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The Valuation of Companies in Emerging Markets: A Behavioural View with a Private Company Perspective

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Dissertation submitted in partial fulfilment of the requirements for the degree of

Master of Management in Finance & Investment

FACULTY OF COMMERCE LAW AND MANAGEMENT

WITS BUSINESS SCHOOL

UNIVERSITY OF THE WITWATERSRAND

Submitted: March 2015

Declaration

I, Bonisile Mtsweni, declare that the research work reported in this dissertation is my own, except where otherwise indicated and acknowledged. It is submitted for a master's degree at the University of the Witwatersrand, Johannesburg. This thesis has not, either in whole or in part, been submitted for a degree or diploma to any other university.

Signature: 

9 June 2015

Acknowledgments

I would love to give all Glory to my Lord and precious Saviour for granting me the strength and patience to complete this phase of my life while continuing to establish my career. I thank my parents for the moral support and my employer, the Public Investment Corporation in South Africa, for providing financial and other resources to enable me to complete this degree. Furthermore, I would like to thank all the professors at the Wits Business School who lectured me for the duration of my studies, with a particular mention for Dr Thabang Mokoaleli-Mokoteli for her input and caring nature, and Professor Kalu Ojah for his guidance in this research paper. Lastly, I would like to thank my partner Kevin for providing the support and ear whenever I needed it.

Abstract

Researchers have suggested that emerging markets' activity is driven largely by unlisted companies. These companies are dynamic, and show a relatively equitable income distribution. However, they operate under severe challenges which can be a deterrent to their success. In spite of these difficulties, the companies form exceptional investment targets due to their innovative abilities, ability to customize products and formulate business models that reduce bottlenecks and input costs as well as take advantage of economies of scale and scope. Important risk factors such as: political, currency, corporate governance and information risks, amongst others, should be factored in during the valuation process of emerging market companies. In this paper, several criteria are used to assess thirteen popular emerging market valuation models' ability to effectively incorporate these risks.

Based on the outcomes of the assessment a best fit model is selected. However, none of the emerging market valuation models explicitly factor in irrationality of market participants. In order to address this, the study focuses on seven behavioural approaches to valuation under the assumption of investor rationality and managerial overconfidence and/or optimism, with a purpose to select one to include in the above mentioned "best fit" emerging market valuation models. Next, assessment mechanisms for adapting these two models for private company valuation were flagged by discussing approaches currently used in academia and corporate finance. Finally, possible means of combining the three objectives, and assessing the success of doing so, as an area for further research, were recommended.

Key Words: emerging markets, valuation, risk premium, country risk, systematic risk, unsystematic risk, private companies, managerial overconfidence, managerial optimism, irrationality, efficient markets, capital asset pricing model

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List of Abbreviations

BRICS	Brazil, Russia, India, China, South Africa
CAPM	Capital Asset Pricing Model
EMH	Efficient Markets Hypothesis
GDP	Gross Domestic Product
GNI	Gross National Income
PE	Private Equity
EVA	Economic Value Added
CFRO	Cash Flow Return on Investment
P/E	Pre/Earnings
NPV	Net Present Value
CEO	Chief Executive Officer
EBIT	Earnings Before Interest and Tax
EBT	Earnings Before Tax
U.S	United States
EPS	Earnings Per Share
IMF	International Monetary Fund
FDI	Foreign Direct Investment
IFC	International Finance Corporation
SME	Small and Medium Enterprises

1. Overview of the Study

1.1. Background

Company Valuation is a complex process which involves several components with no consensus on derivation mechanisms and a great deal of uncertainty. This process is further complicated when international investors seek diversification not only into emerging markets but into private companies within these markets. Valuation, a concept which is at the centre of finance theory, is key to intelligent investment and financing decision making (Damodaran (2006). It is a subjective process which is regarded more as an art more than a science. Underpinning asset valuation is the asset pricing theory, which is a framework designed to ascertain, and quantitatively measure the risk attached to a particular asset and using this to determine a fair rate of return on the asset for bearing the said risks. Value creation is then achieved when the asset is purchased at a price which is below its determined fair value.

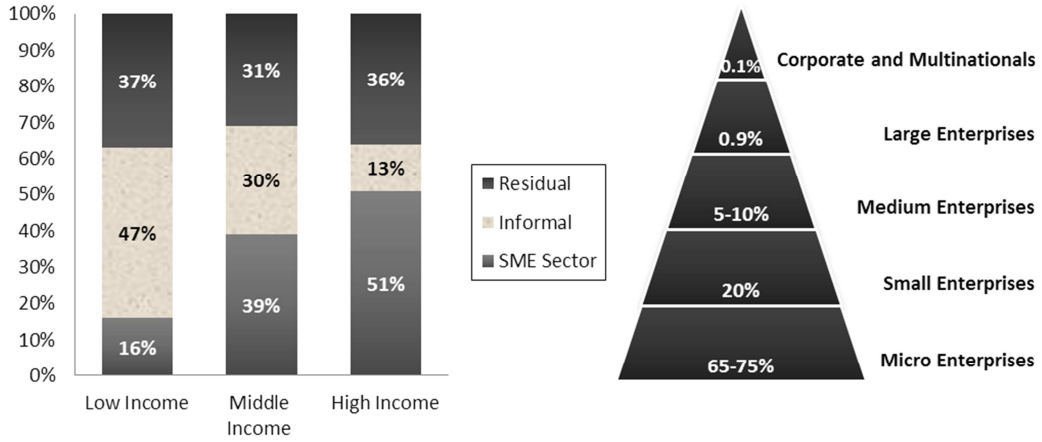
There are several approaches used in asset valuation; ranging from simple (Fernández 2007) to sophisticated (Reilly et.al 2009) each with different assumptions about the fundamentals that underpin the asset's value. However, these approaches do share some common characteristics which are used to classify them into four broad categories namely: (a) discounted cash flow, (b) liquidation and accounting value, (c) relative valuation and (d) contingent claim (Damodaran 2007, and Brealey et al. 2007). These categories allow one to better understand (a) the role that each model plays in the broader scheme of asset valuation, (b) why the models provide different results and (c) where they have important errors in logic.

The first category is the discounted cash flow valuation which defines an asset's value as the present value of future expected cash flows derived from the valued asset (Damodaran 2001). The second category termed, liquidation and accounting valuation, centres around valuing the existing assets of a firm, using accounting estimates (Fernández 2007). The third, relative valuation, estimates the value of an asset by using 'comparable' assets relative to a common variable such as earnings, cash flows, book value or sales (Brealey et.al 2007). The final approach, contingent claim valuation (also known as real options), uses option pricing models to measure the value of assets that share option-like characteristics (Pereiro's 2002). Of these methods, the discounted cash flow approach is most widely used by appraisers in finance (Copeland et.al 2000, Damodaran 2007, Graham & Harvey 2001, Jagannathan & McGrattan 1995 and so forth.). These categories assume efficient markets with free and equally available

information and rational market participants (Damodaran 2001, Copeland et.al 2000, Reilly et.al 2009 and so forth). Although certain academics found that emerging markets are weak form efficient (Ojah & Karamera 1999, Aga & Kocaman 2008), these were in larger more established emerging markets such as Australia, Latin American countries, South Africa and so forth. There is little evidence to prove the same for smaller emerging markets with newer stock exchanges.

Emerging markets are characterised by small stock markets and have economies driven significantly by unlisted companies. According to the IFC, SMEs[1] contribute up to 62% to the GDP of low and middle income economies. The figure below illustrates the typical business landscape in emerging economies along with the contribution of the SME sector in economic growth.

Figure 1: Typical business landscape in Emerging Economies



Source: IFC SME Banking Knowledge guide 2010, "Residual" includes sources such as large enterprises and public sector

The significance of SMEs in emerging markets, as illustrated in the figure above, makes private company valuation an even more vital component for investors. These markets are faced with severe market inefficiencies and distinct investor behaviour which render them perfect

[1] The IFC defines SMEs as "registered businesses with less than 250 employees". They further estimate that SMEs account for at least 95% of registered firms worldwide. However, to distinguish the firms further, the organization categorises them into micro, small and medium enterprises based on the number of employees, size of assets and annual revenue, Micro enterprises are typically small with less than ten employees, less than USD100,000 in asserts and USD100,000 in revenue. Small enterprises employ between 10 and 50 people, have less than USD3 million assets and revenue while medium sized entities have between 51 and 250 employees and less than USD15 million in assets and generate the same level of revenue.

candidates for profitable investment opportunities (Mobarek & Fiorante 2014). However, emerging markets are also characterised by indigenous sources of risk which include political events, economic conditions, length and stages of their respective business cycles and so forth. These are not factored in when using conventional valuation methodologies. Furthermore, the participants within these markets make decisions based on characteristically limited information and as such tend to rely on their own cognitions (Ackert & Deaves 2009).

The difficulty of applying the previously mentioned valuation approaches to emerging market assets has been a subject of debate in academia and commerce (Bekaert et.al 1997, Stulz 1999, Bruner & Chan 2002 and Bruner et.al 2002 to mention a few) particularly around the selection of a "best practice" valuation approach. There is yet to be a universally acceptable solution. This study will evaluate several popular valuation methodologies that have been developed for emerging market assets, with the objective of rating them using a set of requirements from several sources and recommending a 'best practice' framework that is feasible, theoretically sound, and incorporates all major elements which are crucial to reasonably valuing emerging market private companies.

1.2. Research Overview

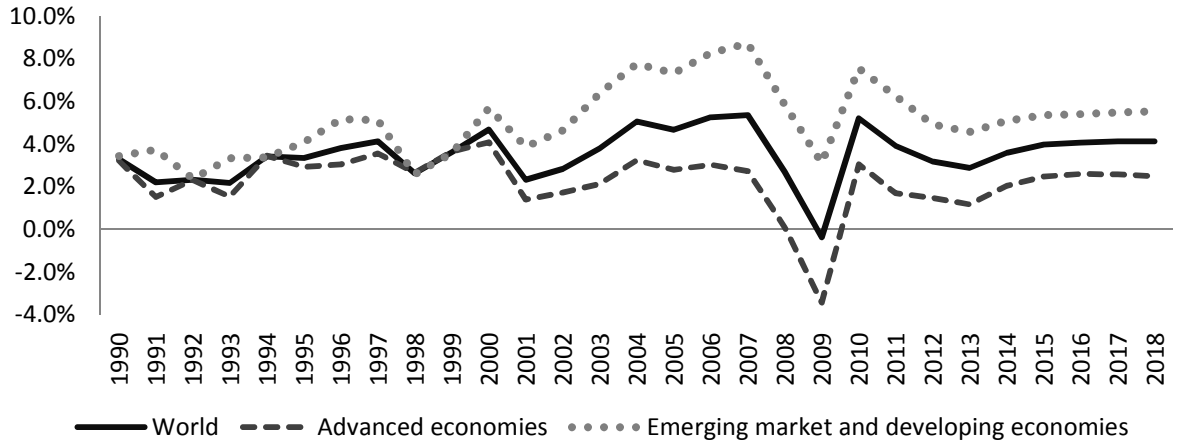
The objective of the study therefore, is to analyse the valuation of private companies in emerging markets from a behavioural perspective; the aim being to study the differential characteristics of these markets which necessitate a change in valuation approaches of their companies. This will involve an evaluation of several approaches to company valuation in emerging markets, outlining the successes and drawbacks of each model in addressing the macroeconomic, market and company specific risk factors found in emerging markets.

All models will be assessed against several qualities of good valuation models which were identified in previous literature as well as by appraisers (CFA Institute 2011, Fernández 2007, Penman & Sougiannis 1998, Babbel, & Merrill 1998, Damodaran 2001 and so forth). The behavioural approach to the evaluation will be focused on managerial overconfidence and optimism. The ultimate end/point is that "best practice" recommended model should incorporate market imperfections and managerial irrationality as well, particularly from an emerging market asset valuation perspective.

1.3. Research Background

Emerging markets represent 86% of the world's population, 75% of total global land mass and resources, 68% of the global foreign reserves, as well as 50% of world GDP (BlackRock 2010). However, despite their significance and growth prospects, they are severely underrepresented in investors' portfolios for various reasons. These markets provide extensive potential for long-term GDP growth relative to developed countries and positive long term demographic trends; which make this a key rationale for injecting capital investments into them (BlackRock: 2010). The IMF first introduced the term Emerging Markets in the 1990s and since then, the definition of emerging markets has changed from one source to another (Mody 2004 and Wharton 2008). The global financial crisis between 2007 and 2010 revealed the relatively strong position of emerging markets. Figure 1 below depicts the strong growth of emerging markets since the 1990s which continued to outperform their developed counterparts even during the global recessionary periods.

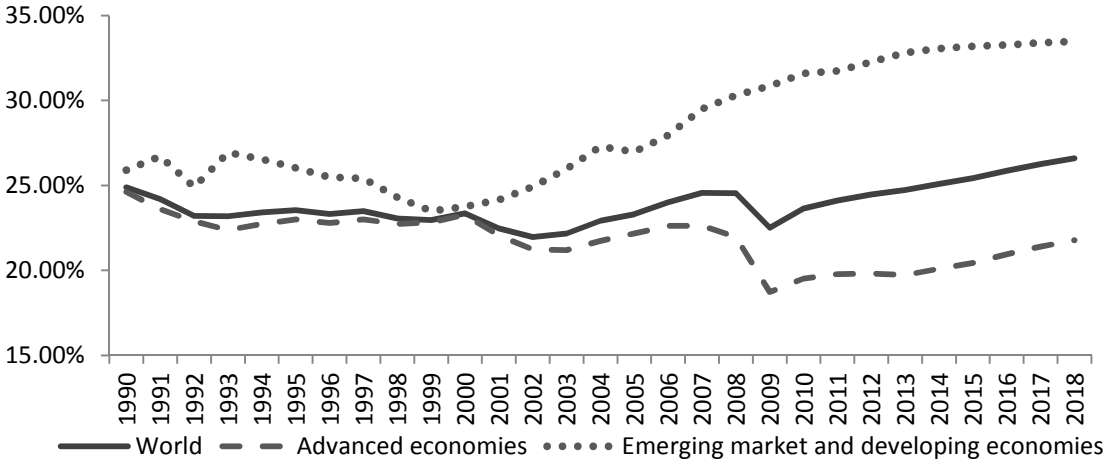
Figure 2: GDP at Constant Prices



Source: IMF World Economic Outlook Database, October 2013

This is largely attributed to the growth in direct investments since the popularity of the markets became apparent in the 1990s. Their companies and public entities have stronger balance sheets which allowed them to emerge from the crisis in a much stronger position than the developed world. Furthermore, their banking systems endured negligible exposure to the effects of the subprime mortgage crisis that was encountered by the U.S and European banks. As such, their banks are well capitalised and do not face the lending constraints present in developed countries (BlackRock: 2010). Figures 3 and 4 respectively depict the growth in net direct investments and total debt capital inflows over the last 24 years.

