COST OF EQUITY IN EMERGING MARKETS

BUSINESS VALUATION

TAMARA AYRAPETOVA & KSENIA LARIONOVA

In the past 20 years emerging markets have been gaining extreme importance in international markets and have become one of the regions where new opportunities are found. With the GDP growth and productivity growth slowing down in advanced economies, emerging markets are commonly viewed as the place for positive future economic prospects. Moreover, liberalisation of trade and free movement of capital have allowed financial institutions, companies, and individual investors to consider these places as possible assets in their portfolios. As the results of such shifts, the tools and methods used by the businesses/financial institutions as well as individual investors who are using emerging markets either as diversification tool or as a main stream of income have to also be adjusted.

In this paper, the authors compare and contrast different approaches to business valuation, keeping in mind the specific settings of the emerging markets such as high return volatility, low integration, and asymmetric returns distribution. As the area of business valuation is very broad, it is important to highlight that this paper focuses on the problem of estimation of cost of equity for the emerging markets; specifically, it examines such measures as CAPM by evaluating their assumptions and variables. Furthermore, it looks at alternative models such as Local CAPM, International CAPM, Godfrey and Espinosa Model and Estrada Simple Approach that can be applied for the emerging markets and provides a comprehensive overview of their limitations.

To conclude, it is evident that the area of business valuation is still under great development. Thus, a lot of areas are still under debate and one of such areas is the estimation of cost of equity adjusted to the realities of the emerging markets. Currently, available models are still based on the CAPM and therefore carry its main limitations.

1. INTRODUCTION

In the past 20 years, emerging markets have been gaining extreme importance in international markets and have become one of the regions where new opportunities are found. With the GDP growth and productivity growth slowing down in the advanced economies, emerging markets are commonly viewed as the place for positive future economic prospects. Moreover, liberalisation of trade and free movement of capital have allowed financial institutions, companies, and individual investors to consider these places as possible assets in their portfolios. As the result of such shifts, the tools and methods used by the businesses/financial institutions as well as individual investors who are using emerging markets either as diversification tool or as a main stream of income have to also be adjusted to reliably express all of the region specific factors.

Over the past four decades we have seen a stable trend of using the model suggested by of William Sharpe (1964) and John Lintner (1965) – CAPM (Capital Asset Pricing Model). It is widely applied by professionals from developed economies for measuring the cost of capital for firms as well as valuing stock and portfolios worldwide as well as locally. The results received are later used to estimate WACC value of the firm or project, and as a result, playing a crucial role in the success of the business operations. CAPM is a very intuitive model in the way it builds a relationship between the risk and the expected returns. However, as any model, its assumptions are limiting its application only to a certain spectrum of problems. The main question this paper will try to answer is connected to reliability and applicability of the CAPM to emerging market settings. The authors will look at various adjustments to this model such as Local CAPM, International CAPM, Godfrey and Espinosa Model and examine possible alternatives such as downside risk measures suggested by Estrada (2000) or credit rating models.

2. MEAN-VARIANCE BEHAVIOUR AND EMERGING MARKETS

When we are talking about measuring risk, CAPM is one of the most intuitive ways of explaining the relationship between returns and risk. It is based on the efficient market portfolio theory suggested by Markowitz (1952) also called Modern Portfolio Theory, where the investors are assumed to be risk averse and therefore would aim to reduce the amount of risk. To do so, the theory proves that it is better to choose assets not based on their individual characteristics, but rather based on the way they behave in a bundle with other assets in your portfolio. This idea plays a crucial role for the development of the CAPM and for financial risk management overall, and is called diversification. Markowitz argues that it is possible to construct an optimal portfolio that would give the highest return for a given level of risk that would not be possible owning only one asset. The whole idea of the relationship between the assets is expressed through correlation coefficients while the risk and returns are expressed through variance and mean returns, respectively. Such a relationship is generally called Mean-Variance Behaviour (MVB), where the utility of the investor is defined by the variance and the main returns. The risk of an individual asset can be expressed through the following mathematical equation:

$$\sigma_i = \sqrt{E[(R_i - \mu_i)^2]}$$

This equation represents standard deviation of the assets returns. However, usually investors hold more than one asset and in this case instead of standard deviation of the asset i we would have standard deviation of a portfolio (in this case consisting of 2 assets):

$$\sigma_P = \sqrt{w_1^2 \sigma_1^2 + w_2^2 \sigma_2^2 + 2w_1 w_2 \rho_{1,2} \sigma_1 \sigma_2}$$

