influence capital structure decisions, but rather to identify the change in aggregate capital structures after a severe shift in macroeconomic conditions (i.e. the financial crisis of 2008).

By determining the effect of the financial crisis on firms’ capital structures this study provides managers with insight that may prove useful should similar macroeconomic conditions prevail in the future.

1.3. Research Aim

Much research has been done in the field of corporate capital structures; however the literature focuses predominantly on three aspects, namely:

- Developing an integrated model of factors internal to the organisation that influence capital structure decisions (e.g. Titman & Wessels (1988), Huang & Song (2006), Titman & Tsyplakov (2007), Frank & Goyal (2009), Gwatidzo & Ojah (2009) and Bhamra, Kuehn, & Strebulaev (2010)).
- Setting out to prove / disprove theoretical bases (e.g. Graham and Harvey (2001), Baker & Wurgler (2002), Frank and Goyal (2003), Leary & Roberts (2005), Huang & Ritter (2009)).

- Predominantly focused on developed nations, particularly based on US data.

It is commonly acknowledged that emerging markets have become significantly more important to the global market and in view of the increasing contribution, further investigation is required into whether firms in emerging markets behave similarly (in a variety of fields) to their counterparts in developed markets. Based in the field of corporate finance, this paper focuses on firms in emerging markets, with the view to understanding capital structure decisions in the face of global macroeconomic fluctuations.

Unlike most research on the topic, this paper does not seek to prove / disprove particular theories nor does it seek to develop a model of contributory factors affecting capital structure decisions. Rather, this study has the exploratory objective of determining whether the capital structures of firms in emerging markets changed after the financial crisis of 2008. Additionally, this paper further seeks to investigate whether all countries and all industries within emerging markets were uniformly affected by the financial crisis or whether disparities exist.

The remainder of this paper is outlined as follows: Chapter 2 provides a review of academic literature and the theoretical base considered relevant to the study. Chapter 3 describes the research hypotheses while Chapter 4 details the research methodology. Chapter 5 presents the results of the research which are further discussed in Chapter 6. Chapter 7 concludes the report presenting major findings and providing recommendation for future studies.

Chapter 2: Theory and Literature Review

2.1. Capital Structure Theory

Myers (2003) wrote that “there is no universal theory of capital structure, and no reason to expect one. There are useful Conditional Theories, however” (p. 3). Firms’ Capital Structure decisions are reported to be affected by Trade-Off Theory, Pecking Order Theory, Market Timing Theory and Agency Theory; these theories purport that leveraging decisions are driven by a number of factors which are discussed below.

2.1.1. Trade-off Theory

Modigliani and Miller’s (1958, 1963) seminal work served as the basis for the modern iteration of Trade-Off Theory. In principle, Trade-off Theory asserts that firms have optimal capital structures that they actively target. The theory is best illustrated when considering a business manager or decision maker who evaluates leveraging options available to the business, and who considers the marginal costs and benefits of those options while seeking to find balance therein. The marginal benefit of the interest tax shield (created by deducting the cost of debt from earnings prior to tax) is balanced with the marginal cost of financial distress (inability to service the debt).

2.1.2. Pecking Order Theory

Pecking Order Theory originally described by Myers (1984) and Myers and Majluf (1984) states that rational business managers will seek funding first from internal financing (i.e. retained earnings or excess cash) and only then from external sources (initially through debt and lastly by issuing equity). Frank and Goyal (2003) describe the premise of the theory in that “equity is subject to

serious adverse selection problems while debt has only a minor adverse selection problem” (p. 220); they conclude that equity is riskier than debt and as a result outside investors require a higher rate of return on equity than on debt.

2.1.3. The Market Timing Model

The Market Timing Model argues that firms issue equity when share prices are high and buy back their own shares when share prices are low; the result is that the firm’s capital structure fluctuates with its share prices. While the concept has been previously discussed (see Myers, 1984), it appears that it has gained traction in recent times. In a survey conducted by Graham and Harvey (2001), they find that “recent stock price performance is the third most popular factor affecting equity-issuance decisions” (p. 222), more popular than maintaining a target debt-to-equity ratio.

Baker & Wurgler (2002) tested the Market Timing Model on US listed company data from 1968 to 1999 and found that “capital structure is strongly related to historical market values” (p. 1). Baker & Wurgler (2002) continue to conclude that in the market timing theory there is no optimal capital structure but proffer that “capital structure is largely the cumulative outcome of past attempts to time the equity market” (p. 29).

2.1.4. Agency Theory

Agency Theory recognises that business managers (agents) and shareholders’ (principals) interests are not shared; it further notes asymmetry of information toward the business manager. Jensen and Meckling (1976) first discussed the agency problem with respect to the firm; they noted that debt is a mechanism which can be used to discipline managers into efficiently allocating free cash flow, i.e. to return the debt to the creditor as opposed to reckless spending of free

cash reserves. This is confirmed by Stulz (1990) who concluded that business managers tend to over-invest in projects when free cash flow is high and under-invest when reserves are low. Furthermore, Harris and Raviv (1990) postulate that debt is used as a “disciplining device” (p. 321) because creditors have the option to force the firm into liquidation should it default.

2.2. The importance of capital structure decisions

A key inference generally drawn from a firm’s capital structure is the value of that firm. Modigliani and Miller (1958) postulated in their Proposition I (commonly referred to as MM1) that in a perfect market a firm’s capital structure was irrelevant to the firm’s valuation, i.e. $V_u = V_l$

Where:

V_u is the value of an unlevered firm

V_l is the value of a levered firm

However, in a real market where taxes do exist $V_l = V_u + T_c D$

Where:

V_u is the value of an unlevered firm

V_l is the value of a levered firm

$T_c D$ is the tax rate (T_c) x the value of the debt (D)

The capital structure decision of a firm has a number of implications for the firm but perhaps most important, as shown above, is the influence of the capital structure decision on the value of the firm itself.

2.3. Defining the Capital Structure measure

Academic opinion differs on the preferred constituents used in the determination of a capital structure measure.

While the definition of debt as a constituent of Capital Structure ratios differs, most authors (e.g. Faulkender & Petersen (2006); Huang & Song (2006); Korajczyk and Levy (2003); Brav, O. (2009)) favour simultaneous analysis that considers both long-term debt and total debt i.e. short-term plus long-term debt.

Of equal concern and perhaps a greater source of argument for academics is the use of market or book values of equity. Graham & Harvey (2001), in their research report find that financial managers use book values. Bowman (1980) finds little difference between using market and book values; however Fama & French (2002) find large differences. Welch (2004) supports the use of market values.

Frank & Goyal (2009) address the aforementioned concerns by testing leverage in all four iterations, i.e.:

- TDM: Total debt / market value of assets
- TDA: Total debt / book value of assets
- LDM: Long term debt / market value of assets
- LDA: Long term debt / book value of assets

2.4. Factors affecting Capital Structure

Academics are in agreement that capital structure decisions are influenced by factors both internal and external to the organisation (e.g. Hackbarth et al. (2006); Frank & Goyal (2009); Levy & Hennessy (2007)). It is well documented that the following internal factors influence firms' capital structure decisions: profitability, firm size, age, growth, industry, tangibility of assets, tax rate, and risk; while external factors include stock market conditions, debt market conditions and macroeconomic conditions (expected inflation rate, growth in national GDP, growth in aggregated corporate profits).

Using a market based definition of leverage; Frank & Goyal (2009) find six factors that they consider reliably important in affecting capital structures. They term these the “core factors” (p. 3), which they found account for more than 27% of the variation in leverage in sampled US firms from 1950 to 2003. According to Frank & Goyal (2009), the “core model of leverage” (p. 3) is underpinned by the following factors: asset tangibility, firm profitability, firm size, market-to-book ratio and expected inflation. These and other contributory factors are discussed in further details below:

2.4.1. Asset Tangibility

Deesomsak, Paudyal, & Pescetto (2004) note that firms which are unable to provide collateral (i.e. asset tangibility is low) will be forced to pay a higher interest rate and as such may revert to issuing equity; they determine the relationship between tangibility of assets and leverage to be positive. Research conducted by Frank & Goyal (2009) confirms this as they find that firms with more tangible assets tend to have higher leverage. Gwatidzo & Ojah (2009), however, who studied capital structures in five African countries, found that “tangibility of assets is negatively related to debt for most sampled countries” (p. 17).

Generally, most academics agree that firms with greater asset tangibility tend to be more leveraged than firms where assets bases are less tangible (e.g. Frank & Goyal (2009), Korajczyk & Levy (2003), Myers (2003), and Morellec (2001)).

2.4.2. Firm Profitability

As aforementioned, Pecking Order Theory states that managers seek funding from internal sources i.e. retained earnings. The theory therefore implies that

more profitable firms will be less leveraged than less profitable ones. Trade-Off Theory, however, predicts that more profitable firms would be more leveraged as managers seek to gain the marginal benefit of tax shields, thereby reducing profitability. Fama & French (2002) and Frank & Goyal (2003, 2009), Huang & Ritter (2009) and Titman & Wessels (1988) find in favour of the Pecking Order Theory, i.e. that firms with higher profitability tend to have lower leverage.

2.4.3. Firm Size

Brav (2009) and Frank & Goyal (2009), agree that larger firms tend to have higher leverage (both used the natural log of assets as a proxy for firm size). Their findings are in support of Trade-Off Theory as it is established that large firms face a lower risk of financial distress. This is in contrast to Pecking Order Theory which is usually interpreted to predict a negative relation in firm size and leverage; Frank & Goyal (2009) note that this is based on the common assumption that large (older) firms have had more time to retain earnings.

2.4.4. Expected Inflation

Frank & Goyal (2009) in their “core model of leverage” (p. 3) propose that when inflation is expected to be high, firms tend to have high leverage

2.4.5. Market-to-book asset ratio

Baker & Wurgler (2002) in testing the Market Timing model found that firms' current capital structure was strongly related to their historical market-to-book ratios, concluding that firms with low leverage tended to have issued equity when their valuations were high. Their findings are supported by Frank & Goyal (2009) who concluded that firms with high market-to-book ratios tend to have lower leverage.

2.4.6. Market Timing and speed of adjustment

Baker & Wurgler (2002) conclude their findings by stating that “there is no optimal capital structure, so market timing financing decisions just accumulate over time into the capital structure outcome” (p. 29). Of interest to this point is the speed at which firms adjust their capital structures to reach a transient target, albeit according to Baker & Wurgler (2002), not an optimal leverage target.

A number of academics have provided evidence for a range of speeds, measured in percentage of leverage adjusted in a year. Fama & French (2002), using market and book leverage) estimate the speed of adjustment (SOA) to be between 7% and 18%, while Lemmon, Roberts & Zender (2008) find SOA to be 25% using book leverage. Using market leverage, Flannery & Rangan (2006) calculate SOA to be 35.5% and Huang & Ritter (2009) find SOA to be 23.2%. While discrepancies exist in their findings, they agree that (unanticipated) changes in share prices have an effect on leverage, as predicted by the Market Timing model.

Additionally, Hackbarth et al. (2006) argue that the speed of adjustment is higher in booms than in recessions.

2.4.7. Adjustment costs

It is commonly conjectured that firms adjust capital structures slowly toward a target (e.g. Fama & French (2002), Leary & Roberts (2005), Titman & Tsyplakov (2007) and Drobetz & Wanzenried (2006)), due in part to the potentially high cost of adjustment. Drobetz & Wanzenried (2006) argue that firms that have recognised that their leverage ratios are not optimal, may decide not to adjust

their capital structure if the expected adjustment cost is considered marginally costly.

2.4.8. Access to public debt markets

In line with Pecking Order Theory, Faulkender & Petersen (2006) conducted research into whether the source of capital affects capital structure. They note that firms that have access to public debt funding are 300% larger (in natural logs) than firms that do not have access; their assets are more tangible and they are “significantly older” (p. 55). By controlling for these firm specific factors, Faulkender & Petersen (2006) found that firms who have a debt rating (and thus have access to public debt markets), are leveraged by more than 50% than firms who do not have access. When considering access to public debt markets with firm-specific factors included, Faulkender & Petersen (2006) are able to account for a large portion ($R^2 = 76\%$) of the variability in firms’ leverage.

2.4.9. Macroeconomic cyclicalities

Korajczyk & Levy (2003) consider macroeconomic factors in conjunction with internal factors as they investigate the former’s effect on constrained and unconstrained firms. A firm is classified as constrained “if it does not have sufficient cash to undertake investment opportunities and if it faces severe agency costs when accessing financial markets” (Korajczyk & Levy, 2003, p. 82).

Korajczyk and Levy (2003) make use of three factors as proxies for macroeconomic cyclicalities, namely:

- Two-year aggregate domestic nonfinancial corporate profit growth
- Two-year equity market return (weighted value of shares traded on NYSE, AMEX and NASDAQ)

- Annualized rate on three-month commercial paper over the rate on three-month treasury bill (i.e. commercial paper spread)

Korajczyk and Levy (2003) find that macroeconomic conditions account for 12% to 51% (for unconstrained firms) and 4% to 41% (for constrained firms) of the variation in firms' leverage. Furthermore Korajczyk and Levy (2003) conclude that unconstrained companies' leverage is counter-cyclical while constrained firms adjust leverage pro-cyclically.

In support of Korajczyk and Levy (2003), Bhamra et al. (2010) agree that unconstrained companies' leverage is counter-cyclical while constrained firms adjust leverage pro-cyclically. While exploring aggregate dynamics, Bhamra et al. (2010) find that aggregate leverage has been shown to be counter-cyclical.

Levy & Hennessy (2007), by generating a computable general equilibrium model, show that leverage is counter-cyclical for 'less' constrained firms and flat for constrained firms; they note that their findings are consistent with existing evidence such as that provided by Korajczyk and Levy (2003).

Hackbarth et al. (2006) develop a contingent claims model which predicts that leverage is counter-cyclical consistent with evidence provided by Korajczyk and Levy (2003).

2.4.10. Country of listing

Much of the academic research related to firms' capital structures is based on COMPUSAT data of American firms although a number of authors have investigated capital structure decisions in other regions.

Deesomsak, Paudyal, & Pescetto (2004) investigate leverage of companies in the Asia Pacific Region and conclude that “the capital structure decisions of firms is influenced by the environment in which they operate” (p. 1). Deesomsak et al. (2004) find that the relative importance of capital structure determinants vary across countries and point out the following examples:

- profitability is significantly important for Malaysian firms’ capital structure decisions ,
- firm size has no effect for Singaporean firms.

Deesomsak et al. (2004) also sought to test the effect of the East Asian crisis of 1997 on the capital structures in the various countries that they sampled; they found the crisis to have altered the effect of both country and firm specific factors; their finding in this regard has significance to this paper.

Gwatidzo & Ojah (2009) consider the capital structures of firms in Sub Saharan Africa and note that African firms tend to rely significantly more on internal financing and when external financing is used the tendency is to use short term debt; their findings are in support of Pecking Order Theory. As expected, Gwatidzo & Ojah (2009) find that the sampled African countries are similarly leveraged to other developing countries. Of greatest interest from their findings though, Gwatidzo & Ojah (2009) report that tangibility of assets is negatively related to aggregate leverage of sampled African firms.

Drobetz, & Wanzenried (2006) find that leverage in Swiss firms is comparable to their US counterparts.

Booth, Aivazian, Demirguc-Kunt, & Maksimovic (2002) who research capital structure in developing countries find “persistent differences across countries, indicating that specific country factors are at work” (p. 87); they do note however that firm profitability is consistently negatively related to leverage.

Huang & Song (2006) while investigating the aggregate capital structure of Chinese firms noted a number of discrepancies from US firms, namely:

- Chinese firms rely more heavily on external funding (particularly equity financing) as opposed to retained earnings,
- the ownership structure of Chinese firms has an effect on their leverage,
- leverage in Chinese firms increases with volatility,
- and, the spread between book value and market value of leverage is larger in China.

Huang & Song (2006) conclude that discrepancies are likely to be a result of the continued migration of the country's command economy to a market-based economy; they also note that the state is still a controlling shareholder in the majority of Chinese listed companies and thirdly that the country's bond market is still in "an infant stage of development" (p. 21).

2.4.11. Industry membership

Frank & Goyal (2009), as one of their 'core factors' affecting firms' capital structures, find that industry membership influences firm leverage in so far as it tends to be high in industries where median leverage is high.

Tucker & Stoja (2011), while considering the impact of industry membership on capital structures of firms in the UK, find that firms in the long run adjust leverage to target the industry norms. Tucker & Stoja (2011) note, however, that "whilst targeting behaviour occurs in the majority of industries, the precise gearing ratio targeted varies markedly" (p. 15). They note it surprising that leverage ratios based on book rather than market value equity are more frequently targeted, purporting that financial managers may find it more practical due to fluctuations in market measures.

Tucker & Stoja (2011) add that ‘old industries’ (such as extraction, construction and textile) are more likely to target book value gearing measures while ‘new industries’ (such as IT) are more prone to target market value based leverage indicators. Interestingly they find no evidence of leverage targeting in the engineering and leisure industries.

Almazan & Molina (2005), accepting that industry membership influences a firm’s capital structure, seek to identify industry characteristics that affect the degree of dispersion (i.e. the variance of leverage within the industry); they find that capital structure dispersion is wider in industries that

- are more concentrated,
- use leasing more intensively, and
- exhibit looser corporate governance.

By testing the effect of a variety of factors as influencers of firms’ capital structures across five industries, Talberg, Frydenberg & Westgaard (2008) find that “industries studied are influenced differently” (p. 198). Their model of independent variables account for between 10% ($R^2 = 0.1$) and 40% ($R^2 = 0.4$) of the observed variability in leverage.

2.5. Synopsis

In spite of the established discussion around factors affecting capital structure decisions, Hackbarth et al. (2006) argue that little has been done to quantify the effects of macroeconomic conditions on capital structure decisions.

Much of the research conducted into firms’ capital structures focuses on the following:

- Developing an integrated model of factors internal to the organisation that influence capital structure decisions
- Setting out to prove / disprove theoretical bases
- Predominantly focused on developed nations, particularly based on US data.

Of the research that focuses on macroeconomic conditions as a determinant (in itself) of capital structure decisions; many inconsistencies exist in the findings of the authors.

