Valuation in Emerging Markets

- The Applicability of Conventional Valuation Techniques under the Economic Conditions of Developing Countries

Author of paper:
Moritz David Gimpel
CPR: REMOVED
mogi08ab@student.cbs.dk

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Supervisor:
Jens Borges
External lecturer, Msc. (Econ)
N. Jespersensvej 2.4.th
2000 Frederiksberg
Executive Summary

Conducting valuations in emerging markets is a complex issue as the popular conventional models, namely Discounted Cash Flow and Multiple valuation, are inappropriate to deal with the specific conditions faced in such countries. These tools were imported by practitioners as “best practises”, yet limited attention was paid whether these techniques are actually applicable in this decisively different context.

This thesis analyses the challenges of business valuation in the specific environment encountered in developing countries. The careful dissection of the valuation models shows that they are based on statistical premises and assumptions regarding market efficiencies and investor behaviour, which are necessary to create simplified models, but are highly controversial. In emerging countries, market imperfections combined with limited availability of reliable data series clash with the theoretical foundations and complicate the practical methodology of the common frameworks.

Even the adjusted models produced by scholars and practitioners to capture the intricacies of the developing countries do not solve the problem of theoretical inconsistencies and find only unsatisfactory compromises for the methodological hitches. Yet these issues are not only confined to the popular frameworks, as the analysis of the lesser-known toolsets illustrates. Neither the Adjusted Present Value model, nor the more sophisticated Real Options and Monte Carlo Simulation approaches provide fully satisfactory results, yet enrich the discussion by providing different approaches towards valuation.

The final conclusion is that practitioners in emerging markets need to invest additional effort in the careful selection of the valuation model, the derivation of input parameters, and in the interpretation of the results. Extensive valuation and business experience, as well as intuition are the key to designing meaningful valuation frameworks – instead of endless chains of complex model adjustments to capture all aspects of reality. Textbooks preach that there is no “right” company value and that practitioners should interpret the outcomes of valuation models as first indications or a range of possible values – a principle which appraisers should take even more seriously in emerging markets.
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1. Introduction

Valuations are a required element of almost every strategic business decision to maximize shareholder value. Due to the increasingly global activities of multinational corporations (MNCs) and other institutions, cross-border valuations have become an important subject. Every step of the internationalization process, for instance considering entering a foreign market, relocating production capacity, or acquiring a competitor always entails valuations. Yet conducting a valuation across different countries is a highly challenging task and regarded as “one of the most complex issues in international financial management” (Shapiro, 1999). Exchange rate fluctuations, confusing tax regulations, tariffs and protectionist governments are all substantially complicating the valuation process. Yet among most of the developed countries, trade liberalization efforts as well as a stable political climate and openness to foreign investors have increased the level of market integration and fuelled the economic growth - as well as eased the job for appraisers.

The same can not be said for the large group of countries which has moved in the focus of the global investor community: the emerging markets. News that a MNC opened production facilities, established a joint venture or plans to increase their market share in China, India, Brazil or Russia are common in the daily business press. Behind every such decision lies a detailed analysis of the potential benefits and risks associated with this move, which ideally culminates in the design of a valuation model. Yet appraisers face a business environment in the emerging countries that differs substantially from their familiar conditions at home.

1.1. Relevance of the Topic

The recent rapid economical growth and especially the future potential development have attracted capital from around the globe to the emerging markets. The increasing level of foreign direct investments (FDI) illustrates this global shift of funds. Starting from $0,1bn in 1985, the level reached an intermediate peak in 2008 of $824,1bn. Throughout the economic crisis this level dropped by 36% to $532bn in 2009 – yet the decline for the FDI level flowing to developed countries was substantially higher. As a consequence, for the first time ever, the level of FDI flowing to the emerging countries surpassed that of the developed countries, which is a clear expression of the structural shift in the global capital flows. And according to the World Bank, this trend is also very likely to continue in the future (World Bank, 2010).
Apart from the promise of economic growth, investors are also attracted by the potential diversification benefits by spreading funds over several regions whose markets develop independently from each other. Harvey (1995) studied this effect and found that including emerging markets in a portfolio significantly reduced volatility and increased the expected return in the previous decade. In a more recent study by Pereiro (2002), the observation that many emerging markets have a low correlation with developed markets and thus offer diversification opportunities was confirmed again.

Yet, investing in these booming regions is not a riskless endeavour. Several crises, from the Mexican peso crash in 1994, to the Asian crisis in 1997 or Argentina’s default in 2002 have demonstrated the unstable nature of emerging markets. Even “normal” economic periods exhibit their own risks like routine fluctuations in currency values, changes in government policies that impact the business environment and limited protection of foreign investors’ rights. Under such business conditions, estimating the risks and value of overseas investments becomes a crucial aspect of strategic decision making. This places appraisers, who are endowed with the valuation of an asset or project, in a difficult situation. As FDIs tend to be of medium or long-term nature, future economic and political events and their influence on the asset value need to be considered, yet the prevailing uncertainty renders this task extremely challenging (Oetzel, 2001).

Valuation techniques offer support by a structured approach to modelling the relevant value parameters. However, modern valuation theory was formulated primarily for the application in a developed business climate – with almost perfectly efficient capital markets, an educated and rational investor base and without major political instabilities. Thus the question arises whether the current popular methods can be easily applied within emerging markets, or if they need to be adjusted or substituted by entirely new techniques to capture the intricacies of the developing world (Bekaert, Harvey, 2002). As reliable valuation tools for estimating and validating prices are quintessential to attract investors and secure a high level of FDI, it is in everybody’s interest to establish trustworthy mechanisms.
1.2. Problem Formulation

Following the previous problem outline, the research question of this thesis can be formulated as follows:

Which recommendations can be formulated for appraisers who have to value assets in emerging markets?

This main problem is approached through a number of sub-questions:

- Which valuation techniques are dominantly applied in the developed countries and what theoretical premises and methodology are they based upon?
- Which countries belong to the group of emerging markets, what are their shared characteristics and how do these specifics influence the valuation process?
- Can the traditional valuation techniques cope with the emerging market impracticalities?
- Which adjusted models does the literature provide and are these more suitable for the emerging market context?
- Does the literature provide more sophisticated and lesser-known models which complement the discussion?
- Which implications can be drawn and what can be recommended for appraisers who are currently valuing assets in emerging markets and are unsure how to proceed?

The author’s interest in this topic was created during an exchange semester in India, where he participated in a course about Business Valuation. During the lectures it became evident that the supporting literature, i.e. the standard textbooks which are utilized in Business Schools across the globe, assumes economic conditions which crucially contradict with the observable reality in a developing country like India. This paradox – that scholars teach and practitioners apply methods in a context which seems very inappropriate for the conventional valuation techniques – inspired the author to investigate the aforementioned research question in his Master Thesis.

1.3. Methodology

This thesis is primarily written from an investor’s point of view for the evaluation of real assets. Most of the discussed aspects are also relevant for company-internal purposes, e.g. the valuation of foreign subsidiaries or for tax purposes, yet several important topics for this
group of readers is excluded in this paper. These are, for instance, taxation issues as well as differing accounting standards. Both these aspects have to be included in valuation models, yet are so specific to the particular company, country and currency that a detailed discussion would exceed the scope of this thesis.

Empirical studies regarding the valuation practice in emerging markets do not exist in abundance, but first attempts, for instance by Pereiro (2006), Bruner et al. (2003) and Graham and Harvey (2001), demonstrate that practitioners have imported the “best practices” Discounted Cash Flow Analysis and Multiple Valuation from the developed countries. The theoretical consistency, as well as the methodological aspects of the different valuation techniques, however, receives little attention in the debate. Therefore, this thesis analyzes whether the tools which already found widespread popularity in the emerging markets actually represent a recommendable solution. This analysis is primarily based on the classic valuation literature supplemented with recent articles from financial journals, which are confronted with empirical evidence regarding the investment climate prevailing in the emerging countries. The author’s contribution to the academic is the application of well-known theories and methods, namely the business valuation concept, in a new context, which is the special environment found in emerging markets.

1.4. Structure
The first part of the thesis consists of an introduction chapter, which illustrates the relevance of the topic and defines the research question. The second chapter categorizes the various valuation concepts and outlines the theoretical foundation and methodology of the most widespread models. Chapter 3 defines the term emerging markets and provides the reader with current research concerning the prevailing conditions in these regions. The findings from the previous two chapters are aggregated in Chapter 4 to analyze whether the most common valuation frameworks are actually applicable under the described conditions. This intermediate conclusion is followed by a presentation and evaluation of the adjusted models which were developed in the last decade by scholars and practitioners. If these adjustments are sufficient to create reliable results even in the specific emerging market environment is the object of Chapter 6. Finally, the lesser-known valuation approaches Adjusted Present Value, Real Options and Monte Carlo Simulation, are introduced and studied in regard to their emerging market applicability. The thesis is finalized with a comparison of the valuation
techniques and concluding remarks addressed at appraisers who are currently facing the discussed issues.

Within this thesis, the terms developing country, transition country, emerging country or emerging markets are used interchangeably. The same applies to the labelling of the item under valuation, which is referred to as project, company, asset or simply object.
2. Business Valuation in Developed Markets

Simply put, the aim of every valuation process is to derive the economic value of an object. Valuations are conducted in a multitude of everyday situations: choosing assets for a portfolio, during Mergers and Acquisitions, or while making investment, financing and dividend choices. Ideal valuation tools should satisfy certain criteria: Their theoretical foundation has to be consistent with the real-life conditions. Models need to be easy to apply and simultaneously generate straightforward results. Optimal techniques will also yield a high level of transparency, by pointing out the most relevant value drivers to indicate where management can interfere to influence the value of the object under appraisal.

But in practice, valuing an object is much more complex than the theory suggests, as the result depends very much “on what is being valued for whom for what purpose and how” (Pereiro, 2002). As a consequence, every value derived by a model has to be understood in the specific context, as the identical object would have a different value if it was calculated under different premises for another buyer with another method. And both results have to be considered as equally “right” values for the same object. Thus the aim of valuations in real-life situation is more to determine a target-space, i.e. a range of likely values, which forms the basis for decision-making or further negotiations.

In this chapter, the valuation models which found widespread acceptance in the developed markets are introduced. Special focus is placed on their theoretical concepts as well as the viability of the practical application. The literature provides numerous criteria for categorizing the various approaches, depending on e.g.:

- The nature of the buyer (strategic vs. financial investor)
- The purpose of the valuation (Acquisition, project evaluation, taxation)
- Whether the whole entity or only the equity is valued
- If the value is derived under going concern or liquidation premise.

In this paper, Pereiro’s (2002) structure that segments the valuation models in intrinsic (based on internal operation parameters) or extrinsic methods (using information that is observable on the public or private market) is applied:
The sub-chapters in the following section follow this categorization.

2.1. **Intrinsic Value Derivation**

The intrinsic or fundamental value of an object is calculated by discounting the expected future cash surpluses to their present value. In the course of such a valuation, the main concern is to achieve an unbiased look at the value drivers of a company, e.g. the return on invested capital (ROIC), future growth rates and capital costs, but also at soft facts like the managerial capacities. This procedure for calculating intrinsic values is called the Discounted Cash Flow (DCF) approach. As the term implies, intrinsic values are connected to the internal business drivers of an entity, and not on external buyers’ perceptions. Intrinsic values become extrinsic at the instant when outside investors reach the same conclusion regarding the value calculated on basis of the internal figures and execute the deal (Pereiro, 2002).

The Adjusted Present Value (APV) method is a variation of the regular DCF model, which puts more emphasis on separating the various elements which compose the total value. In contrast to the DCF and APV models, where follow-up changes to the investment decision in the lifespan of the project are not considered, the Real Options approach accounts for managerial flexibility like canceling or extending a project. Both the APV and the Real Options techniques are not common among practitioners due to their complexity and will be discussed in more detail in Chapter 7.
2.1.1. Inflexible Investment Valuation with Discounted Cash Flow Models

A number of different DCF models are used in practice:

- Equity-approaches strive at valuing only the equity component of a company.
- Entity-approaches value the entire asset construct.
- The Weighted Average Cost of Capital (WACC)-approach combines the cost of equity, debt, and the tax effects (the so-called tax shield) in one discount rate.

An exhaustive discussion of the different methods would exceed the scope of this paper and interested readers should resort to the classic valuation literature (see, for instance, Damodaran, 2006 or Brealey et al., 2007). Instead, the basic assumptions of the general DCF approach are presented, which is sufficient for the subsequent analysis in regard to the applicability for the emerging market context.

As the name implies, the DCF value depends on the present value of the cash flows generated with an asset. The approach requires three main steps: Modeling plausible future cash flows for the short-to-mid-term horizon, estimating the terminal value and determining the appropriate discount rate. The sum of the discounted cash flows equals the total value of the asset. By subtracting the initial investment outlay from the asset value, Net Present Value (NPV) of the project is calculated, which corresponds to the economic value generated along the lifespan of the asset. The basic structure of a DCF valuation can be illustrated as such:

![DCF Methodology Diagram](image)

**Figure 2: DCF Methodology.**
Source: Own illustration.

Based on analysis of the historical financial performance and the current economic environment, the expected Free Cash Flows (FCF) over the life of the project under valuation are estimated. The FCFs are those liquid funds which are available for distribution to the debt
and equity holders of the organization after the investment in working capital and fixed assets were carried out (see Appendix I for the detailed derivation of the FCF). As the level of precision for the cash flow projections diminishes over an extended planning horizon, appraisers resolve this problem by assuming a constant cash flow on a plausible, sustainable level after a pre-specified amount of years. This is coherent with the assumption that all companies will eventually reach a stable state and generate constant cash flows which are essentially a perpetuity and can be valued as such. The present value of these perpetual cash flows, the so-called terminal value, is then discounted together with the free cash flows back to the actual valuation data with an adequate rate of return, which corresponds to the risks associated with the investment. The sum of these discounted values equals the asset’s total value. If the project is partly debt financed, the market value of the debt obligations at the valuation date needs to be subtracted to determine the equity value (Damodaran, 2006).

In practice, conducting a DCF valuation is more complex than the above described mechanism suggests. Therefore, the main of a DCF valuation are discussed in the following subchapters.

2.1.1.1. Projecting the Cash Flows
The initial decision when forecasting cash flows is to settle on the length of the extraordinary growth period, i.e. after how many years the company is expected to generate a stable level of cash flows. Depending on firm-specific characteristics like the size (smaller firms are more likely to grow for a longer period of time than large ones), the market potential, the current growth rate (firms which are already experiencing rapid growth are more likely to continue to do so) and the sustainability of a competitive advantage, which is necessary to generate consistent growth, the length of the extraordinary growth period can range from 0 to 15 years (Damodaran, 2006). For this planning horizon the annual FCFs are forecasted with a high level of detail. They depend primarily on the company-specific value-drivers like Return on Invested Capital (ROIC) or cost of capital. One of the major points of criticism about DCF methods becomes evident throughout this discipline: The high level of subjectivity. Different analysts would most probably settle on very different lengths of the detailed planning period, leading to substantially varying final results.
After the detailed planning horizon is defined, the FCFs for each period are forecasted. During this step, appraisers need to apply their best judgment on how the company will evolve in the coming years. The process is illustrated in the following table:

![Methodology for projecting the FCFs](figure3.png)

### Historic Data
- Historic Analysis
- Correction of non-recurring items
- Best estimates for ROIC, Sales, etc.
- Scenario Building
- Simulations

### FCF Projections

<table>
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<tr>
<th>Time</th>
<th>0</th>
<th>1</th>
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Although the explanatory power of historical growth in regard to future growth is doubted, this analysis can be expected to reveal valuable information on how the company performed and why it was successful or not (Brealey et al., 2006). An analysis of the recent macroeconomic conditions provides further information, as the financial results can only be evaluated in the economic context. Profits or losses from economic boom phases or recessions have to be adjusted to correspond to a more balanced scenario. Similarly, non-recurring items are not to be included in the cash flow projections. It is very important during this step that the reliability of the historical data is ensured, i.e. only audited data should be used, and that possible manipulative tendencies due to accounting policies are taken into account. Further complications arise when companies with very volatile or negative earnings are assessed, which can only be dealt with by stretching the observed historical period.

Conclusions based on historical data should be supplemented with external estimates, e.g. by questioning the company’s management or by analysts’ reports. Although this is a convenient approach, as growth projections by the management are usually readily available and in addition the management can be expected to have special insights in the firm’s capabilities which are unknown to outsiders, the expectable bias and conflict of interests call for extra caution. Such forecasts have to be checked with regard to their feasibility and internal
consistency, but should not be generally ignored, as they can yield useful supplementary information. It was demonstrated by empirical evidence that analysts provide better forecasts than models which are entirely based upon historical data (Damodaran, 2006).