As one can see, the standard deviation of a portfolio is a product of standard deviations of the assets with their respective weights and the correlation between the assets represented by $\rho_{i,2}$. The lower the correlation coefficient is, the better it is for the diversification process. However, in reality it is not that easy to find uncorrelated assets since stock returns as well as global markets tend to be correlated at least to some extent. However, one cannot imagine this asset in isolation since most of the time these assets are part of a portfolio; therefore one has to consider its covariance with the market.

$$\sigma_{iM} = E[(R_i - \mu_i)(R_M - \mu_M)]$$

One of the main limitations of covariance as a measure of risk is that it is un-bounding, meaning that the numbers can range from $-\infty$ to $+\infty$, furthermore it is scale-dependent, and therefore does not directly tell us how much the variables are synchronised. As the result, usually correlation coefficient is used to measure risk. To arrive at correlation coefficient, we need to divide the covariance of asset i with the market by the product of their standard deviations.

$$\rho_{iM} = \frac{\sigma_{iM}}{\sigma_i \cdot \sigma_M} = \frac{E[(R_i - \mu_i)(R_M - \mu_M)]}{\sqrt{E[(R_i - \mu_i)^2] \cdot E[(R_M - \mu_M)^2]}}$$

As one can see by performing these operations, we achieve a correlation coefficient between the assets i and the market M . Alternatively, we can divide the covariance of the asset i with the market by the variance of the market and we would arrive at the beta coefficient:

$$\beta_i = \frac{\sigma_{iM}}{\sigma_M^2} = \frac{E[(R_i - \mu_i)(R_M - \mu_M)]}{E[(R_M - \mu_M)^2]}$$

Which can also be rewritten as:

$$\beta_i = \rho_{im} \cdot \frac{\sigma_i}{\sigma_m}$$

The CAPM builds on this crucial idea of diversification, and it suggests that there are two types of risks; one is called systematic risk and it is connected to the overall market volatility, which influences all of the firms regardless of the industry or specific region. Examples of such risk factors could be macroeconomic risks such as government default or financial crisis. It is not possible to eliminate this risk through diversification. On the other side, unsystematic risk, also called firm specific risk, can be diversified away by including assets of various origins into your portfolio. This concept can be represented in graphical terms (see Figure 1). As one can see with increasing number of assets, the firm's specific risk is diversified away; however, the market risk cannot be eliminated. Therefore, based on this crucial assumption, CAPM suggests that an investor has to be rewarded only for systematic risk that cannot be eliminated.

REDUCTION OF UNSYSTEMATIC RISK THROUGH DIVERSIFICATION

Figure 1: Systematic vs. Unsystematic Risk

As we have mentioned above, the modern portfolio theory suggests that it is better to choose less correlated assets since this will reduce the risk (standard deviation). When we are looking from the broader perspective at the correlation of the markets, it is crucial to highlight that investors based in Europe or USA will search for the markets that are less correlated with their own to reduce the risk associated with their home markets. In the table below, one can see a correlation matrix provided by Duff and Phelps (2010) which suggests that the European market has the lowest correlation with the emerging markets (see Figure 2). The same trend we can see for the US investors. Therefore, based on the efficient portfolio theory as well as behavioural finance, both of the groups would prefer to invest in the emerging markets to reduce correlation between the stock returns.

**CROSS CORRELATIONS OF HISTORICAL MONTHLY RETURNS:
JANUARY 1988 - AUGUST 2010; CURRENCY = €**

	Europe	Emerging Markets	USA
Europe	1.00	--	--
Emerging Markets	0.70	1.00	--
USA	0.78	0.69	1.00

Figure 2: Cross Correlation of Historical Monthly Returns

As the result of such findings, we can see the reason why the importance of emerging markets risk assessment is gaining more and more value. When we are talking about the cost of equity estimations in the emerging markets with the use of the common tools such as the CAPM, it is important to keep in mind the assumptions that are underlying the theory and the current market conditions. In the diagram below one can see the volatility of the stock/equity returns for advanced and emerging markets. In this case, the suggestion would be to focus on negative volatility since this is the biggest concern for the investor. As one can see, the lowest stock returns in the US are -34.4%, and in Europe -43.3% whereas in emerging markets the average is -50.8%. Of course, here one should also look at the maximum and emerging markets that offer greater return opportunities than advanced economies summed together. However, this proves that the volatility of the markets is not the same. Therefore, the distribution of the returns most likely is also not the same.