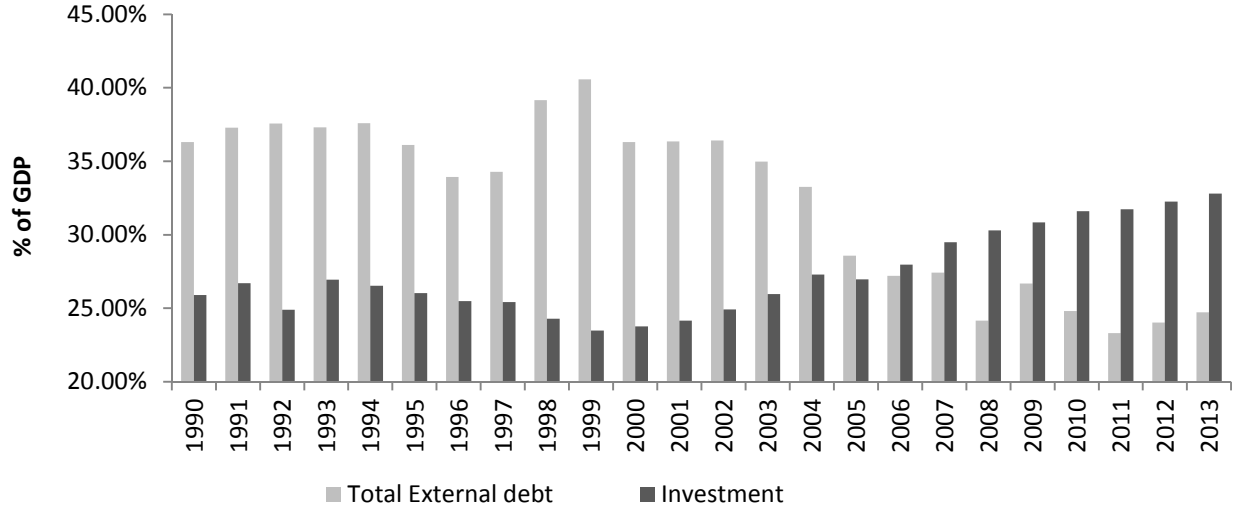
Figure 3: Net Direct Investment of Various Country Groupings



Source: IMF World Economic Outlook Database, October 2013

Figure 3 below depicts the robust improvement of these markets in terms of their ability to attract FDI and reduce their level of indebtedness in relation to total output.

Figure 4: Total External Debt vs. Net FDI for Emerging Markets



Source: IMF World Economic Outlook Database, October 2013

As previously illustrated, emerging markets are driven by small and medium enterprises as a source of socio economic growth and employment. Furthermore, they contribute significantly to the country's innovation (Ayyagari et.al 2012). In China, SMEs have emerged as significant drivers of economic growth. According to a study by China's central bank, SMEs represent more than 90% of all companies and contribute over 60% of China's GDP in 2010. (European Union Chamber of Commerce in China: 2012). In Africa

SMEs comprise over 90% of African business operations and contribute to over 50% of African employment and GDP (Van Scheers 2011).

These private companies offer technology which tends to be found between the highly labour intensive tools of smaller entities, which yields low labour productivity, and the highly capital intensive technologies of large entities which yield high labour productivity, while using more capital per worker than is possible to sustain an economy (Palma 2005). Private companies have shown themselves to be more efficient in distributing income more equitably (Ayanda & Laraba 2011). Furthermore, their intermediate technology characteristic allows the private sector to generate adequate or decent employment for a modest input of capital (Palma 2005 and IFC 2010). Additionally, with their minimal capital injections and high innovation, private companies contribute to increased market competitiveness which results in lower prices and higher quality outputs (Man et.al 2002). Small entities tend to drive industry growth in emerging markets and are dynamic. An economy composed essentially of older larger firms face the possibility of losing its dynamism. (Palma 2005).

However, these companies operate under difficult macro, market and micro environments which affect their ability to generate cash flows and thus value (Man et.al 2002 and Palma 2005). In order to accurately value private companies in emerging markets, their unique characteristics and the environments under which they operate, must be understood. Private companies in underdeveloped markets are characterised by: (a) underdeveloped or varying infrastructure; (b) harsher operating conditions for inputs and resultant products, (c) underdeveloped or inefficient distribution facilities as a result of local monopolies as well as; (d) insufficient access to capital and consumer credit (Veliyath & Brouthers 2010). However, in spite of these difficulties, Veliyath & Brouthers (2010) affirm that these companies form exceptional investment targets due to their ability to innovate, customize products and services, develop business models that limit bottlenecks, exploit lower input costs, build and take advantage of economies of scale and scope, reduce complexity and overcome negative country-of-origin perceptions.

The growth in popularity of emerging markets over the years has attracted several holders of capital with the intention of capitalising on the market inefficiencies and growth potential in order to gain significant returns (IPEV 2012). However, the small size of their stock exchanges limits investors' ability to diversify into these markets using conventional approaches. This lead to the introduction and sudden popularity of private equity funding as an alternative source of funding for entrepreneurs and business minded individuals, with a vision and a unique product who lack

the financial capacity and strategic abilities to advance their companies (SAVCA 2015). This accelerated growth in private company investment into emerging markets has placed an emphasis on the importance of accurate private company valuation methodologies. They portray unique characteristics which may have a significant impact on the company value. These will be discussed further in chapter 2

In order to value any company, the market needs to rely on the availability of accurate reliable information. Accounting statements (prepared in accordance with international reporting standards) along with information provided by financial analysts, allows for accurate and fair valuations in financial markets (Bruner et.al 2002). Research in this area reveals that improved information environments are correlated with higher equity values. There are positive valuation effects that result from improving transparency (Patel et.al 2002), enhanced macroeconomic performance (Black & Carnes 2006), and strengthened legal rights (Leuz et al 2003). What is important to note is the response of companies to this. In the absence of the above necessities in the market, companies create their own informational environment. Lang et al (2003) found more companies in emerging markets are defining their own informational environment as opposed to being passive participants.

Emerging markets have been found to generally have a more corrupt environment and weaker corporate governance institutions (Lee and Ng 2006). As a result, financial markets price their assets at a discount. Lee and Ng (2006) analyse the relationship between corruption and firm value and find that firms from more corrupt countries trade at significantly lower market multiples. In addition, Klapper and Love (2004) focus on firm-level corporate governance practices across emerging markets and find that corporate governance provisions have a greater impact in countries with weaker legal environments.

In contrast, controlling shareholders in emerging markets would expect higher private benefits from control at cost of non-controlling shareholders and as such, value control benefits more than controlling shareholders in developed markets (Dyck and Zingales 2004). These authors found that countries where the private benefits of control are larger, have less developed capital markets, more concentrated ownership, and privatizations that are less likely to occur as public offerings.

All these factors and more increase the riskiness of investing in emerging markets and thus increase the investors' required return. The challenge encountered however, is twofold; first is the identification of additional risk factors of investing not only in emerging markets, but also in

their private companies, second, is the approach used in incorporating these additional risk factors into company valuation.

1.4. Study Proposition

The foregoing have highlighted the uniqueness of emerging markets and their private companies. However, it is important to determine whether these distinguishing features impose substantial problems and impracticalities that can lead to significant valuation constraints. All DCF valuation methods rely on deriving the cost of equity which is commonly based on the CAPM. The CAPM itself is subject to criticism (among others, Fama and French, 1992) due to its numerous self-imposed restrictions. Fama and French (1992) discuss that the model assumes perfectly efficient markets with no transaction costs, no insider information, and fully diversified investors. These premises have been found not to hold in developed markets (Kara & Denning 1998), let alone emerging markets (Del Brio et.al 2002,) that face high transaction costs and rife insider trading activity.

Furthermore, companies are often controlled by families or a few large shareholders where these companies form a major weight of their total portfolios (Bruner et al., 2002). This complicates the process of forecasting cash flows.

DCF valuation often requires practitioners to improvise, use their intuition or compromise to a reasonable degree, which is a tolerated reality in developed economies (Damodaran 2007). In light of these highlighted shortcomings, amongst others, it would be difficult to rationalise the use of DCF methods. Nevertheless, Pereiro (2002) found that these methods are preferred in the emerging markets. The lack of appropriate alternatives and the limited willingness to explore further can be argued to have sustained the widespread acceptance of the DCF as the “best practice” (Pereiro 2002).

The relative valuation approach may appear to be more attractive based on its simplicity and its potential to reflect the market-wide asset price perception. However, extrinsically based methods also exhibit several disadvantages, such as their dependence on available comparable entities which can pose challenges in countries with a limited number of listed companies (Damodaran 2007). In addition, relative valuation also assumes efficient markets such that the market prices are a true reflection of asset values (Reilly et.al 2009). Finally, parameters used to

derive these multiples are based on accounting figures which are subject to accounting rules and, as such, can be manipulated; thus, rendering them unreliable (Copeland et al. 2000).

1.5. Objectives and Scope of the Study

This study will comprehensively evaluate popular emerging market company valuation approaches identifying their advantages and short comings. These models will be evaluated using principles related to theoretical soundness, practical application and the degree to which the models factor in the most relevant risk factors. Using these criteria, which are obtained from several sources (Babbel & Merill 1998, Penman & Sougiannis 1998, Damodaran 2006 and so forth), a “best practice” method will be recommended.

These criteria will, amongst others, aim to answer the following questions:

1. Does the model recognise the importance of incorporating the indigenous risk factors encountered in emerging markets?
2. Does the model accurately identify what these factors are?
3. Does it explicitly account for macroeconomic, market and company specific risk factors that affect the company’s value?
4. Does the model assume universal rationality or is it applicable in less perfect markets with imperfect participants and behavioural realities?
5. Is it a practical model with the potential to be easily adopted i by investment analysts?

The objective is to select one that has the ability to calculate an enterprise value that is closest to the fair value. The study is undertaken based on the following limitations.

1. Widely recognised Emerging Markets valuation models cited by more than ten scholarly articles and/or textbooks.
2. Behavioural models which focus primarily or exclusively on managerial; overconfidence and optimism.

The ultimate objective is to motivate an agenda for how identified “best fit” emerging market valuation model(s) can incorporate behavioural realities.

1.6. Outline of the Report

The report will highlight the characteristics of emerging markets and their private companies with an objective of identifying the unique risk factors which necessitate a change in conventional company valuation models to accommodate them. Thereafter, a methodology is outlined on how such adjustments are currently made. The following section discusses the criteria for assessing emerging market company valuation models of which behavioural risk forms a major part, and uses these to assess thirteen well documented models. A preferred model is then recommended as the “best fit” emerging market valuation model currently available. However, all models fail to incorporate behavioural risk.

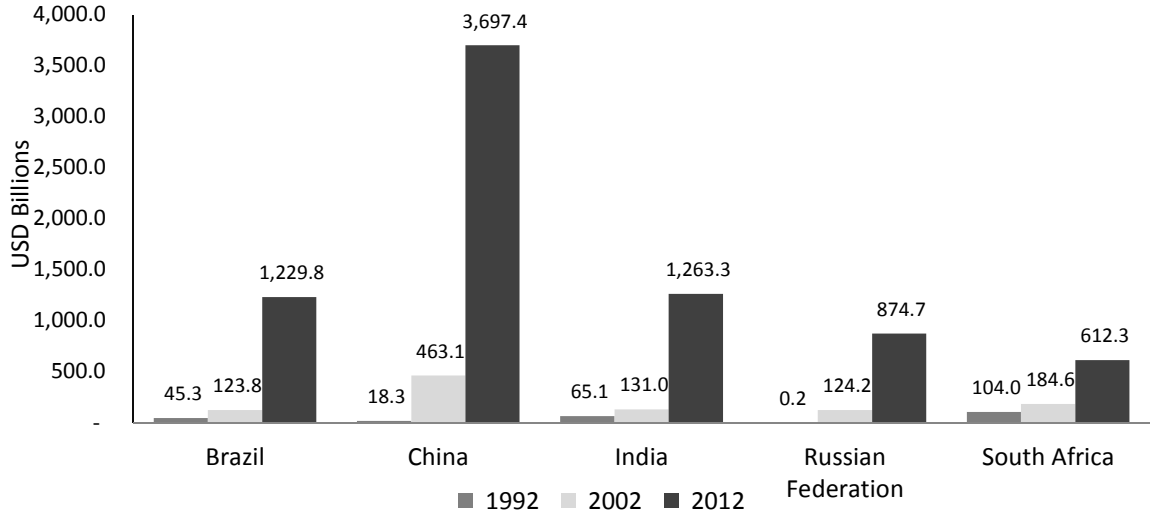
In order to address this, the study focuses on seven behavioural approaches to valuation under the assumption of investor rationality and managerial irrationality, limiting the scope to managerial overconfidence and/or optimism, with a purpose to select one to include in the above mentioned “best fit” emerging market valuation model. The report then assesses mechanisms of adapting the above two “best fit” models for private company valuation, by discussing popularly used approaches. The final chapter proposes possible means of combining both models and adapting them for private companies, and proposing the success of doing so, as an area for further research.

2. Literature Review

2.1. Defining Emerging Markets

The term 'emerging markets' was first coined by the former World Bank economist Antoine Van Agtmael to refer to the markets of countries whose economies were transitioning from developing to developed with per capita gross national income (GNI) below a predetermined hurdle which is adjusted periodically. Currently the hurdle stands at USD 12,196 (S&P Factbook 2010), Based on this criterion, only 69 were considered developed in 2010. The IFC defines emerging markets as stock markets that are "in transition; increasing in size, activity, or level of sophistication". According to the IFC, these markets are further characterized as meeting one of at least two criteria: a) the markets are found in low- or middle-income economies as per the World Bank definition, and b) their investable market capitalization is low relative to their most recent GDP (Mody 2004). Ojah (2010) defines emerging markets as *"countries whose financial (mainly capital) markets are individually and/or collectively emerging from government's dominance in financing production in the economy".*

Figure 5: Stock Market Capitalisation of BRICS economies



Source: World Development Indicators; World Bank, October 2013

Emerging markets are often in the process of transforming from agrarian to industrialised economies and often have valuable resources which render them as attractive investment destinations for global investors. With over 120 emerging economies currently, (S&P Factbook, 2010) one would assume that the investment opportunities with such a large number of countries would be vast. However, many of these countries have inefficient or non-existent stock markets. The World Bank approximated that between 1980 and 1992, the average annual

growth rate in emerging markets was 3.1%. This average included sub-Saharan Africa, which portrayed much lower growth than Asia and the Pacific. Nonetheless, those emerging economies who have managed to develop their stock markets have grown tremendously over the last twenty years. Figure 5 above illustrates this trend for the popularly studied BRICS economies[2].

2.2. Emerging Markets and Their Private Companies

Emerging markets affirmed their attractiveness as investment destinations in the early 1990s, when they regained access to foreign capital after a decade lost in the repercussion of the debt crisis of the mid-1980s. This dramatic increase was followed by a change in their composition. Conventional commercial bank debt was replaced by portfolio flows (fixed income and equity) and foreign direct investment as dominant sources of foreign capital. The aforementioned debt crisis caused emerging markets to embark upon a liberalisation process which included relaxing restrictions on foreign ownership of assets, often in conjunction with macroeconomic and trade reforms. As a result several developing countries transformed their capital markets significantly (Bekaert & Harvey 2002).

Emerging markets are characterised by small exchange markets and have economies driven primarily by unlisted companies (Pereiro 2001 and IFC 2010). This makes private company valuation an even more vital component for investors in those markets. These markets are faced with market inefficiencies and distinct investor behaviour which render them perfect candidates for profitable investment opportunities (Pereiro 2002, Damodaran 2006, Sabal 2002). However, they are also characterised by much higher risk. In many cases they are faced with indigenous sources of risk which are not factored in when using conventional valuation methodologies (Sabal 2007).