Korajczyk and Levy (2003) find macroeconomic factors have a significant impact (between 4% and 51%) on capital structure decisions of firms. The wide range would imply that the relative importance of macroeconomic factors as a determinant of the source of financing decisions is most likely due to the state in which the macroeconomic factors are in at a given time.

Of those authors commenting on the role of macroeconomic conditions as a determinant of capital structure decisions, Bhamra et al. (2010), Levy & Hennessy (2007), Korajczyk and Levy (2003), Hackbarth, et al. (2006) find that leverage is counter-cyclical while Bhamra, Kuehn, & Strebulaev (2010) conclude that while unconstrained companies' leverage is counter-cyclical, constrained firms adjust leverage pro-cyclically.

A number of authors have considered whether the country of operation affects the capital structures decisions of firms. Deesomsak et al. (2004), Gwatidzo & Ojah (2009), Booth et al. (2002) and Huang & Song (2006), agree that differences in capital structures exist between countries and that the relative importance of the internal factors affecting capital structure decisions differ between countries.

Most of the literature which focuses on understanding the role of a firm's industry as a factor affecting its capital structure decision tends to investigate this in regard to trade-off theory with the aim of identifying whether firms target an industry average leverage ratio (e.g. Frank & Goyal (2009), Tucker & Stoja (2011), Almazan & Molina (2005)). Additionally, Talberg et al. (2008) consider whether internal determinants of capital structure decisions are uniform across industry types.

Chapter 3: Hypotheses

Focusing on firms within emerging markets this paper seeks to analyse changes in capital structures before and after the global financial crisis of 2008, postulating that capital structures of firms have been influenced by the crisis (H1).

The analysis will further seek to determine whether the effect is uniform or varied across sampled countries (H2) and all sampled industry sectors (H3).

3.1. Central Hypothesis (H1)

The following central hypothesis is tested at a 90% confidence level.

H1₀: There is no change in firms' Capital Structures after the 2008 financial crisis

H1_A: There is a change in firms' Capital Structures after the 2008 financial crisis

Stated alternatively as:

$$H1_0: CS_{S,Pre} - CS_{S,Post} = 0$$

$$H1_A: CS_{S,Pre} - CS_{S,Post} \neq 0$$

Where:

$CS_{S,Pre}$: Average Capital Structure of the entire sample
Pre financial crisis (2003 .. 2007)

$CS_{S,Post}$: Average Capital Structure of the entire sample
Post financial crisis (2008 .. 2012)

3.2. Secondary Hypotheses (H2)

The following secondary hypothesis is tested per country at a 90% confidence level.

H_{20} : There is no change in firms' Capital Structures after the 2008 financial crisis

H_{2A} : There is a change in firms' Capital Structures after the 2008 financial crisis

Stated alternatively as:

H_{20} : $CS_{C,Pre} - CS_{C,Post} = 0$

H_{2A} : $CS_{C,Pre} - CS_{C,Post} \neq 0$

Where:

$CS_{C,Pre}$: Average Capital Structure of firms by country
Pre financial crisis (2003 .. 2007)

$CS_{C,Post}$: Average Capital Structure of firms by country
Post financial crisis (2008 .. 2012)

3.3. Secondary Hypotheses (H3)

The following secondary hypothesis is tested per industry at a 90% confidence level.

H_{30} : There is no change in firms' Capital Structures after the 2008 financial crisis

H_{3A} : There is a change in firms' Capital Structures after the 2008 financial crisis

Stated alternatively as:

$$H3_0: CS_{I,Pre} - CS_{I,Post} = 0$$

$$H3_A: CS_{I,Pre} - CS_{I,Post} \neq 0$$

Where:

$CS_{I,Pre}$: Average Capital Structure of firms by industry classification
Pre financial crisis (2003 .. 2007)

$CS_{I,Post}$: Average Capital Structure of firms by industry classification
Post financial crisis (2008 .. 2012)

Chapter 4: Research Methodology

4.1. Research design

The research has been conducted by means of a quasi-experimental time-series based event study. Secondary Financial data has been collected on companies listed on the stock markets of the countries for which this study focuses. A model has been built to consider the relevant variables.

In order to test the hypotheses, data has been analysed statistically for significance.

4.2. Population

The population of the study is all publicly listed companies who operate in countries considered to be emerging markets. Emerging markets are considered to be those countries identified on all of the following emerging market lists or indices:

- International Monetary Fund (IMF)
- Morgan Stanley Capital International (MSCI)
- Financial Times and the London Stock Exchange (FTSE)
- Standard & Poor's (S&P)
- Dow Jones

Emerging countries are therefore limited to Brazil, Chile, China, Hungary, India, Indonesia, Malaysia, Mexico, Peru, Philippines, Poland, Russia, South Africa, Thailand and Turkey.

4.3. Sampling

Of the emerging market population a sample of five countries (with the largest market capitalisations) has been selected; namely China, Brazil, India, South Africa and Russia. Their respective stock markets are listed in Table 1 below with the corresponding (global) ranking in terms of domestic market capitalisations.

Country	Exchange	Ranking
China	Hong Kong Exchanges (HKEx)	6
China	Shanghai Stock Exchange (SSE)	7
China	Shenzhen Stock Exchange (SZSE)	12
Brazil	BM&FBovespa	13
India	National Stock Exchange of India (NSE)	16
South Africa	Johannesburg Stock Exchange (JSE)	19
Russia	Moscow Exchange (MICEX / RTS)	21

Table 1: Largest emerging market stock exchanges by domestic market capitalisation adapted from World Federation of Exchanges (2013).

As in Drobetz & Wanzenried (2006) and Gwatidzo & Ojah (2009), companies in the financial sector have been excluded from the sample due to specific regulatory requirements which affect target leverage.

4.4. Unit of analysis

The unit of analysis is a single listed* company.

*Listed on the HKEx, SSE, SZSE, BM&FBovespa, NSE, JSE and MICEX.

4.5. Data collection

The following data was obtained (for the period 2003 – 2012) for all companies:

- Company Code
- Company Name
- Industry
- Country
- Exchange listed on
- Primary / Secondary listing
- Long-term debt
- Short-term debt
- Book value of assets
- Market capitalisation (local currency)
- Market capitalisation (USD)
- Interest expense
- Earnings before interest and tax

The study is based on standardised financial statement data which was obtained through Thomson Reuters DataStream.

4.6. Data Analysis Approach

Collated data has been manipulated to form a multi-dimensional matrix, with the following axes:

- Time (2003 – 2012)
- Country
- Industry
- Company Ticker, Company Name
- Capital Structure Measure

4.6.1. Capital Structure Measures

Four factors have been used in calculating leverage (as a proxy for firms' capital structures) namely: total debt, long term debt, market value of assets and book value of assets. For the purpose of this study leverage has therefore been denoted, as in Frank & Goyal (2009), by the following terms:

- *TDM*: Total debt / market value of assets
- *TDA*: Total debt / book value of assets
- *LDM*: Long term debt / market value of assets
- *LDA*: Long term debt / book value of assets

In addition to the balance sheet and market related approaches noted above, this study includes an income statement approach by considering Interest Cover to be an extension of leverage, this has been calculated as Earnings Before Interest and Tax / Interest Expense. Interest cover for a number of firms in the data set is exceptionally high (e.g. >100 times), in order to account for the extreme outliers the natural logarithm of interest cover (i.e. $\ln[IC]$) has been used in all analyses.

4.6.2. Aggregate leverage

In order to aggregate capital structure measures for the periods of pre- and post-financial crisis the mean of company capital structures for 2003 to 2007 and 2008 to 2012 have been calculated.

While it would have been preferential to make use of the median (so as to avoid undue influence of outliers), this was decided against for the following reason.

Due to the manner in which the weighted data points are calculated, the median of these would return a number which should be considered meaningless in isolation. It is the sum of the weighted data points which provides the weighted average of the sample.

Thus, to ensure that the weighted and unweighted data sets are comparable, it follows that the aggregate capital structure of the unweighted data set also be calculated using the mean and not the median.

4.6.3. Unweighted and weighted data

This study considers two perspectives in analysing capital structures of firms.

1. The aggregation of firms' capital structures in the market
2. The aggregate capital structure of the market

In the first instance, firms are considered equal and their capital structures are equally weighted when calculating the average for the market; while in the second, credence is given to the market capitalisation (as a proxy for influence on the market) of the individual firms and their capital structures are weighted accordingly when calculating the average for the market. This study refers to these perspectives as *unweighted* and *weighted* respectively.

The study considers both perspectives with a view to addressing different interests. The *unweighted* view should provide greater insight for business managers seeking to understand if (and to what degree) firms shifted their capital structures after the financial crisis of 2008; these results could provide insight into understanding firms' capital structure decisions. The *weighted* perspective seeks to provide clarity on the effect of the financial crisis on the capital structure of the market itself.

The calculation of weighted sample data points has been conducted as follows:

$$x_w = x_{uw} \times (mc_f / mc_s)$$

where

x_w = Weighted Capital Structure measure (TDM, TDA, LDM, LDA, ln(IC))

x_{uw} = Unweighted Capital Structure measure (TDM, TDA, LDM, LDA, ln(IC))

mc_f = Market Capitalisation in USD of the firm

mc_s = Market Capitalisation in USD of the specific sample (i.e. entire sample, country or industry classification)

4.7. Research Limitations

While every effort has been made to ensure the thoroughness of this research, the following limitations have been identified:

Of the 2'976 companies included in the sample, 1'524 (more than 50%) are listed on Chinese stock exchanges; this may provide an unbalanced weighting of the results to that country.

Through the process of data cleansing, care was given to include all firms relevant to the study, particularly those that may have ceased operating after the financial crisis; this was done so as to avoid survivor bias. In spite of this, it was determined that Student's T-Test for paired samples was best suited to statistically testing the hypotheses; an unintended result of this choice was that only firms with data pre- and post-financial crisis could be used due to the mechanical constraint of the statistical test. This has resulted in the sample containing survivorship bias.

Only listed firms from the studied markets have been used, thereby excluding unlisted companies from the sample and the study. This reduces the applicability of the results.

In order to perform an event-based study, equal periods before and after the event have been used (i.e. five years before and five years after the financial crisis). While this provides the basis for a window into the effects of the financial crisis, future studies based on a wider timeframe may provide a more thorough perspective.

Chapter 5: Results

5.1. Data Cleansing

Data obtained from Thomson Reuters DataStream have been filtered to exclude inconsistencies and anomalies.

The original data as extracted from DataStream is summarised in Table 2 and Table 3 below:

Country	Number of Companies
Brazil	1060
China	3184
India	2361
N/A	61
Russia	1091
South Africa	1389
Total	9146

Table 2: Raw data set: Number of firms by Country of Listing

Industry Classification	Number of Companies
Automobiles & Parts	306
Banks	255
Basic Resources	755
Chemicals	530
Construction & Material	487

Financial Services	321
Food & Beverage	474
Healthcare	401
Industrial Goods & Services	1516
Insurance	60
Media	164
N/A	209
Oil & Gas	235
Personal & Household Goods	684
Real Estate	385
Retail	298
Technology	514
Telecommunications	254
Travel & Leisure	183
Unclassified	173
Unquoted equities	499
Utilities	443
Total	9146

Table 3: Raw data set: Number of firms by Industry classification

5.1.2. Primary / Secondary listing

Only companies whose primary listing is on the studied stock exchanges (HKEx, SSE, SZSE, BM&FBovespa, NSE, JSE and MICEX) have been included; companies with secondary listings have been removed from the sample.

Additionally, unquoted equities and companies with unclassified industries have been removed from the sample.

5.1.3. Missing descriptive data

Companies with incomplete descriptive data (company name, ticker code or industry classification) were excluded; a total of 6462 companies remained.

5.1.4. Market capitalisation

Market capitalisation has been used pervasively throughout the data analysis, particularly:

- Market capitalisation (in USD) has been used for the weighting of company data
- Market capitalisation (in local currency) has been used in the calculation of LDM and TDM (Leverage measures based on market value of assets).

Companies with no market capitalisation for the period pre- financial crisis (i.e. 2003 – 2007) have been removed as these companies would have been listed after the event (financial crisis of 2008) and as such are irrelevant to the study; 4340 companies remained.

5.1.5. Industry classification

As in Drobetz & Wanzenried (2006) and Gwatidzo & Ojah (2009), companies in the financial sector have been excluded from the sample due to specific regulatory requirements which affect target leverage leaving 3778 companies.

The following industries have been excluded:

- Banks
- Financial Services
- Insurance
- Real Estate

5.1.6. Data anomalies

Anomalies existed in the extracted dataset whereby duplicate companies (and data) were found and removed, leaving 3741 companies.

5.1.7. Market constituency

For each year (2003 – 2012), a firm's market capitalisation was ranked in their respective countries. Firms whose market capitalisation ranked highest and made up 99% of that country's market capitalisation for the year were included in the overall sample; the revised sample included 2796 companies.

Although a particular firm has been included in the overall sample (if its market capitalisation contributed to the country's 99% market capitalisation in any single year), only the years that did so were included in calculations of aggregate market leverage for that year.

5.2. Final Data Set

The final data set is described below as it relates to this study's hypotheses:

5.2.1. Central Hypothesis (H1)

A total of 2796 companies have been included in the sample, however only years where the market capitalisation contributes to the top 99% of the country's market capitalisation are included, this is summarised in Table 4 below:

Year	Number of Companies
2003	1693
2004	1853
2005	1957
2006	2351
2007	2461
2008	2393
2009	2259
2010	2324
2011	2275
2012	2237

Table 4: Final data set: Number of firms by Year

5.2.2. Secondary Hypotheses (H2)

The sample data set contains 2976 companies but as discussed in 5.2.1, only years where the company's market capitalisation contributes to the top 99% of the country's market capitalisation are included in aggregate leverage calculations for that year.

As a result, the data set has been rebalanced each year with different companies contributing to the aggregate leverage calculations based on their market capitalisation weighting in a given year.

Table 5 below outlines the composition of the final sample data set by country of listing as it relates to the secondary hypothesis (H2).

The column labelled *Total* identifies the total number of companies, by country of listing, that were included in the data set; while columns labelled *2003 ... 2012* account for the number of companies included for that specific year.

Country	Total
Brazil	197
China	1524
India	887
Russia	190
South Africa	178
Total	2976

2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
107	112	112	118	150	137	128	116	113	102
1162	1241	1235	1273	1321	1324	1347	1352	1335	1345
274	336	414	724	714	654	566	626	615	597
31	40	73	113	141	154	110	121	107	90
119	124	123	123	135	124	108	109	105	103
1693	1853	1957	2351	2461	2393	2259	2324	2275	2237

Table 5: Final data set: Number of firms by Country of Listing

5.2.3. Secondary Hypotheses (H3)

The sample data set contains 2976 companies but as discussed in 5.2.1, only years where the company's market capitalisation contributes to the top 99% of the country's market capitalisation are included in aggregate leverage calculations for that year.

As a result, the data set has been rebalanced each year with different companies contributing to the aggregate leverage calculations based on their market capitalisation weighting in a given year.

Table 6 below outlines the composition of the final sample data set by industry classification as it relates to the secondary hypothesis (H3).

The column labelled *Total* identifies the total number of companies, by industry classification, that were included in the data set; while columns labelled *2003 ... 2012* account for the number of companies included for that specific year.

Industry	Total	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Automobiles & Parts	140	86	92	120	112	97	95	103	100	105	86
Basic Resources	365	223	236	286	300	306	280	291	291	275	223
Chemicals	244	170	168	197	200	194	194	193	195	195	170
Construction & Material	211	109	112	155	175	177	158	163	159	162	109
Food & Beverage	191	121	122	153	156	146	159	155	150	143	121
Healthcare	215	160	168	180	183	180	175	180	182	182	160
Industrial Goods & Services	571	357	384	454	488	483	454	471	444	446	357
Media	49	24	27	33	40	38	36	37	36	34	24
Oil & Gas	82	44	45	58	58	57	52	57	57	54	44
Personal & Household Goods	251	141	153	198	200	179	161	176	182	175	141
Retail	134	102	103	107	109	107	105	105	100	106	102
Technology	189	103	110	142	155	145	127	130	127	120	103
Telecommunications	50	32	35	35	40	39	38	34	26	25	32
Travel & Leisure	86	54	61	74	77	75	65	67	68	65	54
Utilities	198	127	141	159	168	170	160	162	158	150	127
Total	2976	1853	1957	2351	2461	2393	2259	2324	2275	2237	1853

Table 6: Final data set: Number of firms by Industry Classification

5.3. Characteristics of sample

Appendix 1 contains Figures 3 through 24 which provide graphical representation of capital structures as they relate to the hypotheses over the period of the study.

Figure 3 illustrates the five measures for capital structure (as defined in this study) for the unweighted sample, while Figure 4 illustrates the same for the weighted sample. For Figure 3 and Figure 4, TDM, TDA, LDM and LDA are associated with the primary Y axis while $\ln(IC)$ is associated with the secondary Y axis.

Visual inspection of Figure 3 and Figure 4 time-series charts provides encouragement that differences exist in capital structures pre- and post-financial crisis (2003...2007 and 2008...2012 respectively) as they relate to the central hypothesis.

Further support can be found in the remaining figures of Appendix 1 where visual confirmation for differences (pre- and post-financial crisis) exist in most cases as they relate to the secondary hypotheses.

5.4. Descriptive statistics

Table 7 below provides descriptive statistics for the unweighted sample data set by capital structure measure for the periods pre- and post-financial crisis (i.e. 2003 ... 2007 and 2008 ... 2012), while Figure 2 on the following page illustrates this in the form of a box plot diagram.

As is conventionally the case, Figure 2 makes use of the adjusted min and adjusted max statistics in Table 7 for the box plot's min and max points, the definition of the adjusted values is described below:

- Adjusted Min = Maximum of ([Mean - (2 x Standard Deviation)] *and* Min)
- Adjusted Max = Minimum of ([Mean + (2 x Standard Deviation)] *and* Max)

By making use of the adjusted min and max values, Figure 2 ignores outliers; the number of which ranges from 0.3% to 4.5% of the individual data set and can thus be considered statistically insignificant.