In general, there are three different approaches how to project the individual cash flows:

- **Expected Value Approach**: The most widely used is the expected value approach, where appraisers calculate the single best cash flow estimate for each period. In practice, this approach is based on further estimates regarding revenue growth, operating margins, tax rates etc., that determine the final cash flow. This leaves ample room for subjectivity, but is the simplest and most straightforward approach available.

- **Scenario analysis**: Within this method, cash flows are estimated for different scenarios, ranging from optimistic to pessimistic. The appraiser needs to identify possible scenarios and estimate the cash flow level and occurrence probability for each. The finally calculated range of outputs has the advantage that the value impact of the underlying input variables becomes transparent. Problems arise when the generated output range is very high, especially when extreme scenarios are used. Similar to the expected value approach, a high level of subjectivity is present, for instance when guessing the scenario likelihoods.

- **Simulations**: The most sophisticated approach is to estimate probability distributions for each input factor and to run a number of simulations, each using a unique set of values. The result is a distribution for the value of the business, which also reflects the uncertainty in estimating the inputs for the valuation. Simulations work best in situations where there is extensive historical data available to compute feasible distribution functions, as ad-hoc estimates regarding the distribution parameters can lead to false results.

### 2.1.1.2. Terminal Value Estimation

The Terminal Value corresponds to the present value of all future cash flows which are generated after the detailed planning horizon. There are two different methods of estimating the terminal value under a going concern premise (in contrast to a liquidation premise, where the selling value of the company’s accumulated assets would represent the terminal value). One uses a Multiple factor to earnings, revenues or book values, a concept which is described in more detail in Chapter 2.2 of this paper. The other approach assumes that the cash flow in
the last year of the detailed planning horizon will grow at a constant rate forever. This cash flow stream can be valued using a perpetual growth model:

\[
\text{Terminal value}_t = \frac{\text{Cash flow}_{t+1}}{(r - g_{\text{Stable}})}
\]

where \( r \) equals the company’s discount rate and \( g_{\text{Stable}} \) is the rate with which the cash flows will grow each year. Depending on the company under valuation, a no-growth (\( g_{\text{Stable}} = 0 \)) or negative growth scenario (\( g_{\text{Stable}} < 0 \)) can also be appropriate. The process can be illustrated as such:

Both the Multiple as well as the Perpetual-growth methods have major advantages as well as disadvantages. While the Multiples approach offers a simple solution, mixing relative and DCF valuation in one model generates problems. Multiple factors are constantly changing, and whether the terminal value in a five year horizon can be precisely determined based on today’s Multiples is very questionable. In contrast, using a perpetual growth model is more consistent, but it places too much weight on the growth rate which is difficult to quantify and subject to strong bias. How much annual cash flow growth a company can generate depends on many aspects, which need to be carefully analyzed by appraisers: Are there regional constraints to the company, e.g. can it only operate domestically or enter foreign markets? Which currency is being used, e.g. it is a high or low-inflation currency? What are the current capital reinvestment and retention rates and are these subject to change? Does the company under valuation have a comparative advantage and how long will it be able to sustain it? And such input factors need to be based on consistent premises, for instance the reinvestment rate should correspond to the growth projections.
In general, the overall growth rate of the economy serves as a good reference point, since a significantly higher constant growth rate in perpetuity is not feasible. Eventually, all industries mature as competition increases and profitability shrinks (Pereiro, 2002).

2.1.1.3. Deriving the Discount Rate - the Capital Asset Pricing Model

During a DCF valuation, the riskiness of the investment is reflected by the discount rate. It corresponds to the rate of return that investors could expect from an alternative investment which yields cash flows with the same risk pattern. Risk in the valuation context addresses the likelihood of getting a return on the investment which deviates from the expected level. The deviation can either be positive for the investor (the so-called upside risk) as well as negative (downside-risk) and both tendencies are equally considered.

As it can be expected that most firms are both equity and debt-financed, a discount rate for each source of financing has to be calculated. The cost of debt incorporates the default risk of the debt securities, whereas the cost of equity is the compensation equity-holders demand for taking the risk of investing in the particular company. While the cost of debt can be derived from corporate bond yield rates, which are observable on the capital market, determining the cost of equity, which can not be directly observed and theoretically represents the risk-attitude and return expectations of the total investor base, is a very complex task. First of all, the risk of the investment has to be measured, and secondly, this risk has to be converted to an appropriate discount rate. The methodology can be illustrated as follows:

Figure 5: CAPM / WACC Methodology.
Source: Own illustration.
As defined above, risk corresponds to the spread of actual returns around the expected value. This statistical measure is called the variance or standard deviation of the distribution – the greater the deviation of actual returns from the expected level, the greater the variance and the greater the risk. But according to modern financial theory, only a portion of the total risk is actually relevant to the investor: the so-called non-diversifiable risk. The rationale is that by holding a well-diversified portfolio, i.e. with the capital spread on a multitude of securities, the risk from company-related actions like investment decisions or managerial failures become almost irrelevant. As each individual position represents only a small fraction of the total portfolio value and as positive and negative effects will eventually cancel each other out, firm-specific (diversifiable or unsystematic) risk should not be included in the discount rate. Instead, the investor should only be compensated for the market (non-diversifiable or systematic) risk of an investment, which he can not eliminate by diversifying. The market risk measures the exposure to macroeconomic developments like exchange-, interest-, inflation- and GDP growth rate changes (Brealey et al., 2007).

But how can exposure to market risk be measured and translated into a cost of equity rate? The standard model for this procedure is called the Capital Asset Pricing Model (CAPM):

\[
\text{Expected return on asset } i = r_f + \beta_i \times (r_M - r_f)
\]

According to the CAPM, the expected return for an asset is determined by the rate which investors could expect without taking any risks, plus an individual risk premium. This risk premium depends on the general level of market risk and a factor which measures a stock’s exposure to market risk. In the CAPM formula \( r_f \) denotes the so-called risk-free rate, which is the expected return from a riskless investment, i.e. where the expected return is known with certainty. In practice, highly-liquid long-term sovereign bonds issued by governments with excellent ratings are considered as risk-free investments and their yields (either current or historical averages) are used. \( r_M \) is the average return holders of the market portfolio can expect. Thus the term \( (r_M - r_f) \), the so-called Market Risk Premium, measures the extra return investors expect for investing their funds in an asset with average risk (called the market portfolio) instead of the risk-free investment. Basically, investors need to own one of every traded security to hold the market portfolio, which is not feasible in reality. Instead, the average historical performance of well-diversified and reputed indices (e.g. Standard and Poor’s Composite Index) is used (Brealey et al., 2007)
The CAPM uses the factor Beta ($\beta_i$) to capture the level of sensitivity to market risk of the company. It is computed as

$$\beta_i = \frac{\text{Covariance of asset } i \text{ with the market portfolio}}{\text{Variance of the market portfolio}} = \frac{\text{Cov}_{i,m}}{\sigma^2_m}$$

The reasoning for Beta as risk measure demonstrates the rigid theoretical assumptions that underlie the CAPM. It is assumed that as there are no transaction costs and nobody has access to private information, investors will not hold individual shares. Instead, they only invest in a combination of the market portfolio, to realize maximum diversification effects, and the risk-free asset to match their level of risk-aversion. Thus the risk of a particular asset depends on the risk it adds to market portfolio – measured by the covariance of the asset with the market portfolio. To produce a standardized risk measure, the covariance is subsequently divided by the variance of the market portfolio. Assets with the same market risk as the market portfolio will have a Beta of 1, assets which are riskier than the average asset a Beta > 1 and if they are safer than the average, a Beta < 1. Beta values also indicate how stocks will react to movements of the market: Stocks with a Beta above 1 on average amplify the general tendency, and stocks with Betas between 0 and 1 tend to move in the same direction as the market, but not as strong (Brealey et al., 2007).

The intuitive reasons why some firms have low Betas whereas others have higher Betas are discussed by Damodaran (2006), who argues that Beta is determined by three aspects of a firm:

- **Business Type:** Firms in cyclical industries (e.g. housing, automobiles) are very sensitive to changes in the overall economic conditions, resulting in a higher Beta.

- **Operating leverage:** Firms with a very high degree of operating leverage, i.e. high fixed costs in relation to total costs, experience a higher variability in operating income, again leading to a higher Beta.

- **Financial leverage:** A high level of financial leverage increases the variance in earnings per share and makes equity investments in this firm riskier, resulting in an increased Beta.
For non-listed companies, Beta can be determined with the help of average industry Betas, a Peer Group of comparable listed companies or a qualitative approach with a subjective assessment of the specific risk factors. The above mentioned criteria from Damodaran (2006) provide some advice on which firm-specific characteristics should be analyzed.

The literature is also in a dispute if and how Beta values should be adjusted. Intuitively, using past data-sets to predict future behavior is questionable. Some practitioners have thus resorted to the adjusted Beta, which is based on studies that surviving companies become more diversified and stable, which pushes their Beta value towards 1. High Betas are thus adjusted downwards and low Betas upwards to predict this movement. But the magnitude of this adjustment is, again, subject of debates (Damodaran, 2002).

With the cost of equity quantified, appraisers can now calculate the cost of capital or discount rate for the firm. When several sources of financing are used, the individual rates are weighted by the proportion of their use in the financing mix. This rate corresponds to the aforementioned Weighted Average Cost of Capital (WACC). Finally, the projected FCF from the detailed planning horizon and the terminal value are discounted with the WACC to the valuation data. The sum of these components corresponds to the DCF value of the firm.

2.1.1.4. Concluding Remarks about the Discounted Cash Flow Approach

Although the DCF method is widely used and has been applied since the 1960s, there are still numerous problems appraisers will encounter during real-life valuations, where the literature has not reached a consensus. The following remarks hint at some of the predominant issues appraisers will face, and stress why company valuation is also referred to as a mix of science and art, where a “rigorous quantitative risk-return model” needs to be filled with “intuitive elements that belong to the artistic realm”, as expressed by Pereiro (2002).

This is especially prominent for all measures which are sourced from historical data – starting from the historical financial performance of the company under valuation, average historical market returns to determine the market risk premium, the sovereign bond yields as substitute for the risk-free rate, or the covariance as basis for Beta. Analysts need to apply their best judgement, experience and intuition to answer for instance the following questions:

- Which substitutes for the risk-free vehicle and the market portfolio should be chosen?
- Should arithmetic or geometric returns be taken?
• How long should the dataset be - are the last 20 years sufficient to generate reliable average market risk premiums or is a 30 year period better?
• Should nominal or real values be used?
• What will the inflation rate be in the near future?
• How much sustainable growth will the company be able to generate?
• How much will the whole industry grow?
• Is the current capital structure sustainable or what is the target structure?

However, the CAPM, one of the decisive parameters of every DCF, is also a source of precariousness, as the relation between Beta and return remains unproven (see, among others, Jagannathan, McGrattan, 1995).

To deal with the uncertainty, experienced appraisers recommend conducting a sensitivity analysis. In the course of such an analysis, single input factors are changed to assess the influence on the final value. This help to identify the major value drivers of the project. As studied by Pereiro (2002), the most influential input factors change from company to company. While unit prices have significant influence on the final value for consumer goods producers, it is less important for sellers of high margin and low volume products. In an attempt to identify the generally most relevant value drivers, Akalu (2002) assigned the highest influence on the company value to the operating cost and the cost of capital. Appraisers should thus focus on making detailed predictions for the most influential input factors and try to keep the others as simple as possible.

Further criticism addresses the strong theoretical premises the CAPM is based on. In developed markets, the efficient market hypothesis can be tolerated as a necessary element for simplification, as transaction costs are relatively low, investors are usually well diversified and insider information is limited. Yet the assumption that investors hold only combinations of the risk free investment and the market portfolio is controversial. A further problematic issue is the market portfolio itself, as the theoretical concept that every market participant holds one of every traded asset is unrealistic. Despite all these flaws, CAPM remains the most popular tool for the estimation of equity costs thanks to its ease of application and intuitive relationship between risk and return. In addition, no clearly superior model has emerged up to now (Bruner et al., 2002).
2.1.1.5. Adjusted Present Value

The Adjusted Present Value (APV) highlights the value impact of the financing decision by separating the effects arising from the capital structure. Calculating the APV is a three step process, which begins with estimating the value of the firm if it was all-equity financed, the so-called base case. In the next steps, the base case is adjusted by the present value of the financing effects, namely the tax reduction benefits from using debt capital, as well as the costs due to the added risk of bankruptcy.

The APV equation can be extended by further value-affecting aspects to compare the impact of available alternatives. Luehrman (1997) argues that this flexibility is a decisive advantage of the APV technique as it can display additional relevant managerial information. This could be an interesting option for capital budgeting problems in emerging markets, as the source of the value is more transparent. By calculating the base value of the investments and the down- or upwards-adjustments for the additional effects separately, the impact of the location decision becomes evident. The feasibility of this process is discussed in Chapter 7.1.

2.1.2. Flexible Investment Valuation with the Real Options Technique

The term “flexible” valuation in this context indicates that the Real Options technique captures the value effect of managerial decisions during the project which is lost in a DCF analysis. Intuitively, this approach is better suited to assess the true value of an investment, since many projects offer the chance to actively react to unforeseen events, whereas the static DCF model assumes that after an investment was made, it remains passive and can only be observed.

A simplified example can illustrate the difference between the flexible and inflexible approach. If a MNC considered acquiring a foreign competitor and applied the DCF approach, they would assume the takeover target to remain as it is, predict future cash flows and horizon values with the scenario technique, the discount rate with the CAPM and determine the investment’s NPV. By the Real Options approach, the same MNC would also acknowledge that buying the foreign company offers them a range of real options, enabling them to react to unforeseen events. Economic growth that exceeds the expectations could be matched with follow-on expansion investments, or as a reaction to unexpectedly low demand the acquisition could be disinvested again. This flexibility creates value that can turn a
negative-NPV project when using DCF into a worthwhile investment when considering the embedded real options.

The inclusion of real options substantially complicates the valuation process, which is one of the reasons why this technique has not found widespread popularity (Pereiro, 2006). Yet the Real Options approach promises to be very useful in the context of emerging markets. The uncertainty in developing markets due to the potential opportunities as well as threats is hard to model into a static framework, but demands for a flexible approach. Chapter 7.2. will therefore elaborate on the Real Options technique whether it is a feasible approach particularly for the emerging market environment.

2.2.  **Extrinsic Value Derivation**

Extrinsic values (alternatively called Multiples or relative values) are assigned to an asset by comparing it to similar objects for which the market values are known. The underlying rationale is that transaction prices between market participants, who interact “without coercion [---] and who are all in possession of reasonable knowledge of the relevant facts of the situation” (Pereiro, 2002), reflect a representative consensus price based on a large number of perceptions regarding the correct asset value. These values can be identified either on public markets, e.g. by observing quoted comparable companies, or on the private market in the course of comparable transactions. Although the calculation of intrinsic values is more intensively discussed and debated in classrooms and among scholars, there is evidence that most assets are actually valued on a relative basis. Equity research reports are often based on Multiples and in everyday situations the need for easy-to-use decision models favors relative valuation. In addition, a relative valuation is usually executed alongside intrinsic techniques as a double check. (Damodaran, 2006).

The first step of a relative valuation is to identify a set of firms, the so-called peer group, which exhibit similar cash flow and business risk characteristics as the target under appraisal. In the second step, data regarding the average market pricing factor for relevant economic parameters, for instance sales, earnings, or book value, need to be collected for these firms. This Multiple is subsequently applied to the same target object’s parameters to estimate the equivalent market values. If not enough listed comparable companies can be identified, recent Mergers & Acquisitions transactions on the private market can also be used as a reference. It can be differentiated between Multiples that value the whole company (firm or enterprise
value Multiples), or those that target only the equity value. The former allows for the comparison of companies with different capital structures, which equity Multiples do not.

A relative valuation yields several advantages compared to intrinsic models: As easy-to-source data is used and the value derivation is more comprehensible, it is superior in terms of simplicity and speed. Furthermore, Multiples represent the shared opinion of a group of investors, whereas the intrinsic value is the result of a single analysis. If extrinsic and intrinsic values differ to a huge degree, the result of a Multiple valuation can be expected to be closer to actually realizable spot buy-sell transaction values, even if the intrinsic model was based on reasonable premises. Especially in the case of high-growth companies, extrinsic and intrinsic values are bound to differ by a wide margin (Damodaran, 2006). In general, Multiples are a much coarser valuation technique which is thus not accepted among many appraisers and serves more as a rule-of-thumb or double-checking technique in their perspective, as it is very affected by one-time events (Benninga, 1996).