Some of the most distinguishing characteristics enjoyed by emerging markets are rapidly improving living standards and an increasing middle class with high economic aspirations. As a result, their global importance is increasing as attractive markets for exports and investment (Sabal 2002). Other characteristics are listed in the table below

[2] BRICS economies: are an association of five major emerging national economies (Brazil, Russia, India, China and South Africa) formed to build trade and other relations aimed at economic growth and development of one another's countries.(ww.bricsforum.org.za)

Table 1: Key Differences among the Three Major Country Groups

Characteristics	Advanced economies	Developing economies	Emerging markets
Industry	Rapidly Developed	Poor	Rapidly Developing
Competition	Substantial	Limited	Moderate but Increasing
Trade Barriers	Minimal	Moderate	Rapidly Liberalising
Trade Volumes	High	Low	High
Inward FDI	High	Low	Moderate to High
Median age of citizens	38 years	24 years	32 years
Major sector focus	Services, Branded products	Agriculture, commodities	Manufacturing, Some products
Education level	High	Low	Medium
Economic and political freedom	Free or Mostly free	Moderately repressed	Moderately free or mostly not free
Economic / political system	Capitalist	Authoritarian, socialist, or communist or	Rapidly transitioning to capitalism
Regulatory environment	Minimal regulations	Highly regulated environment, burdensome	Achieved much economic liberalization
Country risk	Low	Moderate to high	Variable
Intellectual property	Strong	Weak	Moderate and improving
Infrastructure	Well-developed	Inadequate	Moderate but improving

Source: Cavusgil et.al (2007)

All these make conducting business in emerging markets both difficult and interesting with tremendous potential for substantial returns. However, private companies operate under difficult circumstances which make valuation of such companies rather complicated.

2.2.1. Importance of Emerging Markets

As previously mentioned, emerging markets represent 86% of the global population, 75% of the total land mass and resources, 68% of total foreign reserves, and 50% of world GDP (BlackRock 2010). However, despite their significance and growth prospects, they are severely underrepresented in investors' portfolios for various reasons. These markets provide extensive potential for long-term GDP growth relative to developed countries and positive long term demographic trends; which make this a key rationale for injecting capital investments in them (BlackRock: 2010).

Furthermore, the global financial crisis between 2007 and 2010 revealed the relatively strong position of emerging markets. Their companies and public entities had stronger balance sheets which allowed them to emerge from the crisis in a much stronger position than the developed

world. Their banking systems endured negligible exposure to the effects of the subprime mortgage crisis that was encountered by the U.S and European banks. As such their banks are well capitalised and do not face the lending constraints present in developed countries (BlackRock: 2010). From a microeconomics perspective, household debt levels in Emerging market economies are low and savings rates are high - in China, for example, households saved in excess of 30% of their disposable income during 2008 versus 5% in the US (BlackRock: 2010). This, coupled with the range and increasing affordability of goods available, and the increased consumer base, present further impediments for GDP growth.

2.2.2. Efficiency of Emerging Markets

There have been several studies conducted to determine whether emerging markets are efficient. In many financial markets, research on market efficiency focuses mainly on informational efficiency. The efficient markets theory (EMH) acknowledges the variations in the speed with which security prices adjust to new information, yet, asserts that the most efficient response is the instantaneous adjustment of prices to this new information. The theory articulates that when markets are efficient, prices are accurate indicators of economic worth. The EMH is an application of the Rational Expectati*ons Theory which asserts that expectations are optimal forecasts using all available information, i.e. people use all available information in forming their* expectations (Grossman 1981). The implication being, that forecasting errors should on average be non-existent and unpredictable. When applied in finance, it asserts that future prices of securities are equal to optimal forecasts using all available information, that is, the market's expectations of security prices are rational. Given the above implication, Fama (1970) proposes three predictions namely; *weak form efficiency (which states that* past information cannot be used to predict future security prices), *semi-strong efficiency (*which articulates that no historic or public information can be used to predict security prices) and *strong form efficiency* (which states that the price of a security is a reflection all information available, that is, historical, public and private information).

Weak Form Efficiency can be tested using the sequence and order of events i.e. tests of serial correlation of prices through time, (Fama 1970). A study conducted by Mobarek & Fiorante (2014) to assess the weak form efficiency of BRIC economies, analysed the random walk hypothesis to assess ,possible predictive content in stock prices. Their findings revealed that these markets had positive autocorrelation in their returns and found significant anomalies

during earlier sub periods which indicated weak form inefficiency. Other empirical studies have also shown that stock prices in emerging markets are predictable *(*Ojah and Karamera 1999).

Semi-Strong Efficiency is tested using public information such as public announcements of dividends, earnings, or stock splits and the reaction of the market to such announcements (Fama 1970). Recent empirical studies in developing markets indicate that markets tend to anticipate news prior to public announcements which is evidenced by stock price increases or decreases in anticipations of announcements (Hussin et.al 2010, Alexakis et.al 2010 and Torun Kurt 2008). However, these price changes revert almost immediately thereafter.

Strong Form Efficiency is tested by assessing the share price impact of trading activities of insiders (Fama 1970). As expected, empirical studies reveal that insiders are able to consistently outperform the market in developed countries *(*Friederich et.al 2002). This is also found to be true to a greater extent in emerging markets (Chau & Vayanos 2008 and Del Brio et.al 2002).

2.2.3. Factors that Affect Valuation of Private Companies in Emerging Markets

Chapter 1 highlighted that emerging economies are significantly driven by SMEs. These companies operate under different macro, market and micro environments which affect their ability to generate cash flows and thus their fair value. In order to accurately value private companies in emerging markets, their unique characteristics and the environments under which they operate, must be understood. Some of these characteristics, as cited by Damodaran (2006), are discussed below.

Currency volatility: Currency risk is widespread in emerging markets in terms of inflation and purchasing power. Some emerging market economies use a fixed exchange rate in order to create an inaccurate impression of economic stability. This risk would be factored into the country risk from a foreign investor's perspective. Damodaran (2006) cites that analysts have previously found it difficult to incorporate this risk factor into the valuation models commonly used. He then lists some of the common mistakes he has come across in the valuation process. For example, in instances where analysts could not obtain risk free rates or other risk measures in the emerging market's local currency, some converted firm cash flows or discount rates into what they deemed to be a more stable currency, such as the U.S dollar. The difference between the inflation rates of the two currencies may result in over valuation. He also noted that some

analysts use real values in an effort to mitigate the currency effect. However, this can create further inconsistencies.

Information gaps and accounting differences: While information disclosure requirements have become more stringent globally, this trend has not completely filtered to all emerging markets. Damodaran (2006) notes that in some markets, significant and material information about earnings, reinvestment and debt is disclosed. Additionally, differences in accounting standards may further complicate valuation as it becomes difficult to compare numbers for emerging market companies with those of developed market companies.

Corporate governance: The history and environment of emerging market companies is one of minimal separation between stockholders and managers. In many emerging markets most companies transitioned from family owned businesses. Upon listing, these family members retain the control and management using several mechanisms such as; different classes of shares, pyramid holding structures and holdings across several companies. Furthermore, external investors who attempt to oppose the management tend to be obstructed by inter alia, legal restrictions. Thus, separating management and control in these markets is far more complex than in larger more developed economies

Overall Country risk: This risk is an all-encompassing macroeconomic risk factor which is taken into consideration by foreign investors when investing in offshore assets. This risk is one which affects all companies irrespective of how well they are run. This will be discussed further in the section which follows.

Other limitations described by Veliyath & Brouthers (2010) were discussed in section 1.3.

2.2.4. Country Specific Risk of investing in Emerging Markets

This risk, formally defined as *"The specific risk associated with the geographic location of the investment"*, is determined by: social stability, institutional consistency and continuity (Sabal, 2002). Analysis of such risks is undertaken with the objective of identifying and quantifying the risks associated with investing in a specific country. Due to the long nature of the investment period, investors do not only concern themselves with the current state of a particular country, they also consider possible future risks that could appear (Reilly et.al 2009). In the context of valuation, this analysis should be extended to measure the influence of possible risks on the fair value of the company. The following are prevalent types of country risks;

- Political Risk: This risk is the risk of any governmental action and interference (e.g. political instability and war that can negatively impact an investment (Sabal 2002).
- Expropriation Risk: This risk (which forms part of political risk) is defined as the “forced divestment of equity ownership of a foreign direct investor” and is the worst form of political risk. In many cases, these investors receive little or no compensation (Minor, 1994).
- Liquidity Risk: Although private companies generally face liquidity risk, it is even higher in emerging markets with limited domestic investors and hesitant foreign investors which limits the market of buyers and creates an oversupply of sellers (Fernando and Herring, 2001).

3. Research Methodology

The objective of the study was to analyse the valuation of companies in emerging markets from a behavioural perspective; the aim being to study several models under selected criteria in order to select a “best fit” model. The research is introduced with a brief discussion of conventional approaches to company valuation in developed markets and highlights of some drawbacks to these methods which limit their applicability in emerging markets. This is then followed by a study of the development of emerging markets valuation models, outlining the successes and drawbacks of each model in addressing their additional risk factors. All models are assessed against several qualities of good valuation models which are identified in previous literature (Babbel & Merill 1998, Penman & Sougiannis 1998, Damodaran 2006 and so forth).

However, all the models specifically designed for emerging markets assumed universal rationality which literature has disproved in both developed and emerging markets (Kahneman and Tversky, 1979, Heaton 2002, Hilary and Hsu 2011, Lin et al 2005 and so forth). For this reason, the subsequent section assesses several approaches to valuation from a behavioural perspective with a focus on managerial irrationality under the assumption of investor rationality. This aspect of the examination focuses on managerial overconfidence and optimism; comparing models and assessing them against the previous set of criteria derived from literature as well as three additional internally derived criteria. The best practice approach is then selected.

The next chapter discusses mechanisms of combining the two best approaches as an area of further research to analyse the effect of implementing behavioural biases in private company valuation in emerging markets.

4. The Development of Company Valuation Methodologies

4.1. Conventional Company Valuation Models used in Emerging Markets

Private company valuation to a large extent incorporates valuation methods used to value public companies. However, due to the distinctions in the purpose for valuation, adjustments must be made to the conventional public company valuation methods. This becomes an intricate process which entails developing a set of assumptions based on industry-wide and company specific characteristics and adjustments of financial statements, before an appropriate valuation method can be applied. The table below outlines the most common private company valuation methods.

Table 2: Conventional Private Company Valuation Methods

Method	Description
Conventional Discounted Cash Flow Valuation Approach	This method is based on the understanding that the fair value of an asset is the present value of all future economic benefits that will be derived from it. The economic benefits are forecasted using several growth assumptions. Thereafter, an appropriate discount rate is calculated using the method of choice, and is used to discount these forecasted figures (Reilly et.al 2009).
Advanced Discounted Cash Flow Technique (ADCF)	This method is flexible as it can be applied to any stream of cash flows. It can be applied to all businesses ranging from start-ups, to leveraged buyouts. However, the difficulty is in forecasting cash flows, estimating the terminal value and deriving the most appropriate risk-adjusted discount rate (IPEV 2012).
Balance Sheet Based Methods	These methods derive a company's value by determining the value of its assets from a static view point. They do not take into account, the company's possible evolution or other factors that do not appear in the balance sheet. They are appropriate for businesses with negative or marginal earnings and one whose value is derived from the value of its assets (e.g. investment companies) (Fernández 2007)\.
Price of a Recent Investment	It is assumed that when an investment is made recently, then the cost price reflects the enterprise's fair value. However this method is temporary and would have to be revised in the future. It is generally used in seed, start-up or early-stage companies, with no current or short term future earnings or positive cash flows (IPEV 2012).
Goodwill Based Methods	There are two approaches used: one attempts to perform a static valuation of the company's assets and the other quantifies the value that the company will generate in the future (Fernández 2007).
Value Creation	The two methods are the Economic Value Added (EVA) and the Cash Flow Return on Investment (CFROI). EVA measures the surplus value created by an investment. CFRO measures the expected return on an investment, using its cash flows and considers the time value of money. It is thus the modified internal rate of return (IRR) for investments already made (Damodaran 1999).
Income Statement Based Methods	These methods determine a company's values through the size of income statement line items such as sale, earnings etc. They identify an indicator which is then multiplied by a certain variable (Fernández 2007). It is recommended to use variables that exclude capital structure for accuracy purposes (IPEV 2012).

4.2. Criteria for an effective Private Company Model for Emerging Markets

In order to determine the most appropriate valuation method in emerging markets, it is important to develop criteria against which to measure all the available techniques. Below is a table of the criteria that will be used in the following sections of the report.

Table 3 Assessment criteria for effective Emerging Markets Private Company Models

Criteria	Description
Academic Assessment	It must be considered as methodologically sound with reasonable assumptions that are recent and relevant (Penman & Sougiannis 1998).
Adjustment Mechanism	The mechanism must be derived from a theoretically sound background with a framework for determining the adjustment variables. (Penman & Sougiannis 1998).
Practical applicability	It should surpass the theoretical approach and be applicable in practical conditions in emerging capital markets (Penman & Sougiannis 1998).
Easily Understandable	The model must be "user friendly" and understandable for all people involved in the valuation process (Penman & Sougiannis 1998).
Learning Effect	The valuers must be able to discover information which is valuable for future research purposes (Penman & Sougiannis 1998).
Acceptability by Valuers	It should be widely acceptable in the industry to ensure that users of the final value and the valuers of the company do not dispute its accuracy (Damodaran 2009 and Fernandez 2007).
Applicable in inefficient markets	It must not assume efficient markets as this is not a characteristic of emerging markets (Sabal 2002, Bruner et.al 2002).
Dependence on stock market	It should be least reliant on stock market information or ensure a mechanism to account for the lack of information available on the stock markets (Sabal 2002 and Bruner et.al 2002).
Ability to adjust for inflation	It must have a mechanism to account for the volatile nature of inflation rates of emerging markets (Pereiro 2002, Shapiro 2003)
Reliance on quality data	It should be least reliant on availability of quality data or ensure a mechanism to account for the lack of quality data (Sabal 2002, Bruner et.al 2002).
Time Value of Money	Since investment horizons in private companies are long term in nature, the model must be able to incorporate the investment period into the valuation (Sabal 2007, Bruner et.al 2002 and Reilly et.al 2009).
Risk	The model must encompass the most influential risk factors into the model to ensure the most accurate reflection of the company's value. (Bruner et.al 2002,Pereiro 2002)
Framework for deriving variables	The model should have some form of framework for determining the variables in the model itself to ensure uniformity in inputs calculated (Fernandez 2007).
Verifiable	It should be open to a set of parameter specifications from parties with an interest in promoting solvency (Babbel & Merrill 1998).
Investor Rationality	The model should not assume that both investors and valuators behave rationally and as such find a mechanism to account for this (Harvey 2001).

4.3. Comparison of Emerging Market Valuation Models

Chapter one and two highlighted the extent to which emerging markets are inefficient and highlighted their unique characteristics which render them perfect candidates for profitable investment opportunities. However, they are also characterised by higher risk factors which were emphasised by Damodaran (2006). Some popular models applied in emerging markets, which take these into account, are those listed in the table below.

Table 4: Emerging Market Company Valuation Models

Country Risk $RC = Yield_I - Yield_L$	**Lessard's Model** $R_E = R_{f,U.S.} + ß_{L,U.S.} \times ß_{U.S.} \times MRP_{U.S.}$
Espinosa Model $RE = R_{f,US} + RC + (\sigma_L/\sigma_{US}) \times MRP_{US} \times 0{,}60$	**Goldman Model** $R_E = R_{f,U.S.} + (RS+RC) + (\sigma_L/\sigma_{U.S.}) \times ß_{S,L} \times MRP_{U.S.} \times (1-corr(S,B))$
G-CAPM $RE = R_{f,G} + ß_G \times MRP_G$	**Adjusted L-CAPM** $R_E = R_{f,G} + RC + ß_L \times MRP_L + (1 - R_i^2)$
Solomon- Smith- Barney Model $R_E = R_{f,G} + ß_G \times MRP_G + [(\gamma1+\gamma2+\gamma3)/30] \times PRP$	**Erb- Harvey- Viskanta Model** $R_{Country,\ t+1} = \gamma0 + \gamma1 \times \ln(CCR_{Country,\ t}) + \varepsilon_{Country,\ t+1}$
Estrada Downside Risk Model $R_E = R_{f,G} + ß_i^D \times MRP_G$	**Adjusted Cash Flows** Probability-weighted scenarios; their effect on cash flows.
Adjusted Multiples Adjust multiple using correction coefficient	**Adjusted Present Value** $APV = PV_{(unlevered\ firm)} + PV_{(tax\ shield)} - PV_{(bankruptcy\ costs)}$
Real Options Call = decision to invest Put= Decision to Disinvest Valued using Black- Scholes Model.	