	TDM		TDA		LDM		LDA		LN(IC)	
	'03..'07	'08..'12	'03..'07	'08..'12	'03..'07	'08..'12	'03..'07	'08..'12	'03..'07	'08..'12
Min	0.0003%	0.0001%	0.0007%	0.0001%	0.0005%	0.0003%	0.0005%	0.0008%	-4.00	-4.08
Max	2189.9%	1273.9%	943.5%	1068.9%	2064.4%	1156.4%	86.5%	156.5%	11.78	11.36
Mean	43.5%	63.3%	28.4%	29.5%	25.3%	42.5%	14.1%	16.0%	1.66	1.59
Median	25.2%	30.0%	27.4%	27.8%	9.5%	15.4%	10.0%	12.2%	1.42	1.23
Range	2189.9%	1273.9%	943.5%	1068.9%	2064.4%	1156.4%	86.5%	156.4%	15.78	15.44
1 st Quartile	10.0%	11.2%	15.3%	14.7%	3.0%	4.6%	4.0%	4.8%	0.47	0.27
3 rd Quartile	54.0%	74.6%	39.3%	41.4%	25.5%	44.0%	21.0%	23.3%	2.45	2.45
Standard Deviation	76.3%	98.5%	24.9%	28.4%	67.5%	78.3%	13.2%	14.6%	1.69	1.84
Variance	58.2%	96.9%	6.2%	8.1%	45.5%	61.2%	1.7%	2.1%	2.85	3.38
Adjusted Min	0.0003%	0.0001%	0.0007%	0.0001%	0.0005%	0.0003%	0.0005%	0.0008%	-1.72	-2.08
Adjusted Max	196.0%	260.3%	78.2%	86.2%	160.2%	199.0%	40.5%	45.1%	5.03	5.27
Number of Outliers	51	100	9	12	39	80	101	96	96	116
Number of Data Points	2'754	2'567	2'756	2'568	2'391	2'268	2'392	2'269	2'785	2'593

Table 7: Descriptive statistics for unweighted sample

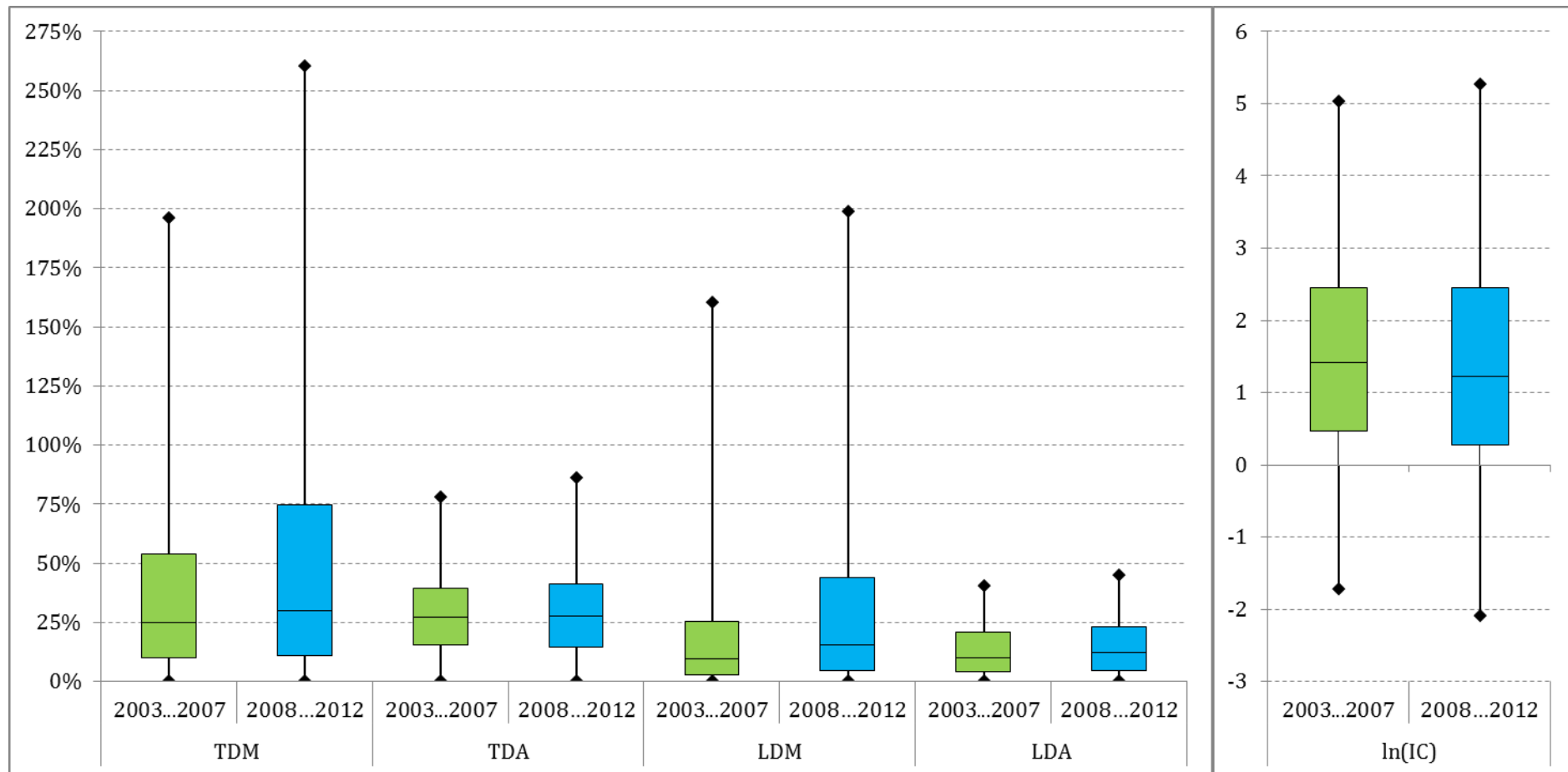


Figure 2: Box Plot for unweighted sample

5.5. Statistical Analysis

5.5.1. Analysis tools used

Microsoft Excel has been used to perform statistical analysis to test the central and secondary hypotheses.

5.5.2. Statistical analysis technique

This paper seeks to test the central hypothesis that a difference exists between aggregate capital structures pre- and post-financial crisis of 2008 by performing a quasi-experimental event-based time-series study.

Statistical analysis has been performed though a univariate technique making use of Student's T-Test for paired samples as the data is considered metric and the data sets are related (i.e. pre- and post-financial crisis).

Skewness and Kurtosis tests have not been conducted as sample sub set sizes contain more than 30 data points.

5.5.3. Statistical Findings

Appendix 2 includes Tables 12 through 17 which provide a detailed view of the results of the statistical analysis.

The *%Diff* field reflects the percentage difference (increase or decrease in capital structure measure) from pre- to post-financial crisis for the respective sample.

The P-Value associated with each tested sample is interpreted as the probability of making a Type I error by rejecting the null hypothesis. The P-Value (for a two tailed test) has been highlighted as described below for easy interpretation:

- **Green** : The P-Value is lower than the test's significance level (0.1) and thus the null hypothesis should be rejected
- **Red** : The P-Value is higher than the test's significance level (0.1) and thus the null hypothesis fails to be rejected

A significance level of 0.1 (or 10%) as opposed to the more conventional 0.05 has been used as the findings have been subjected to a final aggregation which further reduces the probability of making a Type I error by rejecting the null hypothesis. Individually, each capital structure measure (through its P-Value) rejects (or fails to reject) the null hypothesis. In order to reject the central and secondary null hypotheses, three of the five capital structure measure's P-Values (as they relate to the respective samples) need to be less than the significance level of 0.1. Table 8 below provides an example of the logic:

Sample	TDM	TDA	LDM	LDA	Ln(IC)	Decision
Example 1	0.03	0.01	0.02	0.09	0.07	Reject H_0
Example 2	0.5	0.8	0.7	0.4	0.6	Failed to Reject H_0
Example 3	0.06	0.8	0.4	0.02	0.03	Reject H_0
Example 4	0.5	0.8	0.7	0.04	0.6	Failed to Reject H_0

Table 8: Example of decision method for aggregation of individual capital structure measures

5.6. Summary of Findings and Statistical Inference

A summary of the findings as they relate to the hypotheses is discussed below for both the weighted and unweighted variations.

5.6.1. Central Hypothesis (H_1)

Table 9 below summarises the findings of the statistical tests as they relate to the central hypothesis:

$$H1_0: CS_{S,Pre} - CS_{S,Post} = 0$$

$$H1_A: CS_{S,Pre} - CS_{S,Post} \neq 0$$

Where:

$CS_{S,Pre}$: Average Capital Structure of the entire sample
Pre financial crisis (2003 .. 2007)

$CS_{S,Post}$: Average Capital Structure of the entire sample
Post financial crisis (2008 .. 2012)

Sample	Unweighted	Weighted
Entire Sample	Reject $H1_0$	Reject $H1_0$

Table 9: Summary of statistical findings : Entire Sample

5.6.2. Secondary Hypotheses (H2)

Table 10 below summarises the findings of the statistical tests as they relate to the secondary hypothesis:

$$H2_0: CS_{C,Pre} - CS_{C,Post} = 0$$

$$H2_A: CS_{C,Pre} - CS_{C,Post} \neq 0$$

Where:

$CS_{C,Pre}$: Average Capital Structure of firms by country
Pre financial crisis (2003 .. 2007)

$CS_{C,Post}$: Average Capital Structure of firms by country
Post financial crisis (2008 .. 2012)

Sample	Unweighted	Weighted
Brazil	Reject H2 ₀	Reject H2 ₀
China	Reject H2 ₀	Reject H2 ₀
India	Reject H2 ₀	Reject H2 ₀
South Africa	Reject H2 ₀	Failed to reject H2 ₀
Russia	Reject H2 ₀	Reject H2 ₀

Table 10: Summary of statistical findings : By Country

5.6.3. Secondary Hypotheses (H3)

Table 11 below summarises the findings of the statistical tests as they relate to the secondary hypothesis:

$$H3_0: CS_{I,Pre} - CS_{I,Post} = 0$$

$$H3_A: CS_{I,Pre} - CS_{I,Post} \neq 0$$

Where:

CS_{I,Pre}: Average Capital Structure of firms by industry classification
Pre financial crisis (2003 .. 2007)

CS_{I,Post}: Average Capital Structure of firms by industry classification
Post financial crisis (2008 .. 2012)

Sample	Unweighted	Weighted
Automobiles & Parts	Failed to reject H3 ₀	Failed to reject H3 ₀
Basic Resources	Reject H3 ₀	Reject H3 ₀
Chemicals	Failed to reject H3 ₀	Reject H3 ₀
Construction & Material	Reject H3 ₀	Reject H3 ₀

Food & Beverage	Reject H_{3_0}	Failed to reject H_{3_0}
Healthcare	Reject H_{3_0}	Failed to reject H_{3_0}
Industrial Goods & Services	Reject H_{3_0}	Reject H_{3_0}
Media	Failed to reject H_{3_0}	Failed to reject H_{3_0}
Oil & Gas	Failed to reject H_{3_0}	Failed to reject H_{3_0}
Personal & Household Goods	Failed to reject H_{3_0}	Failed to reject H_{3_0}
Retail	Reject H_{3_0}	Failed to reject H_{3_0}
Technology	Reject H_{3_0}	Reject H_{3_0}
Telecommunications	Failed to reject H_{3_0}	Failed to reject H_{3_0}
Travel & Leisure	Reject H_{3_0}	Failed to reject H_{3_0}
Utilities	Reject H_{3_0}	Reject H_{3_0}

Table 11: Summary of statistical findings : By Industry

Chapter 6: Discussion of Results

In this chapter, discussion of results relate only to those findings that are statistically relevant, i.e. those where P-Values are less than the test's confidence level of 0.1 or 10%; no reference is made to results that are not statistically relevant.

6.1. Central Hypothesis (H1)

Chapter 5 provides a synopsis of the data analysis findings as they relate to the hypotheses. Table 9 above summates that the central null hypothesis (H_{10}) has been rejected for both the weighted and unweighted instances.

Summarised in Table 9 and detailed in Tables 12 and 15, the study has found statistically that capital structures have increased post-financial crisis of 2008.

For the unweighted sample, i.e. the aggregation of firms' capital structures in the market, the following statistically relevant observations have been made:

- Market-value related measures of leverage have increased by 45.6% and 68% for total debt and long term debt respectively.
- Book-value measures have increased by 3.9% and 13.4% for total debt and long term debt respectively.
- The income statement measure has decreased by 3.8% implying an increase of leverage.

For the weighted sample, i.e. the aggregate capital structure of the market, the following statistically relevant observations have been made:

- Market-value related measures of leverage have increased by 34.6% and 42.1% for total debt and long term debt respectively.
- Book-value related measures provided inconclusive results.

- The income statement measure has decreased by 28% implying an increase of leverage.

The study's results therefore imply that leverage is counter-cyclical, agreeing with the findings of Levy (2001), Hackbarth et al. (2006) and Korajczyk and Levy (2003). The results, however, disagree with Gertler and Gilchrest (1993) who find that leverage is pro-cyclical, with Levy and Hennessy (2007) who state that firms substitute debt for equity during contractions and with Bhamra et al. (2010) who note that "while capital structure is pro-cyclical at dates when firms re-lever, it is counter-cyclical in aggregate dynamics" (p. 4187).

Assuming that firms' retained earnings, and therefore free cash reserves, were reduced by the financial crisis of 2008, the study's findings would agree with pecking order theory which postulates that firms first seek funding internally, failing the availability of which they will next seek funding from debt, thus increasing leverage.

The findings of the study can be interpreted to disagree with trade-off theory which offers that firms seek to balance the marginal benefit of income tax shields from increased debt against the probability of financial distress. Assuming the financial crisis eroded firms' profitability as it did with market capitalisation (figure 1), it could be postulated that the probability of financial distress for the firms (in general) was higher, and thus the theory would predict that leverage would be decreased.

While not expressly tested by this study, the buy-back of shares (i.e. reduction in equity) could also affect firms' leverage as outlined by the Market Timing Model which proffers that firms buy back their own shares when share prices are low. Figure 1 illustrates market capitalisation (and by inference the market share price) falling dramatically in 2008, which the model predicts would result in a buy-back of shares and thus an increase in leverage. The study's outcomes

therefore agree with the Market Timing Model's predications; however it can be reasonably supposed though that if the outcome was based on share buy-backs we would see that same change to total debt and long term debt ratios; this however is not the case.

6.2. Secondary hypotheses (H2)

Table 10 above summates that the secondary null hypothesis (H₂₀) has been rejected for all countries in the weighted instance and all countries except South Africa in the unweighted instance.

Summarised in Table 10 and detailed in Tables 13 and 16, the study has found statistically that for most countries studied (and by most measures), leverage has increased post-financial crisis of 2008.

For the unweighted sample, i.e. the aggregation of firms' capital structures in the specific countries, the following statistically relevant observations have been made:

- Market-value related measures of leverage have increased by between 17.4% and 258.4% for total debt and between 51.1% and 220.6% for long term debt.
- Book-value measures have increased by between 4.4% and 21.8% for total debt and between 16.5% and 28.9% for long term debt.
- The income statement measure has decreased by between 8.4% and 20.9% implying an increase of leverage.

Worth noting though is the 87.2% increase in Brazilian firms' interest cover from pre- to post-financial crisis, implying a decrease in leverage which is in disagreement with the other capital structure measures. A likely cause of this anomaly is the dramatically reduced interest rates in Brazil over the studied period. Adapted from Trading Economics (2013), the average prime lending rate

of the Banco Central Do Brazil pre- financial crisis was 17.5% which reduced to an average of 10.5% between 2008 and 2012; furthermore the interest rate declined from a maximum of 26% to a minimum of 6% over the studied period.

Of further interest is the extremely high increase in Russian firm's market related measures of capital structure (i.e. 258.4% and 220.6% for TDM and LDM respectively). This may best be explained by the dramatic loss of value of the Russian stock exchange as a result of the financial crisis; market capitalisation dropped by 71% between 2007 and 2008.

For the weighted sample, i.e. the aggregate capital structure in the specific countries, the following statistically relevant observations have been made:

- Market-value related measures of leverage have increased by between 18.7% and 157.3% for total debt and between 18.1% and 181.6% for long term debt.
- Book-value measures provided mostly inconclusive results, however those that did, include a 14.5% decrease in TDA for China and for Russia a 28.1% increase in TDA and 54.8% increase in LDA.
- The income statement measure has decreased by between 20.3% and 34.6% implying an increase of leverage; however as in the unweighted results the Brazilian market's interest cover increased.

It is evident from the study's results that the degree of change in capital structure measures pre- to post-financial crisis differs between countries which would imply that country-specific factors are at play; this has been shown in the cursory examples above that relate to Brazil and Russia. While it is noted that a number of country-specific factors affect capital structure decisions (e.g. interest rates, inflation, market capitalisation, GDP, regulatory requirements, etc.), it is considered beyond the scope of this paper to define an exhaustive list of these nor to investigate the effect thereof; but rather to conclude that these country-specific factors affect capital structure decisions of firms.

This conclusion has previously been drawn by academics, for example Gwatidzo & Ojah (2009) who found that “documented results indicate that country-specific factors play a role in determining corporate leverage” (p. 18) and Deesomsak et al. (2004) who conclude that “the capital structure decision is driven by both firm and country specific factors” (p. 17) as well as Booth et al. (2002) who state that “there are persistent differences [in capital structures] across countries, indicating that country specific factors are at work” (p. 87).

Of particular interest to this study is the finding made by Deesomsak et al. (2004) who studied the effect of the East Asian financial crisis of 1997 on firms in the Asia Pacific region. Deesomsak et al. (2004) conclude that “the financial crisis of 1997 is found to have altered the role of both firm and country specific factors” (p. 20).

While this study does not expressly set out to determine the effect of the financial crisis of 2008 on the determinants of capital structures but rather to identify the effect on capital structures after the crisis, it can be reasonably concluded that the 2008 financial crisis had similar effects to those of the East Asian financial crisis of 1997. This supposition would provide an explanation in the shift in aggregate capital structures of those countries studied in this paper.

6.3. Secondary hypotheses (H3)

Table 11 above summates that the secondary null hypothesis (H_{30}) has been rejected (for both weighted and unweighted instances) for the utilities, industrial goods & services, basic resources, technology and construction & material industries while it has failed to be rejected (for both weighted and unweighted instances) for the personal & household goods, telecommunications, media, automobiles & parts and oil & gas industries. For the balance of industries

studied, the secondary null hypothesis (H_{30}) has been rejected or failed to be rejected in either weighted or unweighted instances, but not both.