In real-life valuations, appraisers would usually resort to applying different methods due to obvious shortcomings of each technique and the missing consensus among the valuation community regarding a uniform approach. Especially the DCF and Multiples approach are often conducted in parallel, as they are based on contrasting perspectives: The DCF on a detailed, forward-looking and very individualized approach representing a single analyst’s opinion, and the Multiple technique with a coarser, much simpler method that captures the current general market sentiment.
3. Characteristics of Emerging Markets

The prefix emerging implies that the set of countries which is addressed as such are currently in a state of transition, where they ascent from their previous state of development aiming for a higher level. Depending on the source, as heterogeneous and geographically dispersed countries like Chile, Poland, Indonesia, Kenya or Pakistan are uniformly labeled as “emerging markets”. Institutions, scholars and practitioners have different perceptions which countries belong to this group, and struggle to find parameters which define them as such. The further sub-categorization, for instance into the Asian Tiger states (Hong Kong, Singapore, South Korea and Taiwan) or the BRIC countries (Brazil, Russia, India and China), indicates the need for terms with a clearer focus, as the phrase emerging markets has become too blurred. However, a consensus exists that investments in the emerging markets (irrespective of the selected definition or sub-group) entail specific risks which are measurable in a significantly higher return volatility (among others, Aguiar and Gopinath, 2007; Mody, 2004). The source for these risks is of varied nature, ranging from expropriation, hyperinflation and drastic exchange rate fluctuations to trade barriers and financial restrictions. Whether the increased risks also lead to higher returns, as economic theory postulates, is controversial. Harvey (1995) confirmed this hypothesis, whereas Kohers et al. (2004) concluded that the variance in emerging markets is significantly higher than in developed markets, yet the average returns were lower for most of the observed time frames due to regularly occurring economic shocks.

The following chapter illustrates how the term emerging markets found its way into everyday language and presents some of the prevailing definitions and buzzwords utilized in the current discussion. The second part deals with the specific economic conditions found in the emerging countries.

3.1. Definitions

The term emerging market was first used during a conference regarding Thailand’s development in 1981. The economist Antoine van Agtmael, who was then employed with the World Bank, aimed at creating a term which differentiated countries like Thailand with a high economic growth potential from the pool of non-developed countries. His main motive in this context was to attract investors with a new term to avoid the prejudices associated with the expression “Third World Country”. Agtmael defined that stock markets in countries with a
per capita income of at least $10,000 are classified as emerging, a cutoff point which never found broad recognition and faded away quickly (Authors, 2006). Today, the World Bank uses a threshold of $11,906 per capita Gross National Income (GNI) to distinguish between the developed and developing nations (World Bank, 2008).

Yet many academics try to define emerging markets not by numerical criteria, but by qualitative attributes. Mody (2004), for instance, argues that the often cited rapid growth as indicator for an emerging market is not generally true, as no region outside the East Asia and Pacific region has grown at consistently higher rates than the developed nations in the last two decades. Instead, he defines an emerging market by two basic characteristics: a high degree of volatility and a transitional status “occurring in economic, political, social and demographic dimensions”. Essential characteristics in this context are for instance if the rule of law applies, regulatory controls are present and enforcement of contracts is secured. These conditions signal that an economy is transitioning from an informal to a formal system, where rules are transparent and apply equally to all participants in a market (Wharton, 2008).

A further point of reference for a list of emerging countries is provided by investment information services, although their classification methodology is not transparent. For example, the MSCI Emerging Markets Index, initiated in 1988 as the first consistent benchmark for this sector of the global equity market, had a significant influence on the interpretation and acceptance of the term emerging markets. Inclusion in this index, which was acknowledged as the reference index for emerging markets, granted countries attention from the international investor community and increased inflow of funds, which in turn fueled the growth of the domestic economy. The composition of the MSCI Emerging Markets Index is shown in Appendix II (MSCI, 2008).

Similarly, the FTSE Group, a British provider of capital market indices, publishes an emerging market index. FTSE distinguishes between Advanced and Secondary Emerging Markets, with the Gross National Income and development status of the capital market infrastructure as the relevant classification criteria. The illustration in Appendix II provides more information on the composition of the index and the detailed classification criteria. Interestingly, FTSE lists states like China and India, which dominate the emerging market discussion thanks to their economical and population size, in the group of Secondary Emerging markets. This indicates that these states massively lack capital market infrastructure
although they are on a par with some Advanced Emerging markets in terms of gross national income. Also noteworthy is that MSCI and FTSE selected almost exactly the same group of countries for their indices, rendering their lists in fact a meaningful source of information about which countries can be considered as emerging markets (MSCI, 2009; FTSE, 2009).

It is recommended that a mixture of qualitative and quantitative criteria is applied whenever practitioners are assessing a country. In the context of this paper, it is important to understand that although many countries are uniformly labeled as emerging, huge differences among their markets exist. These differences are of manifold nature and can only be accounted for in a valuation process by a thorough investigation of the country-specific conditions. Investments in China, for instance, which is considered to be at the forefront of the soon-to-be developed nations, are still exposed to massive risks due to the low protection of intellectual property and limited enforcement of contracts, among others.

Thus in this paper, the term emerging markets does not refer to any given definition to avoid narrowing down the applicability of the discussed issues to a fixed set of countries. Instead, the focus of this paper is on all economies where additional risks, which are embedded in the target object’s environment, exist and need to be accounted for in the valuation equation. This certainly applies to all countries which are regularly defined as emerging markets from various institutions, but can also be extended to countries which are not commonly considered as belonging to this group. The recent economic crisis has demonstrated that governmental protectionism of local industries, investment barriers, manipulated balance sheets and even state bankruptcies also occur in developed nations. Thus, the awareness and sensitivity of practitioners towards country-related risks needs to increase in general during every valuation, irrespective of the target country.

3.2. Country Risk Analysis
This specific risk associated with the geographic location of the investment is referred to as country risk. It depends to a huge degree on the reputation a country has built in the previous years. Social stability, institutional consistency and continuity are factors which determine the perceived level of country risk (Sabal, 2002).

A country risk analysis aims at identifying and measuring the risks associated with an investment in a particular country. Such risks are, in general, events or developments that
“affect the business climate in such a way that investors will lose money or not make as much money as they expected when the investment was made” (Howell, 1998). As investments are usually of a medium- to long-term nature, investors are not only interested in the current state of a country, but also in predicting whether new risks might appear, or if existing risks will increase or decrease over the investment horizon. In the valuation context this analysis should be extended to quantify the influence of potential risks on the value of the target object. Especially for investments in emerging markets, a thorough country risk analysis needs to be performed, as the idiosyncratic risk characteristics of a particular emerging country can vastly affect the strategic investment decision.

Country risk ratings, which aim at predicting the probability of unfavourable political or economic events, are regularly calculated by rating agencies using a mix of quantitative and qualitative econometric models. Yet these ratings are often criticised, as they try to compress too much information about the risk potential at any given time into a single parameter (Vij and Kapoor, 2007). As a result, they are often very poor at predicting actual risks, as they fail to capture all significant factors as studied by Oetzel et al. (2001). Furthermore, as the precise input factors and weightings are not disclosed and a substantial amount of subjectivity is involved in the rating process, the investor can not assess to which extend the target project will be exposed to the same risk, and at the same degree as identified by the rating agency.

Due to these shortcomings, the analyst needs to conduct his own assessment to determine the exact risk exposure of the target project depending on specific factors like industry, capital intensity, technological level, political relationship between the home and foreign government etc. Analysts thus need a good understanding of the investment environment in the target country before they can make valid assumptions.

The next section introduces exemplary risk elements with special focus on their origin, influence on the target value and possible ways of diminishing the influence on the target project. This is essential for understanding the shortcomings of the valuation methods presented earlier and defines the challenges any adapted valuation model needs to deal with. This also highlights that a very thorough investigation of the investment environment – which is often neglected in the initial screening phase – is necessary to grasp the entire risk spectrum.
3.2.1. **The Question of Market Efficiency**

Capital market efficiency is essential for creating confidence in the pricing mechanism of a market. Without this characteristic, markets fail in fulfilling their tasks in an economy, which is to attract investment, boost domestic savings, and improve the pricing and availability of capital (Worthington and Higgs, 2006). Facets of market efficiency are:

- **Allocation efficiency**: Does capital flow to the projects with the highest risk-adjusted returns?
- **Operational efficiency**: Are transactions completed on a timely basis, accurately and at low costs?
- **Informational efficiency**: Do observable prices incorporate all relevant information, preventing investors from exploiting information advantages?

Financial economics focuses primarily on the informational efficiency, e.g. if prices fully reflect all available information, which is called the Efficient Market Hypothesis (Mensah, 2003). Literature differentiates between several levels of efficiency, ranging on a continuum from weak to strong:

<table>
<thead>
<tr>
<th>Meaning #1</th>
<th>Meaning #2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Weak Form</strong></td>
<td>You can not beat the market by using historical information on prices and volume</td>
</tr>
<tr>
<td><strong>Semi-Strong Form</strong></td>
<td>You can not beat the market by using any public information</td>
</tr>
<tr>
<td><strong>Strong Form</strong></td>
<td>You can not beat the market by using any public or private information</td>
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| Table 1: Levels of Market Efficiency. Source: Mensah (2003). |

Markets exhibit different levels of efficiency at different points of time. In general, capital markets in developed countries are considered to exhibit at least a semi-strong level of efficiency. In emerging markets the situation is entirely different. Worthington and Higgs (2006) tested capital markets in 27 emerging countries for their level of efficiency and found that only Hungary, Israel, Egypt, Korea, Malaysia and Argentina satisfied most of the criteria.
and concluded that there is a weak level of efficiency, yet no semi-strong level of efficiency.
This has several implications for appraisers in emerging markets. The observable prices on
the capital markets do not reflect all available information and can not be considered as the
“true” value of the asset. In contrast, market inefficiencies open up business opportunities as
assets can be substantially over- or undervalued, insider information can be exploited and
abnormally high returns can be earned (Sabal, 2002)

3.2.2. Expropriation Risk
The act of expropriation, i.e. “the forced divestment of equity ownership of a foreign direct
investor” (Minor, 1994) constitutes the most dramatic form of political risk and the worst case
scenario for any financial engagement in an emerging market. Recent examples, e.g. the
expropriation of numerous oil operating facilities in Venezuela in 2007, demonstrate that
governments in emerging countries occasionally resort to this action to pursue national
interests (Rosenberg, 2007). The legal basis for such actions is provided by international laws,
which state that sovereign countries can confiscate capital and recourses within their territory
and the disowned entity can only seek compensation through the courts of the expropriating
country. Developed nations usually have clear and reliable guidelines regarding the form,
amount and method of compensation and since investors can expect a timely and fair
compensation at market value, the added risk due to expropriation is negligible. In contrast,
many developing countries provide only limited or even zero compensation in such cases,
resulting in legitimate risk premiums when investments in such environments are analysed
(Sornarajah, 2004).

The occurrence of nationalization actions is extensive, as history shows: In a past study Minor
(1994) documented 575 expropriation actions against MNCs between 1960 and 1992 by a
total of 79 developing countries. This demonstrates the need to incorporate this factor into the
capital budgeting process when the valuation object is situated in emerging markets, even if
no immediate risk of expropriation is observable. An essential element of the valuation
process lies in estimating the likelihood of an expropriation and if and how much
compensation can be expected in such a case. Comparable examples from recent history can
serve as reference regarding the percentage of the asset’s current market value which could be
retrieved in a particular country. Indirect costs associated with the reimbursement process,
like legal costs, deferral of payments etc. also have to be accounted for.
Bansal and Dahlquist (2003) tried to measure the impact of the expropriation threat on the required rates on equity markets located in emerging countries. The authors based their study on the basic idea that expropriation should not be considered as a systematic risk, since international investors have a wide range of emerging markets to choose from. Instead, the expropriation risk is captured in the individual selectivity premium (the additional return investors require when investing in a specific country) according to the authors. And Bansal and Dahlquist also found evidence that around 50% of cross-sectional difference in the equity premiums can be explained by proxies for the risk of expropriation, like financial market reputation and liquidity in the target country. Based on their dataset, the authors quantify the average risk premium due to the expropriation threat at around 6% across all emerging markets. Sovereign nations can substantially reduce this premium by improving their financial market reputation, and lessen the fear of future trade sanctions.

Duncan (2006) states that the only reason preventing governments from constantly expropriating foreign assets are the associated internal (based on the original contract) and external (imposed by a third party) costs. In his study, Duncan examined expropriation cases in the mining industry and found that most nationalization waves took place in times of price booms for the output mineral. This suggests that governments do not engage arbitrarily in expropriations, but base their decisions on at least rudimentary economic principles by weighting the costs and benefits. This has several implications for the valuation process: If the corporation can influence the expropriation costs for the host government, this needs to be considered in the decision process as well. Furthermore, some industries are more exposed to expropriation risk than others. Target objects with extreme volatility in the asset value, as for instance observed in the mining industry, face a higher risk due to the extreme potential expropriation gain for the host government in times of high material prices. This relation was already studied by Kobrin (1980) in an earlier publication, who concluded that investments within infrastructural sectors, like telecommunication or utilities, are more likely to be nationalized. In addition to the industry characteristics, enterprises which are fully owned by foreign subsidiaries and which primarily use diffused technologies, like petroleum or mining, are most vulnerable.
3.2.3. Liquidity Risk

A liquid market can be defined as a market where agents can execute large transactions at short notice with minimal transaction costs and minimal price fluctuation. In general, the degree of liquidity in a secondary market is determined by its “depth, breadth and resiliency as well as its organizational structure and the reliability of clearing and settlement arrangements” (Fernando and Herring, 2001). But the equity markets in emerging regions often provide much less liquidity than experienced in developed countries. The reasons are manifold: Small numbers of educated and wealthy investors, governmental restrictions, high trading costs due to inefficient market transaction mechanisms, underdeveloped banking sector, limited number of publicly traded firms, and mistrust in the overall system due to information asymmetries or bad corporate governance (Sabal, 2002). Lesmond (2005) demonstrated that emerging markets are prone to limited liquidity by observing the average quoted bid-ask-spreads, which measure the price difference of an immediate purchase and sale of an asset, and found average spreads of up to 47% in some emerging markets. On the other end of the scale, Lesmond observed that developed markets have an average spread of around 1%.

But liquidity is an essential condition for an efficient asset pricing mechanism and for a high degree of reliability in the market. Without these qualities, it is very difficult for investors to predict the selling price of an asset in the case of a divesture, and as a consequence this so-called liquidity risk has to be modelled into the valuation equation. As studied by Bekaert et al. (2007), limited liquidity affects the price of an asset as the average equity premium is substantially increased compared to liquid markets. Furthermore, variations in the degree of liquidity also influence the time-variation of expected returns and thus diminish the significance of historical data. In the same study, Bekaert et al. (2007) reach the conclusion that models which take liquidity effects into account, yield much better results at predicting future returns than those that focus only on market risk. This view is supported by a recent study conducted by Hearn (2009), who compared the explanatory power of the level of liquidity when calculating the expectable markets returns between three developing African countries and the UK. He found empirical evidence that liquidity has a very strong influence on the expected returns in the developing markets under observation, and should therefore be part of every transaction analysis.
Liquidity risks can be accommodated in the valuation process by different approaches. The expected future transaction costs for liquidating the asset can be estimated and subtracted from the expected cash flows in the year of the divesture. Alternatively, the discount rate can be adapted to represent the limited liquidity of an asset (Damodaran, 2006). The second approach is supported by a study sowing that liquidity risk constitutes a non-diversifiable risk as liquidity shocks are contagious among economically integrated region (Pastor and Stambaugh, 2003). This would justify that investors require an increased risk premium for bearing this additional systematic risk. Regardless of this finding, the shared idea behind both approaches is that illiquidity leads to a lower trading price for an asset compared to the identical asset when traded under highly liquid conditions. The magnitude of this effect is substantial, as Pereiro (2002) demonstrates, who observed median illiquidity discounts of 35% in Argentina.

This conclusion gives rise to a number of strategic valuation implications. Investors can take advantage of lower asset prices due to the current liquidity discount and speculate on a future increase in liquidity, which would theoretically lead to a general upward adjustment of the asset prices. Substantial increases in the level of liquidity were witnessed after equity market liberalization actions, as shown by Bekaert (2007). Furthermore, strategic asset investments which are not regarded as temporary can be acquired at a comparably lower price than in liquid markets. On the other hand, investors have to take into account that illiquid markets provide much less price certainty and flexibility when an asset is divested. This is especially relevant for projects where the final liquidation gain constitutes a significant portion of the total expected return of the investment.