4.3.1. Conventional Yield Spread Approach

The conventional method initially uses the yield spread between two government bonds with the same maturity and currency; one issued locally; and the other internationally. This is because the yields represent the investors' minimum risk investment in their particular country. The differential return represents the additional return that required for incurring the specific country risk. This premium is included in the total required rate of return calculated using any appropriate model such as CAPM. The applicability of this technique is subject to the availability of comparable government bonds with identical maturities and currencies. Furthermore, the total country risk of listed companies is not completely systematic because the markets in the different countries are not perfectly correlated. (Cruces et al 2002). As such, only the undiversifiable portion of the country risk should be incorporated. However, since private companies operate in relatively illiquid markets, the ability to diversify is significantly diminished and thus it can be argued that the total country risk should be factored in. This approach also

assumes identical country risk across all companies within a market which is inaccurate as different business sectors are not equally exposed to country risk. Finally, the yield is measured on the assumption that the government in question will not default which could have its own implications. (Sabal 2002).

4.3.2. Lessard Model

This model aims to resolve the above-mentioned dilemma of unreliable local information by creating the first hybrid model that combines local information with comparable global data. Lessard (1996) uses data from the U.S as an representation of global changes. He determines the cost of equity by estimating the risk premium demanded by U.S investors for a similar company based in the U.S and multiplies this with the corresponding Beta. He then multiplies this risk premium with the Beta of the company in question. He describes this component as; "*the country's sensitivity to fluctuations of the U.S. stock market returns and represents the additional systematic risks that investors expect to be compensated for when investing in this particular country".* He then includes this variable to obtain the total cost of equity. The model is depicted as follows

$$R_E = R_{f,U.S.} + ß_{L,U.S.} \times ß_{U.S.} \times MRP_{U.S.}$$

Where:

- $R_{f,U.S.}$ = U.S Risk Free Rate
- $ß_{L,U.S.}$= Beta of the Emerging Market Company
- $ß_{U.S.}$ = Beta of the comparable U.S company
- $MRP_{U.S.}$ = U.S Market Risk Premium

Lessard's stance on using Country Risk on the discount rate is that it is possible to diversify away by international companies that conduct their operations in several countries. He further states that most these risks tend to decline over time and thus would be inflated if integrated into the discount rate. Lessard (1996) does however acknowledge its usefulness for initial screening purposes. Although his model is relatively simple to apply, his assumption that the U.S is a reliable and accurate proxy for the entire global economy is not plausible; especially post the recent 2007 economic recession which saw emerging markets recover a lot faster than their developed counterparts. Secondly the $ß_{L,U.S}$ can have a high volatility of even a short period and this volatility can be difficult to foresee.. Finally obtaining a comparable company may prove to be difficult.

4.3.3. Godfrey and Espinosa Model

Godfrey and Espinosa (1996) present two additional essentials in calculating the discount factor. Firstly, the authors argue that Lessard's method of applying the country Beta will yield conflicting results for valuations in emerging markets. This claim was reinforced by a study they had conducted which revealed that emerging markets such as Venezuela, Argentina or Sri Lanka, displayed negative country betas relative to developed markets; which was caused by small positive (or negative) correlation between emerging markets returns and global market returns.. Consequently, this would result in negative risk premiums (Godfrey & Espinosa 1996). Although emerging markets exhibit highly volatile returns, their country Beta renders them as attractive investment destinations as these return patterns have little or no correlation to the global market. However, due to the private company's inability to diversify away unsystematic risk, the authors substitute Lessard's use of the country Beta with an adjusted Beta which incorporates total risk as opposed to systematic risk. He bases this on an assumption that the correlation between all markets is 1. The formula is depicted as follows;

$$\text{Adjusted Beta} = \sigma_L/\sigma_{US.}$$

Where:

- σ_L = The standard deviation of the emerging market's equity returns
- σ_{US} = The standard deviation of the global market's equity returns

Secondly, the authors promote the use of the country risk premium which Lessard criticised. However, they recognise that this overestimates the discount rate and support their statement with reference to a study conducted by Erb et al (1995), who resolved that up to 40% of equity volatility (i.e. σ_L) is explainable by the particular country's economic and political aspects which are already factored into the country risk premium. As a result, the authors reduced the adjusted beta by this percentage. They do however; recognise that this correction method requires further attention. The final model is depicted as follows;

$$R_E = R_{f,US} + RC + (\sigma_L/\sigma_{US}) \times MRP_{US} \times 0{,}60$$

Where

- RC = Country Risk Premium
- 0,60 = 1- 40% of the equity volatility explainable by economic and political aspect

Godfrey and Espinosa's violation of the basic assumption of CAPM, makes the model more useable in actual situations. However, they make two strong assumptions which are not apt in

the current dynamic conditions in which emerging markets operate. Firstly the assumption that the correlation between returns of emerging market indices and the global market index returns is equal to 1. Secondly, they infer that 40% of the country risk is explained in the local return volatility (Godfrey & Espinosa 1996). Although they support this using empirical evidence, this cannot be completely accurate consistently due to the volatile nature of emerging markets; which then renders the results unreliable (Mariscal & Hargis 1999).

4.3.4. Goldman-Sachs Model

This model, which was developed by Mariscal & Hargis (1999) for the U.S. investment bank Goldman Sachs, was an adaptation of the previous model. It introduces a company specific risk factor RS. This can be calculated using a method that is most appropriate for that company (e.g. industry cyclicality, percentage of foreign sales etc.). This is added to the country risk premium RC. The authors also promote the use of Adjusted Beta. They introduce another component which accounts for the company's beta relative to the local market equity index $ß_{S,L..}$ Lastly the authors adjust for the double counting of the country risk by using the correlation between the emerging market's stock returns and the yield of the local government bond used in calculating the country risk premium. The Model is depicted as follows;

$$R_E = R_{f,U.S.} + (RS + RC) + (\sigma_L/\sigma_{U.S.}) \times ß_{S,L} \times MRP_{U.S.} \times (1 - corr(S,B))]$$

The model illustrates all the significant risk drivers. Firstly the risk free rate and market risk premium indicate global investor expectations. Secondly, the country risk premium and adjusted beta represent domestic macroeconomic risk. Thirdly, the company-specific risk premium and $ß_{S,L}$ .take the company specific risk features into account. However, the model still uses the U.S as a proxy for the global economy.

The model bears further disadvantages. Firstly it is not an easily applicable model and the number of components included, leaves room for subjectivity, arbitrariness and imprecision. For example, the lack of guidelines and uniform method for the calculation of the company-specific risk premium could yield inconsistent results especially when valuing and comparing two or more companies. Secondly, although the authors recognise the risk double-counting problem, in two risk factors of the equation, they failed to determine if the same applies to other input components. For instance, it is expected that a certain level of correlation between the RS and the $ß_{S,L}$ exists, therefore, the probability of double risk counting is intensified with each

additional variable. Furthermore, $ß_{S,L}$ can only be calculated provided that reliable long-term financial data is available which again, may not be the case in some emerging markets. Finally, research conducted by Harvey (2001) found that altering the beta using relative market volatility has no economic foundation,

4.3.5. Global or International Capital Asset Pricing Model

In this G-CAPM or I-CAPM model studied by O' Brien (1999), Stultz (1999) and Schramm and Wang (1999) the assumption is that all financial markets across the world are deeply integrated and investors have identical attitude regarding risk and returns. Furthermore the model assumes that all investors can move their assets around anywhere in the world without restrictions, low transaction costs and can predict their returns with reasonable certainty. The model is depicted as follows;

$$R_E = R_{f,G} + ß_G \times MRP_G$$

Where:

- $R_{f,G}$ = Global risk free rate
- $ß_G$ = Correlation of the company's return with the global index.
- MRP_G = Global market risk premium

The obvious criticism of this model would be the assumption that all markets are deeply integrated. Empirical studies such as that conducted by Bekaert et al (1997) indicate that there are many financial barriers which exist which make it difficult to have a globally integrated capital market. Furthermore, The FDI Restrictiveness Index, published by the OECD (2008) shows that China and India, the two largest emerging markets, have the highest level of restrictions in terms of investment and ownership rights. This proves that markets were certainly not integrated and as such render the model inapplicable in emerging markets.

4.3.6. Local Capital Asset Pricing Model

An attempted solution to the obvious flaw in the previous model is the local CAPM (L-CAPM) by Pereiro (2001). The model assumes partial market separation, which consequently implies investor isolation. This thus exposes them to country-specific risks which can, at the least, be partly diversified. Consequently, the model is depicted as follows;

$$R_E = R_{f,L} + RC + ß_L \times MRP_L$$

Where:

- $R_{f,L}$ = Local Risk Free Rate
- $ß_L$ = Local company Beta
- MRP_L = Local Emerging Market Risk Premium

However, this model alone results in double counting of the market risk which could also be found in the RC. The obvious consequence would be to adjust the L-CAPM and create an AL-CAPM variant. Pereiro (2001) suggests that the MRP_L be multiplied by (1- R_i^2), where R_i^2 represents *"the amount of variance in the equity volatility of the target company i that is explained by country risk".* Unlike Godfrey & Espinosa (1996), Pereiro (2001) does not assume a constant R_i^2 which the former authors assumed to remain constant at 40%. Nevertheless, the model in its adjusted state is confronted with the same disadvantage faced by previous models of limited availability of information in emerging markets. Therefore, it would have to be adjusted further to incorporate both local and global data. Pereiro then suggests the use of AH- -CAPM. This model is identical to Lessard's formula with the exception that he does not use U.S. data and adds the aforementioned factor to adjust for double counting. The result is as follows:

$$R_E = R_{f,G} + RC + ß_L \times MRP_L \, x(1 - R_i^2)$$

Although the model relies on easily computable data, it is no longer a simple model and because it includes country risk premium, it faces the same criticism motioned earlier. Furthermore the volatility of the Beta component of emerging market companies complicates mid-to-long term projections of the discount rate.

4.3.7. Salomon-Smith-Barney Model

In this model Zenner & Akaydin (2002) extended the G-CAPM model on behalf of the U.S. investment bank Salomon Smith Barney. They affirm that the use of locally derived variables is useless due to market inefficiencies. They further argue that since most of the larger companies function in integrated global financial markets, their discount rates should also be calculated using global indices. To account for the shortfall that emerging markets were not deeply integrated with global markets, the authors' extension of the model is as follows:

$$R_E = R_{f,G} + ß_G \times MRP_G + [(\gamma 1 + \gamma 2 + \gamma 3)/30] \times PRP$$

Where:

- γ1 = Factor that ranks access to capital markets
- γ2 = Factor that measures a company's exposure towards governmental interference
- γ3 = Factor that measures the relative importance of the company to the investor
- PRP = Political Risk Premium

To calculate the PRP, the authors use the sovereign bond yield spread which was introduced earlier. However, the authors acknowledge that using the full yield spread as an representation for political risk potentially overestimates required returns. They therefore, conducted research which indicated that a country risk premium of 5,33%, which they found to be common in practice when using sovereign bond yield spreads, already corresponds to a "*50% probability of a total loss scenario"* – which is only suitable in extraordinary situations (Zenner & Akaydin 2002). *Based* on this finding, the authors developed a technique to adjust the country risk premium depending on the company specific risk characteristics.

The company risk level is measured using equally weighted parameters γ1, γ2 and γ3 on a scale from 0 to 10 where most developed markets are anticipated to have factors close to 0. γ1 ranks access to capital markets. Companies with a low γ1 have a well-diversified investor base and have good access to capital markets. Those will high figures will obviously have the opposite characteristics. These investors will therefore expect compensation exposing themselves to country-specific risks. γ2 depicts political risk. In other words, it measures the probability of expropriation. γ3 is dependent on the relative importance of the company to the investor.

This model offers several positive attributes; it is easily applicable, encompasses company specific components, and excellently illustrates the separate risk drivers. However, the risk parameters γ1, γ2 and γ3 are not supported by empirical findings and are arbitrarily determined. The method of deriving these parameters is highly subjective with no guidelines for the derivation of the parameters

4.3.8. Erb-Harvey-Viskanta Model

This model, developed by Erb, et al (1995), is a deflection from the CAPM approach. Instead of relying on historical data to calculate Beta, the authors advocate for the use of country credit ratings published semi-annually by the Institutional Investor magazine. The authors argue that

these ratings are more appropriate for assessing political risk of emerging markets. Furthermore these ratings are also published for markets without stock markets which renders the model particularly useful for private company valuation in markets with no comparable listed companies. The resultant model is *a* cross-sectional regression model using a sample of equity market returns and country credit ratings from 1979 to 1995:

$$R_{Country,\ t+1} = \gamma 0 + \gamma 1 \times \ln\left(CCR_{Country,\ t}\right) + \varepsilon_{Country,\ t+1}$$

Where;

- $R_{Country,\ t+1}$ = the return in U.S. Dollars for a specific country, t is measured in half-years
- $\varepsilon_{Country\ t+1}$= is the regression residual.
- $(CCR_{Country,\ t})$ = Credit risk rating of the country

The authors ascertain that the model can be applied in countries with extremely inefficient or non-existent equity markets. However, it can only measure the country's cost of equity and not that of the company. This poses a severe shortfall as it implies that all companies would have the same required rate of return regardless of industry or company specific factors which influence valuation such as cyclicality or operational leverage. Furthermore, the credit rating published by the Institutional Investor magazine is computed using surveys among bankers who rate each country on their default risks. Therefore, it may be subjective and has to be analysed using up to date empirical evidence.

4.3.9. Estrada Downside Risk Model

Estrada (2002) is another alternative to the traditional CAPM method. Estrada (2002) argues that "*the variance of returns is a dubious measure of risk*", as it can only be applied to values that are symmetric and normally distributed. As such, he suggests substituting this variance with a *semivariance t*hat only captures the downside volatility of returns. This is because it is more functional when the underlying returns are asymmetric and where investors only seek the downside fluctuations of their returns. Using the semivariance, the Beta can then be calculated as *"the ratio between the semistandard deviation of returns with respect to the mean in market i and the semi-standard deviation of returns with respect to the mean in the world market"* (Pereiro, 2001). Consequently, the D-Beta is calculated and the D-CAPM (Downside CAPM) model is formulated using the G-CAPM model and depicted as follows;

$$R_E = R_{f,G} + ß_i^D \times MRP_G$$

According to the studies conducted by the author the downside Beta is 50% higher than the standard Beta for emerging markets, while the difference is far less for their developed counterparts; proving that emerging market risk is more accurately captured by downside volatility. This result consequently increases the cost of equity by 250 basis points. However, the author uses local data to derive the D-Beta which, once again, limits the applicability of the model in many emerging markets due the lack of reliable long-term financial information.

4.3.10. Adjusted Cash Flows

In this approach, the forecasted cash flows would be adjusted by incorporating emerging market risks into the assumptions used during cash flow forecasting. For example, the incremental country risk may have an impact on currency and GDP forecasts which would affect revenues and cost forecasts. The advocates of this approach argue that only systematic risk should be included in the discounted rate and since country risk is diversifiable form the global investor's perspective, it should not be incorporated into the cost of equity (Lessard 1996, Shapiro 2003). Another argument against adjusting discount rates was that it assumes that risks are uniform across the entire country. However, as pointed out by Lessard (1996), in order to incorporate country risk into the cash flows, the precise impact of political incidents would have to be quantified which could prove to be difficult.

Nevertheless, it would be possible for historical information to be used. For example, an analysis of sales changes in figures after a political incident can be used (under the assumption that the change was a direct result of the political incident). Furthermore, Lessard (1996) suggests that rates for international political risk insurance can be used as an indicator for the cost of these effects. However, in order for this approach to be widely applicable, a framework for quantifying the effect of country risk would have to be developed.