Summarised in Table 11 and detailed in Tables 14 and 17, the study has found statistically that for most industries studied (and by most measures), capital structures have increased post-financial crisis of 2008.

For the unweighted sample, i.e. the aggregation of firms' capital structures in the specific industries, the following statistically relevant observations have been made:

- Market-value related measures of leverage have increased by between 36.4% and 118.9% for total debt and between 24.7% and 171.8% for long term debt.
- Book-value measures have increased by between 6.8% and 15.3% for total debt and between 10.6% and 55.5% for long term debt, while TDA for the healthcare industry has decreased by 8.1% post-financial crisis.
- The income statement measure has decreased by 11.2% and 29.3% for industrial goods & services and basic resources respectively implying an increase of leverage in these industries, while interest cover increased in healthcare by 19.7%, in retail by 32.3% and in food & beverage by 21.2% implying a decrease in leverage in these.

For the weighted sample, i.e. the aggregate capital structure of the specific industries, the statistical findings are far less conclusive with most industry related capital structure measures not found to be statistically relevant; those that are however are discussed below:

- Market-value related measures of leverage have increased by between 31.5% and 83% for total debt and between 31.1% and 120.9% for long term debt.
- Book-value measures provided mostly inconclusive results, however those that did include a 15.6% increase for TDA in utilities, a 21%

increase in TDA for chemicals, a 22.8% decrease in TDA for healthcare and a 17.6% decrease in TDA for construction & materials. With regards to LDA, increases range between 19.8% and 80.3% while a decrease of 22.7% was experienced by the automobiles and parts industry.

- The income statement measure has decreased by between 28.7% and 47.1% implying an increase of leverage; however interest cover in the personal and household goods industry increased by 23.1%, implying a decrease in leverage in that industry.

It is evident from the summation above and from tables 14 and 17 that industry's capital structures were not uniformly affected by the 2008 financial crisis. Furthermore from the comparison between weighted and unweighted instances, it could be concluded that intra-industry changes were not uniform.

Differences found between industry's aggregate capital structure changes post-financial crisis provide support to academic rhetoric as outlined below:

Huang & Song (2006) note that "companies in different industries tend to have different leverage" (p. 16), while Frank & Goyal (2009) conclude that firms target industry-mean leverage, and Talberg et al. (2008) found differences in industry capital structures as well as factors that affect industry capital structures, which is confirmed by Tucker & Stoja (2011), who state that "most firms demonstrate target gearing behaviour, though such targeting is restricted to those measures most appropriate to their industry and their investors" (p. 20).

Regarding the intra-industry variation in capital structures, which has been noted above as a possible cause of the disparate findings between weighted and unweighted instances, Almazan & Molina (2005) find that dispersion is greater in some industries while MacKay & Phillips (2005) conclude that industry related factors explain part of the wide intra-industry variation in capital structure.

In summation the changes in capital structures post-financial crisis are mixed between industries and are best investigated individually by consulting Tables 10, 14 and 17.

6.4. Other observations

6.4.1. Capital structure measures

This study set out to consider changes in capital structures after the financial crisis of 2008. Five capital structure measures were calculated, namely:

- Total debt to market value of assets
- Long term debt to market value of assets
- Total debt to book value of assets
- Long term debt to book value of assets
- Interest cover

These measures considered three approaches: book value, market value and income statement. This approach was adopted due to differing academic opinion on the correct measure to use, for example Bowman (1980) finds little difference between using market and book values; however Fama & French (2002) find large differences. Furthermore, Barclay, Morellec, and Smith (2006) note that book-leverage is backward looking while market leverage is forward looking.

It is the finding of this paper that large differences exist between book and market related approaches. For example for the unweighted sample, TDM increases by 45.6% while TDA only increases by 3.9% and LDM increases by 68% while LDA increases by 13.4%.

Also of interest is the comparison of total debt measures compared to long term debt measures; for example, for the unweighted sample TDM increases by 45.6% while LDM increases by 68%. In almost all instances (as considered by this

study), long term debt has increased by more than total debt, implying that firms have sought to rebalance their leverage post-financial crisis from short-term toward long-term debt.

6.4.2. Unweighted and weighted data

Point 4.6.3 above outlines the reasons for study's use of two data set instances, one with unweighted data sets and the other with weighted data sets; the implication of which in terms of the analysis, reflect the aggregation of firms' capital structures in the market and the aggregate capital structure of the market, respectively.

While the decisions to reject or fail to reject the study's null hypotheses have been mostly similar for both instances; the detailed tables contained in Appendix 2 indicate, in most cases, large differences between the capital structures differences pre- and post-financial crisis and in extreme cases reflect an increase in capital structures of the unweighted data set with a decrease for the corresponding weighted data set.

By inference the weighted data sets provide larger firms (by market capitalisation) a greater weighting in the data set and thus the weighted data set can be considered representative of larger companies while the unweighted data set is, in relation, more representative of smaller firms. The observation, could thus be made that in general larger firms' (or the market itself) capital structures were less affected by the 2008 financial crisis than relatively smaller firms.

6.5. Research objectives

This paper set out to test if capital structures of firms in emerging markets were affected by the global financial crisis of 2008. From the data analysis performed and statistical tests conducted in relation to the central and secondary

hypotheses, findings have been made which address the objective of this research.

The analysis is thus determined to have met the research objectives.

Chapter 7: Conclusion

7.1. Main findings

This study had the objective of investigating firms' capital structures before and after the financial crisis of 2008 with the aim of determining whether a shift had occurred. By focusing on firms in emerging markets and by comparing capital structure changes of different countries and of different industries, this paper sought to provide valuable insight for business managers as it relates to their respective firms' country of operation and industry membership.

Furthermore, this study presented findings through two additional dimensions, namely:

- Five measure of capital structure considering three sources (i.e. market value, book values and income statement considerations),
- Weighted and unweighted data sets.

To reiterate as previously stated, academic opinion varies in support of each of the capital structure measures with valid arguments having been presented in favour of the consideration of each. In specific reference to, and for the purpose of this research report, it is the opinion of this paper that book value based measures (i.e. TDA and LDA) provide the greatest insight; an argument in support of this assertion follows.

Market related measures as they are used in this paper (i.e. TDM and LDM) are ratios driven by debt in the numerator and market capitalisation in the denominator. It has been shown above that the effect of the financial crisis on market capitalisation was severe (e.g. Russia's market capitalisation reduced by 71% from 2007 to 2008, China's decreased by 61% for the same period, Brazil by 57% and South Africa by 24%). Even if debt remained constant these decreases in market capitalisation would infer a massive increase in market based capital

structure measures, i.e. TDM/LDM would be highly correlated with market capitalisation and would by inference imply counter-cyclicality.

In contrast, the book value approaches would not have been affected in the same way as the market value approaches; i.e. the book value of assets denominator (being more consistent over the period) would have less of an impact than the debt numerator. Compared to the market value measures, the changes in debt would, therefore, be more influential in the calculation of the book value ratios. For the reasons noted above, the balance of this chapter will refer to the book value measures, i.e. TDA and LDA.

This paper has considered an unweighted and weighted instance when testing the central and secondary hypotheses. The relevance of the findings of each will depend on the purpose of its interpretation. The unweighted instance provides an equal footing for all sampled companies while the weighted instance infers greater relevance on those companies which are larger. The former method should provide more valuable insight to business managers who seek to understand the implied decisions of their peers while the latter provides insight into how the aggregated markets' capital structures were affected post-financial crisis. For the balance of this chapter reference is made to the unweighted instance, presenting findings as they relate to firms in general as opposed to the aggregate market.

The core objective of this study was to identify whether firms' capital structures changed after the global financial crisis of 2008. This paper finds statistically that firms increased their leverage after the financial crisis by 3.9% ($P = 0.00017$) and 13.4% ($P = 2.2E-14$) for total debt and long term debt respectively. Interestingly, this would imply that firms rebalanced their leverage away from short term debt to long term debt. This has been observed for the entire sample, for all countries excluding India, and for all industries excluding basic resources.

In addition, the 3.9% increase in TDA was greatly affected by Chinese firms (which as stated earlier account for approximately 50% of the sample). If China had been excluded from the sample, the increase in TDA would have been significantly higher.

In addition to the central objective, the paper investigated whether firms in sampled countries adjusted their corporate structure uniformly between countries. With reference to the total debt measure, three of the five countries sampled provided conclusive statistically relevant findings; Brazilian firms increased leverage by 13% ($P = 0.0071$), Indian firms increased leverage by 4.4% ($P = 0.016$) and Russian firms increased leverage by 21.8% ($P = 5.2E-05$). Firms in all countries (excluding India) increased long term debt leverage by between 16.5% and 28.9%. The findings provide evidence that country specific factors influence the capital structure decision of firms.

Finally, the study considered whether firms in sampled industries adjusted their corporate structures uniformly between industries. This test proved less conclusive than those above with only four of the fifteen industries providing statistically relevant findings when considering the total book value measure of capital structures and just over half when considering the long term book value measure. Of those that had statistically relevant findings, leverage was found to be counter-cyclical for all of them (except healthcare), with TDA increasing by between 6.8% and 15.3%, and LDA increasing by between 11.5% and 55.5%.

7.2. Conclusion

This research finds in agreement with Korajczyk and Levy (2003), Hackbarth, et al. (2006), Levy & Hennessy (2007) and Bhamra et al. (2010) that leverage is counter-cyclical.

In agreement with Booth et al. (2002), Deesomsak et al. (2004) and Gwatidzo & Ojah (2009), this paper finds that country specific factors influence capital structure decisions of firms.

While this paper has been unable to make conclusive findings in the uniformity or variability of changes in capital structures of firms in different industries, it can be reasonably concluded in agreement with Huang & Song (2006), Talberg et al. (2008), Frank & Goyal (2009) and Tucker & Stoja (2011) that industry specific factors influence the capital structure decisions of firms.

7.3. Recommendations for future research

This paper has taken the exploratory approach of determining whether a change in capital structure occurred after the global financial crisis of 2008 and it has been established that that this is indeed the case.

Based on the foundation of this paper, future research could be conducted in the following areas:

- Establish a causal relationship between the change in macroeconomic variables and the capital structure decisions made by firms with particular focus on determining the degree of influence that factors external to the organisation had compared to those internal to the organisation.
- Investigate how capital structures changed over the same period for unlisted companies, particularly small and medium sized enterprises.
- Conduct qualitative research with the view to understanding how important macroeconomic conditions were in the minds of business managers during the financial crisis.
- Investigate whether the financial crisis affected the source of debt for firms and whether a shift occurred from short to long term debt.

Reference List

Almazan, A., & Molina, C. A. (2005). Intra-Industry capital structure dispersion. *Journal of Economics & Management Strategy*, 14(2), 263-297.

Baker, M., & Wurgler, J. (2002). Market timing and capital structure. *The Journal of Finance*, 57(1), 1-32.

Barclay, M.J., Morellec, E. & Smith Jr., C.W., 2006, On the Debt Capacity of Growth Options, *The Journal of Business* 79, 37-59.

Bhamra, H. S., Kuehn, L. A., & Strebulaev, I. A. (2010). The aggregate dynamics of capital structure and macroeconomic risk. *Review of Financial Studies*, 23(12), 4187-4241.

Booth, L., Aivazian, V., Demirguc-Kunt, A., & Maksimovic, V. (2002). Capital structures in developing countries. *The Journal of Finance*, 56(1), 87-130.

Bowman R.G. (1980). The importance of a market-value measurement of debt in assessing leverage. *The Journal of Accounting Research*, 18(1), 242-254

Brav, O. (2009). Access to capital, capital structure, and the funding of the firm. *The Journal of Finance*, 64(1), 263-308.

Deesomsak, R., Paudyal, K., & Pescetto, G. (2004). The determinants of capital structure: Evidence from the Asia Pacific region. *Journal of Multinational Financial Management*, 14(4), 387-405.

Drobetz, W., & Wanzenried, G. (2006). What determines the speed of adjustment to the target capital structure? *Applied Financial Economics*, 16(13), 941-958.

Fama, E.F., & French, K.R., (2002). Testing trade-off and pecking order predictions about dividends and debt. *Review of Financial Studies* 15, 1–33.

Faulkender, M., & Petersen, M. A. (2006). Does the source of capital affect capital structure? *Review of Financial Studies*, 19(1), 45-79.

Flannery, M. J., & Rangan, K. P. (2006). Partial adjustment toward target capital structures. *Journal of Financial Economics*, 79(3), 469-506.

Frank, M. Z., & Goyal, V.K. (2003). Testing the pecking order theory of capital structure. *Journal of Financial Economics*, 67(2), 217-248.

Frank, M. Z., & Goyal, V.K. (2009). Capital structure decisions: Which factors are reliably important? *Financial Management*, 38(1), 1-37.

Gertler, M. and S. Gilchrist, 1993. The Role of Credit Market Imperfections in the Monetary Transmission Mechanism: Arguments and Evidence, *Scandinavian Journal of Economics* 95, 43-63.

Gwatidzo, T., & Ojah, K. (2009). Corporate capital structure determinants: Evidence from five African countries. *African Finance Journal*, 11(1), 1-23.

Graham, J. R., & Harvey, C. R. (2001). The theory and practice of corporate finance: Evidence from the field. *Journal of Financial Economics*, 60(2), 187-243.

Hackbarth, D., Miao, J., & Morellec, E. (2006). Capital structure, credit risk, and macroeconomic conditions. *Journal of Financial Economics*, 82(3), 519-550.

Harris, M., & Raviv, A. (1990). Capital structure and the informational role of debt. *The Journal of Finance*, 45(2), 321-349.

Huang, G., & Song, F. M. (2006). The determinants of capital structure: Evidence from china. *China Economic Review*, 17(1), 14-36.

Huang, R., & Ritter, J. R. (2009). Testing theories of capital structure and estimating the speed of adjustment. *Journal of Financial and Quantitative Analysis*, 44(02), 237-271.

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), 305-360.

Korajczyk, R. A., & Levy, A. (2003). Capital structure choice: Macroeconomic conditions and financial constraints. *Journal of Financial Economics*, 68(1), 75-109.

Leary, M. T., & Roberts, M. R. (2005). Do firms rebalance their capital structures? *The Journal of Finance*, 60(6), 2575-2619.

Lemmon, M. L., Roberts, M. R., & Zender, J. F. (2008). Back to the beginning: Persistence and the cross-section of corporate capital structure. *The Journal of Finance*, 63(4), 1575-1608.

Levy, A. (2001) Why does capital structure vary with macroeconomic conditions?, *Working Paper, UC Berkeley*.

Levy, A., & Hennessy, C. (2007). Why does capital structure choice vary with macroeconomic conditions? *Journal of Monetary Economics*, 54(6), 1545-1564.

Mackay, P., & Phillips, G., (2005), How does industry affect firm financial structure? *Review of Financial Studies* 18, 1433–1466.

Modigliani, F., & Miller, M. (1958): The cost of capital, corporation finance and the theory of investment. *The American Economic Review* 48, 361-297.

Modigliani, F., & Miller, M. H. (1963). Corporate income taxes and the cost of capital: A correction. *The American Economic Review*, 53(3), 433.

Morellec, E. (2001). Asset liquidity, capital structure, and secured debt. *Journal of Financial Economics*, 61(2), 173-206.

Myers, S. C. (1984). The capital structure puzzle. *Journal of Finance*, 39, 575-592.

Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, 13(2), 187-221.

Myers, S. C. (2003). Financing of corporations. *Handbook of the Economics of Finance*, 1, 215-253.

Stulz, R.M. (1990) Managerial discretion and optimal financing policies. *Journal of Financial Economics*, 26(1), 3-27

Talberg, M., Winge, C., Frydenberg, S., & Westgaard, S. (2008). Capital structure across industries. *International Journal of the Economics of Business*, 15(2), 181-200.

The World Bank. (2013). Market capitalization of listed companies (current US\$). Retrieved 09/21/2013, from <http://data.worldbank.org/indicator/CM.MKT.LCAP.CD>

Titman, S., & Tsyplakov, S. (2007). A dynamic model of optimal capital structure. *Review of Finance*, 11(3), 401-451

Titman, S., & Wessels, R. (1988). The determinants of capital structure choice. *The Journal of Finance*, 43(1), 1-19.

Trading Economics. (2013). Brazil Interest Rate. Retrieved 09/22/2013, from <http://www.tradingeconomics.com/brazil/interest-rate>

Tucker, J., & Stoja, E. (2011). Industry membership and capital structure dynamics in the UK. *International Review of Financial Analysis*, 20(4), 207-214.