3.2.4. Information Risk

Valuation models rely to a huge extent on information which is provided by the target object on voluntary and mandatory terms. Financial statements and cash flow forecasts usually form the basis for the subsequent analysis, and investors depend on useful information as basis for their decision making. But it can be doubted whether financial data published by firms in emerging markets display all relevant information to derive the true market value of an asset. In addition to the complexity created by differences in the various international accounting systems, the reliability of figures which are disclosed by organizations in emerging markets are often highly questionable. Investors usually interpret publications with a certain level of scepticism, due to the lack of accounting standards and qualified auditors, to corruption to
nonexistent supervision by neutral commissions, to only rudimentary corporate governance mechanisms, and to hardly any sanctions in the case of fraudulent behaviour. And, as Lee (1987) pointed out, establishing an effective and trustworthy accounting infrastructure is essential for emerging capital markets to operate efficiently.

Whether the disclosed accounting information is perceived as economically feasible by the market participants was studied by measuring the explanatory power of published legal statements with regard to the market prices through regression analysis. Among the emerging countries, especially the Chinese equity market was the research object of choice for this method. Bao and Chow (1999), for instance, tracked the degree of explanatory power of accounting information for the observed stock prices over the period 1992 to 1996. Their study revealed two important aspects: Firstly, that accounting data has significant information content for the valuation of share prices. Secondly, that the level of explanatory power has increased throughout the observed period due to the adoption of international accounting policies by the Chinese government. The same beneficial effect of regulatory reforms became evident when the markets for “A” shares and the very tightly monitored and standardized stock exchange for “B” shares were compared with the same method. Chen et al. (2001) extended Bao and Chow’s study over a longer time period (1991 to 1998) and essentially draw the identical conclusion that accounting information is value relevant to the Chinese investor base “despite the young age of the market and the perception of inadequate accounting and financial reporting in China”. This can also be observed in other emerging markets as demonstrated by Oyerinde (2009), who conducted a similar study for the Nigerian equity market. The author also found that accounting figures affect equity values and that there is a certain relation between accounting numbers and share prices in the Nigerian Stock Market.

Although the aforementioned studies lead to similar and promising results, their specific context has to be taken into account. Chen and al. (2001) themselves admit that the results could be distorted due to the bias in the utilized dataset, created by market inefficiencies, especially the aforementioned liquidity issue. Accordingly, the conclusions drawn by Bao and Chow (2001) and Oyerinde (2009) have to be interpreted with care as well. Nevertheless,

1 Since 1992, selected Chinese companies can trade the so-called “B” shares on a separated stock market, which is only open to foreign investors. These shares are traded in foreign currency and separated from the shares available to the Chinese citizens, called the “A” shares. The two stock markets are rigidly separated, although both share types entitle to the same rights and obligations (Bao and Chow, 1999).
their studies have an important implication for valuations in the context of emerging markets: Contrary to widespread perception, even in emerging markets with only rudimentary regulatory infrastructure, disclosed financial data contain some information which can support the pricing mechanism. After all, even in emerging markets accounting information is the most important source for local market participants, as surveyed by Al-Razeen and Karbhari (2007).

Salehi and Velashani (2009) provide some advice on how to deal with the remaining information gap of unreliable disclosed data. The authors formulate the problem that in many emerging countries, financial statements fail to provide the required data on time and withhold essential non-financial information. As a reaction, the market participants use other sources to supplement or verify published data, like brokers, friends, financial analysts' reports, media, companies' websites, and corporate staff. International investors who conduct a valuation should thus mimic the locals' behaviour and consult various sources of information instead of relying on possibly faulty figures.

In Chapter 2, the available valuation techniques were introduced and discussed with regard to their underlying assumptions, as well as their practical methodology. Subsequently, in Chapter 3, a description of the environment which appraisers are facing when conducting a valuation in an emerging market was provided. The following chapter elaborates whether the methods which found widespread acceptance in the developed nations can directly be applied to emerging countries, or if the special conditions impose substantial problems and impracticalities that lead to serious constraints.

4.1. Valuation based on Discounted Cash Flow models

An important factor within every DCF valuation is the derivation of the cost of equity, which is usually based on the CAPM. The CAPM itself is subject to criticism (among others, Fama and French, 1992) due to its strong theoretical restrictions. It assumes perfectly efficient markets with no transaction costs and no insider information, as well as fully diversified investors who only hold either the risk-free investment or the market portfolio. These premises do not even hold in developed markets, where transaction costs (if only the transaction fees for the financial intermediary) and insider information do exist to a certain degree. But in emerging markets, these market imperfections are substantially higher. Large companies are often controlled by families or few large shareholders. This group of investors is usually not well diversified, as these businesses represent a major proportion of their total portfolios (Bruner et al., 2002). Highly concentrated ownership, focus on informal information channels, limited access to capital markets for many participants etc. are all leading to market conditions that are far from the theoretical concept assumed for the CAPM.

Furthermore, the practical application of the DCF model is extremely complicated – if not rendered impossible – when considering the specific conditions faced in the emerging markets. For instance, as outlined in Chapter 3.2.4., the information risk associated with unreliable published data by companies is ever-present in these countries. Within a DCF valuation, past financial data play an important role for forecasting the future cash flows, which in turn have a substantial impact on the object’s final value. Manipulated data – either with illegal intentions or by fully utilizing the local accounting options – poses a problem, both in the developed and developing nations. But in the latter group of countries, which often lack accounting standards, qualified supervision and credible sanctions, this threat is more
present, especially as the seller has an information advantage and the understandable interest
to present his company’s performance as favorably as possible.

This projection of cash flows is rendered even more complicated by the huge level of volatility which is one of the basic characteristics of emerging markets. This puts appraisers in a dilemma: To identify the impact of the huge market swings and to generate a more balanced view of the company’s performance, data from a longer time period have to be analyzed. But exactly these required historical data are difficult to source in emerging markets. A similar dilemma exists when the future cash flows are projected: To accommodate for the volatility of the market, the detailed cash flows need to be projected for a longer period of time at the cost of more subjectivity and imprecision. The common approach for appraisers to use scenarios for modeling the cash flow projections is also more complex when facing the conditions in emerging markets. The risk of expropriation, as explained in Chapter 3.2.2., is an immanent threat to engagements in many emerging markets, especially for the expropriation-prone industries. But including an expropriation scenario in a cash flow model poses difficulties, as the probability of such an event, as well as the level of a possible compensation payment is hard to quantify.

Furthermore, during a DCF valuation, multiple input factors have to be sourced using local stock market data. For instance the CAPM, which is used to derive the appropriate cost of equity, uses the covariance between the specific stock and the market to calculate the risk premium for a company. This requires an efficient stock market which provides reliable data for a longer time horizon. As pointed out in Chapter 3.2.3., many emerging markets can not provide such facilities. The changing level of liquidity within the market, as well as other market imperfections like ownership restrictions or sectoral imbalances, heavily distorts historical data. For non-listed entities, the cost of equity is estimated with the help of comparable companies whose cash flows display similar risk characteristics. Within emerging markets, the limited number of listed companies forces appraisers to fill the peer group with companies that show less resemblance to the company under valuation, or with entities from other countries, with both approaches diminishing the reliability of the generated results. Another input parameter for the discount factor, the risk-free rate, also is a constraint. While appraisers in the developed countries can expect the rates on highly liquid long-term sovereign bonds issued by their government to be close to the risk-free rate, this situation is different in emerging markets. Although also emerging market governments can theoretically
not become bankrupt, as they can always print more money or collect taxes from their citizens, history has demonstrated (e.g. Argentina in 2002) that governments can actually default and cease to repay their debts. This essentially disqualifies the use of their rates as the risk-free component, but feasible substitutes are rare. In addition, liquid government bonds whose maturity exactly matches the project’s lifetime are not always available.

These explanations illustrate that the application of the DCF method in the emerging market context violates its theoretical foundation. In addition, the specific conditions of the developing countries complicate the overall methodology for every step of the valuation process. A DCF model always requires the appraiser to improvise, use his intuition or settle on a compromise to a certain degree, which is a tolerated fact in the developed countries. In the emerging markets, however, it is hard to justify the use of the DCF facing the aforementioned issues. Nevertheless, it is the preferred method of practitioners in the developing countries, as studied by Pereiro (2006). The lack of comprehensible alternatives and the limited willingness to question the underlying mechanisms have sustained the widespread acceptance of the DCF as the “best practice” also in the emerging markets.

4.2. Valuation based on Multiples

A relative valuation seems like an attractive approach as it requires only a rather simple methodology and promises to reflect the market-wide price perception for an asset, as opposed to a single opinion generated through a DCF. But extrinsically based methods also exhibit several disadvantages: First of all, the feasibility and acceptance of the final value depends to a huge degree on the careful selection of the comparable entities. Especially in countries with only a limited number of listed companies, generating an adequate peer group can be troublesome. This problem becomes especially evident in emerging markets: While there are approximately 7,000 companies listed on the U.S. stock exchange, the only emerging market with more than 1,000 listed companies is Brazil. In transition countries like Indonesia, Russia and Turkey there are only about 250 listed firms (Pereiro, 2006). This is not a sufficient number of entities for analysts to gather a relevant peer group for every company.

In addition, relative valuation only makes sense under the assumption that capital markets are efficient, and thus market prices correctly display the “true” value of an object. As outlined in Chapter 3.2.1., this is often not the case in emerging countries. Nevertheless, in the context of the high volatility of emerging markets, multiples can be a good indicator for a potential spot
buy-sell transaction, but are not suitable for valuing a company in the long run. A high degree of uncertainty is also created by the limited level of liquidity in many developing markets, as outlined in Chapter 3.2.3., regarding the realizable selling value of the object under valuation. Finally, as many of the economic parameters which are used to calculate multiples are subject to accounting regulations, they become manipulable and thus unreliable, as pointed out in Chapter 3.2.4, (Copeland et al., 2000).
5. Adjusted Models for Valuation in Emerging Markets

Chapter 4 has shown that the methods traditionally applied in developed markets are not suitable for the specific conditions present in emerging countries. The following section illustrates how scholars and practitioners are trying to adapt the valuation principles derived from financial theory to emerging markets in a realistic manner. The following adjusted models are analyzed with regard to their theoretical concept, as well as their applicability.

The general perception is to remain with the DCF technique and adjust the CAPM to capture the country risks. A debate has evolved which of these risks should be incorporated in the valuation model and whether these risks are better modeled into the discount rate or into the projected cash flows.

5.1. Determining a country-risk adjusted discount rate

Cash flows that are generated in emerging markets, mostly in a foreign currency and in an unfamiliar setting, are commonly perceived as very risky. Therefore, increasing the discount rate to visualize their riskiness feels like the appropriate response. This approach is also attractive as expressing the risk level of a country or project in form of a discount rate is very intuitive, convenient for comparisons and easy to communicate. Yet the academics are in a disagreement how to derive this risk-adjusted discount rate, as Zenner and Akaydin (2002) point out: “The only real consensus is that there is no real consensus about how to estimate international cost of capital”.

All following methods, with the exception of Erb-Harvey-Viskanta and Estrada’s Downside Risk model, are basically adaptations of the classic CAPM. Two frameworks, the Goldman-Sachs and the Salomon-Smith-Barney model, were developed by practitioners with the subsequent application in their specific businesses in mind. The CAPM-based models are presented in chronological order of their publication, as some models are advancements of previous ones. This also highlights various trends and counter movements in the valuation approaches.
5.1.1. The Starting Point – A simplistic Country Risk Premium Approach

A widespread method for quantifying the Country Risk Premium is using the yield spread between dollar denominated sovereign bonds with the same maturity, issued by the home and the foreign government (see, for instance, Estrada, 2007). By comparing these rates, which express investor’s expectations for a minimum risk investment in their respective country, analysts infer the additional return that compensates for the specific country risk. This premium is then added to the discount rate for a comparable investment based in the home market (which is usually estimated by the regular CAPM) to compute the country-risk adjusted rate for the project in the respective market. Appendix III shows the country risk premiums for a group of emerging markets with the U.S. Treasury-Bills as the home country’s reference sovereign bond (Sabal, 2002)

This simplistic practice seems appealing, especially when compared with the subsequently introduced models. Methodological problems arise when no liquid dollar denominated sovereign bonds of the right maturity are available in the respective emerging market and therefore no feasible reference bonds for both countries with a maturity corresponding to the project’s horizon can be found. Using bonds with differing maturities will overvalue or undervalue long-term projects, as the time structure of default risks is hardly ever flat but upwards or downwards sloping (Cruces et al., 2002). In addition, country risks are not totally systematic risks, as stock returns in the developing and developed world are not perfectly correlated. Thus a diversification effect from spreading funds over various countries is realizable. Consequently, only a portion of the total country risk should be added to the discount rate, as investors expect compensation only for the undiversifiable risk component. This approach also assumes that the country risk is identical for all projects or companies within a market. This is counter-intuitive, as different business sectors will have a different exposure to the country risk. Finally, the yield measures the investor’s expectations that a government will repay its debt. However, whether this measure is a good approximation for a country risk lacks empirical evidence (Sabal, 2002).
5.1.2. **Lessard’s Model**

Lessard (1996) tries to solve the problem of unreliable local information by combining it with global data and thereby designed the first of the so-called Hybrid models. More specifically, he uses U.S. data as an approximation for global market developments:

\[ RE = R_{U.S} + \beta_{L,U.S} \times \beta_{U.S} \times MRP_{U.S} \]

Lessard calculates the cost of equity by determining the risk premium investors would demand for a comparable project if it was based in the U.S. This premium, which is calculated on the basis of U.S. equity market data and a comparable project’s Beta, \( \beta_{U.S} \), is then multiplied with the country Beta of the investment’s specific location, \( \beta_{L,U.S} \). This country Beta measures 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. Lessard adds this premium to the U.S. risk-free rate and suggests using the final result for discounting foreign cash flows.

Lessard also comments on the use of Country Risk Premium on the discount rate. He states that this technique is misleading, as many risks can be diversified by international corporations that are engaged in various countries. Furthermore, many of these risks are declining over time, for instance regulatory uncertainties or unfamiliarity with the market, and would be overstated if they were incorporated in a higher discount rate. But he acknowledges that using a country risk premium can be useful for initial screening approaches. If a risk premium is used, he recommends premiums with as little room for subjectivity as possible, for instance sovereign bond yield spreads, quoted insurance premiums or rates based on political risk ratings from reputed institutions.

Lessard’s model represents an easy-to-use framework, which recommends accounting for most risk effects in the cash flow projections. But the applicability of his discount factor model depends very much on his claim that the U.S. serves as a good proxy. This assumption seems especially outdated since the recent economic crisis, where emerging markets recovered much quicker than the developed markets. Whether any developed market today can serve as a proxy for the global development is difficult to answer. \( \beta_{L,U.S} \) can also be expected to fluctuate widely over even a short time horizon and is difficult to predict. Furthermore, finding a comparable project with similar cash flow patterns for the estimation of
the project Beta is not as feasible in practice as it sounds in theory, especially across different countries.

5.1.3. *Godfrey-Espinosa Model*

Godfrey and Espinosa (1996) introduce two additional elements in the discount factor discussion. Firstly, the authors argue that the application of the country beta as suggested by Lessard (1996) will often lead to confusing results if the valuation takes place in the context of emerging markets. This claim is supported by their study, which shows that several emerging countries like Venezuela, Argentina or Sri Lanka can exhibit a negative country beta in relation to developed markets. This would lead to negative risk premiums for investments in these countries. Godfrey and Espinosa found that the reason for this paradox is the small (or negative) correlation between the market returns in emerging markets with those on the global level. Although these markets exhibit a very high return volatility, their country beta identifies them as relatively safe locations for investments as their return patterns show little correlation with the world market.

This result is in line with the basic assumptions underlying the CAPM, as investors should only be compensated for the systematic risk exposure of a project. An investment in a country with high diversification potential should only require a low or negative risk premium. Yet, as Godfrey and Espinosa point out, this is of little use to managers who aim to assess the risk of a country independently from the global portfolio. And very few firms will hold a portfolio of productive and financial assets which is equal to the global portfolio and thus consider the diversification benefits to the same extent. The authors suggest using the total risk – instead of the covariance risk in the form of beta – of a country to determine the risk premium. They substitute the country beta used in Lessard’s model by their so-called adjusted beta, which is the ratio of a specific country’s equity volatility to that of the U.S. market, calculated as $\sigma_L/\sigma_{US}$. Essentially, this is based on the assumption that the correlation between all markets is 1.