Another approach, suggested by Copeland et al (2000), is quantification by using probability weighted scenarios. He articulates that a set of clear macroeconomic variables should be determined for each scenario. Each set would fit a possible scenario ranging from total expropriation or hyperinflation to significant growth. Thereafter, the impact of these conditions on the company's cash flows is approximated for each scenario, and the values are probability weighted to calculate the final cash flow value. The author then uses G-CAPM to discount these cash flows; under the assumption that all markets are perfectly integrated and investors are well diversified. The problem however, is that cash flow projection is itself prone to manipulation and

arbitrariness prior to complicating it further by adding probability-weighted scenarios. It requires expert managerial knowledge and instinct. James & Koller (2000) consider this method as *"educated guesses at best"* and affirm that the approach should be used with a certain level of scepticism. However, by creating and quantifying scenarios, risk management can be enhanced by identifying the risk factors with the most significant impact on the value and develop mitigation or hedging strategies accordingly.

4.3.11. Adjusted Multiples

This method, as developed by Pereiro (2002), uses earnings multiples from U.S. companies with cross-border corrections to reduce the issue of limited comparable companies. It involves an initial standardisation of financial statements due to differing accounting standards; or alternatively uses multiples that use free cash flows as they are least unaffected by accounting standards. However, investors may assign differing multiples for the same company due to; different perceptions regarding country risk, differing opinions on the country's economic state, differing opinions regarding managerial value added and so forth. To combat this, Pereiro suggests the use of a *market-wide correction coefficient,* (e.g. dividing the P/E Multiple of a particular emerging country with the reference value from the U.S) and thereafter assume that the capital markets over- or undervalue the same company by this factor.

The method has been seen to be intuitively correct and supported by empirical findings. However, it has ample opportunities for subjectivity and bias (For example; the choice of the multiple factor for calculating the correction coefficient, as well as the application of several correction coefficients). These adjustments could be extended to such an extent that the result will be significantly different from the initially derived Multiple; making it unfeasible for real-life valuations.

4.3.12. Adjusted Present Value Approach

This method is an advancement of the traditional DCF method and depicted as follows;

$$APV = PV_{(unlevered\ firm)} + PV_{(tax\ shield)} - PV_{(bankruptcy\ costs)}$$

Where;

- PV of tax benefits = (Tax rate × Cost of debt % × Debt) / Cost of debt %

The model involves three steps the first of which is determining the firm's value if it had no debt financing. The second step involves determining the present value of the benefits received from the debt portion of the total financing and adding this to the value derived in the initial step. These tax benefits are considered as an infinite stream and thus calculated as a perpetuity. If the tax, debt rates and capital structure are anticipated to vary significantly, a separate annual tax shield must be calculated separately and discounted with an appropriate discount rate. Finally, the present value of the costs due to the added probability of bankruptcy that arises as a result of the debt portion of financing, are calculated and deducted from the total value. Bankruptcy costs increase as leverage levels increase. However these costs are difficult to compute which could result in inaccurate company valuations as they could be significantly underestimated (Reilly et.al 2009).

This method is preferred over the DCF method by some academics as it does not assume a static capital structure (i.e. constant debt-equity ratio) and tax payments, and separates the company's operating cash flows from its leveraging effects. For this reason Sabal (2007) recommends it for use in emerging markets as these elements are volatile in such markets where the high economic uncertainty provides leveraging opportunities and changing tax legislations are a reality. Nonetheless, since its core component is derived from the DCF, it faces the same limitations.

4.3.13. Real Options

The model is based on the Real Options approach which is *"to transfer financial option valuation techniques to capital budgeting decisions in order to include managerial flexibility in the equation"* (Copeland et al 2000). According to this approach, investing in a company corresponds to an option to invest (call option) or disinvest (put option) in an underlying asset up to a future date (expiration date. As implied by the term "option", no obligation to exercise is created. According to Damodaran (2007), there are three most recognised real options entrenched in capital investment; (1) the option to expand, (2) the option to delay investing, or (3) the options to abandon or sell the object.

When valuing the financial option; the initial investment is similar to the option spot price; the present value of the embedded option is the underlying asset, the time horizon to exercise the option, is the expiration date. However, applying this method in practice is more complex than is

suggested by academics. Incorporating the effects of the entire managerial decision range into one option value requires expert judgement. Usually investment opportunities contain a string of options which would theoretically all have to be incorporated as separate factors into the model and often, these options tend to be intertwined and each option would tend to create a new one. Nonetheless, the real options approach provides insights to valuation process as it recognises the importance of managerial flexibility '(Damodaran 2007).

4.3.14. Assessment of Models against criteria

A majority of the criteria may seem apparent; nevertheless, it is important to ensure that the models meet them. Some models were adapted from traditional models in an effort to relax the assumption of efficient equity markets, to make them applicable in emerging markets. They all cover various important characteristics of emerging markets; yet there is no single model that comprehensively accounts for every risk identified in emerging markets. Furthermore, some models ranging from the Espinosa model to the Salmon-Smith- Barney model attempt to reduce the effect of double counting of the various risk elements however, are unable to do so for every possible risk. Nonetheless, all models have met the fundamental corporate finance criteria of incorporating risk and the time value of money. The table below summarises the assessment of each model against the previously mentioned criteria.

Table 5 Assessment of Private Company Valuation Models for Emerging Markets

	Yield Spread Method	Lessard Method	Espinosa Model	Goldman Model	Global CAPM Model	Adjustable Local CAPM Model
Academic Assessment	No theoretical foundation	Methodologically sound	Assuming a constant market correlation and adjusting factors are unrealistic	No theoretical foundation	Problematic; empirical evidence advises that markets are not fully integrated	Methodologically sound
Adjustment Mechanism	Yield spread of government bonds	Country Beta in relation to U.S Beta	Relative volatility, and country risk spread and adjusting factor	Relative volatility, company specific risk and credit risk spread	Global Beta	Local Beta, credit risk spread and adjusting factor
Practical applicability	Can be understood by all users of model	Can be understood by all users of model	Can be understood by all users of model	Can be understood by all users of model	Can be understood by all users of model	Deriving R^2 may statistical expertise
Easily Understandable	Simple to Implement	Simple depending on availability of comparables	Simple depending on availability of information in equity markets	Too many variables which are prone to subjectivity	Simple to apply but depends on availability of a global proxy	Depends on available info and R^2 may be complex
Learning Effect	Not much learning effect since results cannot be dissected	Many emerging markets are not highly correlated with U.S markets	Existence of Beta alternatives and risk double counting must be considered	Explicitly determines risk drivers for emerging market companies	None as it is a typical CAPM model. Assumptions are expectedly unrealistic	Can account for risk double counting and not use constant adjusting factor
Acceptability by Valuers	Its simplicity and use of widely acceptable credit risk spread methods, renders method widely acceptable	Based on widely CAPM and depending on availability of data, method should be widely acceptable	Calculation of volatility and yield spreads is widely acceptable practice, therefore model might be accepted	Numerous number of factors and its complex nature will make user more resistant towards applying model	Typical CAPM model which is widely acceptable but assumptions may prove unrealistic when applied in emerging markets	Complexity and number, of variables and dependence on quality info may cause resistance among users
Applicable in inefficient markets	No, assumes markets are perfectly correlated and contain no unsystematic risk	No, use of CAPM assumes efficient markets where unsystematic risk is diversified away	Yes. use of total risk implies markets are unable to completely diversify away unsystematic risk	Yes. use of total risk implies that markets are unable to completely diversify away unsystematic risk	No, assumes investors have same risk attitude, globally integrated markets and returns are reasonably predictable	Yes, assumes no easily available information and accounts for this by using global data alongside local data

Dependence on availability of a stock market	Uses sovereign debt yields. Instruments may be unlisted	Extensive use of Beta renders it extremely dependent on stock markets	Highly dependent for calculating equity volatility and market risk premium	Highly dependent for calculating equity volatility and market returns	Highly dependent on global stock markets for calculating Beta and market risk premium	Highly dependent for calculating Beta and market risk premium
Ability to adjust for inflation	No, but cash flows can be adjusted	No, but cash flows can be adjusted	No, but cash flows can be adjusted	No, but cash flows can be adjusted	No, but cash flows can be adjusted	No, but cash flows can be adjusted
Dependence on availability of quality data	Dependent on availability of government bonds with same maturity and denominated in same currency both locally and internationally	Dependent on availability of data required to calculate Beta	Dependent on availability of data required to calculate equity volatility and country risk	Dependent on availability of data required to calculate equity volatility and company Beta, and country risk	Dependent on availability of data required to calculate Beta	Highly dependent on available quality data but uses global data alongside local data to account for possible lack of local information
Time Value of Money	Incorporated in identical maturities of bonds	Incorporated in risk free rate and final discount rate	Incorporated in risk free rate and final discount rate	Incorporated in risk free rate and final discount rate	Incorporated in risk free rate and final discount rate	Incorporated in risk free rate and final discount rate
Risk	Incorporates country risk in its entirety and does not identify sources of risk	Incorporated in Beta calculations but no unsystematic risk is accounted for	Incorporates country risk in its entirety	Incorporates country and company specific risk, systematic, and unsystematic risk	Incorporated in Beta calculations - no unsystematic risk is accounted for	Incorporated in Beta, and country risk but unsystematic risk is not accounted for
Framework for determination of variables	Same currency and maturity government bonds	Traditional format for calculating Beta, risk free rate and premium	Traditional format for deriving volatility and country risk spread	None for deriving company specific risk, rest have frameworks	Traditional format for calculating Beta, risk free rate and premium	Traditional format for calculating all variables included
Verifiable	Yes	Yes	Yes	Yes	Yes	Yes
Irrational investor	No	No	No,	No,	No	No,

	Solomon- Smith-Barney Model	Erb- Harvey-Viskanta Model	Estrada Downside Risk Model	Adjusted Cash Flows	Adjusted Multiples	APV Method	Real Options
Academic Assessment	No theoretical foundation	Methodologically Sound	Methodologically sound	Methodologically sound	Methodologically Sound	Methodologically sound	Methodologically sound (if valued like Financial Options)
Adjustment Mechanism	Qualitative Assessment of risk and yield spread	Country Risk Rating	Downside systematic risk	Cash flow scenarios	Heuristic correction factors	Different discount rates per variable	Comparable company volatility
Practical applicability	Easily understood but risk drivers need industry and political expertise to derive	Information must be extracted from external sources	Easily understood	Requires expert managerial knowledge	Easily understood	Easily understood	Difficult to single out options as separate factors
Easily Understandable	Simple to implement once drivers are derived,	Needs regular adjustment	Simple to implement	Prone to make biased estimates	Simple to implement	Tricky to derive bankruptcy costs	Tricky to identify options singly
Learning Effect	Able to visualise company specific parameters which define its riskiness	Discover how to derive cost of capital in the absence of CAPM	Discover another possible more precise risk factor	Forces valuers to quantify cash flow impact of country risks	Learn how one asset is valued very differently across markets	Illustrates various components that form the value	Understanding value effect of managerial flexibility
Acceptability by Valuers	Depending on valuers' willingness to use expertise to derive risk drivers, model could be widely accepted	May not be accepted widely by users as it is too controversial	Since basis of model is CAPM, it is likely to be widely accepted	Complicates cash flow forecasting and is highly subjective and thus may be rejected	May be rejected due to high level of subjective parameters	May be rejected due to problematic nature of deriving bankruptcy costs	Model is highly subjective and arbitrary and may be rejected.
Applicable in inefficient markets	Yes, uses global data and company specific factors	Yes, does not require equity market at all	No, uses systematic risk thus assumes efficient markets	Yes, involves adjusting cash flows which is possible in all markets	Yes, risk parameters are applicable in any market	Yes, if equity cost is derived using model applicable in efficient markets	Yes, measures management decisions which, do not need an efficient market
Dependence on	Uses global data, no	No ,applicable in	Dependent for	Does not	Only when using	Depends on	Highly dependent

availability of a stock market	comparable public companies are required.	countries with no equity markets	calculation of downside Beta	depend on existence of equity market	comparable company figures	formula for equity cost	on comparable companies' data
Adjust for inflation	No, adjust in cash flows	No, adjust in cash flows	No, adjust in cash flows	Yes	Yes	Yes	Yes
Dependence on availability of quality data	Prone to high subjectivity and qualitative nature of information makes it crucial to ensure accuracy of risk drivers	Can only be used if credit rating magazine is available	Highly dependent on information obtained from relatively efficient markets	Approach is highly subjective and prone to manipulation even if quality data is supplied	Highly dependent on quality cash flow data for accuracy	Highly dependent on quality cash flow data for accuracy	Reasonable dependence on quality data
Time Value of Money	Incorporated in maturity of bond used to obtain risk free rate and total discount rate	Incorporated into semi-annual credit rating from magazine and final discount rate	Incorporate in risk free rate and total discount rate	Incorporated in whichever discount rate will be used	Implied in "price" component of multiple	Incorporated in discounting of cash flows	Maturity of option is used to value option
Risk	Incorporated in Beta, country risk spread and company specific factors	Incorporated in adjusted credit rating	Incorporated in downside Beta	Incorporates risk in cash flows.	Incorporates risk by adjusting multiples	Incorporated in rates and bankruptcy costs	Incorporated when calculating volatility
Framework for determination of variables	No set framework for determining company specific factors	Country credit ratings from Institutional Investor magazine	Traditional method used in finance to calculate downside risk	No set framework to incorporate country risk; no consensus among academics	No framework or consensus on multiple used in estimating correction factor	Traditional framework used in all NPV models	Framework for methodology but no framework for identifying options explicitly
Verifiable	Problematic due to lack of set frameworks and use of extensive qualitative data	Yes	Yes	Problematic due to lack of set frameworks and use of extensive qualitative data	Problematic due to lack of set frameworks	Yes	Problematic due to lack of set frameworks and use of extensive qualitative data
Irrational Investor	No,	No	No,	No,	No,	No	No,

4.4. Introducing Behavioural Company Valuation in Emerging Markets

One very crucial criterion that all the previously discussed models failed to address effectively, was the ability to account for the impact that irrationality of participants has on the final value of the company. The assumption of universal rationality proposes managers will employ all relevant information that is available for their valuation and subsequent decision making (Kahneman and Tversky, 1979). The problem, however, is that these decisions are made by human beings and, as such, the decision making process will be subject to their cognitive aspects. Individual behavioural characteristics of the valuers can result in biased forecasts especially in firms where the authority to make decisions rests significantly on a single individual (Rangel et.al 2008). Several studies have been conducted to test and prove the irrationality of the human mind and its effects in corporate finance (Hopwood 1976, SchmiSlders 1970, Wilkins 1984 and so forth). However, apart from the Prospect Theory, not many theories have been developed that incorporate the psychological aspect of the decision makers (Shefrin 2009). The Prospect Theory states that market participants' choices in the absence of certainty, are based on perceived gains and losses versus rationally based criteria (Kahneman and Tversky, 1979).

4.5. Criteria for Evaluating Behavioural Company Valuation Models

There are two main types of users of such models; investors and managers. There is empirical research conducted which assesses both viewpoints (Kahneman and Tversky, 1979; Heaton 2002, Schrand and Zechman 2012 and so forth). The first view asserts that funders are rational and managers, who seek capital for investment purposes, are not. The second view states that investors, particularly those who participate in public capital markets, are irrational and managers thus make investment decisions taking this into account. Since private companies do not participate in public capital markets, this paper takes the funders' perspective under the assumption of irrational managers.