Welch, I. (2004). Capital Structure and stock returns, *The Journal of Political Economy*, 112(1) Pt.1, 106-131

World Federation of Exchanges. (2013). Domestic market capitalization (monthly reports). Retrieved 04/27/2013, from <http://www.world-exchanges.org/statistics/monthly-reports>

Appendix 1: Capital Structures over study period

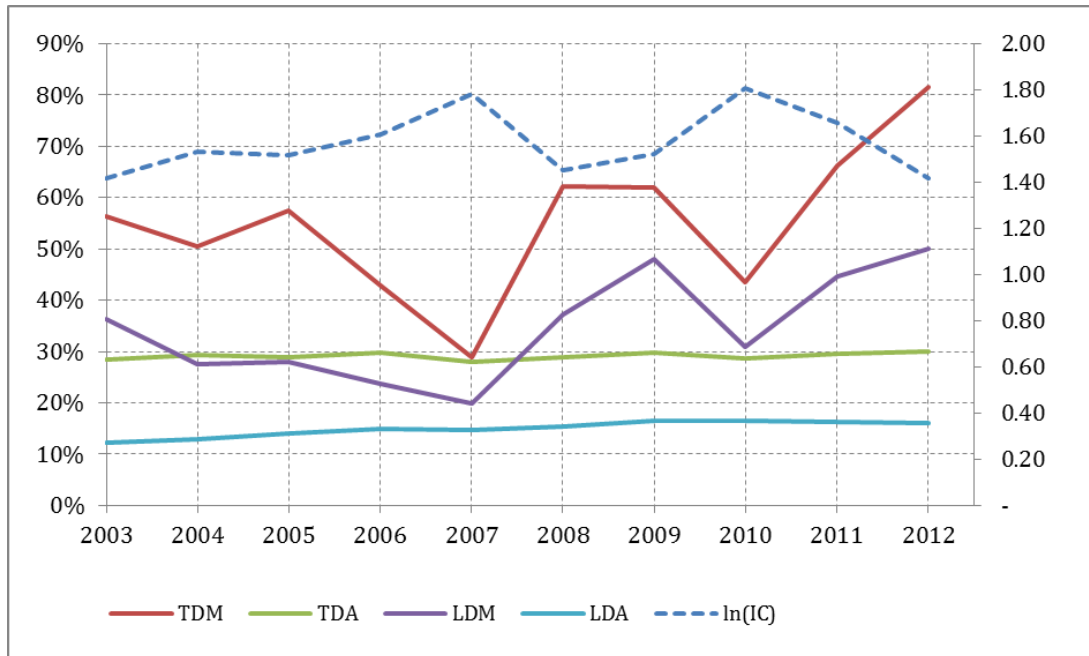


Figure 3: Capital Structure of Sample : Unweighted

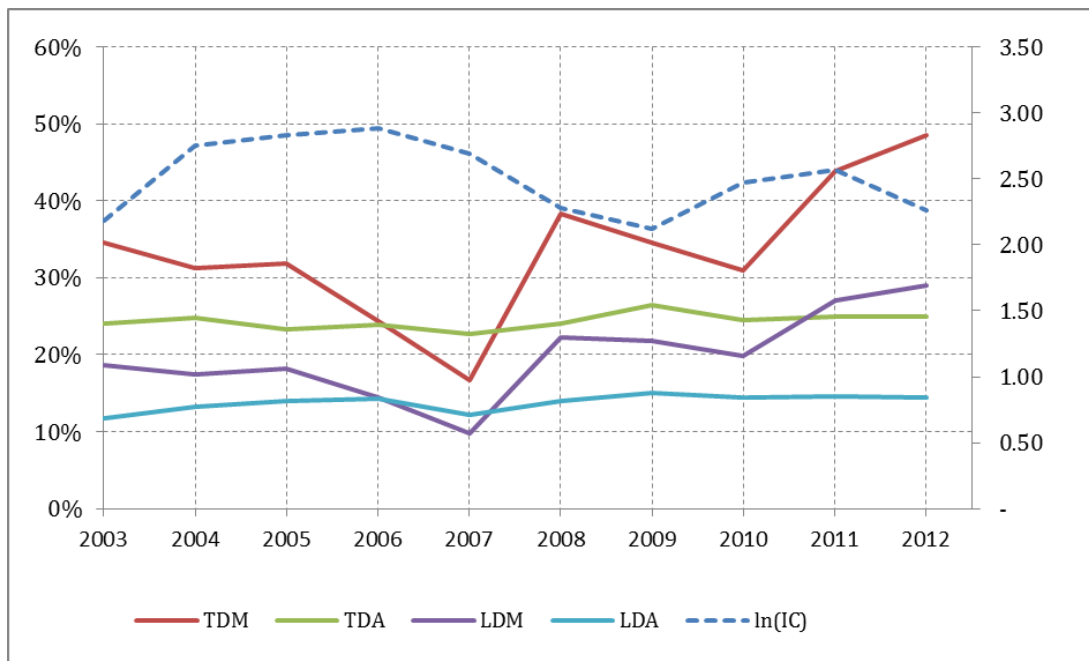


Figure 4: Capital Structure of Sample : Weighted

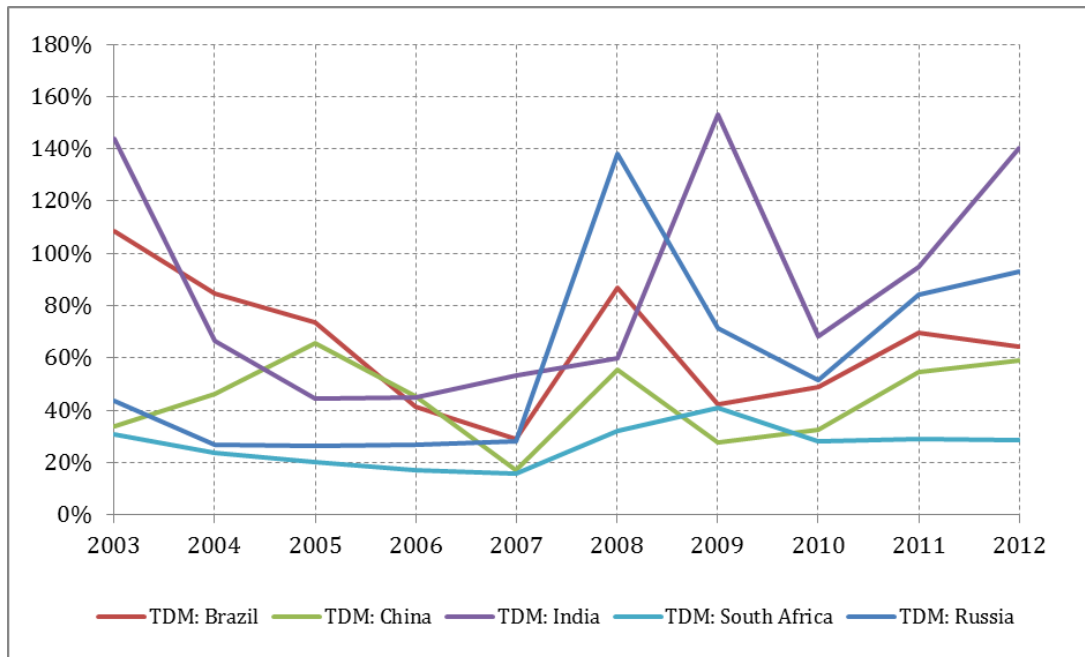


Figure 5: Capital Structure by Country : TDM : Unweighted

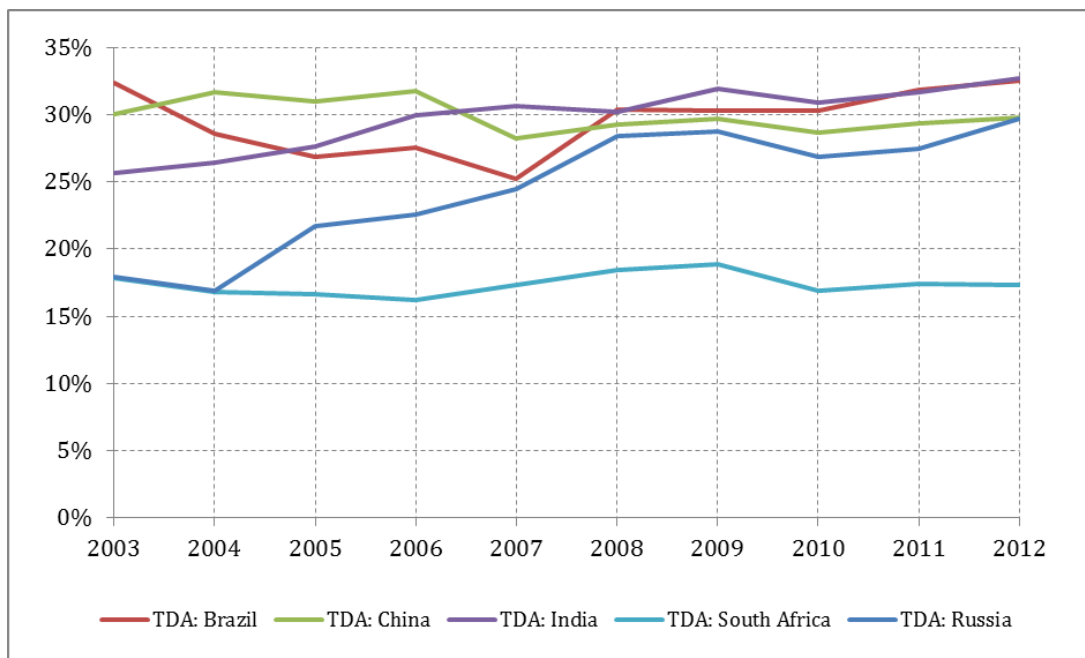


Figure 6: Capital Structure by Country : TDA : Unweighted

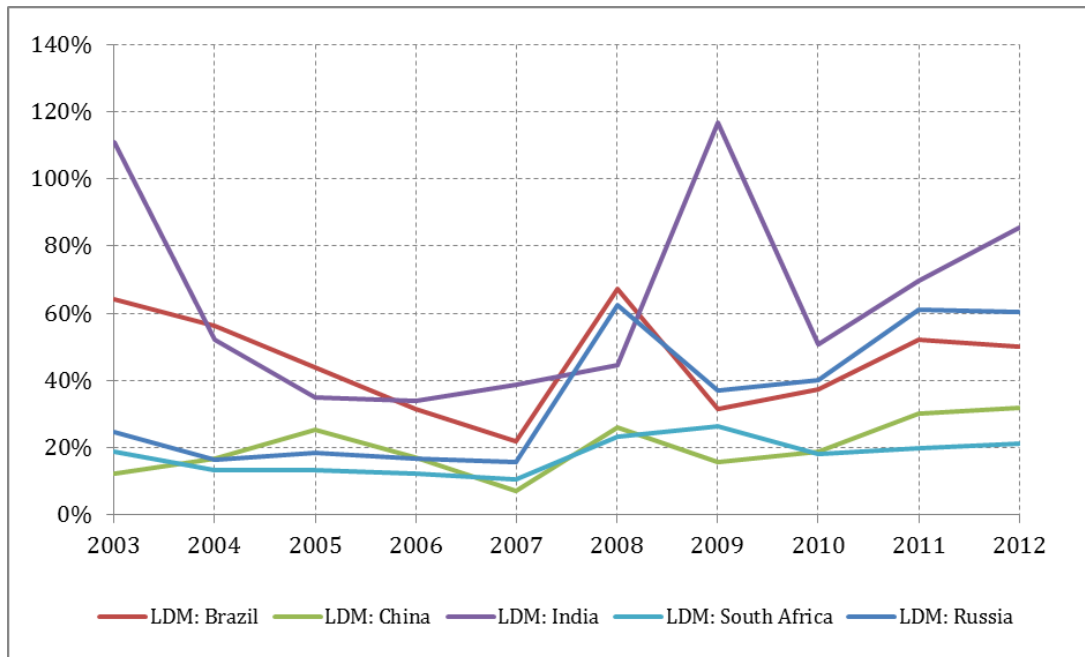


Figure 7: Capital Structure by Country : LDM : Unweighted

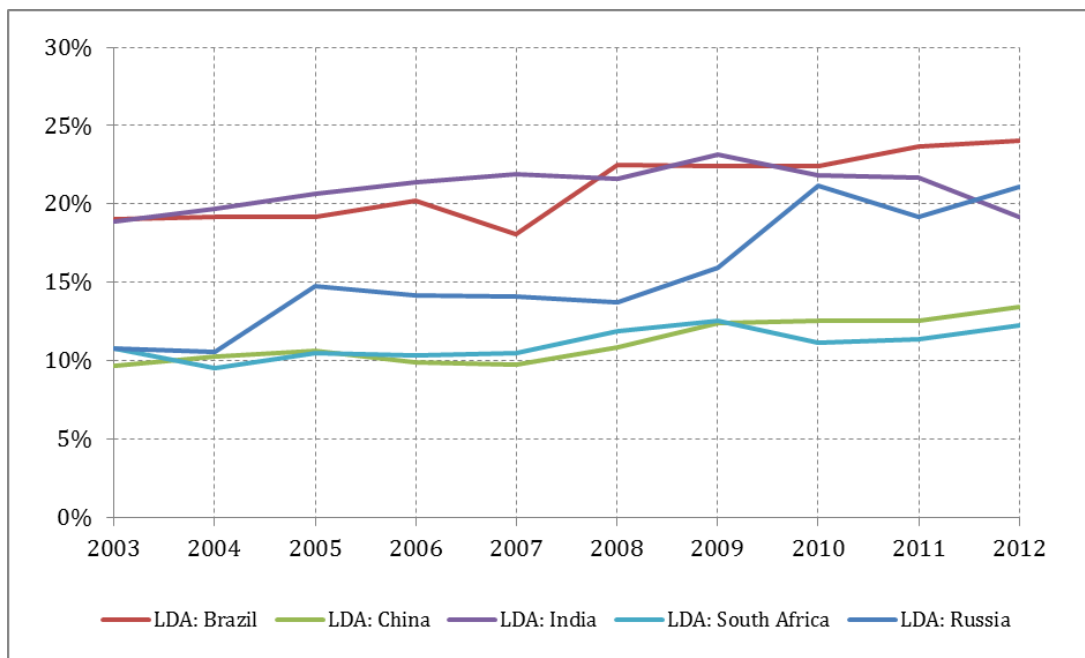


Figure 8: Capital Structure by Country : LDA : Unweighted

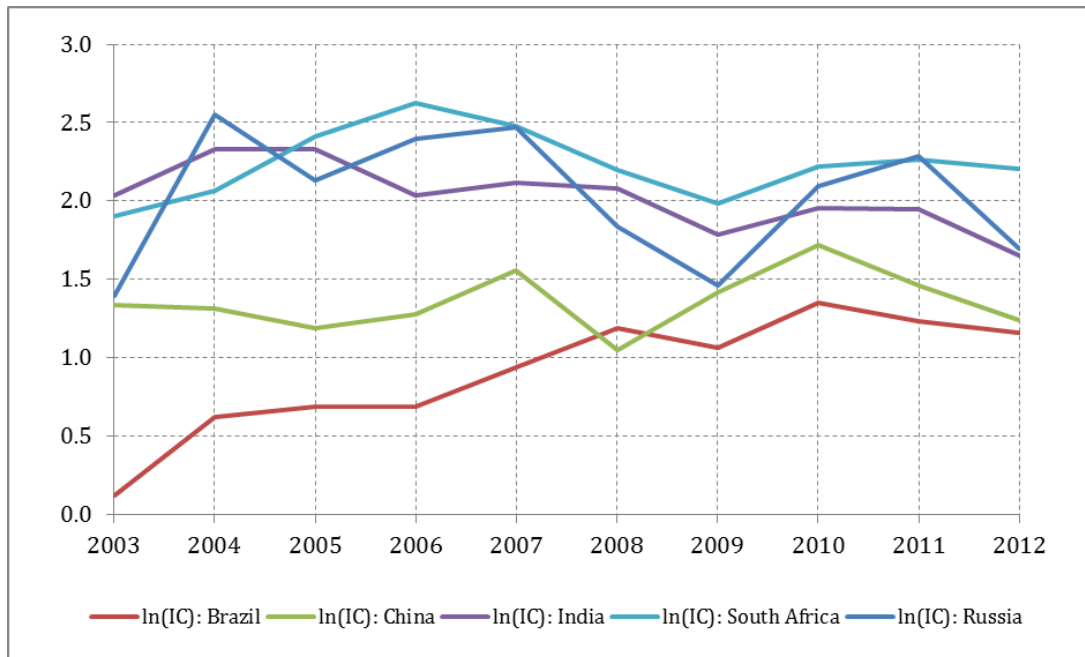


Figure 9: Capital Structure by Country : ln(IC) : Unweighted

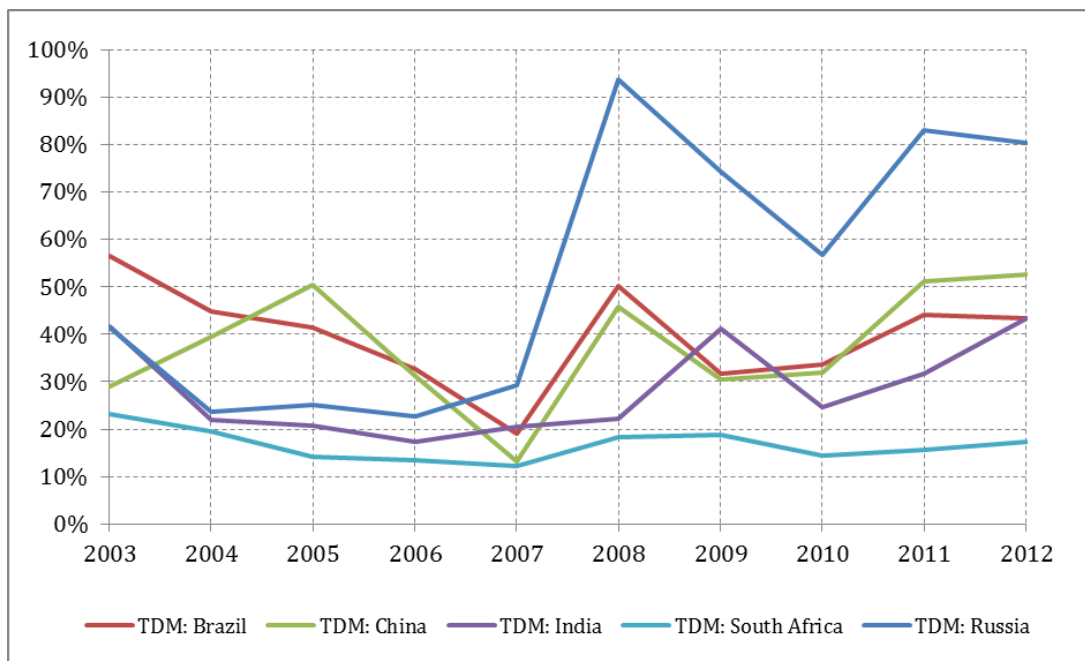