Furthermore, the authors argue that the use of a risk premium, $R_C$, which was criticized by Lessard (1996), is recommendable, but overestimates the country risk and thus the discount rate. Since it can be assumed that the market volatility already incorporates parts of the country risk, a double-counting of risk occurs. Godfrey and Espinosa refer to a study by Erb et al. (1995), who concluded that up to 40% of the equity volatility can be explained by
economic and political aspects which are already incorporated into the country risk premium. As a consequence, Godfrey and Espinosa propose a reduction of the adjusted beta by this factor, although they simultaneously acknowledge that this ad-hoc correction technique needs further consideration. The final model for calculating the required return on equity is as follows:

\[
R_E = R_{f,US} + R_C + \left( \frac{\sigma_L}{\sigma_{US}} \right) \times MRP_{US} \times 0.60
\]

Godfrey and Espinosa adapt and extend Lessard’s initial concept in a comprehensible way. The substitution of the Beta by a factor that measures the volatility risk violates a basic assumption of the CAPM, but yields results that are allegedly more useable in real life situations. But Godfrey and Espinosa make two strong assumptions in their model which do not fit to the ever-changing conditions of emerging markets. Firstly, they set the correlation between emerging and global market returns equal to 1 and secondly, they claim that the country premium explains 40% of the local return volatility. Although this is practice is supported by empirical evidence, these premises are not realistic due to the volatile nature of the markets in question and therefore render the results unreliable.

5.1.4. Goldman-Sachs Model

The model developed by Mariscal and Hargis (1999) was clearly inspired by Godfrey and Espinosa’s (1996) ideas. The authors introduced more company-specific components into the discount factor model:

\[
R_E = R_{f,US} + (R_S + R_C) + \left( \frac{\sigma_L}{\sigma_{US}} \right) \times \beta_{S,L} \times MRP_{US} \times (1 - \text{corr}(S,B))
\]

This model, which was developed for the U.S. investment bank Goldman Sachs, introduces the concept of an individual company-specific risk factor \(R_S\). It can be positive or negative and depends on the company’s characteristics, e.g. industry cyclicality, percentage of sales generated outside the target country etc. The aforementioned country risk premium \(R_C\) is added on top.

Mariscal and Hargis also prefer to use the relative volatility risk \(\sigma_L/\sigma_{US}\) instead of the covariance when determining a specific country’s risk, for the same reasons pointed out by Godfrey and Espinosa (1996). Furthermore, with the company-specific orientation in mind,
the authors also accounted for the target company’s beta in relation to the local economy with the factor $\beta_{S,L}$. The last term in the formula adjusts for the double counting of risks that occurs by using the sovereign spread as country risk premium. The correlation between the target country’s stock returns and the sovereign bond which was used for measuring the yield spread is removed from the equation.

The Goldman-Sachs Model does a very good job at illustrating the various risk drivers that constitute and influence the final discount rate. Firstly, the U.S. risk-free interest rate and the equity premium determine the global investor expectations. The country risk premium and the relative volatility risk are the domestic macroeconomic indicators that measure the risk of the target company’s economic environment. In addition, the company-specific risk premium and Beta take the individual risk characteristics of the object into account.

Mariscal and Hargis’ approach deviates from the previous idea of developing a comprehensible and easy-to-use framework. Adding further components gives room for subjectivity, arbitrariness and imprecision. For instance, there are no guidelines on how the company-specific risk premium, $R_S$, should be calculated. And although the authors acknowledge the issue of double-counting risks in two factors of the equation, they did not research if the same applies to other input components. For instance, a certain level of correlation is conceivable between the company-specific risk premium and the local beta. And the issue of risk-double counting is amplified with every additional term. Furthermore, combining the beta of the target company with the local market creates the problem of limited availability of reliable long-term financial data in many emerging markets. Finally, the technique of adjusting the beta by the relative volatility factor bears no economic foundation, as concluded by Harvey (2001).

5.1.5. Global or International Capital Asset Pricing Model
A radically different and simplified idea is the basis for the Global or International CAPM (abbreviated as G-CAPM or I-CAPM). The basic assumption is that all international financial markets are deeply integrated, which means that investors have the same risk-return attitude everywhere in the world. Furthermore these models assume that investors can move their funds from one country to another with no restrictions, minimal transaction costs and with a certain predictability of their returns.
Stulz (1999) supports this view, stating that developed countries have largely abandoned all financial barriers and that emerging countries have quickly caught up in the past decade. He proposes that the cost of equity for companies with access to the global capital markets, no matter in which country they are located, should be measured with the G-CAPM:

\[ R_E = R_{f,G} + \beta_G \times MRP_G \]

\( MRP_G \) denotes the required risk premium on equity investments on a global scale, and \( \beta_G \) is the global Beta i.e. the correlation of the company’s returns with a global index (Stulz recommends the Morgan Stanley Capital Markets World Index [MSCI]). This theory implies that corporations with access to the global capital markets should discount their cash flows originating in any country using the same rate of return calculated with the G-CAPM.

A major point of criticism in the fundamental idea of G-CAPMs is that all markets are deeply integrated. This issue is heavily debatable, as research has indicated (among others, Bekaert et al., 1997) that many financial barriers exist which prevent a globally integrated capital market. Also, the latest FDI Restrictiveness Index, published by the OECD (2008), which measures the level of investment barriers for foreign investors, notes that China and India, the two largest emerging markets, have the highest level of restrictions in terms of investment and ownership rights. These markets have to be regarded as separated and with this classification the essential principles of the G-CAPM are violated, and so the applicability seems inappropriate for emerging markets. On the other hand, Bekaert and Harvey (2002) discovered a gradual increase in the correlation between emerging and developed capital markets after the recent liberalization period. This indicates that in the near future the G-CAPM could gain more support in the discussion.

5.1.6. The Local Capital Asset Pricing Model

Advocates of the local CAPM (L-CAPM) models believe that the emerging markets are at least partly separated from the developed markets, with the consequence that investors can be isolated and thus exposed to country-specific risks that could be at least partly diversified in integrated markets. A survey among financial practitioners conducted by Keck et al (1998) showed that around 95% of the questioned practitioners believe in globally segmented financial markets. As a consequence, Pereiro (2001) postulates that the components for computing the cost of equity have to be derived from the specific local market instead:
\[ R_E = R_{f,L} + R_C + \beta_L \times MRPL \]

where \( R_{f,L} \) is the local risk free rate and \( R_C \) the well-known country risk factor. The \( \beta_L \), the local beta, is the sensitivity of the object under valuation with regard to the local stock index. Pereiro argues for the use of a risk premium in the discount rate as, in his opinion, it is almost impossible to estimate the effect country-specific risks will have on the cash flows. He feels supported by the fact that in other surveys, scholars found evidence that adjusting the discount rate by a risk premium is the widespread use in financial modeling (Petit et al., 1999).

As illustrated earlier, Godfrey and Espinosa (1996) argue that adding a country risk premium leads to a double-counting of risk factors, as the market premium might already incorporate parts of the country risk. Thus simply adding a premium would lead to an overestimation of the discount rate. The obvious consequence is to correct the initial L-CAPM by this factor, as Pereiro does by formulating the adjusted local CAPM (AL-CAPM) variant. He multiplies the market risk premium with the factor \((1 - R_i^2)\), where \( R_i^2 \) denotes “the amount of variance in the equity volatility of the target company \( i \) that is explained by country risk” (Pereiro, 2001). Pereiro avoids the restrictive assumption of a static \( R_i^2 \) in contrast to Godfrey and Espinosa’s model.

But the extensive need for local data in the AL-CAPM confronts practitioners with the problem of limited reliable long-term data. Instead, Pereiro (2001) suggests a further adaptation which he calls the adjusted hybrid CAPM (AH-CAPM), a combination of local and global data. This model is essentially in line with Lessard’s (1996) formula, with the only exception that Pereiro uses global instead of U.S. data for computing betas, market premiums and risk-free rates, and adds the aforementioned correction factor to avoid the country-risk double-counting. The result is as follows:

\[ R_E = R_{f,G} + R_C + \beta_L \times MRPL + (1 - R_i^2) \]

The AH-CAPM has the definite advantage of relying mostly on easily computable data. On the other hand, it deviates from the initial premise of a simple and transparent model. And all models that include the country-risk premium \( R_C \) have to face the criticism outlined before.
Furthermore, the included Beta values can be expected to fluctuate substantially over time, rendering mid-to-long term projections of the correct discount rate extremely difficult.

5.1.7. Salomon-Smith-Barney Model

The authors Zenner and Akaydin (2002) developed an extended G-CAPM approach for the U.S. investment bank Salomon Smith Barney. They support for the use of global factors in their model as, according to their opinion, locally derived factors are essentially useless due to the market inefficiencies. Furthermore, as most of the larger corporations operate in integrated financial markets with a global investor base, their rates of return should also be based upon global indices. To account for the aforementioned shortcomings of the G-CAPM approach, namely that emerging markets are not fully integrated and harbor specific restraints and complications that justify a risk premium, the authors extend the basic G-CAPM in the following way:

\[ R_E = R_{fG} + \beta_G \times MRP_G + \left[ \left( \gamma_1 + \gamma_2 + \gamma_3 \right)/30 \right] \times PRP \]

Essentially, Zenner and Akaydin suggest adding an idiosyncratic risk premium to the G-CAPM formula, which is the country risk premium adjusted by the risk level of the specific project. As base country risk premium, referred to as PRP (unadjusted political risk premium) in the formula, the authors use the sovereign bond yield spread which was introduced earlier. But in their opinion, using the full yield spread as an approximation for political risk extremely overestimates the required rate of return. Their research indicates that a country risk premium of 5.33%, which is not uncommon in practice when sovereign bond yield spreads are used, already corresponds to a 50% probability of a total loss scenario – which would only be appropriate in extreme situations. Thus the authors designed a framework to adjust the country risk premium depending on the individual risk characteristics of the specific project, and only cash flows from very risky projects will be discounted with the full premium.

The risk level of a project is measured by the equally weighted parameters \( \gamma_1 \), \( \gamma_2 \) and \( \gamma_3 \) on a scale from 0 to 10. All three factors are expected to be close to 0 in developed markets

- \( \gamma_1 \) ranks the company’s access to capital markets. Corporations with a low \( \gamma_1 \) have good access to the global capital markets with a well-diversified investor base which is only interested in the systematic risk component. In contrast, companies with high
have only limited access to capital markets with investors that are not able to fully diversify their investments and therefore expect compensation for the country-specific risks they feel exposed to.

- $\gamma_2$ expresses the exposure of the investment towards governmental interference. Engagements in utilities, defense or telecommunication sectors are usually more in danger of expropriation in times of political turmoil than other industries, and should therefore generate higher rates of return and have a higher $\gamma_2$.

- $\gamma_3$, depends on the relative importance of the object under valuation for the investor. The reasoning here is that if the potential capital expenditure represents a substantial fraction of the investor’s assets, a higher risk premium and thus a higher $\gamma_3$ should be utilized. A score of 10 in all three parameters would imply the maximum added risk premium in the form of the full sovereign bond yield spread.

Similar to Mariscal and Hargis’ (1999) model, which was discussed beforehand, Zenner and Akaydin try to develop a comprehensible model which encompasses project specific components, is easy-to-use in the practical context and does a good job at illustrating the separate risk drivers. Furthermore, their critical assessment of the common derivation of the country risk premium and the implicit assumptions with regard to the total loss scenario provide new insights that need to be addressed in future discussions. But the use of their risk parameters $\gamma_1$, $\gamma_2$ and $\gamma_3$ lacks empirical foundation and is a highly arbitrary method. Determining the individual score for a project forces practitioners to make several subjective assumptions, as no specific guidelines for the derivation of the qualitative parameters are available.

5.1.8. Erb-Harvey-Viskanta Model

The model developed by Erb, Harvey and Viskanta (1995) demonstrates the authors’ distrust in the applicability of CAPM in an emerging market environment. Instead of relying on the traditional risk measurement Beta, the authors choose a model based on country credit ratings which are published semi-annually by the Institutional Investor magazine. These credit ratings are assumed to be an approximation for political and other typical country risks. According to the authors, using this forward looking risk factor is more appropriate for the volatile nature of emerging markets than factors based on historical data like Beta. A further advantage is that country credit ratings are also published for economies without a stock market, where the determination of the risk premium is hardly feasible with CAPM-based models.
The authors calibrated the following cross-sectional regression model with a dataset of equity market returns and country credit ratings from 1979 to 1995:

\[ R_{\text{Country}, t+1} = \gamma_0 + \gamma_1 \times \ln(CR_{\text{Country}, t}) + \varepsilon_{\text{Country}, t+1} \]

\( R_{\text{Country}, t+1} \) is the return in U.S. Dollars for a specific country, \( t \) is measured in half-years and \( \varepsilon_{\text{Country}} \) is the regression residual. Subsequently, the calibrated model was used to forecast equity returns for countries without stock markets.

Erb, Havrey and Viskanta’s model demonstrates that valuation approaches deviating from the traditional CAPM can yield viable results. Especially for countries with extremely inefficient or no equity market at all, this model offers a systematic approach for determining the discount rate. But the model has two substantial shortcomings: It can only determine the cost of equity on a country-level, and not on a company or project-specific level. And whether the same hurdle rate is applicable countrywide is highly questionable, as specific factors like the cyclicality of an industry or the project leverage should have an important influence on the valuation outcome. Furthermore, the methodology used by the Institutional Investor magazine to compute the country credit ratings is based on surveys among bankers who rate each country on their default risks. This method is prone to high subjectivity and needs to be analyzed concerning empirical evidence, as argued by Estrada (2000).

5.1.9. Estrada’s Downside Risk Model

Estrada (2002) argues against the use of the traditional CAPM as it implicates assumptions that are significantly violated in emerging markets as described beforehand. In addition, Estrada argues that the variance of returns is a dubious measure of risk, as it is applicable only to symmetric and normally distributed values. And, as this basic foundation is already heavily debatable in developed countries, and even more so in developing countries, the author suggests to replace the variance of returns by the semivariance. This factor would only capture the downside volatility of the returns. The arguments for the semivariance are that it is more useful when the underlying returns are asymmetric and that investors are only interested in the downside fluctuations of their returns anyway.
Based on the semivariance, the downside Beta can be derived as “the ratio between the semi-standard 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, 2006). Subsequently, the D-Beta, $\beta_i^D$, is used to formulate the D-CAPM (Downside CAPM) model:

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

Estrada (2002a) has conducted extensive studies which provide evidence that the D-CAPM is better able to explain the cross-section of returns in emerging markets than the traditional variant. On average, the downside Beta is 50% higher than the standard Beta for emerging markets, whereas the difference is much smaller for developed countries. This illustrates that the emerging market risk is better captured by the downside volatility. This corresponds at average to an increase of the required cost of equity by 250 basis points.

The author illustrates how basic assumptions, which are implicit in the traditional valuation methods, are violated in the emerging market context and demonstrates how this issue can be solved. But, as Estrada uses local data to specify the D-beta, the applicability of his model in emerging markets can be doubted. Locally derived factors are often difficult to determine due to limited reliable long-term data, but are essential for the correct semivariance estimation.

### 5.2. Incorporating Country Risk in the Cash Flows

Although the majority of models suggest that the discount factor adjustment is the prominent practice, it is easy to find a similar number of advocates for the cash flow adjustment approach. Their primary argument is that only non-diversifiable risks should be incorporated into the discount rate and as the country-related risk is diversifiable from the perspective of a global investor, it should not be included (see, among others, Lessard, 1996; Shapiro, 2003). James and Koller (2000) add another argument against the use of risk premiums in the discount rate, namely that risks are uniform in a country, but vary widely across industries and even among companies within the same industry. Using the same risk premium countrywide would overstate the risk for some, and understate it for others. This line of argumentation is further extended by Bruner et al. (2003), who fiercely criticize the common practice of adding a constant risk premium, which is, inappropriate in their opinion, because country risk varies widely over time.
The common criticism of country risk accounting in the cash flows is that the precise impact of political incidents like political turmoil are very hard to quantify. Lessard (1996) tries to counter this argument by suggesting that rates for international insurance against political risks can be used as an approximation for the cost of these effects. Although this seems like a comprehensible approach at first, the fact that neither scholars nor practitioners have picked up on this idea gives rise to the assumption that this approach is not as realizable as imagined by Lessard.

Adjusting the cash flows is also recommended by Copeland et al. (2000), who suggest that the specific risks of emerging markets can best be accounted for by probability-weighted scenarios. For each scenario a set of coherent macroeconomic variables like the inflation rate, GDP growth, exchange rate and interest rates needs to be determined. Each set must be linked in a way that it matches a possible scenario, which could range from total expropriation, extreme inflation or relative stability to prosperous growth. Subsequently, the impact of these macroeconomic conditions on the project’s cash flows is estimated for each scenario, and the individual values are weighted with the likelihood of occurrence to compute the project’s final value. Copeland et al. (2000) suggest using the global CAPM, assuming perfectly integrated markets and globally diversified investors.