In light of the relatively new nature of this field of research, there has yet to be a widely accepted "best practice" behavioural valuation model. As such, this section will assess models which concentrate on most common biases found among managers, particularly during fund raising processes and investment decision making. Private company investors such as Private Equity funds often use information given by the target private company managers. Forecasted cash flows are projected by these managers using various assumptions which they themselves produce. Empirical evidence reveals that two of the most prevalent biases observed during

managerial cash flow forecasting and investment decision making, are overconfidence and excessive optimism (Heaton 2002; Baker et. al 2004; Hilary & Hsu 2011 and so forth).

4.5.1. Measuring Overconfidence

Overconfidence is *""The tendency of managers to overestimate their knowledge, abilities and the precision of their information, or to be overly sanguine of the future and their ability to control it."* (Ackert and Deaves 2009). Measuring managerial overconfidence is very difficult and this is further complicated by the lack of consensus regarding an appropriate measure. Park & Kim (2011) cite the "*Upward-biased earnings forecasts by managers"* method proposed by Lin et al (2005), Hribar & Yang (2013) and Huang et al (2011). They argued that overconfident managers were prone to make upward-biased earnings forecasts and used the EBIT forecasts to determine the Forecast Error (FE). If the number of upward-biases were more than downward-biases, the managers were defined as overconfident.

4.5.2. Measuring Excessive Optimism:

Optimism is defined by Ackert et al (2009) as a manifestation of overconfidence where managers display a tendency to assign extremely high/low probabilities to events when historical data is in contradiction to these probabilities. From this definition, and in the context of private equity, the producers of the projected cash flows, used in valuation, formulate their forecasts with the objective of depicting their company as financially stable and solvent, worthy of the potential funding that they may obtain from investors. As a result, they would overestimate their projections and thus true value of the company as well. The models discussed in the following section, will be assessed against the aforementioned criteria in chapter 4.2. In addition to those criteria, the following criteria will also be applied;

Table 6 Assessment criteria for effective Behavioural Approaches to Valuation

Criteria	Description
Acceptability by Valuers	Should have the potential to be widely acceptable in the industry to ensure that users of the final value and the valuers of the company do not dispute its accuracy.
Dependence on non-company specific data	Should not rely on non-company specific data as this would defeat the purpose of the model. Since the bias is specific to the manager, the model should incorporate data that is directly influenced by the manager in question.
Use objective variables	Should use variables that are objectively derived. Since these models measure the degree to which subjectively affect valuation, the variables cannot be subjective.

4.6. Comparison of Behavioural Approaches to Valuation

4.6.1. Hubris Hypothesis

Roll (1986) introduces his hubris theory which posits a rational investor-irrational manager approach where managers *"engage in acquisitions with an overly optimistic opinion of their ability to create value and potential synergies in a proposed takeover*". As a result, they overbid for target firms at the expense of their own shareholders. He displays overconfidence in two forms: first, he asserts that a corporate manager may overestimate the synergy gains of the potential merger based on his/her belief that his leadership skills are above average or from underestimating the downside of the merger. The Hubris hypothesis, assuming strong form efficiency, purports that, a) the combined value of the target and bidder firms should slightly fall, b) the value of the bidding firm should decline and c) the value of the target firm should increase. However, empirical evidence in his paper reveals that bidding firms sometimes increase and sometimes decrease. On the other hand, the values of target firms consistently increased only in instances where the bids were successful. He noted that there is no increase in value for target firms that do not eventually enter a corporate combination.

Roll concludes that available results from his study provide no reasonably convincing evidence against the hubris hypothesis. He states that bidders may indicate, by their actions, a belief in the existence of takeover gains, but systematic studies have provided little to show that such beliefs are well founded. He further notes that managers might act consciously against shareholder interests; however, he affirms that the hypothesis does not rely on this result. It is sufficient that managers act, de facto, against shareholder interests by issuing bids founded on mistaken estimates of target firm value. They overestimate the future returns from 'hand-picked' investment projects or the capitalized value of their future leadership. It should follow therefore, that overconfident bidders should experience lower returns than non-overconfident bidders in their acquisitions. Recent research by Malmendier and Tate (2008) supports this theory. The authors documented that overconfident managers are more likely to engage in acquisitions and obtain worse performance than non-overconfident managers

The hubris hypothesis however, does not quantify overconfidence for inclusion into a valuation. However, it does highlight the significance of factoring managerial irrationality into the valuation process.

4.6.2. Heaton Approach

In his research, Heaton (2002) studies the impact of managerial optimism on free cash flow forecasting. He found two distinct features of managers. First, that optimistic managers believed that capital markets undervalued their firm's securities and as such, do not undertake positive net present value (NPV) projects that must be financed externally. Secondly, optimistic managers overvalued their own corporate projects and invested in negative NPV projects despite their loyalty to shareholders. He asserts that *"If all managers are optimistic, and markets are efficient (or at least are less optimistic about particular firms than their managers), then shareholders may prefer large amounts of free cash flow to be retained by firms with good investment opportunities".* Thus, the managerial optimism theory links the benefits and costs of free cash flow to two variables namely: level of managerial optimism and; investment opportunities available to the firm.

4.6.2.1. Heaton's Optimism Theory explained

Heaton's theory is a simple three date-two period model. He begins his theory under the following assumptions;

- Assumption 1: Information about the firm's cash flows and investment opportunities are simultaneously available to the capital market and the managers.
- Assumption 2: Managers take all projects that they believe have positive NPV (including the perceived NPV of financing) and never take projects-including perquisite consumption-which they believe to have negative NPV.
- Assumption 3: The capital market is rational. Security prices always reflect discounted expected future cash flows under the true probability distributions.
- Assumption 4: The capital market is risk neutral and the discount rate is zero. There are no taxes and no costs of financial distress.

The project generates cash flows at date t=1 and date t=2. Cash flow at date t=1 is certain, and cash flow at date t=2 is uncertain. There is a "good" cash flow state (denoted as ${}_{G}Y_{2}$) and a "bad" cash flow state (Denoted as ${}_{B}Y_{2}$). Heaton uses probability theory where the sum of the probably of a good and bad outcome is 1 (i.e. ${}_{T}P_{G}+{}_{T}P_{B}=1$). The true probability distribution can be viewed as "the *actual probability distribution governing assets in the firm's industry".* The capital market is assumed to know the values of cash flows in t=1 and t=2 under both good and bad conditions as well as the probabilities of the cash flows in period t=2 (i.e. ${}_{T}P_{G}$ and ${}_{T}P_{B}$).

However, managers disagree about the probabilities of the t=2 cash flows. The firm then receives a new investment opportunity that will require an investment in t=1 of i. The payoff of the project at t=2 can either be high (denoted as r_H) or low (denoted as r_L). The probabilities of these payoffs (i.e. ${}_TP_H$ and ${}_TP_L$) as well as r_H and r_L are known to the capital market but once again, the manager disagrees on the market's accuracy about the probabilities. Heaton then derives the following definition

Definition 1: Managers are "optimistic" and exhibit "managerial optimism" when they perceive probabilities ${}_MP_G$ (managerial probability of a good outcome) and ${}_MP_H$ (managerial probability of a high payoffs from investment i) such that

$$ {}_MP_G > {}_TP_G : {}_MP_B < {}_TP_B \text{ and } {}_MP_H > {}_TP_H : {}_MP_L < {}_TP_L $$

At date t=2, the firm is fully operational and cash flows are distributed to security holders in accordance with the rights associated with their security. Heaton limits the security selection to; 1) risk-free debt, 2) risky debt, and 3) equity. Based on this definition, he derives the following results;

a. Managerial Perception of External Finance

The manager will always strictly prefer to issue risk free debt over equity issues. In cases where the manager must issue some risky security to finance the project, the manager will issue the security with the largest component of risk-free debt, equivalent to a preference for risky debt over equity.

b. Managerial Cash Flow Forecasts

Optimism leads the managers' forecasts to be biased. Consider managerial forecasts of cash flows in t=2 at t=0. While the best forecast is $E_T(y_2) = {}_TP_G * {}_Gy_2 + {}_TP_B * {}_BY_2$, the optimistic manager forecasts $E_M(y_2) = {}_MP_G * {}_GY_2 + {}_MP_B * {}_BY_2$ (where $E_M(y_2) > E_T(y_2)$).

c. Benefits for Free Cash Flow

The perception that risky securities are undervalued can lead to social losses that are alleviated by sufficient amounts of free cash flow. If the managers have internal funds, they will use this before raising external funds. Since capital markets are assumed to be efficient, there is never any overvaluation of the firm's external securities thus; managers never perceive gains from selling them. Therefore the net costs of issuing investments are always positive. If managers

decide to invest in positive NPV projects (excluding issuing costs), they will inevitably not invest if they mistakenly believe the costs of external financing are higher than the project NPV.

d. Costs for Free Cash Flow

Optimistic managers may invest in negative NPV projects that they believe are positive NPV projects. Whenever $E_M(r) > I > E_T(r)$, the optimistic manager wants to take negative NPV projects that he perceives to have positive NPV. His reluctance to utilize external financing leaves room for the use of free cash flow in two circumstances namely: when external funding is unavailable because the project's cash flows will not be sufficient to return the required rate of return for the particular security; and when the cost of financing outweighs the perceived positive NPV of the project. If either condition holds, and the firm has sufficient cash flows, the manager will accept the project, and the value of the firm will fall. In this case, access to free cash flow is detrimental.

e. Additional Implications

The managerial optimism model generates the following additional testable predictions; the existence of biased cash flow forecasts, the pecking order capital structure preferences, efforts to hedge corporate cash flow, even in the absence of significant asymmetric information, and lastly, takeover resistance. Heaton acknowledges that managerial optimism may have limits as a complete theory as it may not explain the rich results on announcement effects, or account for the importance of legal mechanisms that target rational agency problems and problems of managerial loyalty if used on its own, and without some amount of asymmetric information

Heaton's approach, although thorough, only provides insight into the impact of optimism on investment decision making. It does not quantify the bias which renders it ineffective for the purpose of this study.

4.6.3. Malmendier and Tate Approach

Malmendier and Tate (2005) study the relationship between managerial overconfidence and overinvestment. The authors argue that managerial overconfidence can account for corporate investment distortions. Overconfident managers overestimate their investment returns for the firm's projects and view external funds as excessive. As such, managers overinvest when the firm has excess internal funds, but curtail investment when external funding is required. Their study depicts that investment of overconfident CEOs is significantly more responsive to cash flow, particularly in equity-dependent firms

4.6.3.1. Malmendier and Tate Theory Explained

The authors' hypothesis is tested using panel data on personal portfolio and corporate investment decisions of Forbes 500 CEOs. The CEOs are classified as overconfident if they persistently do not strive to reduce their personal exposure to company-specific risk. CEOs compensation often includes large grants of stock and options. However, they are disallowed from trading their options or hedging their risk by short-selling company stock. Additionally, the value of their human capital is intimately linked to the firm's performance. As a result of this under-diversification, the authors, citing other research, stipulate that risk-averse CEOs should exercise their options as soon as their stock price is sufficiently high.

They then construct three measures of overconfidence, based on three questions: (1) Does the CEO hold his options beyond a theoretically calibrated benchmark for exercise? The benchmark is described as the "*minimum percentage in-the-money at which CEOs should exercise their options for a given year immediately following the vesting period"*. CEOs who persistently exercise options later than suggested by the benchmark, are considered overconfident in their ability to maintain the company's upward stock price trend and profit from said increases. (2) Does the CEO hold his options even until the last year before expiration? CEOs who are optimistic enough about the company's future performance, such that they defer exercising their options all the way to expiration (typically 10 years), are considered overconfident. (3) Does the CEO habitually buy stock of his company during the first five sample years? CEOs who habitually increase their holdings of company stock are also classified as overconfident The authors then develop a regression model of investment on; cash flow, the overconfidence measure, as well as the interaction of overconfidence and cash flow.

The results show a strong positive relation between the sensitivity of investment to cash flow and executive overconfidence with overconfidence being highly significant for all of overconfidence measures. This also implies that overconfident CEOs tend to invest more when internal funds are abundant. Further, the authors found that the sensitivity of investment to cash flow is strongest for CEOs of equity-dependent firms, for whom perceived financing constraints are most binding.

However, in emerging markets SMEs, most CEOs are founders or members of the founding family and do not have typical incentive schemes such as stock options. This might limit the applicability of this approach in emerging market private companies. Nonetheless, the model can be incorporated into a CAPM style model by multiplying the beta of the overconfidence

measure regressed on investment, with the market beta. However, there would have to be a mechanism of removing the portion of this risk that is found in the company beta. A framework for this mechanism would also need to be developed.

4.6.4. Baker et.al Approach

In Baker et.al (2004) the authors assess the impact of investor irrationality and managerial irrationality on corporate finance. For purposes of this research, the focus will be on the latter. In their irrational managers approach, the authors develop a simple model to demonstrate how managerial optimism and overconfidence, in leading managers to believe their firms are undervalued, encourage overinvestment from internal resources, and a preference for internal finance (particularly internal equity) over external finance with a least preference for external equity. In this approach, the primary difficulties for empirical tests include; (a) distinguishing predictions from standard, non-behavioural models, and (b) empirically measuring managerial biases. The authors discuss various propositions for measuring irrationality but do not propose a measure of their own. They only conclude by asserting that if the main source of irrationality is on the managerial side, efficiency requires reducing discretion and obligating managers to respond to market price signals.

4.6.4.1. Baker et.al Explained

The authors' approach is derived in the spirit of Heaton (2002) and Malmendier and Tate (2005). They begin with the assumption that the manager is optimistic about the value of the firm's assets and investment opportunities. Based on this, the manager then balances two conflicting goals. The first is to maximize perceived fundamental value. To capture this, they augment the enterprise value with an optimism parameter γ such that the NPV of a firm is;

$$(1+\gamma)\, f(K,\cdot) - K,$$

Where

- $f(K,\cdot) - K$,=NPV of the firm

The manager's second goal is to minimize the perceived cost of capital. As a basis, the authors assume that the manager acts on behalf of existing investors, because of his/her own equity in the firm as well as his/her fiduciary duty with the exception that such a manager believes there is never an optimal time to issue equity. In particular, since the capital market is efficient it will

value the firm at its true fundamental value. However, since the manager believes that the firm is undervalued, selling a fraction of the firm will be detrimental to existing shareholders.

Based on their simplified model, the authors make two conclusions about the aforementioned conflicting goals. The first condition is about investment policy. The more optimistic the manager and the less equity he/she is forced to raise in financing investment, the greater the problem. The second condition is about financing. The marginal value lost from shifting the firm's current capital structure away from equity is weighed against the perceived market timing losses. To assess this, the authors consider special cases.

a. Investment policy.

If there is no optimal capital structure, and the manager refuses to issue equity, assuming no interaction between financing, internal funds, and investment, the optimistic manager will overinvest. They refer to Heaton (2002) and Malmendier and Tate (2005), who state that there is an optimal capital structure (i.e.. an upper bound on debt). Therefore, if the manager needs equity to invest the degree of overinvestment will decrease.

b. Financial policy.

The optimism theory predicts a pecking order of financing decisions: The manager relies on internal capital and debt and uses outside equity only as a last resort. Exceptions can occur, for example, if the manager is risk averse with an undiversified position in the firm's equity, he/she will buy at a price he believes to be less than the firm's worth.

Unlike Heaton (2002) and Malmendier and Tate (2005), the authors do not attempt to quantify managerial overconfidence which places the approach in a similar position as the Hubris hypothesis.

4.6.5. Lin, Hu and Chen Approach

This study assesses the same relationship as Mamadier and Tate (2005) however, with a different approach. Lin et. al (2005) examine the relation between managerial optimism (derived using management earnings forecasts) and corporate investment decisions, by using a sample of listed companies in Taiwan. Similar to the results found in Mamadier and Tate (2005), their results show that in more financing constrained firms, optimistic managers exhibit higher investment–cash flow sensitivity than non-optimistic managers.