Figure 10: Capital Structure by Country : TDM : Weighted

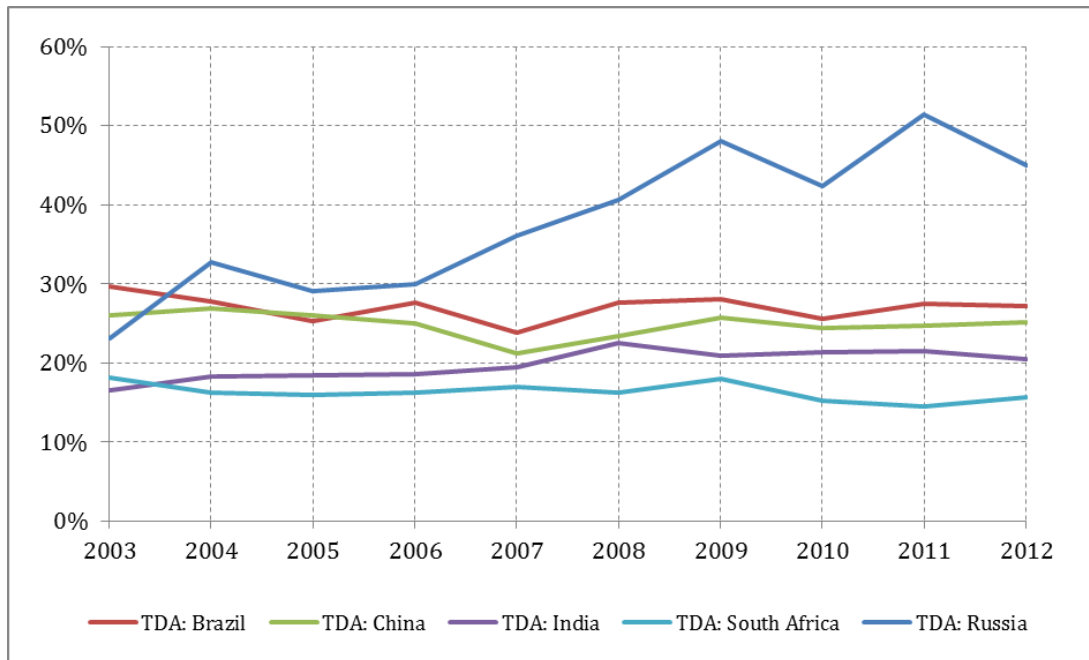


Figure 11: Capital Structure by Country : TDA : Weighted

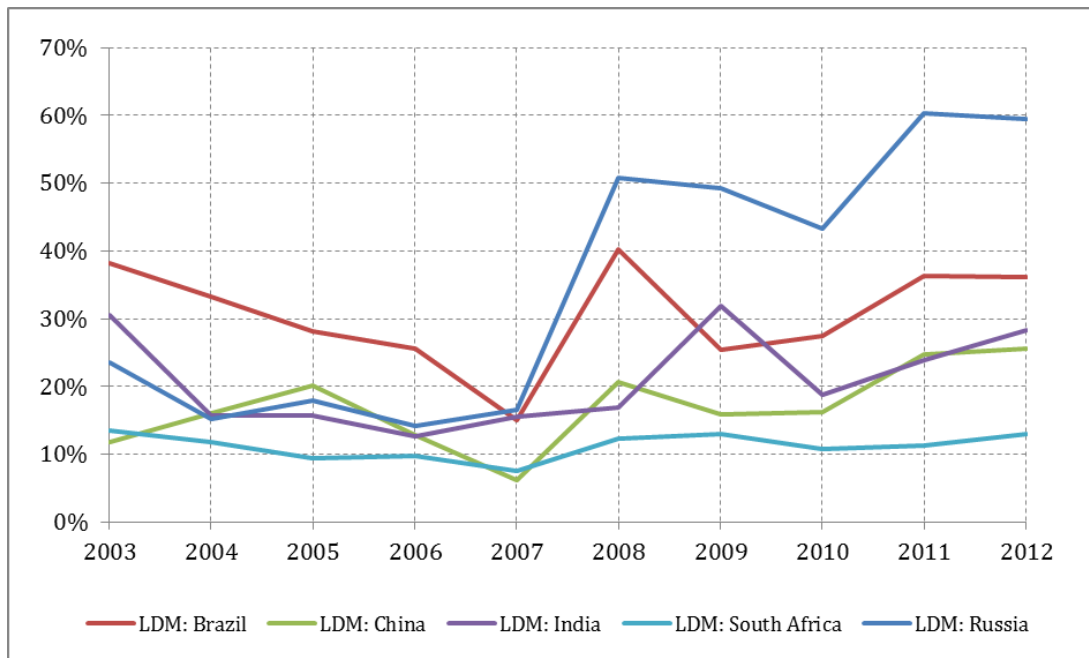


Figure 12: Capital Structure by Country : LDM : Weighted

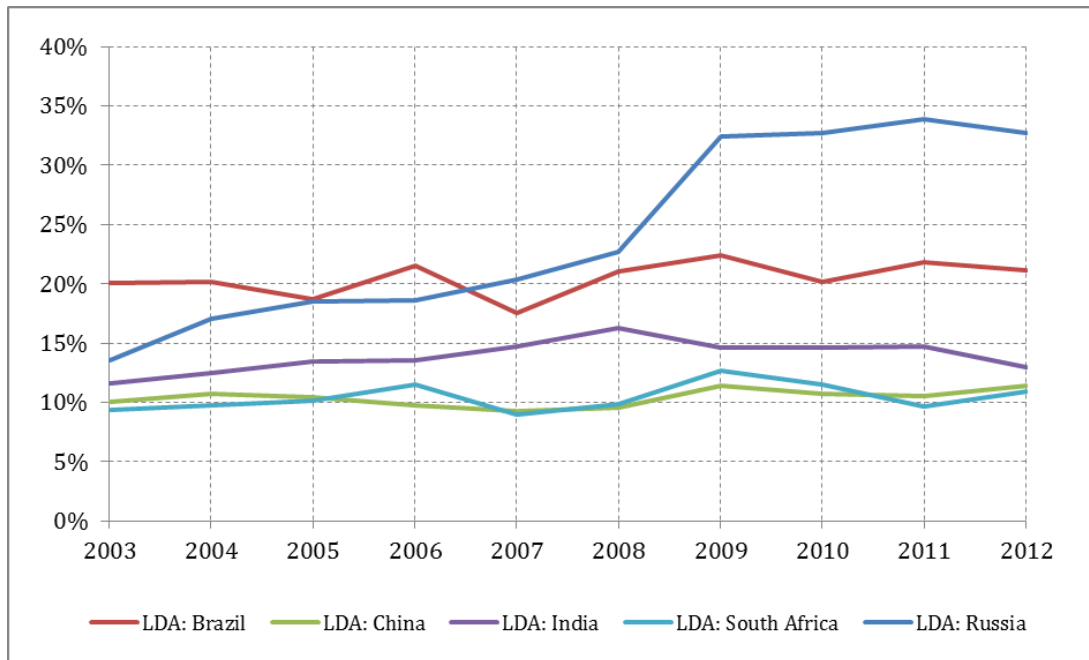


Figure 13: Capital Structure by Country : LDA : Weighted

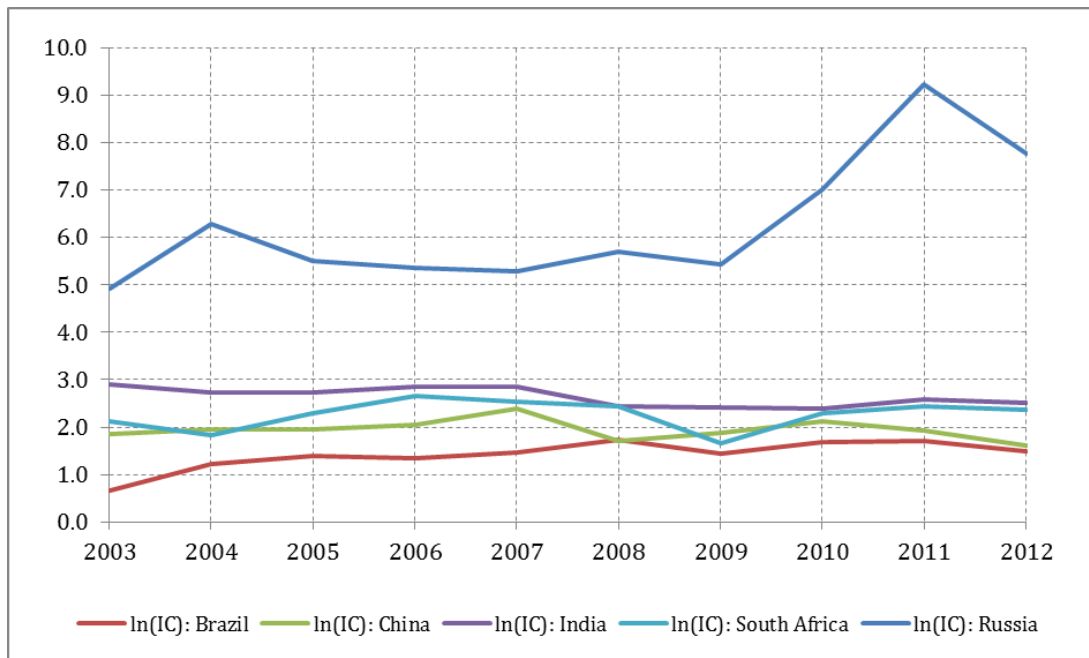


Figure 14: Capital Structure by Country : ln(IC) : Weighted

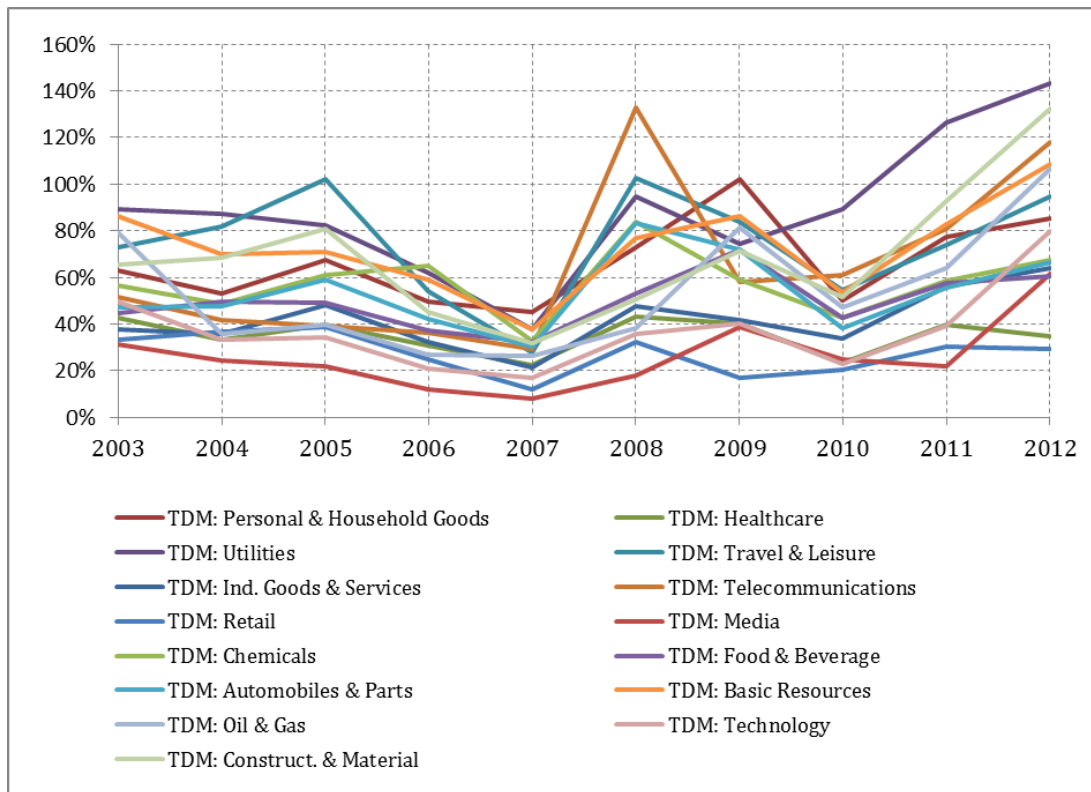


Figure 15: Capital Structure by Industry Classification : TDM : Unweighted

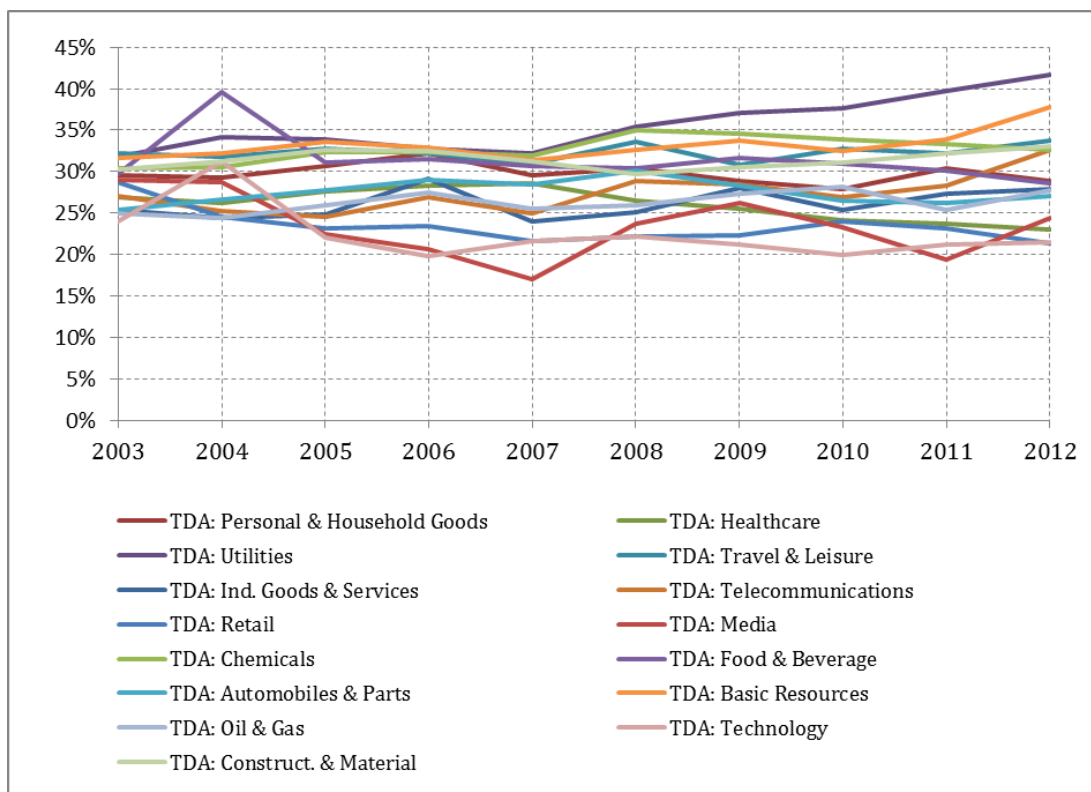


Figure 16: Capital Structure by Industry Classification : TDA : Unweighted

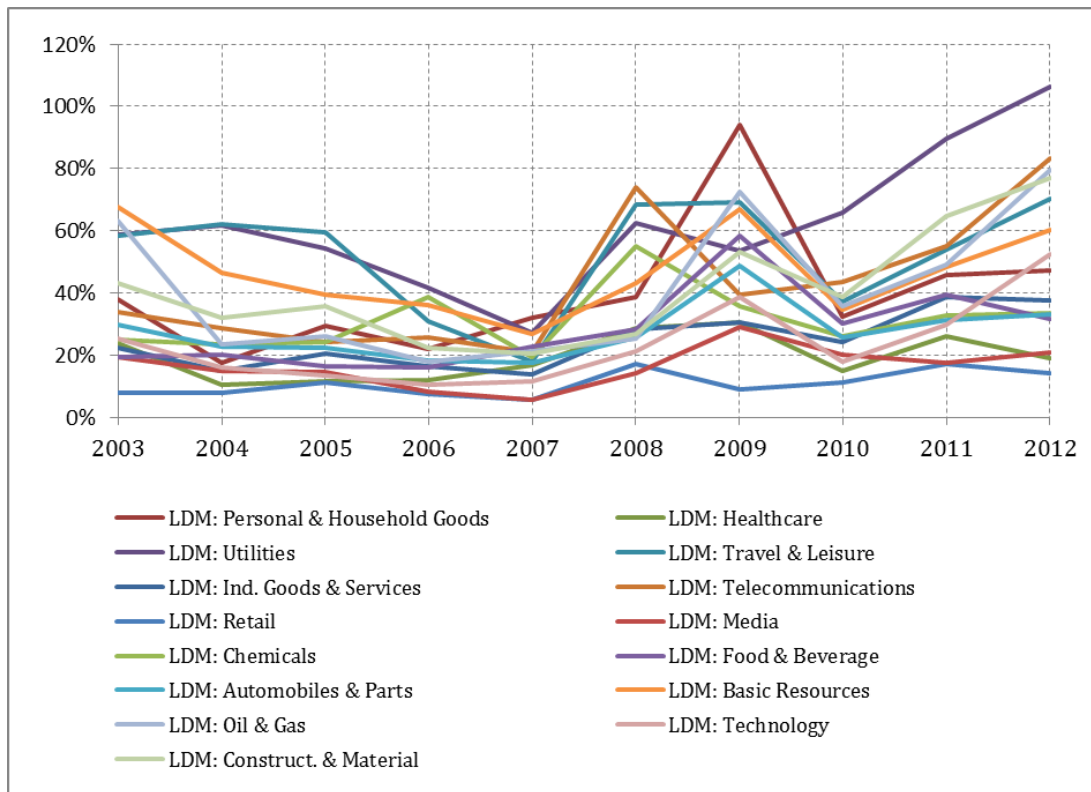


Figure 17: Capital Structure by Industry Classification : LDM : Unweighted

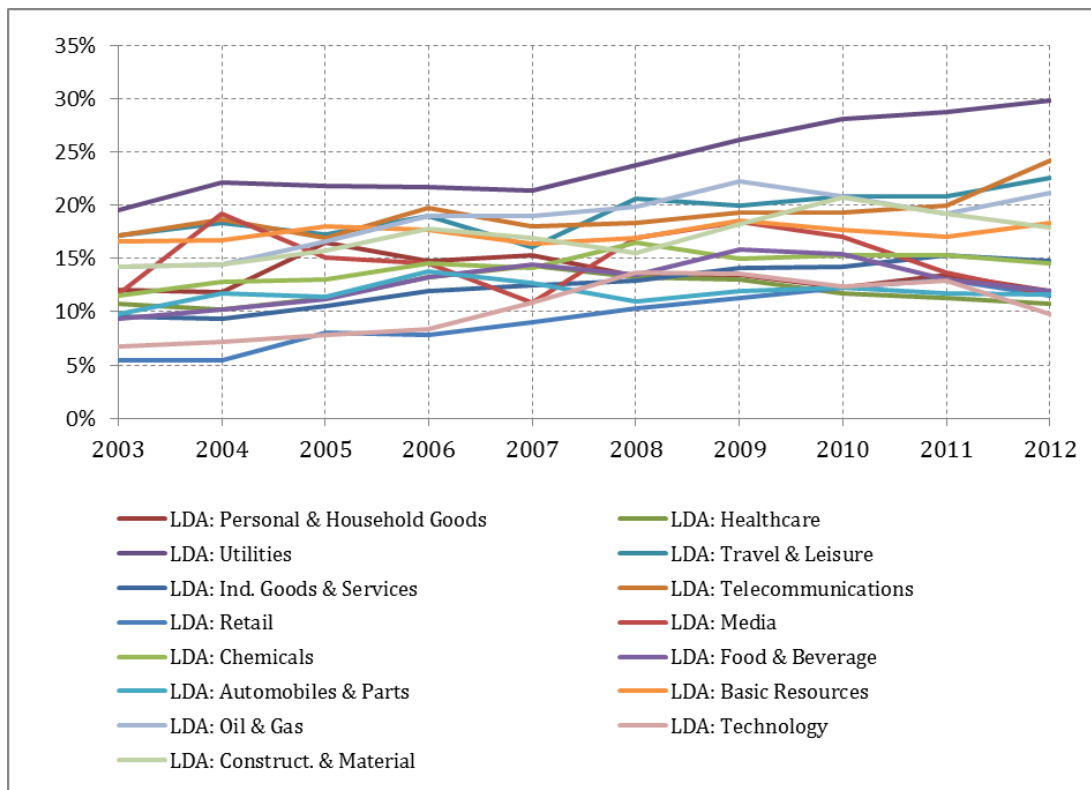


Figure 18: Capital Structure by Industry Classification : LDA : Unweighted

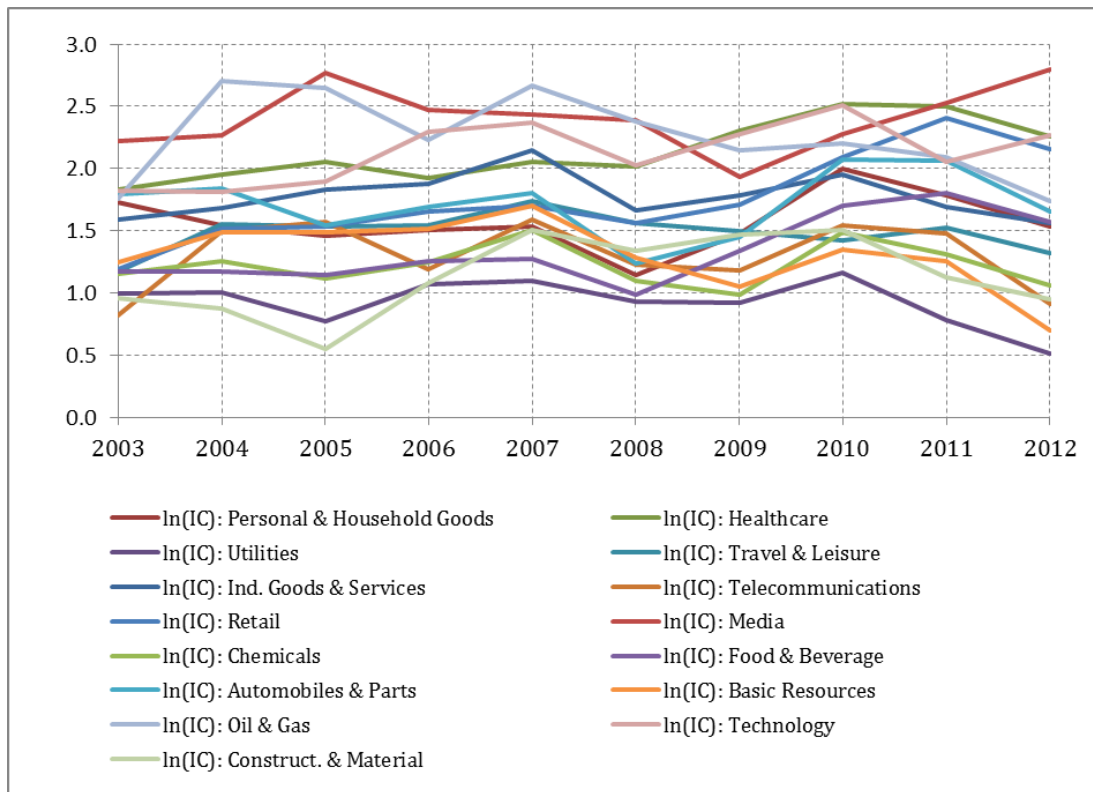


Figure 19: Capital Structure by Industry Classification : ln(IC) : Unweighted