The probability-weighted scenario approach is also supported by Shapiro (2003), but neither of the authors elaborates on the significant potential for subjective decision making and arbitrariness which is also inherited in the cash flow projections. Weighting the scenarios and evaluating the cash flow implications requires a huge degree of managerial knowledge and instinct and is thus prone to manipulation. The results are, as pointed out by James and Koller (2000), “educated guesses at best” and should be considered with a certain degree of skepticism. But by creating scenarios and quantifying their influence on the project’s outcome, the management can identify the risk elements with the biggest impact on the final value – and can make plans to mitigate or hedge against these factors.

5.3. Adjusting Multiples for Country Risk

An adjustment to the regular Multiples approach is provided by Pereiro (2002). He suggests using Multiples from the U.S. market with subsequent cross-border corrections to alleviate the problem of limited comparable companies and transactions in most emerging markets. His suggested approach can be illustrated as such:
Differing accounting standards require an adjustment of the published figures, or Multiples based on free cash flow denominators have to be used, as these are less affected by accounting practices. A further issue is that national capital markets often value the same particular asset very differently. This may be due to perceptions regarding country risk, the level of general optimism in the economy or how the market participants assess the managerial and company attributes. Consequently, even after adjustments for accounting, cross-border Multiples need further modification. Pereiro recommends using a market-wide correction coefficient, e.g. dividing the recent average Price-Earning-Multiple of a particular emerging country with the reference value from the U.S. and then assume that the capital markets generally over- or undervalue the same asset by this factor.

The necessity for the correction of Multiple values which were calculated for a different market is intuitively correct and supported by empirical findings. Yet this method provides ample room for biased decision making, ranging from the initial choice of the Multiple factor (depending on whether the Price-Earnings-Ratio or Price-Sales-Ratio is selected, very different Multiples can plausibly be generated), over the length of the reference period for determining the correction coefficient, to the application of additional adjustment factors. Besides, as Pereiro (2002) argues, it would also be sensible to adjust reference Multiples for the illiquidity aspect on emerging capital markets (as discussed in Chapter 3.2.4.), and Multiple factors from past transactions should also be adjusted to reflect the changes in the economic conditions that happened in the meantime. This string of adjustments could possibly be extended up to a point where the result will be nowhere near to the initially derived Multiple. This may find theoretical justification, yet lacks any feasibility for real-life valuations.
5.4. Evidence on the Common Practice among Companies

In developed markets, appraisers are in accordance concerning the aforementioned mainstream practices DCF with CAPM and Multiples, yet in emerging markets the dominance of single models is less present, as studied by Bohm et al. (2000) and Pereiro (2002). Faced with such a multitude of contrasting approaches and models with different core components, it is interesting to note what practitioners resort to in real life valuations:

- Keck et al.’s (1998) survey among 131 financial analysts found that country or project specific risks are usually modeled into the discount rate with the exception of tax effects, which are allegedly easier to model into the cash flow projections.

- In Graham and Harvey’s (2001) study, a total of 392 CFOs provided details about their valuation practice. The results show that approximately 51% of the respondents always or almost always use risk-adjusted premiums to accommodate for country and project specific risk when valuing international objects. Out of these 51%, 28% adjusted for risk in the discount rate, 31% in the cash flows and 41% in both, even though the latter technique incorporates the risk of double-counting. But these findings also imply that roughly half of all companies value projects with an unadjusted company-wide discount rate, no matter if the project is domestic or located overseas. These findings lead the authors to conclude than many practitioners accidentally do not apply the CAPM correctly.

- Graham and Harvey (2001) could also demonstrate that the level of sophistication of the valuation procedure depends very much on the firm size, with large companies exhibiting a more elaborate approach towards international project valuation. Still, it is interesting to note in this context that only a small fraction (11%) of practitioners showed awareness of the momentum aspect of the risk factors, and acknowledged that all inputs of the valuation models are continuously changing.

- The most detailed study among practitioners in an emerging market was conducted by Pereiro (2006), who questioned practitioners in the Argentinean market regarding their preferred method. Among the respondents were local companies and subsidiaries from international MNCs, financial advisors and private equity funds, as well as financial institutions like insurance companies and banks. In general, CAPM-based models were the preferred choice, with approximately 68% of all respondents opting for this framework. Alternative models were the so-called Arbitrage Pricing Theory (APT)
and the Economic Value Added (EVA) framework, which were both not frequently used by the respondents. If at all, these models were applied parallel to CAPM-based approaches. Despite the discussed flaws, country-risk was mostly quantified by the simplistic risk premium approach introduced in Chapter 5.1.1., as 70% of the surveyed Argentinean corporations and 100% of the financial advisors utilized this technique. However, especially corporations seemed to lack deeper understanding of the underlying concept as only 29% matched the terms of the sovereign bonds with the project’s lifetime. Among the surveyed corporations, only one reported using the Erb-Harvey-Viskanta model, albeit only supplementary to a local CAPM. And nobody stated the use of Estrada’s downside risk model.

- Pereiro (2006) also found that the use of Multiples was widespread. Especially financial advisors seemed to rely on this technique as 100% confirmed its application and 45% even named it as their primary tool. Using U.S. Multiples as reference seemed to be a common practice, as 83% of the financial institutions and 91% of the financial advisors supported this approach. Among the institutions only 20% resorted to cross-border adjustments, yet 64% of the advisors did. Corporations seemed to understand the Multiples approach as a double-checking tool, as 50% used it as secondary tool, but hardly anybody as primary. Interestingly, Corporations and advisors estimated the horizon value very differently, with 91% of the first group relying on the perpetuity approach, whereas the majority of the latter group (73%) calculated terminal values based on Multiples.

5.5. Selecting the Valuation Model

The previous illustration of the various valuation models (which was, by no means, exhaustive) and the presented studies demonstrate that academics and practitioners are far from reaching a consensus concerning the method yielding the most viable result. And, as the choice of model dramatically influences the final result of the valuation, this is definitely not a trivial decision. For instance, when choosing the cost of equity model, the generated rates can differ by 300 to 1,000 basis points, as presented by Bruner and Chan (2002), who compared the CAPM, adjusted CAPM, global CAPM, and an individual multifactor model. Appendix IV provides Cost of Equity estimates for a range of major Latin American markets derived with the various methods. The rate for Peru, for instance, ranges from 10.6% (based on the global CAPM) to 39.4% (based on the Erb-Harvey-Viskanta model) – which illustrates the immense effect the choice of model has.
The only consensus the authors agree upon is that all risks whose effect on the cash flows can be predicted with a high level of certainty should be modeled into the cash flow projections. This procedure is supported even by most of the authors that designed special emerging markets-compatible CAPM variants, ranging from Lessard (1996), over Pereiro (2001) to Zenner and Akaydin (2002). Essential in this context is that risk elements, which are considered in the cash flow projections, are not accidentally double-counted if a simultaneous adjustment of the discount rate is used.

This leaves practitioners with the question which discount rate they should apply. The final judgment in this context depends on the individual characteristics and location of the target object and the preferences of the investor. The following framework designed by Pereiro (2001) illustrates one possible decision-making process:

First of all, the appraiser needs to decide for either a CAPM or non-CAPM based model. If no local stock market exists in the target country, the Erb-Harvey-Viskanta model is the only viable option. Otherwise, a cost-benefit analysis would probably tempt practitioners towards CAPM based models, as the utilized beta values are widely available in contrast to the input required for the non-CAPMs. This is a relevant aspect, as most financial analysts use data
provided by financial information services instead of computing their own figures [Bruner et al., 1998]. If the appraiser chooses a CAPM-based model, the degree of perceived financial integration on the one hand and the reliability of the local data on the other hand need to be assessed in the next step. This categorization determines the final choice of the model and needs to be based upon the specific characteristics of the target country.

This step-by-step approach illustrates the various fundamental ideas that differentiate the models and provides a first structured selection process. But the categorization of the approaches lacks a further dimension, namely the need for company or project specific risk adjustments. Among the presented models, Lessard’s, Erb- Harvey- Viskanta’s, as well as Godfrey and Espinosa’s models have no individual risk factors in the equation. The global, local, hybrid and adjusted local CAPM accommodate company specific risk in the beta. At the other end of the scale, the Goldman Sachs and Salomon-Smith Barney models include target specific adjustments to a large extend. This demonstrates that appraisers also need to assess whether the valuation object is exposed to the “average country risk” or exhibits a very high degree of idiosyncratic risk that needs to be accounted for by additional risk adjustments.

Furthermore, Pereiro’s framework lacks specific guidelines how the level of financial integration and local data reliability should be measured. In addition, the degree of these qualities is changing over time, as concluded in a past study by Bekaert and Harvey (1995). Rankings like the FDI restrictiveness index which is published by the OECD could serve as an indicator for a country’s financial integration and expert surveys for the market data reliability. But in the end, the decision depends on the appraiser’s personal beliefs in the approach of a specific model. In his later publication, Pereiro (2002) argues that if a low degree of financial integration is perceived, the adjusted local CAPM should be preferred over the regular local CAPM, as it compensates for the double-counting of the risk factors. When a low reliability of the data series is perceived, the adjusted hybrid approach should be the model of choice, as it avoids the strong assumptions with regard to the market correlation inherent in Godfrey and Espinosa’ model.

In his publication, Thurner (2003) compares the probability-weighted cash flow scenario, Erb-Harvey-Viskanta, Estrada, Goldman-Sachs and Salomon-Smith-Barney approaches with regard to their applicability for the specific case of a valuation in Mainland China. According to the author, the Salomon-Smith-Barney model is his preferred model of choice as it is
“straightforward to use” and “provides a more nuanced approach to political / country risk”. Nevertheless, the author also acknowledges that the model lacks the economic foundations to gain widespread academic recognition.
6. Applicability of the Adjusted Models

Apart from substantially increasing the complexity of the already hard to operationalize conventional methods, it still needs to be evaluated whether the adjusted models diminish some of the problems outlined in Chapter 4.

6.1. Selection of the Input Parameters

Most of the adjusted models require the appraiser to estimate additional parameters like determination coefficients, the covariance of market returns from different countries or betas based on locally sourced data. With every added factor, the complexity increases substantially, as well as the probability for errors. One of the most important principles when working with valuation models is abbreviated as GIGO – garbage in, garbage out. This saying illustrates that a model can be sophisticatedly designed and technically correct, but as long as the input is based on questionable data, the output is equally arguable. Within complex valuations in emerging markets, precisely determining all input parameters is an impossible task. Instead, appraisers should rather rely on fewer variables.

The popular practice of using the sovereign bond yield spread as an approximation for country risk is also controversial. Despite the flaws outlined in Chapter 5.1.1., Godfrey and Espinosa, as well as Mariscal and Hargis and Pereiro use this component in their frameworks. The practical implementation of these approaches is complicated, because how should appraisers proceed if a specific country did not issue any dollar-denominated bonds of the required maturities? And can such rates be considered as a feasible approximation for the risk exposure of all industries, and even all companies within a market? Most probably the discount rate will be significantly overestimated for some companies, and underestimated for others.

A serious issue revolves around the models which use locally sourced data, like Pereiro’s L-CAPM or Godfrey and Espinosa’s model. As argued in Chapter 3 and 4, most, if not all emerging markets do not possess efficient capital markets. Statistical data sourced from these markets may be heavily distorted. In addition, many emerging markets have just recently entered a phase of economic opening, for instance if they have been under communist regime beforehand. In such countries, data series will be extremely short and influenced by the strong
upward business trend in the post-liberalization phase (Pereiro, 2002). Thus local data can only be utilized in markets that show at least a weak form of efficiency.

Another problematic issue is the high level of arbitrariness through the selection of the input parameters. Within Mariscal and Hargis’ model, for instance, an idiosyncratic premium according to the valuation target’s risk characteristics has to be included. Depending on the personal motives and perceptions of the appraiser, it will be very difficult to secure an unbiased analysis of the situation. The same can be said for Zenner and Akaydin’s model, which requires the ranking of the firm’s specific risk level on three different dimensions – entirely based on subjective evaluations. Here, comprehensible benchmarks and reference values need to be defined before this framework could actually be applied.

6.2. Adherence to the Theoretical Foundation
As discussed in Chapter 4.1., the generalized use of the CAPM is highly controversial. The assumption of perfectly efficient markets without transaction costs and no insider knowledge is highly unrealistic in emerging markets. Also the high level of concentrated ownership in emerging countries does not fit into the theoretical concept of the CAPM, which assumes diversified investors. Yet there are no other widely applied frameworks for quantifying the expected rate of equity for an investment. The attempts by Estrada and Erb, Harvey and Viskanta, who avoid using the CAPM due to its obvious flaws, led to alternative approaches. But these tools yield substantially higher rates than the CAPM-based models, as they also capture a portion of the unsystematic risk. This contradicts the general diversification theory, i.e. that investors only expect compensation for the systematic risk component, and leads to an overestimation of the discount rate.

However, whether investors really consider only systematic risks when assessing investment opportunities in emerging countries is highly questionable. Pereiro (2002) proposes to correct values derived from CAPM with adjustment factors to compensate for the unsystematic risk elements: illiquidity (stocks trade at lower prices in illiquid markets), size (larger companies trade at a premium as they have more solid track records and credit ratings) and control (minority interests are worth less than a controlling interest). The factors which Pereiro derives from an empirical study among Argentinean companies add up to a 50% discount on the initial value – which basically assumes that assets on the emerging Argentinean market are only traded at half their price compared to the identical asset traded in a developed market.
The author himself acknowledges that his approach is a “debatable, heuristics-based method” (Pereiro, 2002) which is founded on a questionable empirical basis.

A phenomenon called contagion effect further complicates the diversification discussion. It occurs when the economic situation in one particular country deteriorates and investors withdraw their money not only from this country, but from the whole region. As the level of foreign capital has a huge impact on the relatively small emerging economies, this effect weakens even stable neighboring economies (Bekaert, Harvey, 2003). A good example of this effect is the Asian crisis of 1997, which began with the devaluation of the Thai currency and spread to all of South-East Asia. Studies have shown that stable countries like Singapore can blame the sharp fall of equity prices on their capital markets solely on the contagion effect (Tan, 1998).

However, if contagion takes place, the diversification benefit of investing in several emerging economies - the foundation of Lessard’s (1996) model and the main argument of the cash flow adjustment advocates like Shapiro (2003) - is generally overstated. For a thorough analysis of the diversification effects, the return correlations among different emerging countries need to be calculated – an endeavor which is very likely to produce unreliable results due to the lack of available data and the fact that correlations change continuously, especially in the case of economic shocks.

6.3. **Interim Conclusion**

The analysis of the adjusted models shows a very disillusioning result. Although a reasonable evolution from the conventional methods is observable, the adjustments hardly solve the most prominent issues. Theoretical hardliners will argue that the general use of the CAPM in the emerging market context contradicts economic reason, and that alternative techniques should be preferred. But for most practitioners, the CAPM still remains the model of choice for estimating the discount rate and can be expected to do so in the coming years. The reasons are that the study of investor behavior in emerging markets is not yet advanced enough to provide alternative frameworks, that the CAPM is still fairly simple compared to other tools, and due to its dominant position, alternative techniques are hard to establish.

Since empirical evidence that adjusted models yield better results than the basic techniques is still missing, it is not possible to make a final judgment regarding the potential benefits of the
additional effort. This represents an interesting field for further studies. So far, the additional required time and increased complexity are hard to justify when most critical points of the conventional models persist.
7. Alternative Methods described in the Literature

The previous discussion showed that the search for a suitable valuation method which can deal with the existing difficulties in the emerging markets is not concluded yet. The general applicability of the DCF approach has to be doubted, as neither the theoretical foundation is ensured, nor are the conditions for a practical implementation provided. Now the question arises whether the literature offers further valuation approaches which bear the chance of yielding more plausible results. Subsequently, the already mentioned Adjusted Present Value (APV) and Real Options approaches, as well as the Monte Carlo simulation technique will be introduced and discussed.