4.6.5.1. Lin Hu and Chen Theory Explained

Lin et. al (2005) measure managerial optimism from their earnings forecasts. The measure is helpful to test the theoretical predictions for the behaviour of optimistic managers. Given that a CEO's optimism in assessing future outcome is likely to result in upwardly-biased forecasts, the authors classify whether a CEO is optimistic if *"he/she has at least two forecasts and define a CEO to be optimistic if there are more upwardly-biased forecasts than downwardly-biased forecasts during the CEO's tenure".* They define forecast as upward biased if the forecast error is positive. Each CEO is classified as optimistic if the number of the CEO's upwardly-biased forecasts is more than that of the downwardly-biased forecasts. Forecast error is depicted as:

$$FE=EBT_{M)}-EBT_{A}$$

Where:

- EBT_M: Managers forecast for earnings before tax
- EBT_A: Actual earnings before tax

An obstacle of the classification is that CEOs may have reasons other than optimism to deliberately bias their forecasts. To avoid this, Lin et. al (2005) eliminate biased forecasts that may be influenced by effects such as stock offerings, financial distress, and insider trading to remain with a sample of 69% of the CEOs being classified as optimistic.

The authors investigate the extent to which managerial optimism provides a satisfactory explanation for the investment decisions of listed Taiwanese firms; focusing on whether cash flow plays a relatively more significant role in investment decisions for optimistic managers, than for non-optimistic managers. Several classifications are utilized to identify whether firms are constrained. They then regress the investment on; cash flows, the optimism measure, and the interaction of optimism and the cash flow using the more constrained firms. Their results are similar to those found in Mamadier and Tate (2005), that optimistic managers display higher investment–cash flow sensitivity than non-optimistic managers. Their findings also dismiss the possibility that the result is due to agency[3] and information asymmetry[4] theories. The authors' approach has several advantages. Firstly, its simplistic nature allows it to easily be integrated into the valuation process as the optimism measure is explicitly derived. Mechanisms to

[3] Agency theory is a supposition that explains the relationship between shareholders and managers in a company. The two problems the theory addresses are: 1) the conflicting objectives that may arise between shareholders and managers which the shareholders are unable to identify or verify and 2.) problems that arise when both have different attitudes towards risk. These problems may cause managers, who should act as agents for the shareholders, to make decisions which are not in the interest of shareholders (Damodaran 2001).

[4] Information asymmetry theory addresses the problems that arise when managers and shareholders do not have the same amount of information available to them at the same time (Damodaran 2001).

incorporate it might differ among academics but the method of quantifying the optimism measure may remain the same.

4.6.6. Everett and Fairchild Approach

Everett and Fairchild (2014) present a theoretical analysis of business ventures that investigates the relationship between overconfidence and successful outcomes (in the form of acquisitions and/or IPO). The authors found that overconfidence produces two conflicting effects on the probability of a successful exit: firstly, it encourages an entrepreneur to increase the riskiness of a venture thus lowering likelihood of a successful exit; secondly, it conversely drives higher entrepreneurial effort, which increases the likelihood of a successful exit. As a result of this conflict, the authors find that a U-shaped relationship exists between overconfidence and successful exits. Additionally, their model, along with their empirical findings, proposes that increased external equity mitigates the negative effects of overconfidence.

4.6.6.1. Entrepreneurial Overconfidence Theory Explained

The authors derive a measure of overconfidence in two ways. Firstly, they utilise changes in entrepreneurial actions. This change may be attributable to increased acclimatisation and knowledge of the business or an escalation of commitment. This method is far more difficult to apply. Second, the authors use the entrepreneur's decision to start a new business venture in conditions where business failure is rife (i.e. high industry failure rates in the sample). Based on these definitions, along with empirical evidence, the authors develop the following hypotheses:

- Hypothesis 1: There exists a curvilinear relationship between overconfidence and the probability of a successful outcomes,
- Hypothesis 2: The negative effects of overconfidence may be mitigated by outside equity, perhaps due to monitoring or other controls.

The authors assert that irrational, entrepreneurs either overestimate their personal ability to succeed inspite of long term negative odds, or alternatively, believe these negative circumstances are short term. They attribute the distortions to attribution bias[5]. This breeds overconfidence which can lead to inefficient management actions, such as overinvestment.

[5] Attribution bias refers to "the tendency to attribute good outcomes to our superior ability, while attributing bad outcomes to bad luck or other external forces" Everett and Fairchild (2014)

Conversely, overconfidence increases motivation levels, which could mitigate some of the adverse effects it causes.

The insight that may be drawn from the first hypothesis is that new ventures may be best managed by people that are either perfectly rational about their own abilities or else managed by someone highly overconfident. The authors find empirical results which suggest that success may be more limited for managers that are between the two extremes. Furthermore, the authors purport that outside equity mitigates the ill decision-making effects of overconfidence while enhancing the motivation of the founder/entrepreneur. These relationships are tested using data from more than two thousand startup firms supplied by the Kauffman Firm Survey. Interestingly, their findings do not support their hypothesis, but they attribute this to the short time horizon of their study Their results show that outside control of the firm limits the life of the firm by encouraging both successful exits and prompting failures. However, the fact that findings do not support their hypothesis is troubling. Furthermore, if the model requires long periods of analysis in order to yield desired results, it might prove limiting for implementation in emerging market private companies with limited historical information.

4.6.7. Hilary & Hsu Approach

In this study, Hilary & Hsu (2011) extend the study by Lin et. Al (2005) and examine whether attribution bias leads managers who have experienced short- term forecasting success to become overconfident in their ability to forecast future earnings. Treating overconfidence as endogenous, with an intensity that varies with the length of success, they also examined the effect of this bias on the managerial credibility. They found that managers who had predicted earnings accurately in the previous four quarters were less accurate in their subsequent earnings predictions. Finally, they found that after controlling for manager fixed effects, both investors and financial analysts place less weight on the forecasts issued by managers who have recently made a series of accurate predictions which reveals their reluctance to believe that their accuracy will persist.

4.6.7.1. Hilary and Hsu Theory Explained

The authors assert that a combination of self-attribution and overconfidence produces a dynamic concept of overconfidence in which managers becomes overconfident in their ability to predict future earnings after a series of good predictions. This then results in suboptimal behaviour, whereby managers overweight on their own private information and underweight public signals. Therefore, the subsequent forecast of a manager with a series of successful historical predictions is more likely to deviate from an optimal forecast derived by a less biased manager leading to a forecast that is less accurate on average. They thus hypothesize the following;

- H1- The management forecast accuracy of a given manager decreases after a series of accurate forecasts.

The above hypothesis may also reduce the likelihood that an overconfident manager's subsequent forecasts will be superior to analyst forecasts. However, in their study, the authors find that overconfident managers do not necessarily underperform other managers or analysts unconditionally; rather, they underperform relative to their own performance (i.e., expected performance in the absence of overconfidence). In other words, the theory describes time-series behaviour, rather than making cross-sectional predictions.

The authors also assess the reaction of the users of management forecasts to the forecasts of overconfident managers. These users may be expected to assign greater weight to forecasts issued by historically more accurate managers. In other words, a manager's past performance enables analysts to ascertain that manager's skill and, accordingly, overweight on their forecasts relative to other public signals received. However, the authors argue that if the above hypothesis is true, and market participants recognize this behaviour, there will be minimal market reaction to the forecasts of that manager (assuming managerial skill remains constant).

This leads to their second set of hypotheses.

- H2a- Investor reactions to the management forecasts issued by a given manager weaken after that manager has issued a series of accurate forecasts.
- H2b- Financial analyst reactions to the management forecasts issued by a given manager weaken after that manager has issued a series of accurate forecasts.

The model provides insight into the interactions between managers and investors in imperfect capital markets. However, the approach is not practical for private company valuation,

particularly in emerging markets. Furthermore, the authors do not attempt to quantify their optimism measure which renders this approach obsolete for the purpose of this study.

4.6.8. Assessment of Behavioural Valuation Models against Criteria

The models assessed were primarily examining the impact of overconfidence on corporate finance related activities such as forecasting, valuation and investment decision making. None of the models were directly defined as a behavioural DCF valuation method. As such, the approach in assessing them would revolve around three primary objectives; a) the ability to objectively and reliably quantify the bias in question (i.e. overconfidence or optimism), b) the ability to adjust the model to incorporate the optimism/overconfidence variable into a CAPM-like model, and c) can the adjusted model (or at the very least, the behavioural variable) be used in inefficient markets with poor quality of information. In terms of the first objective, all models, with the exception of the hubris theory and Hilary and Hsu (2011), were able to quantify overconfidence. However, Heaton (2002) and Baker et.al (2004)) did not provide a defined framework for measuring the variables. They simply provided for a measure of quantifying overconfidence. Baker et. al (2004) simply provided for a (1+y) optimism parameter to adjust the NPV of an investment opportunity. The authors did not allude to a possible calculation or derivation of the y variable. Heaton (2002) further complicates this by having several unknown factors such as probabilities with no defined framework for deriving them. Hilary and Hsu (2011) did not provide a method to quantify overconfidence and instead proposed hypotheses based on findings from surveys.

The second objective is even more difficult to achieve. As CAPM is essentially a regression model, the measure of overconfidence or optimism would have to be one that can be incorporated into a multi linear regression model with a behavioural variable which can be added or multiplied.

Malmendier and Tate (2005), Lin et. al (2005), and Everett and Fairchild (2014) were the only authors who created models or variables which could be adjusted to suit this purpose. Lin et.al (2005) were the only papers that created a model most practical enough for incorporation into CAPM. The third objective was expectedly achieved by most models with the exception of Baker et.al (2005) and Roll (1986). Behavioural models in essence study irrationality of market participants. This essentially relaxes a major assumption in the efficient market hypothesis. However, for the study of the irrationality of a particular market participant (in this case

managers) one must assume all other market participants are rational and make decisions after taking the irrationality of the participant in question into account.

The one major criticism of these models is their complexity. A complex model is less practical and prone to subjectivity or calculation errors which could lead to severe misevaluations. Furthermore, most of the models do not encourage valuers to adopt the model. This thus reduces the model's probability of success as a solution to company valuation in imperfect markets and/or by imperfect users. A more comprehensive comparison of the models is found in the following table.

Table 7 Assessment of Behavioural Approaches to Valuation and Investment Decision Making

	Roll	Heaton	Baker et.al	Malmendier and Tate	Lin et. al	Everett and Fairchild	Hilary and Hsu
Academic Assessment	Theoretically sound	Theoretically sound	Theoretically sound	Theoretically sound	Theoretically sound	Empirical findings do not support findings	Empirical findings do not support findings
Adjustment Mechanism	Not simple to incorporate into CAPM as it does not quantify overconfidence	Not simple to incorporate into CAPM as it does not quantify optimism	Regression of overconfidence against cash flow. Can add in into CAPM	Regression of overconfidence against cash flow. Can add in into CAPM	Regression of overconfidence against cash flow. Can add in into CAPM	Regresses overconfidence against probability of a successful exit	Assesses effect of overconfidence on forecasting ability. Can be adjusted to suit CAPM
Practical applicability	Relies on announcements and market prices and is thus not applicable for private companies	Relies on market consensus but applicable for private companies if many appraisals are obtained	Uses firm NPV irrespective of whether the company is listed or not	Uses CEO investing behaviour and perceptions and thus applicable in private firms	Uses managerial forecasts against subsequent actual cash flows to analyse trends in forecast errors	Uses entrepreneurial behaviour and probability of successful exits	Uses managerial forecasts against actual cash flows to analyse trends in forecasted error
Easily Understandable	Yes	Simple to understand but difficult to apply.	Simple to understand but difficult to apply.	Understandable and applicable	Understandable and applicable	Difficult to apply	Understandable and applicable
Learning Effect	Assesses reasons for overpricing of entities during bidding of mergers	Compares valuations from objective sources with manager's data	Shows impact of managerial overconfidence on investments and cash flows	Shows impact of managerial overconfidence on investments and cash flows	Shows impact of managerial overconfidence on investments and cash flows	Asses impact of overconfidence on probability of successful exit	Assess impact of managerial overconfidence on earnings forecasting
Acceptability by Valuers	Not practical for unlisted firms.	May be acceptable as it incorporates certain level of prudence.	May be acceptable once overconfidence can be quantified	Acceptable if using consensus benchmark	Acceptable as it is simple to measure	Acceptable if 2nd overconfidence measure is used	Acceptable with minimal complications
Applicable in inefficient markets	No. Assumes market efficiency	No assumes markets are efficient	No assumes markets are efficient	Yes, no stock market needed	Applicable as it uses managerial forecasts against actual forecasts	Applicable as it does not rely on stock market	No, relies on analyst reactions

Dependence on availability of a stock market	Highly dependent on efficient stock markets	Relies on stock market unless there is a market of appraisers	No stock market required	No stock market required	No stock market required	No stock market required	Relies on stock market unless there is a market of appraisers
Dependence on availability of quality data	Highly dependent on quality market and micro data	Highly dependent on market perception about company	Highly dependent on accurate firm values	Highly dependent on CEO investments information and firm value	Dependent on availability of reliable financial statements that depict true cash flows of firm	Does not use financial information but relies on existence of industry measure	Dependent on availability of reliable financial statements that depict true firm cash flows
Risk	Identifies risk but cannot quantify it.	Identifies overconfidence risk on cash flows and investment	Identifies overconfidence risk on firm value	Identifies overconfidence risk on cash flows and investment	Identifies overconfidence risk on cash flows in investment	Identifies overconfidence risk on likelihood of successful exit	Identifies overconfidence risk on forecasting accuracy
Framework for determination of variables	No framework provided.	No framework for deriving market probability of outcomes	No framework for deriving optimism measure.	Defined framework for overconfidence	Defined framework for overconfidence	Two frameworks for deriving overconfidence	Defined framework for overconfidence
Rationality	Assumes rational investors and irrational managers	Assumes rational investors and irrational managers	Assumes rational investors and irrational managers	Assumes rational investors and irrational managers	Assumes rational investors and irrational managers	Assumes rational investors and irrational managers	Assumes rational investors and irrational managers
Dependence on non-company specific data	Uses both market and micro data	Uses market data on forecasted outcomes of cash flows	Uses market data on firm value	Uses market data on forecast cash flows	Does not rely on any non-company specific data	2nd approach uses industry benchmarks	Does not rely on any non-company specific data
Use of objective variables	Uses objective variables to determine overconfidence	Probabilities are not objectively determined	No framework for deriving optimism therefore cannot assess objectivity of measure	Variables are objectively derived	Variables are objectively derived	Variables are objectively derived. but length of analysis period not defined	Variables are objectively derived. but length of analysis period is not defined

4.7. Assessment of the Best Principle Models

The emerging markets valuation methods discussed, were very distinct from the conventional methods used in developed economies. They all covered various important characteristics of emerging markets; yet there is no single model that comprehensively accounts for all risks identified in emerging markets and there is little to be done. Nonetheless, all the emerging markets models have met the fundamental criteria of incorporating risk and the time value of money. Some of them were so dependent on the availability of a stock market, that they could not be adjusted appropriately to suit private company valuation. Based on the outcomes of the assessment of emerging markets models, the Goldman Sachs model was found to be the most appropriate as it explicitly incorporates the countrywide, market and company specific risk factors that have an impact on a company's value.

The Goldman-Sachs model is easily understood and most risk factors can be calculated provided information is available. However, it offers no framework for some of the variables which lend themselves to subjectivity of the valuer. This can yield differing results and limit comparability across practitioners. Furthermore, the model uses the U.S Treasury Bill yield as an appropriate proxy for the global risk free rate and global market risk premium which has already been rendered inaccurate in the previous chapter.