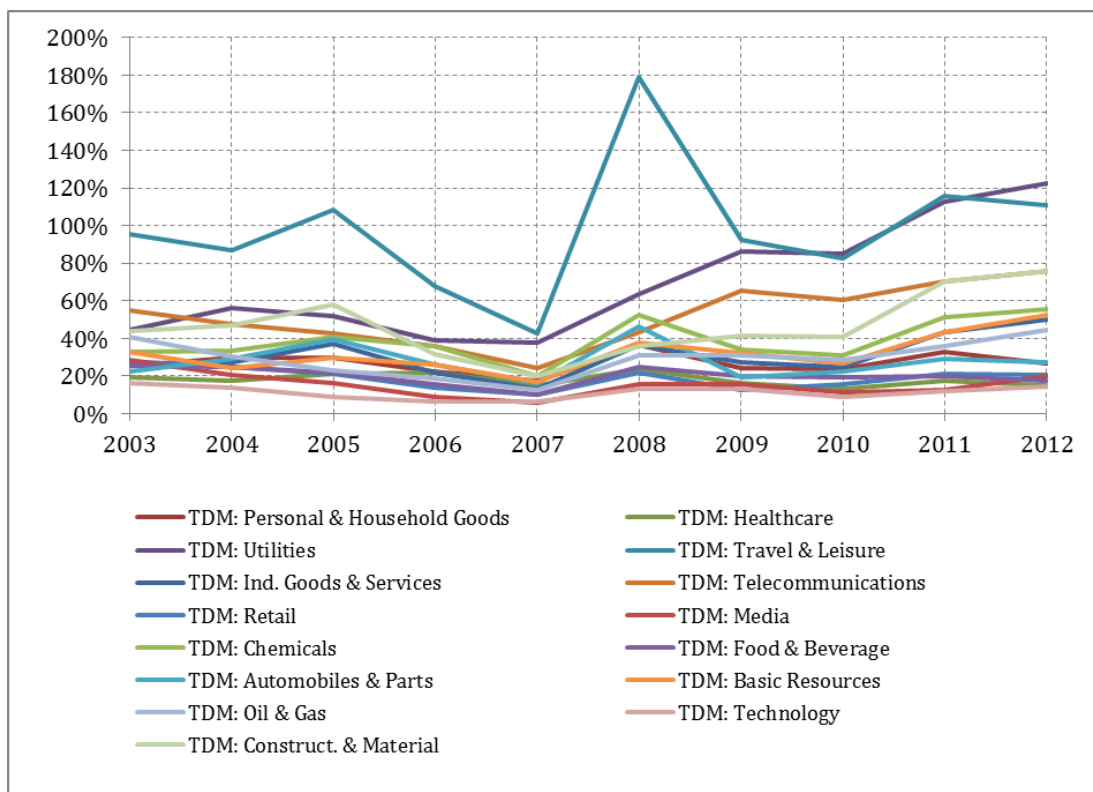


Figure 20: Capital Structure by Industry Classification : TDM : Weighted

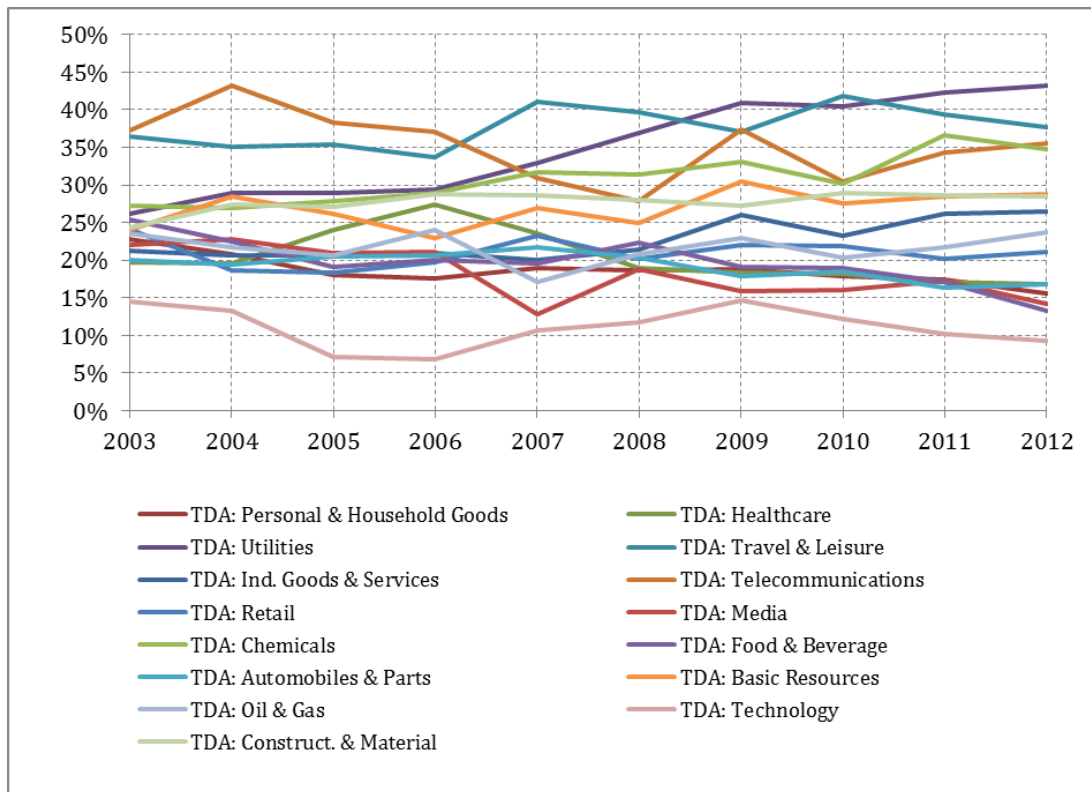


Figure 21: Capital Structure by Industry Classification : TDA : Weighted

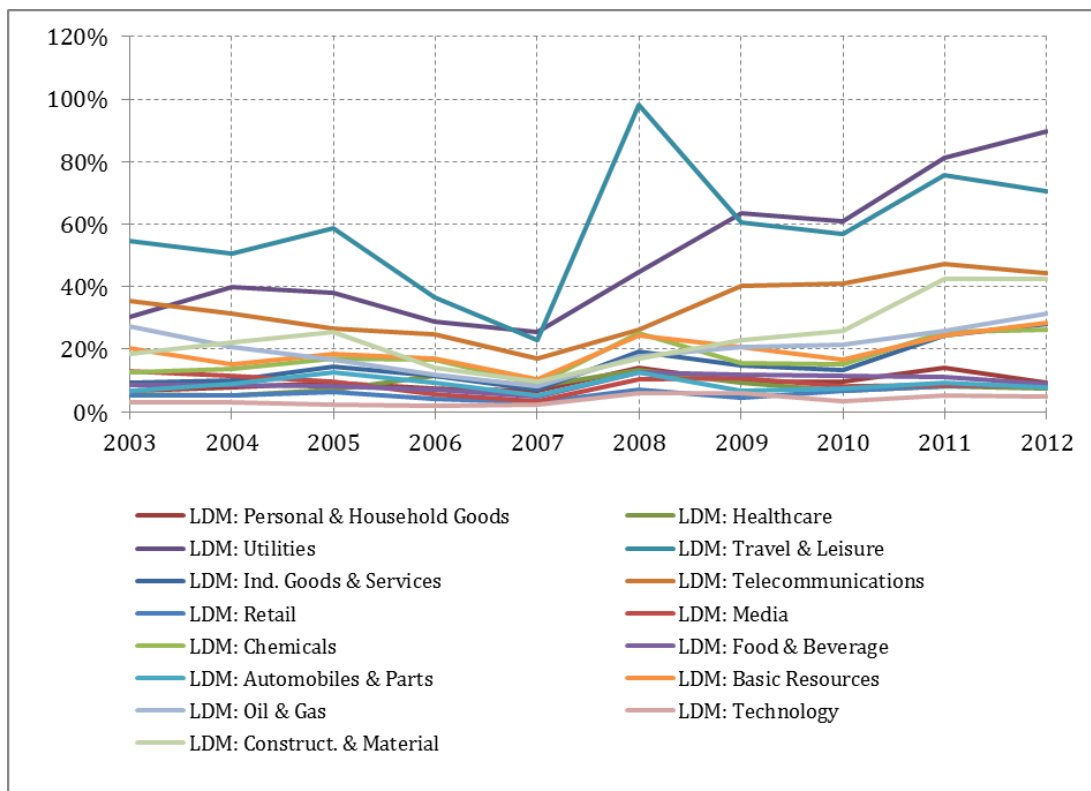


Figure 22: Capital Structure by Industry Classification : LDM : Weighted

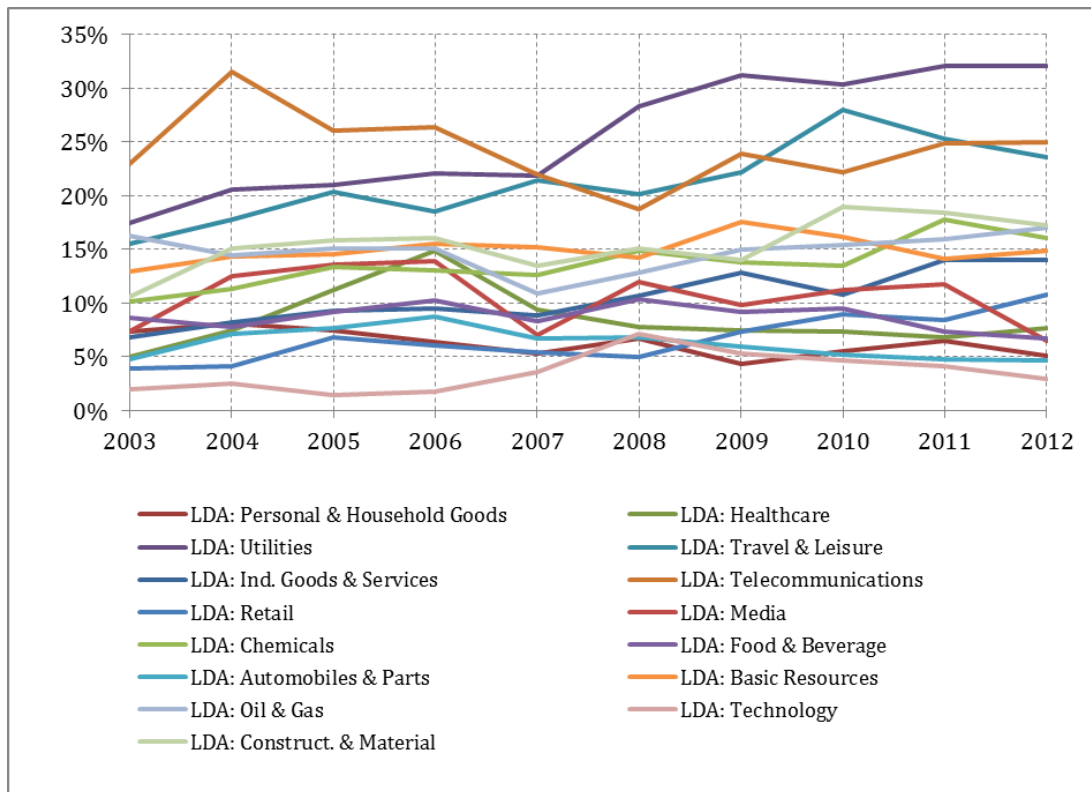


Figure 23: Capital Structure by Industry Classification : LDA : Weighted

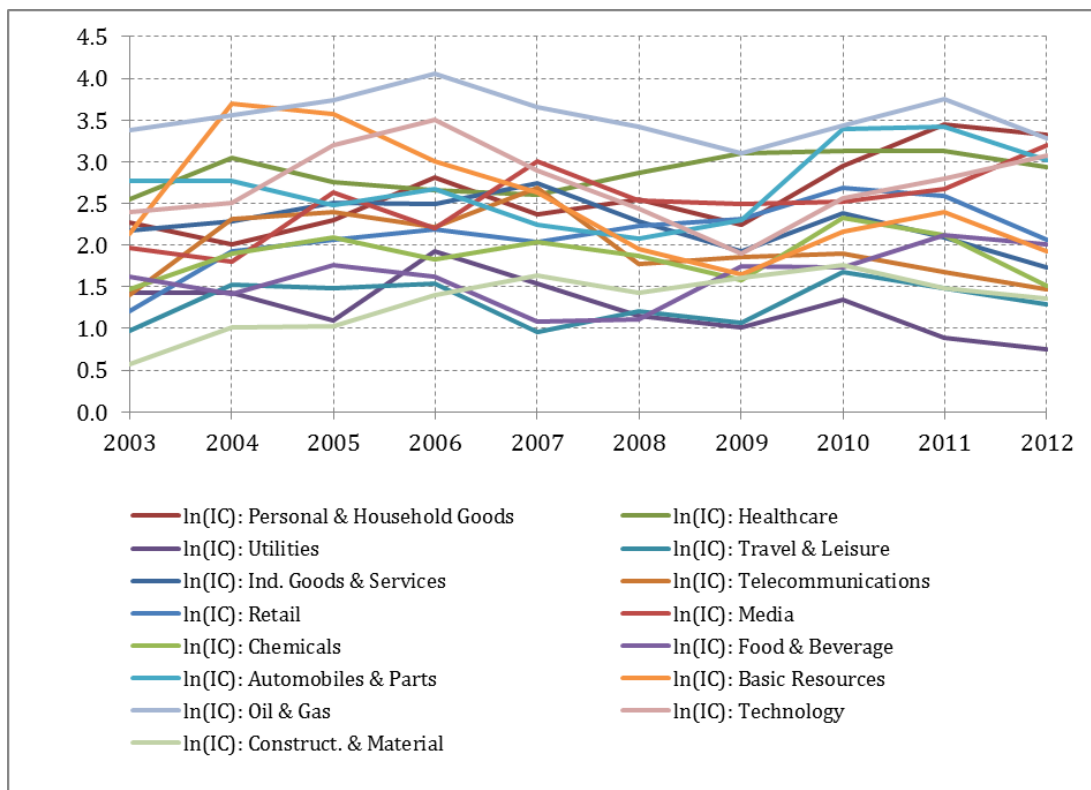


Figure 24: Capital Structure by Industry Classification : ln(IC) : Weighted

Appendix 2: Statistical Findings

Student's T-Test: Paired Samples	TDM			TDA			LDM			LDA			ln(IC)		
	2003 ... 2007	2008 ... 2012	% Diff	2003 ... 2007	2008 ... 2012	% Diff	2003 ... 2007	2008 ... 2012	% Diff	2003 ... 2007	2008 ... 2012	% Diff	2003 ... 2007	2008 ... 2012	% Diff
Sample	43.5%	63.3%	45.6%	28.4%	29.5%	3.9%	25.3%	42.5%	68.0%	14.1%	16.0%	13.4%	1.66	1.59	-3.8%
Observations (n)	2'401			2'402			1'956			1'957			2'443		
P-Value: P[T<=t] two-tail	2.42E-27			0.000177			7.14E-28			2.26E-14			0.044453		