7.1. Adjusted Present Value

The Adjusted Present Value (APV) technique is an advancement of the basic DCF methodology. The conventional formula is as follows:

\[
\text{APV} = \text{PV(unlevered firm)} + \text{PV(tax shield)} - \text{PV(bankruptcy costs)}
\]

The three step APV process requires the appraiser to estimate the value of the firm if it was all-equity financed. This so-called base case value is then adjusted by the present value of the financing effects, namely the tax reduction benefits from borrowing money, as well as the costs due to the added risk of bankruptcy. The tax benefits, also called the tax shield, can be determined with a function including the marginal tax rate of the firm, the cost and level of debt. Hypothetically assuming that these inputs remain constant over the project’s lifetime, the value of the tax benefits can be calculated as follows (Damodaran, 2006):

\[
\text{PV of tax benefits} = \frac{(\text{Tax rate} \times \text{Cost of debt} \times \text{Debt})}{\text{Cost of debt}}
\]

With this approach, the tax benefits are essentially considered as an infinite constant cash stream which is valued by the perpetuity formula. This concept implies a positive net income in each period of the project’s lifetime, as the tax shield is only applicable when there are actual tax obligations for a particular period. If the tax and debt rates as well as the capital structure are expected to change significantly, the tax shield for every year of the investment horizon needs to be estimated separately and discounted with the appropriate cost of debt, which is the factual rate at which the company can issue debt in the market (Pereiro, 2002).
In the last step, the additional expected bankruptcy costs due to the increase of the debt ratio need to be estimated. Bankruptcy costs increase with the level of leverage and appear in direct and indirect form. Direct bankruptcy costs are associated with the lawyers, valuators etc., who are required to conduct the bankruptcy process and who generate costs that reduce the value of the firm for the debt holders. Indirect costs are harder to identify: Companies with an increased likelihood for bankruptcy will encounter distrust from their consumers, suppliers and employees, which leads to higher costs. As no direct way of determining these cost effects exists, appraisers resort to empirical studies which estimate the bankruptcy costs for specific capital structures and firm sizes (see, for instance, Altman, 1984, who found that the indirect costs of bankruptcy can reach up to 15% of a firm’s value). Unfortunately, only limited recent evidence on this aspect is available, leading to a certain lack of clarity regarding the costs of financial distress.

While the regular DCF approaches incorporate all side effects into the cash flow projections or buries them in the discount rate, the APV does not only highlight how much the asset is worth, but also where the value comes from and how it changes under different financing premises. The classic DCF approach assumes a static capital structure (otherwise it would be necessary to compute the discount rate for each period individually) which is controversial to real-life situations. The APV avoids this issue by separating the operating cash flow of the business from the leverage effects. Sabal (2007) acknowledges that the APV is useful for emerging market valuations due to this aspect. In Sabal’s opinion, a regular DCF model is inappropriate as it assumes a static debt-equity-ratio and constant tax payments, premises which are often violated in emerging markets, where the high economic uncertainty leads to opportunistic leveraging decisions and changing tax legislations have to be faced.

Theoretically, the APV equation could be extended by further value-affecting aspects, as demonstrated by Luehrman (1997). His example illustrates this aspect in the following figure:
In Luehrman’s example, which is outlined in more detail in his paper, the base value of the investment corresponds to less than 50% of the total value. The remaining parts are generated by, as he calls it, financial maneuvers, i.e. the composition of the future capital structure, and value gains from operational improvements. Through the separation of the different value components, managers can make the sources of value and its distribution more transparent.

This procedure is helpful for cross-border valuation problems, for example when various possible investment locations are compared. Ideally, it should be possible to calculate the base case for a project with the home country parameters, and then subsequently adjust for the side effects generated by the location decision, e.g. the effects of currency hedging, governmental subsidies or insurance fees to compensate for expropriation. However, this theoretically appealing methodology is only applicable with restrictions in real-life situations, as the precise costs for each side effect are hard to quantify. It is also controversial which discount rate should be used to calculate, for example, the present value of the currency hedging activities.
The problem of the APV approach within emerging markets is that the core component, the base case, is derived by the standard DCF methodology and thus faces almost the exact same fundamental and operational difficulties that were discussed in Chapter 4 and 6. It is nevertheless an improvement above the regular DCF approach, especially when a static financing structure over the project’s lifetime seems unlikely, or if recent history has shown that the tax policies are subject to regular changes.

Another drawback of the APV is that the outcome actually consists of several values – the base case and the individual side effects – and is thus more complex to interpret and communicate than the single output of a regular DCF. Many practitioners, as well as laymen in the field of valuation, may invest the necessary diligence to fully understand the components of the APV – especially if some factors, like the expected costs of financial bankruptcy, are vague and hard to quantify. This can also be noted as the biggest limitation of the APV model, diminishing the perceived accuracy of the results. Thus the increased transparency will be lost on many appraisers, leading to the question if the additional effort of conducting an APV is at all reasonable.

7.2. Real Options

The basic idea behind the Real Options approach is to transfer financial option valuation techniques to capital budgeting decisions in order to include managerial flexibility in the equation (Copeland et al., 2003). Under the rationale of the Real Options approach, investments in a project or the acquisition of a company correspond to an option to invest (analogue to a call option) or disinvest (analogue to a put option) in the underlying asset until a future point in time (the expiration date). As the term option implies, the holder has no obligation to exercise it, but can also let the option expire. Literature identifies four particular relevant real options embedded in capital investments: the option to expand and make follow-on investments, the option to delay investing, or the options to abandon or sell the object (Damodaran, 2007).

Analogue to the financial option valuation,

- the initial investment outlay corresponds to the spot price of the option.
- the present value of the embedded real options (expanding in a new market, selling the asset to a third party etc.) represent the underlying asset.
• the time horizon the company imposes on itself until it plans to decide whether or not to exercise the options is understood as the expiration date (Damodaran, 2006).

A further important input factor for the valuation equation is the volatility of the real option’s present value. The present value of an expansion option, for instance, would change over the option’s lifetime due to unforeseen events in the foreign country like new competition, regulations, political changes or economic developments. This variance in the option’s value is an essential factor in the valuation model, as it is often the parameter which generates the actual value of the option (especially for out-of-the-money options, which exhibit a negative NPV, but bear a high probability for being in-the-money again over the option’s lifetime due to the high variance – see the AmBev expansion example in Damodaran, 2006, for further clarification).

Therefore options with a high cash flow variance, i.e. a high uncertainty regarding their final level, usually have a substantial value. This leads to the conclusion that projects in emerging markets, where there is a high economic uncertainty, should rather be valued with the Real Options methodology, since the associated options will represent a substantial value that is not captured by inflexible valuation techniques (Sabal, 2002). But the derivation of the option’s variance presents a difficult task, since projects are not traded and thus no stock market data can be used. The appraiser can either resort to variance estimates based on simulations, or use the variance of comparable publicly traded firms from the same industry. Neither of the two attempts produces results which are completely reliable – a major problem, as critics point out. Moreover, applying the Real Options approach on real-life valuation is more complex than theory suggests. Incorporating the effects of all possible real options, and therefore the whole managerial decision range into one option value, requires informed judgment. Usually projects also entail not only one real option, but a string of options that would theoretically all have to be incorporated as separate factors into the model. The Real Options approach nevertheless adds to the valuation discussion, as it highlights the value of managerial flexibility, which is entirely neglected in static models like the DCF technique (Brealey et al., 2007).

The question remains why the Real Options approach has not found widespread acceptance, although it captures much more value-determining effects, which seems to be especially relevant for emerging market valuations. Barrow et al. (2001), for instance, did not find a
single advocate of this methodology in their survey among 140 appraisers from several developed countries. In the course of Copeland’s (2002) study in the US, not more than 27% of the respondents stated that they account for real options in their valuation. The study by Pereiro (2006), which was conducted in Argentina, draws a similar conclusion, as only very few institutions resort to the Real Options approach. As explanation for such low numbers, the authors state that practitioners question the overall methodology of an analogous valuation of real and financial options, and have major difficulties in identifying and modeling the options embedded in the real assets. Thinking in terms of real options is highly complex, especially because they tend to be intertwined and each option will most likely create new options, resulting in a long and complicated string of options on options (Sabal, 2002). The specific conditions in emerging markets can be expected to amplify these problems substantially. The uncertain market environment creates a large number of real options with substantial value – but simultaneously renders the valuation of these options more complex. Finding appropriate comparable projects to derive a reliable level of variance is even more difficult in emerging countries due to the limited number of listed companies and inefficient markets. And without this extremely important input factor, any value derived by a Real Options model can only be regarded with highest skepticism.

In summary, appraisers need to trust their intuition whether the additional effort of a thorough Real Options procedure is justified. Since the NPV of the initial investment (without options) needs to be estimated in the course of a Real Options model anyway, appraisers can forego a follow-on valuation of the real options in the case that the stand-alone project already satisfies the investment decision criteria. Real options usually have positive values (as they can be left to expire) and will thus not lower the initial project’s NPV. If the project does not seem like a good investment at first, experienced appraisers can make an educated guess whether the embedded real options can actually turn the project into an attractive opportunity. Only if there is uncertainty if the real options have the potential to bridge the gap, a thorough Real Options modeling is recommendable, as it can generate new insights (Sabal, 2002).

The contribution of the Real Options approach is not the provision of an easy-to-use tool, but highlighting the immense value effect contributed by managers’ decision making. These aspects, as well as a good understanding of the underlying business, should always influence the valuation process. Compressing a multitude of future scenarios into cash flow projections and utilizing complex formulas to derivate option values may be a solid theoretical approach.
which pleases the technocrats, but does not liberate appraisers from using their intuition and experience. Real options are the key links between finance and strategy and it is essential to understand the underlying business to “identify, create, nurture and exercise the real options associated with a project [...] and thus create additional value” (Sabal, 2002). The Real Options approach highlights this aspect, but fails to condense this complexity into an easy-to-use and flawless framework.

7.3. Monte Carlo Simulation
This is basically an enhancement of the scenario technique mentioned in Chapter 2.1.1.1., as it is possible by means of a Monte Carlo simulation to estimate a project’s value based on an almost infinite number of randomly created possible scenarios. The regular approach would be to first define the necessary input parameters, which are subject to uncertainty. Such factors in a project evaluation are, for instance, future inflation rates, economic growth rates, exchange rates, capital costs etc. Within a regular DCF, it is necessary to make one single best estimate for each of these inputs. In contrast, in the course of a Monte Carlo simulation, random values for each of the input parameters are generated within a specified range and probability distribution (Holtan, 2002).

The expected values and distribution characteristics can be estimated with the help of historical data series for many macroeconomic factors like inflation rates or GDP developments, which in turn have a major influence on the level of future cash flows. For more specific input factors, estimated guesses regarding the expected level and distribution characteristics are required by the appraiser. Usually, most input factors are assumed to have a Gaussian distribution, which is debatable, but helps to attain simplicity. Subsequently, a range of possible outcomes is computed by running the model repeatedly, thousands of times, each cycle with a different set of input parameters which is drawn from the specified range with the defined distribution. The result is a probability distribution of the possible outcomes (Brealey et al., 2007). An exemplary distribution of NPVs is illustrated below:
In the above example, a regular DCF model would estimate the project’s value to be $40, as it is the most likely outcome, and provide no additional information. Through a Monte Carlo simulation, the project’s NPV is estimated at $45.3, which is the peak value of the Gaussian distribution. Not only the most likely scenarios, but all conceivable scenarios are taken into consideration. As a consequence, the appraiser gets a better sense for the variability of the outcome, and it is also possible to quantify the chance that the project will yield a negative NPV due to unfavorable conditions. In the example illustrated above, the negative-NPV outcomes are colored in grey and represent approximately 23% of all results. This additional information could serve managers as further decision criteria in the capital budgeting issues. Besides predicting a positive NPV, the simulation can yield the additional information whether the probability of achieving a positive NPV falls above a certain threshold. Furthermore, the crafting of a detailed simulation model can increase the deeper understanding of the underlying project, since the pivotal parameters have to be defined, interdependencies qualified, and outcomes analyzed.

A decisive drawback of probabilistic approaches like the Monte Carlo model is its complexity, beginning from the modeling of the input parameters to the interpretation of the results. Interdependencies among the input variables need to be taken into account and accommodated in the model. For instance, if the production costs are an uncertainty factor, appraisers have to consider influence on cost increases, price increases and the decrease of the
sales volume. This selection process is extremely important, and can be regarded as the most difficult part when setting up the simulation. A realistic simulation necessarily has to be complex, leading to frameworks which will be hard to interpret for laymen (Brealey et al., 2007). It is an important aspect to avoid the double counting of risks, e.g. by using a risk-adjusted discount rate and at the same time considering the variability in the cash flows as risk measure (Damodaran, 2009).

Compared to other valuation techniques, Monte Carlo simulations are supposed to be especially useful in the presence of several input factors with a high level of uncertainty. This technique seems like the ideal approach for valuations in emerging markets, to cope with the generally high level of uncertainty. According to Holtan (2002), “there is no constraint on the type of uncertainty that can be modelled”. Yet the application in emerging markets is hindered by several aspects: First of all, it is extremely difficult to identify the interrelationship between parameters when little empirical evidence is provided. An even more difficult discipline is to estimate the underlying probability distributions. Even if analysts try to be unbiased, determining the distribution of macroeconomic factors is impossible without empirical data series. The volatile nature of the emerging markets also renders the estimation of the possible value range, as well as the expected value, very arbitrary.

A comparison with the previously introduced Real Options approach uncovers a conceptual weakness of the simulation approach: It is not possible to model managerial flexibility into the framework. Although the result of the simulation can theoretically be identical to the later economically realizable value, the probability is very slim. A combination of many detrimental economic conditions in the simulation would lead to extremely unfavourable predictions – which would never occur in reality, as the management would certainly react or even abandon the project beforehand. Likewise, the actual outcome under extremely favourable economic conditions is understated by the simulation, as expansion plans cannot be accounted for. Basically, the outcome of the simulation corresponds to a “business-as-usual” strategy, and the more the actual economic conditions diverge from the assumed level, the less reliable will the simulation result be. This is, obviously, especially the case in emerging markets where mid-to long-term developments rarely correspond to current expectations (Brealey et al., 2007). As the previously mentioned statement by Holtan (2002)
points out, everything can be simulated and valued through a Monte Carlo model, yet whether
the final value has any resemblance to economic reality is uncertain.

The limited popularity of simulation techniques can also be explained by the fact that such
complex procedures are only possible since the recent increase in computing power, and can
thus be considered a relatively new approach in the financial context. Today’s widespread
implementation of software solutions, which can easily master even advanced simulation
tasks, will gradually lead to an increased popularity of Monte Carlo-like tools. This tendency
can be observed in developed markets, where appraises already prefer probabilistic models
when faced with a multitude of uncertain and highly value affecting input factors. Commodity, pharmaceutical or technology companies are the forerunners of this development
(Damodaran, 2009).
8. Conclusion

Valuation is a complex discipline even in developed countries, with a multitude of models and no transparent guidelines which technique to choose for what situation, Intuition and compromises for the sake of simplicity have to be applied, and even small adjustments have a significant impact on the final outcome. All these aspects prove even more complex in emerging markets. Inefficient markets render the feasibility of observable prices questionable, and making correct assumptions about future developments is highly improbable. Moreover, every available valuation method has fundamental flaws which make obtained results doubtful. Finding suitable comparable companies or transactions for the relative valuation through Multiples is hindered due to the limited number of listed companies and sectoral imbalances in emerging capital markets.

Even a multitude of adjusted approaches has not eliminated this deficiency, but rather created more intricacy and confusion. The more sophisticated APV and Real Options approaches introduce comprehensible elements into the valuation discussion, but their complexity has led to limited acceptance in the practicing community. Probabilistic approaches like the Monte Carlo simulation offer the attractive promise of a universally applicable framework, even under the most uncertain conditions, but the finally derived value has to be interpreted with caution. Still, practitioners have valued a large number of entities in the emerging markets and continue to do so, preferably with those methods which are heavily criticized in this paper.

8.1. Recommendations for Appraisers

Organizations that venture into emerging markets need to acquire a new set of skills which they can also turn into a comparative advantage. In developed countries, particular technological advancements or organizational capabilities determine who can earn above-average returns on real investments, but in the emerging market context, environmental competitive advantages start to play a major role. How investors deal with the socio-political conditions, i.e. with the inconveniences due to market or institutional and judiciary failures, can frequently be more important than to which degree they possess the conventional capabilities (Sabal, 2002).

The choice of method also determines which aspect appraisers mostly focus on during the valuation and how a project, once it is started, is controlled:
Advocates of the Real Options approach will spend more effort on identifying ways to create and nurture real options.

Advocates of the APV approach are likely to focus on finding the optimal capital structure to maximize the project’s value.

Advocates of the Goldman-Sachs and Salomon-Smith-Barney models will spend most time on determining and minimizing the project-specific risk characteristics.

Advocates of Monte Carlo Simulations will continuously refine their simulation framework and track how the NPV dispersion changes.

Etc.