One very crucial criterion that all the previously discussed emerging market valuation models failed to address effectively, was the ability to account for the effects of irrationality on the final value of the company. The assumption of universal rationality proposes managers will employ all relevant information that is available for their valuation and subsequent decision making (Ackert et.al. 2009). The assessment of behavioural approaches to valuation yielded some insights into the effect of managerial bias on this process. Some approaches went as far as to quantify this bias and analyse its impact on valuation related activities or even the fundamental value of the firm. Of all models evaluated, the Lin et.al (2005) approach was preferred as the most appropriate as both a variable that reliably measures and quantifies managerial overconfidence.

Lin et. al (2005) derived their optimism model by calculating a Forecast Error between a manager's forecasted EBT and the actual (resulting) EBT. In the event that a manager with two or more forecasts has more upwardly biased forecasts than downwardly biased forecasts, the manager was said to be overly optimistic. This optimism measure was denoted by the number one and was then regressed against cash flows and investment activity of the manager. The

measure however is difficult to include in a multifactor valuation model in its current form. Nonetheless, the method of quantifying managerial overconfidence is not difficult to apply. The variable is simple to compute, is objectively derived and has a defined framework that uses company-specific information only, which limits the influence of other factors on its size.

4.8. Adapting Behavioural Valuation in Emerging Markets to suit Private Companies

"Public ownership involves publicly traded shares and public corporate governance, with diffused ownership and control. Private ownership operates without a market listing and involves private contracting, typically with concentrated ownership and control. That is, private and public ownership differ along two dimensions namely, investor liquidity and the allocation of control between managers and investors, which is determined through corporate governance." (Boot et. al 2006). It is this difference in liquidity and control elements which gives differences in valuation methodologies. Furthermore, a significant influencing factor that differentiates the valuation methods between the two company types is the purpose of valuation. This becomes more important in privately held companies than in public companies. In many instances, public company investors value a public company to simply determine over and undervaluation in order to recommend long, short and hold positions (Copeland et.al 2000).

Private company investors have several intentions behind valuations such as a merger transaction or a leveraged buyout, economies of scale, economies of scope, or different perceptions about the industry and the company. Other purposes include strategic decisions on business units/ products/ business lines/ countries/ customers and so forth, to continue, sell, merge, grow or buy. The valuation can also provide a means for measuring the impact of the company's strategies and policies on value creation and destruction (Fernández: 2007).

The Goldman Sachs and Lin et. all models are both developed for use by public companies. However, Lin et al (2005) do not limit the application of their model to public companies. Since the model measures managerial overconfidence and its impact on corporate finance, it can be implemented on both listed and unlisted companies. On the other hand, the Goldman Sachs model does not adjust for incorporation into private companies. However, there is are possible accepted methods of adjusting conventional models to reflect the additional risks associated with investing in private companies. The Goldman Sachs model is depicted below

$$R_E = R_{f,U.S.} + (RS + RC) + (\sigma_L/\sigma_{U.S.}) \times ß_{S,L} \times MRP_{U.S.} \times (1 - corr(S,B))]$$

In order to adapt the model for use in private companies, the conventional approach would be to alter the variables relating to the company itself, i.e. the beta. The company beta can be derived using a listed comparable company, the $ß_{S,}$ will have to be adjusted to reflect a private company beta. (Damodaran: 2001). The derivation of beta requires the use of past prices to determine systematic risk. However, since private companies do not have publicly listed share prices, comparable company information is used. In order to determine whether companies are comparable, one possible method involves determining a correlation between the revenues or operating income of the comparable firms and the firm being valued. If there is a high positive correlation, the companies are considered to be comparable (Damodaran: 2001).The process thereafter follows the following steps;

1. Estimate the average market value debt-equity ratio of these comparable firms.
2. Estimate the average $\beta_{levered}$ of these comparable companies.
3. Calculate the unlevered beta for the business.
   i. $\beta_{unlevered}=\beta_{levered}/(1+(1\text{-tax rate})\times(\text{Debt}/\text{Equity}))$
      Where: $\beta_{levered}$ = Average β of the listed comparable companies
4. Estimate a debt/equity ratio for the private company, using one of two assumptions:
   i. It is assumed that the private firm will move to the industry average debt ratio, therefore the beta for the private firm will converge on the industry average beta.
      - $\beta_{private\ company} = \beta_{unlevered}(1 + (1 - \text{tax rate})$ (Industry Average Debt/Equity)
   ii. The Debt /Equity ratio will be an estimate of the optimal debt ratio for the private firm, based upon its operating income and cost of capital.
      - $\beta_{private\ company} = \beta_{unlevered}(1 + (1 - \text{tax rate})$ (Industry Optimal Debt/Equity)
5. Estimate a cost of equity based upon this beta.

Alternatively, one can obtain an accounting beta by regressing the earnings of the private company against the earnings of an index for as many periods as one can find (Damodaran 2001). However, according to Damodaran (2001), this method has two major drawbacks. The first is that the use of accounting earnings is subject to manipulation and smoothing. Furthermore, private companies do not have to adhere to international reporting standards. As such, the accounting figures cannot be safely relied upon, particularly in emerging markets. Secondly, some private firms may have not existed long enough to have a sufficiently long time period to reliably determine an accurate beta. He suggests that alternatively, one could use

cash flows as opposed to earnings, as they are less prone to manipulation. However, the derivation of the market theoretical cash flows may be difficult to compute in markets where local indices are not available or where price to cash flow ratios are not published by the particular stock exchange. Both approaches are used in industry with the first approach regarded as preferred (Copeland et.al 2000).

The Lin et. al model, although fairly simple to compute, would need to be modified somewhat before it can be incorporated into the above model. This avenue can be researched further. The principle however, remains, that in an imperfect market such as an emerging market, universal rationality cannot be an assumption for an effective emerging market model and as such, managerial irrationality will have to be factored into company valuation, particularly if the company is unlisted.

5. Areas of Future Research

The Goldman-Sachs model adjusts the cost of equity by incorporating countrywide and company specific risk factors. However, the model uses U.S data as the benchmark as opposed to variable proxies that are more globally representative. Future research should modify this approach and incorporate more globally diverse proxies. More specifically, variables can be derived in the following manner;

a. RC can be calculated as the yield spread between the World Bank dollar denominated Global Bond and the local dollar denominated Government bond,
b. $R_{f\,U.S}$. can be changed to the yield on the World Bank Global Bond. (i.e. $R_{f,G}$),
c. ($\sigma_L/\sigma_{U.S}$.) can be calculated as the daily volatility of the emerging stock market index over the volatility of the global equity index. (i.e. σ_L/σ_G.) and lastly
d. $MRP_{U.S}$ can be changed to a global equity index Market Risk Premium (MRP_G) which is the difference between the expected return on the global equity index and the global bond yield

Although the study is applicable to private companies, the model's success is best tested using public companies. If the model is more successful with public companies, it can follow that the model can be equally successful when applied in private companies. It can be adjusted by using the most appropriate method from the options specified in section 4.8.

It was previously mentioned that the Lin et. al (2005) model can also be incorporated into the Goldman Sachs model. However, in the current state, the model measures optimism by calculating a forecast error between a manager's forecast EBT and the actual resulting EBT. In the event that a manager with two or more forecasts has more upwardly biased forecasts than downwardly biased forecasts, the manager is said to be overly optimistic.

This optimism measure is denoted by the number one. This method, in its current state, is not sufficient to incorporate into the Goldman Sachs model. A possible alteration can be achieved by regressing managerial EPS forecast errors (in percentage change form) against consensus EPS forecast errors (in percentage change form). Since the authors assume that markets are efficient, it would follow therefore that analysts are not overconfident and thus the deviation between their forecasts and the subsequent actual values, would be driven by factors other than biases. As such, one can infer that the "excess deviation" would reflect managerial overconfidence. Based on this assumption, the Overconfidence Risk Beta can be derived.

Having made the aforementioned adjustments, the final model that provides a possible solution to behavioural private company valuation, can be as follows;

$$R_E = R_{f,G}. + RC + [(\sigma_L/\sigma_G.) \times \beta_{S,L} \times \beta_{Behavioural} \times MRP_G.x\ (1 - corr\ (S_L,B_L) \times (1 - \lambda)]$$

Where:

a. RC: yield spread between the World Bank dollar denominated Global Bond and the local dollar denominated Government bond,
b. $R_{f,G}$: World Bank Global Bond yield,
c. (σ_L/σ_G): is calculated as the daily volatility of the emerging stock market index over the volatility of the global equity index,
d. MRP_G: is a global equity index Market Risk Premium which is the difference between the expected return on the global equity index and the global bond yield,
e. $ß_{S,L}$: is calculated as the beta of the local index EPS, calculated as the product of the local equity index Price/ Earnings multiple and the Index price, and the company EPS,
f. RS: is eliminated as company specific risk is incorporated in $ß_{S,L}$,
g. $\beta_{Behavioural}$: is the regression coefficient of managerial EPS forecasts against consensus EPS forecasts, and lastly
h. λ: is the component of total unsystematic risk which relates to managerial irrationality.

The model would have to be restricted by several assumptions, some of which include the following;

a. emerging markets, although inefficient, do have existing equity markets,
b. a global index (value weighted and recognised as a valid proxy) is used,
c. the emerging market economy, within which the company concerned operates, is at least partially integrated,
d. every company is equally exposed to country risk and
e. the cash flows forecasts are estimated by one person over the valuation period.

This approach is however, not without faults. It can be argued that a portion of unsystematic risk comprises the risk of managerial overconfidence. Although the abovementioned λ variable is meant to address this double counting of risk, a framework would have to be derived on how it should be computed. Furthermore, it would be difficult to apply the $\beta_{Behavioural}$ in private company valuation as it would require consensus analyst EPS forecasts which may be unavailable, particularly for small companies. Additionally, it would require a manager's historical forecasts

as the beta variable is computed using historical forecasts over time. Even if surveys would be used, the analyst would first need to compile survey results for several years prior to incorporating this beta into the valuation. Other avenues should be explored further in future.

6. Conclusion

Emerging markets are characterised by high GDP growth, resilient capital markets and increasing net direct investments (BlackRock: 2010). The economies are driven by SMEs who are predominantly unlisted. These companies are highly innovative, increase competiveness, which results in lower prices and higher quality outputs, are associated with dynamism, show more equitable income distribution and provide the bulk of the respective country's employment.

However, these companies operate under severe challenges which include (a) underdeveloped or inconsistent infrastructures (roads, power supply, clean water supply, sewer facilities, telecommunications, internet penetration); (b) tougher operating conditions for products and equipment created by the above factors as well as by heat, dust, noise, lack of sanitation and other ambient conditions; (c) underdeveloped or inefficient logistics and distribution facilities characterized by local monopolies and; (d) lower levels of access to capital and to consumer credit and regulated, quasi-sheltered or untapped markets (Veliyath & Brouthers 2010).

Yet, in spite of these difficulties, these companies form exceptional investment targets due to their ability to innovate, customize products and services, develop business models that overcome bottlenecks, exploit lower cost talent and factor inputs, build and exploit economies of scale and scope, reduce complexity and overcome negative country-of-origin perceptions. These unique characteristics and challenges affect the ability to accurately value the companies in the emerging market climes.

Important risk factors such as; political, currency corporate governance and information risks, amongst others, should be factored in during the valuation process (Klapper and Love 2004, Damodaran 2006 and so forth). Taking this into account, several criteria were obtained from previous academic publications (Babbel & Merill 1998, Penman & Sougiannis 1998, Damodaran 2006 and so forth) to assess a model's ability to effectively incorporate them. Using these criteria, thirteen emerging market company valuation models were assessed.

The emerging markets valuation methods assessed, were very distinct from the conventional methods used in developed economies. They all covered various important characteristics of emerging markets; yet there was no model that factored in all risks identified in emerging markets. Some models, ranging from the Espinosa model to the Salmon-Smtih-Barney model, attempted to reduce the effect of double counting of the various risk elements however, were

unable to do so for every possible risk. Nonetheless, all the emerging markets models met the fundamental criteria of incorporating risk and the time value of money.

Some of them were so dependent on the availability of a stock market that they could not be adjusted appropriately to suit private company valuation. Based on the outcomes of the assessment of these models, the Goldman Sachs model was found to be the most appropriate as it explicitly incorporated the countrywide, market and company specific risk factors.

The Goldman-Sachs model is easily understood and all risk factors can be calculated provided information is available. However, it offers no framework for some of the variables which lend themselves to subjectivity of the valuer. This can yield differing results and limit comparability across practitioners. Furthermore, the model uses the U.S variables as appropriate proxies for global variables which may be inaccurate taking into account the impact of the 2008 global recession on the U.S economy relative to the rest for the world.

None of the models explicitly factored in irrationality of market participants. In order to address this, the study focused on seven behavioural approaches to valuation under the assumption of investor rationality and managerial overconfidence and/or optimism. The purpose was to assess the models against the above criteria along with three added criteria that specifically address behavioural valuation, and determine one which could be incorporated into the previously determined “best fit” model. In other words, the intention was to assess possible mechanisms used in literature, to include behavioural risk into the Goldman Sachs model.

The assessment of behavioural approaches to valuation yielded some insight into the effect of managerial bias on this process. Some approaches went as far as to quantify this bias and analyse its impact on valuation related activities or even the fundamental value of the firm. Of all models evaluated, the Lin et.al (2005) approach was adjugded most appropriate as it yields a variable that reliably measures and quantifies managerial overconfidence.

Lin et. al (2005) derived their optimism model by calculating a forecast error between a manager’s forecast EBT and the actual resulting EBT. In the event that a manager with two or more forecasts has more upwardly biased forecasts than downwardly biased forecasts, the manager was said to be overly optimistic. This optimism measure was denoted by the number one and was then regressed against cash flows and investment activity of the manager. This measure however is difficult to include in a multifactor valuation model in its current form. Nonetheless, the method of quantifying managerial overconfidence is not difficult to apply. The

variable is simple to compute, is objectively derived and has a defined framework that uses company specific information only which limits the influence of other factors on its size.

The third objective was to assess mechanisms of adapting these two models for private company valuation by discussing approaches currently used in academia and corporate finance. The preferred method involved adjusting the beta by using an unlevered comparable company composite beta and re-levering this using the private company's target or current corporate structure and specific country's tax rate.

The final chapter proposed a possible means of combining the three objectives, and assessing the success of doing so, as an area for further research. Suggestions for doing so included adjusting the Goldman Sachs model to use global variables such as global equity index returns and Beta as opposed to using U.S data as a proxy for global data. A further suggestion involved testing the model using public companies at first. If the model was more successful with public companies, it would follow that the model can be equally successful when applied in private companies by adjusting the company beta as discussed above. A suggestion for incorporating the Lin et. al model involved regressing managerial EPS forecast errors) against consensus EPS forecast errors. Since the authors assumed that markets are efficient, it would follow therefore that analysts are not overconfident and thus the deviation between their forecasts and the subsequent actual values, would be driven by factors other than biases. As such, one could infer that the "excess deviation" would reflect managerial overconfidence.

The altered model would have to be restricted by several assumptions, some of which included the following; (a) emerging markets, although inefficient, do have existing equity markets, (b) a global index (value weighted and recognised as a valid proxy) is used, (c) the emerging market economy, within which the company concerned operates, is at least partially integrated, (d) every company is equally exposed to country risk and (e) the cash flows forecasts are estimated one person. This model would not be without faults. It could be argued that a portion of unsystematic risk comprises the risk of managerial overconfidence and as such, the model would have to be adjusted for double counting of risk. However, a framework for doing so was not suggested and would have to be determined by future research. Furthermore, it would be difficult to apply the behavioural beta in private company valuation as it would require consensus analyst EPS forecasts which may be unavailable, particularly for small companies. Additionally, it would require a manager's historical forecasts as the beta is computed using historical forecasts over time. Other more efficient avenues would need to be explored further.

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