Table 12: T-Test (Paired Samples) Results : Entire Sample : Unweighted

Student's T-Test: Paired Samples	TDM			TDA			LDM			LDA			ln(IC)		
	2003 ... 2007	2008 ... 2012	% Diff	2003 ... 2007	2008 ... 2012	% Diff	2003 ... 2007	2008 ... 2012	% Diff	2003 ... 2007	2008 ... 2012	% Diff	2003 ... 2007	2008 ... 2012	% Diff
Brazil	54.1%	69.2%	28.0%	27.2%	30.7%	13.0%	35.6%	53.8%	51.1%	18.9%	22.8%	20.2%	0.62	1.15	87.2%
Observations (n)	137			138			129			130			142		
P-Value: P[T<=t] two-tail	0.11673			0.007193			0.013837			0.000434			7.78E-05		
China	37.5%	44.0%	17.4%	29.1%	29.5%	1.6%	13.6%	23.4%	72.3%	9.3%	12.0%	28.9%	1.46	1.44	-1.6%
Observations (n)	1'373			1'373			983			983			1'382		
P-Value: P[T<=t] two-tail	1.5E-05			0.242144			1.18E-15			1.03E-19			0.578624		
India	61.4%	103.2%	68.2%	30.0%	31.3%	4.4%	45.6%	72.5%	59.0%	21.3%	21.3%	0.1%	2.02	1.85	-8.4%
Observations (n)	657			657			624			624			677		
P-Value: P[T<=t] two-tail	4.28E-16			0.016882			7.8E-11			0.963262			0.002037		
South Africa	19.8%	30.4%	53.5%	17.1%	17.7%	3.1%	12.2%	21.3%	74.5%	10.6%	12.3%	16.5%	2.42	2.21	-8.4%
Observations (n)	115			115			106			106			117		
P-Value: P[T<=t] two-tail	0.000706			0.660406			0.00016			0.093288			0.081565		
Russia	25.5%	91.4%	258.4%	23.3%	28.4%	21.8%	15.4%	49.5%	220.6%	14.0%	17.2%	23.1%	2.31	1.82	-20.9%
Observations (n)	119			119			114			114			125		
P-Value: P[T<=t] two-tail	8.18E-12			5.2E-05			1.22E-12			0.00238			0.010967		

Table 13: T-Test (Paired Samples) Results : By Country : Unweighted

Student's T-Test: Paired Samples	TDM			TDA			LDM			LDA			ln(IC)		
	2003 ... 2007	2008 ... 2012	% Diff	2003 ... 2007	2008 ... 2012	% Diff	2003 ... 2007	2008 ... 2012	% Diff	2003 ... 2007	2008 ... 2012	% Diff	2003 ... 2007	2008 ... 2012	% Diff
Personal & Household Goods	50.1%	76.9%	53.4%	28.9%	29.2%	1.3%	22.3%	48.3%	116.8%	11.7%	12.3%	5.4%	1.57	1.63	3.8%
Observations (n)			190			190			141			141			195
P-Value: P[T >=t] two-tail			0.000375			0.692636			0.000191			0.426641			0.592738
Healthcare	34.7%	39.1%	12.6%	27.3%	25.1%	-8.1%	17.2%	26.0%	51.1%	12.9%	12.2%	-5.3%	1.90	2.27	19.7%
Observations (n)			182			182			140			140			191
P-Value: P[T >=t] two-tail			0.296665			0.026158			0.007219			0.338913			0.000534
Utilities	63.0%	99.6%	58.1%	32.7%	37.7%	15.3%	42.5%	69.7%	64.1%	21.5%	26.3%	22.2%	1.07	0.94	-12.2%
Observations (n)			157			157			149			149			163
P-Value: P[T >=t] two-tail			0.000397			0.000181			0.000178			2.17E-06			0.26893
Travel & Leisure	56.9%	78.1%	37.3%	31.6%	32.7%	3.3%	35.9%	56.7%	58.0%	17.9%	21.5%	20.0%	1.57	1.41	-9.9%
Observations (n)			77			77			65			65			78
P-Value: P[T >=t] two-tail			0.053239			0.587129			0.020708			0.019168			0.239425
Industrial Goods & Services	30.0%	47.2%	57.3%	26.0%	27.7%	6.8%	15.6%	32.2%	106.4%	11.1%	14.1%	27.0%	2.02	1.79	-11.2%
Observations (n)			479			479			365			365			486
P-Value: P[T >=t] two-tail			1.75E-10			0.005968			1.31E-11			8.04E-08			0.001785
Telecommunications	39.0%	85.4%	118.9%	26.7%	27.9%	4.4%	25.1%	55.4%	120.3%	18.4%	19.2%	4.2%	1.25	1.30	3.8%
Observations (n)			40			40			39			39			39
P-Value: P[T >=t] two-tail			0.000815			0.534455			0.000329			0.560725			0.852471
Retail	27.7%	27.6%	-0.3%	23.5%	23.2%	-1.2%	7.5%	15.0%	98.5%	7.7%	12.0%	55.5%	1.47	1.95	32.3%
Observations (n)			108			109			74			75			110
P-Value: P[T >=t] two-tail			0.976467			0.824599			6.68E-05			0.000959			0.001136
Media	16.8%	30.0%	78.7%	22.8%	23.2%	1.9%	8.4%	18.8%	123.0%	13.5%	14.8%	9.6%	1.92	2.33	21.1%
Observations (n)			36			36			29			29			38
P-Value: P[T >=t] two-tail			0.08915			0.87039			0.019843			0.487934			0.215076
Chemicals	58.9%	67.7%	14.8%	31.5%	34.1%	8.2%	35.9%	41.3%	15.3%	14.0%	15.5%	10.6%	1.33	1.22	-8.3%
Observations (n)			199			199			172			172			203
P-Value: P[T >=t] two-tail			0.235819			0.018183			0.436896			0.095582			0.295274
Food & Beverage	42.0%	65.4%	55.7%	30.8%	29.9%	-2.9%	21.3%	48.1%	125.6%	13.6%	15.3%	11.9%	1.13	1.37	21.1%
Observations (n)			160			160			126			126			161
P-Value: P[T >=t] two-tail			0.001012			0.423069			0.000228			0.060981			0.061245

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Student's T-Test: Paired Samples	TDM			TDA			LDM			LDA			ln(IC)		
	2003 ... 2007	2008 ... 2012	% Diff	2003 ... 2007	2008 ... 2012	% Diff	2003 ... 2007	2008 ... 2012	% Diff	2003 ... 2007	2008 ... 2012	% Diff	2003 ... 2007	2008 ... 2012	% Diff
Automobiles & Parts	39.9%	62.5%	56.4%	27.1%	27.3%	0.5%	18.4%	31.8%	72.7%	11.4%	11.7%	2.1%	1.80	1.65	-8.2%
Observations (n)			109			109			91			91			109
P-Value: P[T >=t] two-tail			0.002477			0.907046			0.001627			0.786042			0.245872
Basic Resources	60.1%	81.9%	36.4%	32.0%	33.4%	4.6%	39.7%	49.5%	24.7%	17.1%	17.2%	0.8%	1.60	1.13	-29.3%
Observations (n)			300			300			271			271			302
P-Value: P[T >=t] two-tail			0.001005			0.125933			0.060712			0.829351			7.43E-07
Oil & Gas	32.9%	66.2%	101.4%	26.6%	28.5%	7.2%	24.6%	49.1%	99.7%	19.1%	21.5%	12.8%	2.36	2.00	-15.0%
Observations (n)			55			55			50			50			55
P-Value: P[T >=t] two-tail			0.009184			0.354107			0.04311			0.293026			0.124822
Technology	25.2%	43.7%	73.8%	20.3%	22.1%	8.8%	12.1%	33.0%	171.8%	9.0%	12.9%	43.8%	2.40	2.32	-3.3%
Observations (n)			135			135			91			91			137
P-Value: P[T >=t] two-tail			0.006084			0.127567			0.000407			0.003601			0.590636
Construction & Material	50.5%	79.0%	56.2%	30.2%	30.7%	1.6%	26.9%	52.4%	95.0%	16.2%	18.0%	11.5%	1.30	1.34	3.1%
Observations (n)			174			174			153			153			176
P-Value: P[T >=t] two-tail			0.000259			0.62402			3.35E-06			0.055219			0.719063

Table 14: T-Test (Paired Samples) Results : By Industry : Unweighted

Student's T-Test: Paired Samples	TDM			TDA			LDM			LDA			ln(IC)		
	2003 ... 2007	2008 ... 2012	% Diff	2003 ... 2007	2008 ... 2012	% Diff	2003 ... 2007	2008 ... 2012	% Diff	2003 ... 2007	2008 ... 2012	% Diff	2003 ... 2007	2008 ... 2012	% Diff
Sample	30.4%	40.9%	34.6%	28.6%	26.2%	-8.5%	17.7%	25.1%	42.1%	16.1%	15.2%	-5.6%	3.47	2.50	-28.0%
Observations (n)			2'401			2'402			1'956			1'957			2'443
P-Value: P[T >=t] two-tail			9.36E-10			0.128613			3.66E-10			0.36164			0.003831

Table 15: T-Test (Paired Samples) Results : Entire Sample : Weighted

Student's T-Test: Paired Samples	TDM			TDA			LDM			LDA			ln(IC)		
	2003 ... 2007	2008 ... 2012	% Diff	2003 ... 2007	2008 ... 2012	% Diff	2003 ... 2007	2008 ... 2012	% Diff	2003 ... 2007	2008 ... 2012	% Diff	2003 ... 2007	2008 ... 2012	% Diff
Brazil	37.7%	45.7%	21.3%	28.5%	29.3%	3.0%	28.5%	36.8%	29.2%	21.0%	22.3%	6.2%	1.24	1.66	33.7%
Observations (n)			137			138			129			130			124
P-Value: P[T >=t] two-tail			0.054266			0.670392			0.030448			0.389923			0.074091
China	35.7%	43.2%	21.2%	29.7%	25.4%	-14.5%	15.2%	21.0%	38.5%	12.9%	10.9%	-15.5%	3.04	1.99	-34.6%
Observations (n)			1'373			1'373			983			983			1'357
P-Value: P[T >=t] two-tail			0.011937			0.014316			0.002443			0.103623			0.013762
India	28.5%	33.8%	18.7%	22.6%	22.3%	-1.2%	21.2%	25.0%	18.1%	16.5%	15.6%	-5.3%	3.27	2.60	-20.3%
Observations (n)			657			657			624			624			646
P-Value: P[T >=t] two-tail			0.011514			0.878409			0.036572			0.415976			0.006762
South Africa	16.3%	17.3%	6.1%	17.3%	16.4%	-5.4%	10.3%	12.3%	19.9%	10.3%	11.3%	10.2%	2.35	2.42	3.2%
Observations (n)			115			115			106			106			115
P-Value: P[T >=t] two-tail			0.652349			0.594256			0.241206			0.484758			0.788786
Russia	32.2%	82.9%	157.3%	38.8%	49.7%	28.1%	20.0%	56.4%	181.6%	22.0%	34.0%	54.8%	6.52	7.58	16.2%
Observations (n)			119			119			114			114			112
P-Value: P[T >=t] two-tail			8.23E-06			0.076294			4.17E-05			0.001391			0.386062

Table 16: T-Test (Paired Samples) Results : By Country : Weighted

Student's T-Test: Paired Samples	TDM			TDA			LDM			LDA			ln(IC)		
	2003 ... 2007	2008 ... 2012	% Diff	2003 ... 2007	2008 ... 2012	% Diff	2003 ... 2007	2008 ... 2012	% Diff	2003 ... 2007	2008 ... 2012	% Diff	2003 ... 2007	2008 ... 2012	% Diff
Personal & Household Goods	27.8%	31.0%	11.8%	21.8%	18.8%	-13.8%	8.9%	12.5%	40.0%	7.7%	6.0%	-21.4%	2.59	3.18	23.1%
Observations (n)			190			190			141			141			189
P-Value: P[T<=t] two-tail			0.209052			0.172707			0.009374			0.290786			0.083662
Healthcare	19.8%	17.9%	-9.3%	24.1%	18.6%	-22.8%	8.2%	9.5%	15.9%	10.3%	7.7%	-25.0%	2.96	3.30	11.7%
Observations (n)			182			182			140			140			184
P-Value: P[T<=t] two-tail			0.358723			0.012529			0.424252			0.105928			0.267999
Utilities	51.7%	94.6%	83.0%	35.9%	41.5%	15.6%	37.7%	68.0%	80.2%	25.9%	31.0%	19.8%	1.62	1.13	-30.1%
Observations (n)			157			157			149			149			153
P-Value: P[T<=t] two-tail			0.000579			0.051272			0.000941			0.010965			0.013275
Travel & Leisure	90.5%	120.6%	33.2%	45.1%	41.1%	-8.9%	51.2%	74.7%	46.0%	24.7%	25.1%	1.2%	1.47	1.52	2.8%
Observations (n)			77			77			65			65			73
P-Value: P[T<=t] two-tail			0.037258			0.214114			0.02075			0.909698			0.888191
Industrial Goods & Services	26.3%	37.2%	41.4%	24.6%	25.2%	2.7%	12.2%	20.9%	71.5%	10.8%	12.3%	14.6%	3.16	2.26	-28.7%
Observations (n)			479			479			365			365			483
P-Value: P[T<=t] two-tail			0.000111			0.676204			3.8E-05			0.120973			0.009217
Telecommunications	46.1%	73.0%	58.3%	42.8%	40.0%	-6.6%	30.5%	47.4%	55.2%	29.9%	28.1%	-5.9%	2.42	1.95	-19.7%
Observations (n)			40			40			39			39			38
P-Value: P[T<=t] two-tail			0.013393			0.601843			0.026377			0.647339			0.318326
Retail	20.1%	20.4%	1.4%	23.2%	22.5%	-2.8%	5.4%	7.7%	42.1%	6.6%	8.2%	22.9%	1.91	2.56	34.4%
Observations (n)			108			109			74			75			105
P-Value: P[T<=t] two-tail			0.914892			0.760514			0.040347			0.23315			0.123339
Media	18.4%	16.6%	-9.7%	23.3%	19.1%	-18.2%	9.6%	10.4%	7.9%	12.8%	11.8%	-8.0%	2.69	3.03	12.7%
Observations (n)			36			36			29			29			32
P-Value: P[T<=t] two-tail			0.532526			0.162483			0.619418			0.721502			0.515578
Chemicals	34.8%	48.8%	40.2%	29.5%	35.7%	21.0%	15.8%	24.4%	54.8%	12.6%	16.9%	33.3%	1.83	2.33	27.1%
Observations (n)			199			199			172			172			197
P-Value: P[T<=t] two-tail			0.000175			0.036346			0.000747			0.079355			0.224795
Food & Beverage	22.0%	22.4%	2.2%	24.6%	20.2%	-17.8%	9.1%	12.5%	37.2%	11.3%	9.4%	-17.4%	1.46	1.90	29.8%
Observations (n)			160			160			126			126			153
P-Value: P[T<=t] two-tail			0.904736			0.138969			0.244429			0.409375			0.137465

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Student's T-Test: Paired Samples	TDM			TDA			LDM			LDA			ln(IC)		
	2003 ... 2007	2008 ... 2012	% Diff	2003 ... 2007	2008 ... 2012	% Diff	2003 ... 2007	2008 ... 2012	% Diff	2003 ... 2007	2008 ... 2012	% Diff	2003 ... 2007	2008 ... 2012	% Diff
Automobiles & Parts	27.4%	30.2%	10.4%	21.7%	18.5%	-14.9%	9.2%	9.6%	5.2%	7.6%	5.9%	-22.7%	2.79	3.14	12.4%
Observations (n)			109			109			91			91			108
P-Value: P[T >=t] two-tail			0.507594			0.159624			0.732333			0.08389			0.400851
Basic Resources	28.7%	39.7%	38.4%	33.6%	28.8%	-14.3%	18.1%	23.9%	32.0%	19.2%	15.9%	-17.3%	3.98	2.10	-47.1%
Observations (n)			300			300			271			271			293
P-Value: P[T >=t] two-tail			0.000111			0.28908			0.006288			0.171833			0.011102
Oil & Gas	27.2%	34.5%	27.2%	25.8%	22.7%	-12.0%	18.2%	23.9%	31.1%	16.9%	16.1%	-4.6%	5.13	3.44	-33.0%
Observations (n)			55			55			50			50			50
P-Value: P[T >=t] two-tail			0.160506			0.51145			0.085157			0.800992			0.034192
Technology	10.2%	13.8%	34.7%	10.7%	12.5%	16.7%	2.6%	5.8%	120.9%	2.8%	5.0%	80.3%	3.81	3.03	-20.5%
Observations (n)			135			135			91			91			126
P-Value: P[T >=t] two-tail			0.057926			0.362198			0.001883			0.06526			0.137988
Construction & Material	41.6%	54.7%	31.5%	35.1%	29.1%	-17.1%	20.7%	32.2%	55.6%	18.3%	17.4%	-5.1%	1.66	1.65	-0.7%
Observations (n)			174			174			153			153			170
P-Value: P[T >=t] two-tail			0.056589			0.047524			0.007488			0.666911			0.957649

Table 17: T-Test (Paired Samples) Results : By Industry : Weighted