Essentially, the application of all valuation tools helps managers to develop a deeper understanding of their respective investment, and to identify strategic opportunities that have the potential to add further value. The drivers of uncertainty and their magnitudes need to be analyzed, essential strategic decision points defined and opportunities to increase potential gains and decrease potential losses identified (Amran and Kulatilaka, 1999). Especially within emerging markets, this will lead appraisers to realize that the main characteristic of developing countries, namely the high uncertainty and volatility, which may seem value diminishing at first glance, in fact creates opportunities for worthwhile investments.

As this is not feasible in real life situations, appraisers under time constraints should rather focus on the educated interpretation of the valuation outcome than on the overambitious crafting of models, which may capture more aspects of reality, but exceed all reasonable levels of complexity. A definite recommendation is to include a sensitivity analysis in every valuation process. Appraisers need to visualize that even small deviations from their assumed premises can quickly turn an attractive investment in a value-destroying affair. Through a sensitivity analysis, the level of exposure to the most prevalent threats can be identified, and management can formulate counter measures, for instance hedging of a fluctuating currency, insurance against political intervention, or back-up strategies like early divestiture. This, however, requires extensive business and valuation experience, which can generally be pinpointed as crucial for a successful valuation. The following table compares the various valuation approaches, evaluates their theoretical and practical feasibility, highlights the learning effect appraisers gain through their application and points out the recommended area of their use:
<table>
<thead>
<tr>
<th>Country Risk Premium</th>
<th>Lessard</th>
<th>Godfrey-Espinosa</th>
<th>Goldman-Sachs</th>
<th>Global CAPM</th>
<th>Local CAPM</th>
<th>Salomon-Smith Barney</th>
<th>Erb-Harvey-Viskanta</th>
<th>Estrada</th>
<th>Cross-Border Multiples</th>
<th>Cash Flow Adjustments</th>
<th>Adjusted Present Value</th>
<th>Real Options</th>
<th>Monte Carlo</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Academic Assessment</strong></td>
<td>No theoretical foundation</td>
<td>Methodologically sound</td>
<td>Assumption of constant market correlations unrealistic</td>
<td>Problematic as empirical evidence suggests that emerging markets are not fully integrated</td>
<td>Methodologically sound</td>
<td>No theoretical foundation</td>
<td>Methodologically sound</td>
<td>Methodologically sound</td>
<td>Methodologically sound</td>
<td>Methodologically sound</td>
<td>Methodologically sound</td>
<td>Methodologically sound</td>
<td>Methodologically sound</td>
</tr>
<tr>
<td><strong>Adjustment Mechanism</strong></td>
<td>Credit Risk Spread</td>
<td>Country Beta (in relation to U.S. market)</td>
<td>Relative Volatility + Qualitative Risk Assessment + Credit Risk Spread</td>
<td>Global Beta</td>
<td>Local Beta + Credit Risk Spread</td>
<td>Qualitative Risk Assessment + Credit Risk Spread</td>
<td>Country Risk Rating</td>
<td>Downside Beta</td>
<td>Heuristic Correction Factors</td>
<td>None (Cash Flow scenarios)</td>
<td>Unlevered Beta for the base-cases, different discount rates for each side effect</td>
<td>Volatility of a comparable project</td>
<td>Rate which is drawn from a fixed range with pre-specified distribution characteristics</td>
</tr>
<tr>
<td><strong>Practical Assessment</strong></td>
<td>Easy to implement</td>
<td>Generally easy to implement, yet problematic to find comparable projects</td>
<td>Problematic, requires efficient local markets</td>
<td>Problematic, requires efficient local markets</td>
<td>Feasible and straightforward, yet too much room for subjectivity</td>
<td>Difficult to implement, needs regular re-adjustment</td>
<td>Problematic, requires efficient local markets</td>
<td>Easy to implement</td>
<td>Easy to implement, yet difficult to make unbiased estimates</td>
<td>Difficult to value all site effects</td>
<td>Difficult to determine project volatility, identification and valuation of all available Real Options very complex</td>
<td>Complex to design realistic models</td>
<td></td>
</tr>
<tr>
<td><strong>Learning Effect through the Application of the Model</strong></td>
<td>That many emerging countries have a low correlation with the U.S. market</td>
<td>That alternative approaches to Beta exist and double counting of risk has to be accounted for</td>
<td>Visualization of the factors which determine project risk</td>
<td>Visualization of the company-specific parameters which define its riskiness</td>
<td>How to derive capital costs without using the CAPM</td>
<td>That Alternative approaches to CAPM exist, which allegedly yields more precise results than the regular Beta</td>
<td>How the same asset is valued very differently across markets</td>
<td>Forces appraiser to quantify the cash flow impact and likelihood of political/local/nomic risks</td>
<td>To illustrate the various value components which form the final value</td>
<td>Understanding the value effect of managerial flexibility</td>
<td>Understanding of the interdependencies between factors, visualization of the value dispersion around the expected NPV</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Recommended use for</strong></td>
<td>Initial screenings, quick-end-dirty assessments</td>
<td>Projects in countries that have a negative correlation with the Global Portfolio</td>
<td>Projects in countries that have a negative correlation with the &quot;averaged&quot; country risk</td>
<td>Projects whose risk characteristics differ substantially from the &quot;averaged&quot; country risk</td>
<td>Appraisers who believe that emerging markets are segmented yet have at least a low level of efficiency</td>
<td>Projects whose risk characteristics differ substantially from the &quot;averaged&quot; country risk</td>
<td>Projects in countries without any stock markets</td>
<td>Appraisers who do not trust the CAPM</td>
<td>Initial screenings, quick-end-dirty assessment, double-checking</td>
<td>Projects where the cash flows can be precisely estimated</td>
<td>Projects with changing capital structure and uncertain tax regulations</td>
<td>Projects that exhibit low base NPV, yet include valuable Real Options</td>
<td>Projects with many high uncertain factors</td>
</tr>
</tbody>
</table>

Table 2: Comparison of the Valuation models. Source: Own illustration.
Since none of the presented models appears clearly superior in terms of a solid theoretical foundation or applicability, it is important to have good reasons for choosing one model over the competing alternatives. As demonstrated with the Real Options and Monte Carlo techniques, more sophisticated methods can yield additional information, but are not without their own drawbacks. It becomes crucial to be absolutely clear about the pros and cons of every model and to thoroughly consider the overall plausibility of results. This requires paying more attention on the context in which the asset is valued, rather than to the result itself. When interpreting external valuation reports, one should also take the objective of the appraiser into account. Because, as this thesis has demonstrated, there are ample opportunities to steer the outcome in the desired direction. Last but not least, performing a detailed sensitivity analysis is an essential element of every evaluation process, especially in emerging markets.

8.2. Outlook
Most financial models are designed to capture the realities of the developed world – the truth of this statement given in the introduction should be evident by now. The increased activities on the emerging markets do not only provide a challenge for the managers on the field, but also for the academics, who have to acknowledge the inappropriateness of their models in this new context. There are two different levels of development:. while in the U.S., the epitome of a well-developed, highly efficient capital market, scholars compete in crafting highly sophisticated models like the Monte Carlo simulations, practitioners in the emerging markets only find by applying the simplest approaches and spending more effort on understanding the underlying parameters and limitations (Estrada, 2007).

How future valuation tools will be designed is difficult to guess. Bekaert and Harvey (2002) introduce a new element in the discussion, which is to look beyond mere financial aspects and consider the impact investments in emerging markets have on the real economy. Appraisers should also begin to factor more social aspects into their decision models, e.g. the number of people who are elevated to a higher standard of living.

Although much has been discussed regarding discount rates in emerging markets, there is probably a long way to go until a convergence of opinions finally happens. In the current state of affairs, it will take several years before the conventional models can yield reliable results in emerging markets. This would require the implementation of macroeconomic policies, an
enhanced banking system, and capital market reforms (Pereiro, 2002). Yet it is important not to put all emerging countries in one basket and assume that the same conditions apply everywhere. Candidates like Brazil, Mexico, South Korea or South Africa have the potential for establishing more efficient markets in the near future, whereas others still have a long way to go (Bruner et al., 2002). Until then, intuition, common sense and a healthy skepticism need to accompany every valuation and prevent appraisers from blindly trusting any model - valuation techniques are just one way to define a starting point.
References

Articles:


Internet Sources:


Appendix I – How to Compute Free Cash Flows from the Income Statement

Income Statement

Sales Revenue

- Costs and operating expenses (expect interest expenses, depreciation and amortizations)

= Earning before interests, taxes, depreciations and amortizations (EBITDA)

- Depreciations and amortizations

= Earnings before interest and taxes, or operating income (EBIT)

- Interest expenses

= Earning before taxes (EBT)

- Income tax

= Net income

Free Cash Flow to the firm

EBIT

- (EBIT × tax rate)

+ Depreciations and amortizations

- Operating investments (Capital expenses)

- Working capital investments (capital expenses)

= Free cash flow to the firm

Source: Pereiro (2002)
## Appendix II – Emerging Market Classifications

Emerging Markets according to the MSCI Emerging Market Index as of April 2009:

<table>
<thead>
<tr>
<th>Emerging Markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
</tr>
<tr>
<td>Chile</td>
</tr>
<tr>
<td>China</td>
</tr>
<tr>
<td>Colombia</td>
</tr>
<tr>
<td>Czech Republic</td>
</tr>
<tr>
<td>Egypt</td>
</tr>
<tr>
<td>Hungary</td>
</tr>
<tr>
<td>India</td>
</tr>
<tr>
<td>Indonesia</td>
</tr>
<tr>
<td>Israel</td>
</tr>
<tr>
<td>Malaysia</td>
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<tr>
<td>Mexico</td>
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<tr>
<td>Morocco</td>
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<tr>
<td>Nigeria</td>
</tr>
<tr>
<td>Peru</td>
</tr>
<tr>
<td>Philippines</td>
</tr>
<tr>
<td>Poland</td>
</tr>
<tr>
<td>Russia</td>
</tr>
<tr>
<td>South Africa</td>
</tr>
<tr>
<td>South Korea</td>
</tr>
<tr>
<td>Taiwan</td>
</tr>
<tr>
<td>Turkey</td>
</tr>
</tbody>
</table>

Emerging Markets according to the FTSE Group as of September 2009:

<table>
<thead>
<tr>
<th>Advanced Emerging</th>
<th>Secondary Emerging</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>Argentina</td>
</tr>
<tr>
<td>Hungary</td>
<td>Chile</td>
</tr>
<tr>
<td>Mexico</td>
<td>China</td>
</tr>
<tr>
<td>Poland</td>
<td>Colombia</td>
</tr>
<tr>
<td>South Africa</td>
<td>Czech Republic</td>
</tr>
<tr>
<td>Taiwan</td>
<td>Egypt</td>
</tr>
<tr>
<td></td>
<td>India</td>
</tr>
<tr>
<td></td>
<td>Indonesia</td>
</tr>
<tr>
<td></td>
<td>Malaysia</td>
</tr>
<tr>
<td></td>
<td>Morocco</td>
</tr>
<tr>
<td></td>
<td>Pakistan</td>
</tr>
<tr>
<td></td>
<td>Peru</td>
</tr>
<tr>
<td></td>
<td>Philippines</td>
</tr>
<tr>
<td></td>
<td>Russia</td>
</tr>
<tr>
<td></td>
<td>Thailand</td>
</tr>
<tr>
<td></td>
<td>Turkey</td>
</tr>
</tbody>
</table>

Source: FTSE (2009)
Market quality parameters for the classification into Developed, Advanced Emerging, Secondary Emerging and Frontier markets as defined by the FTSE Group:

**QUALITY OF MARKETS CRITERIA**

Markets are assessed against the criteria outlined below. Induction as Developed status requires that all criteria are met. Advanced Emerging requires that the specified 14 criteria are met, induction as Secondary Emerging requires that the specified 8 criteria are met, while induction as Frontier requires that the specified 5 criteria are met. Assessment of markets included in FTSE GCS against these criteria can be found at www.ftse.com/country

<table>
<thead>
<tr>
<th>Market and Regulatory Environment</th>
<th>DEV</th>
<th>ADV</th>
<th>SEC</th>
<th>EMG</th>
<th>FRONTIER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formal stock market regulatory authorities actively monitor market (e.g., SEC, FSA, SEC)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Fair and non-arbitrary treatment of minority shareholders</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non or selective incidence of foreign ownership restrictions</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No objections or significant restrictions or penalties applied on the repatriation of capital</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Free and well-developed equity market</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Free and well-developed foreign exchange market</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non or simple registration process for foreign investors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Custody and Settlement**

| Settlement - Rare incidence of failed trades                                                        | X   | X   | X   |     | X        |
| Custody - Sufficient competition to ensure high-quality custodian services                         | X   | X   |     |     |          |
| Clearing & settlement - T+3 or shorter, T+7 or shorter for Frontier                                | X   | X   | X   |     |          |
| Stock Lending is permitted                                                                       |     |     |     |     |          |
| Settlement - Free delivery available                                                              |     |     |     |     | X        |
| Custody - Omnibus account facilities available to international investors                          |     |     |     |     |          |

**Dealing Landscape**

| Brokerage - Sufficient competition to ensure high-quality broker services                         | X   |     | X   |     |          |
| Liquidity - Sufficient broad market liquidity to support sizeable global investment               | X   |     |     |     |          |
| Transaction costs - Implicit and explicit costs to be reasonable and competitive                 | X   | X   |     |     |          |
| Short sales permitted                                                                           |     |     |     |     |          |
| Off-exchange transactions permitted                                                             |     |     |     |     | X        |
| Efficient trading mechanism                                                                    |     |     |     |     | X        |
| Transparency - market depth information / visibility and timely trade reporting process          | X   | X   |     |     |          |

**Derivatives**

| Developed derivatives market                                                                   |     |     |     |     | X        |

Source: FTSE (2009)
### Appendix III – Country Risk Premiums based on Sovereign Bond Yield Spreads

<table>
<thead>
<tr>
<th>Country</th>
<th>Country Risk Premium (%)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>8.74</td>
</tr>
<tr>
<td>Brazil</td>
<td>10.23</td>
</tr>
<tr>
<td>Mexico</td>
<td>6.25</td>
</tr>
<tr>
<td>Peru</td>
<td>11.90</td>
</tr>
<tr>
<td>Philippines</td>
<td>19.57</td>
</tr>
<tr>
<td>Poland</td>
<td>2.93</td>
</tr>
<tr>
<td>South Korea</td>
<td>1.88</td>
</tr>
</tbody>
</table>

*November 1999. Horizon: 30 years (except 10 years for South Korea).

Source: Sabal (2002)
Appendix IV – Latin America: Cost of Equity Capital $C_E$

<table>
<thead>
<tr>
<th>Model</th>
<th>Argentina</th>
<th>Brazil</th>
<th>Chile</th>
<th>Colombia</th>
<th>Mexico</th>
<th>Peru</th>
<th>Venezuela</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CAPM-bases models (%)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) Global CAPMa</td>
<td>10,6</td>
<td>10,6</td>
<td>10,6</td>
<td>10,6</td>
<td>10,6</td>
<td>10,6</td>
<td>10,6</td>
</tr>
<tr>
<td>(b) Local CAPMb</td>
<td>22,3</td>
<td>25,1</td>
<td>13,9</td>
<td>N/A</td>
<td>17,0</td>
<td>21,0</td>
<td>26,5</td>
</tr>
<tr>
<td>(c) Adjusted hybrid CAPMc</td>
<td>14,3</td>
<td>17,5</td>
<td>9,1</td>
<td>13,1</td>
<td>15,2</td>
<td>13,2</td>
<td>16,3</td>
</tr>
<tr>
<td>(d) Godfrey Espinosa model</td>
<td>16,9</td>
<td>19,1</td>
<td>10,7</td>
<td>15,9</td>
<td>15,4</td>
<td>14,5</td>
<td>20,1</td>
</tr>
<tr>
<td><strong>Non-CAPM-based models</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) Estrada modeld</td>
<td>31,3</td>
<td>30,0</td>
<td>15,9</td>
<td>16,5</td>
<td>19,9</td>
<td>19,8</td>
<td>26,6</td>
</tr>
<tr>
<td>(b) Erb-Harvey-Viskanta modele</td>
<td>30,8</td>
<td>33,0</td>
<td>22,6</td>
<td>27,0</td>
<td>29,3</td>
<td>39,4</td>
<td>35,2</td>
</tr>
</tbody>
</table>

a Assuming a target company with a beta of 1 against the global market and a global market risk premium of 4% (U.S. market).
b Assuming a local company beta of 1 against the local market.
c Assuming that the average Beta of a global comparable is 1, and that the global market premium is 4%
d Data from Estrada (2000).
e Data from Erb et al. (1995).

Source: Pereiro (2001); Estrada (2000); Erb et al. (1995).