**AVERAGE ANNUAL, HIGHEST ANNUAL, AND LOWEST ANNUAL EQUITIES
RETURN (IN PERCENT); 2001 - 2009; CURRENCY = €**

Figure 3: Equity Returns

Not only do emerging markets have greater return volatility (see Figure 3), but they also prove to be segmented. As the result of the segmentation, company or project in a less developed or developing countries (which may be less integrated in the regional or world economy) can be highly influenced by local market volatility (Duff and Phelps, 2010). This idea of higher influence by the local market than the world market defends the lower correlation coefficients, but also puts in question the usual measures of risk such as, for example, beta coefficients. It has also been proven that in emerging markets there is no correlation or weak correlation between the beta and the returns. According to Harvey (1995), the regression analysis granted an R^2 equal to zero. This puts in question the reliability of CAPM when applied to emerging markets. Furthermore, when we consider distribution of the return in the emerging markets they are found to be skewed, or in other words, they are not normally distributed and often suffer from 'fat tails'. In Figure 4, one can see the results of the research performed by J.P. Morgan in 2010 that proves that argument. The distribution of equity returns in the emerging markets is not following the bell-curve and does not show symmetry, which implies that there is unequal negative volatility. All of this is even more augmented by the short history of these markets, which result in difficulties of market return estimations.

EMERGING MARKETS EQUITIES - "FAT" LEFT TAILS IN HISTORICAL RETURNS

Figure 4: Equity Returns Distribution in Emerging Markets

3. CAPM MODEL

The cost of capital has been studied by a number of academics throughout the years, focusing on empirical studies to more advanced analysis. The Capital Asset Pricing Model (CAPM) is a core element of the cost of capital. Sharpe (1964) and Lintner (1965) derived this model and Mossin (1966) highlighted that the principles of the model were based on diversification.

The CAPM is widely taught and used in today's financial services industry and has become a powerful and intuitive approach in estimating the riskiness of a stock in relation to the expected return and risk. However, the CAPM is not flawless; there have been many academics that have proved theoretical failings in the model, mainly due to the simplified assumptions which are taken into account. The CAPM was built on from the Markowitz (1959) model and turned into a testable predictor of the expected return in relation to the risk for an individual stock. The CAPM makes the assumption that there is complete agreement about returns and that all investors will see the same opportunity set. There is also the assumption that there is unrestricted risk-free borrowing and lending, quite an unrealistic assumption. There have been a number of tests performed on the CAPM, which have involved cross sectional or time-series regressions

to estimate the parameters for the model. Furthermore, the tests have assumed that the expected returns on all assets are linearly related to their betas, and that the beta is a positive premium. This should be assumed to ensure that the key assumptions underlying the CAPM are fulfilled.

The original equation suggested looks as follows:

$$\text{Cost of Equity or } E[R] = R_f + \beta \cdot (R_m - R_f)$$

Beta in this case represents the covariance of the firm returns with the returns of the market. When beta is equal to 1, it means that firm moves identically to the market. Beta is the **only firm-specific magnitude**. There are numerous extensions of the model that add additional variables aimed to better adjust to the risk such as size and book-to-market value ratios. The most famous are Ibbotson Premium (size), Fama French Model (add 2 additional factors) and the Duff & Phelps Model. This model proved to be reliable to some certain extent in developed markets. However, there are very strong assumption that we must take into account. As mentioned above, the CAPM expresses a relationship between risk and return. This model is based on the idea of two types of risk: *systematic* or also called market risk and *unsystematic* or also called firm-specific risk. Figure 5 describes some unsystematic and systematic risk.

Unsystematic risk factors	Systematic risk factors
A company's technical wizard is killed in an auto accident.	Oil-producing countries institute a boycott.
Revolution in a foreign country halts shipments of an important product ingredient.	Congress votes a massive tax cut.
A lower-cost foreign competitor unexpectedly enters a company's product market.	The Federal Reserve steps up its restrictive monetary policy.
Oil is discovered on a company's property.	Long-term interest rates rise precipitously.

Figure 5: Systematic vs. Unsystematic Risk

This model implies that the investor should be compensated for taking the extra risk that is specific to the firm, and it should be therefore be accounted for in a *risk premium*. Moreover, investors should also be compensated for time value of money and loss of their purchasing power, which is represented by the risk-free rate. This risk-free rate is usually taken from an appropriate maturity governmental bond.

The CAPM is based on the following assumptions: investors hold diversified portfolios, single-period transaction horizon, investors can borrow and lend at the risk-free rate of return in a perfect capital market. In more detail, it can be described as follows:

- **Investors hold diversified portfolios:** This assumption means that investors will only require a return for the systematic risk of their portfolios, since unsystematic risk has been removed and can be ignored.
- **Single-period transaction horizon:** A standardised holding period is assumed by the CAPM in order to make comparable the returns on different securities. A return over six months, for example, cannot be compared to a return over 12 months. A holding period of one year is usually used.
- **Investors can borrow and lend at the risk-free rate of return:** This is an assumption made by portfolio theory, from which the CAPM was developed, and provides a minimum level of return required by investors. The risk-free rate of return corresponds to the intersection of the security market line (SML) and the y-axis. The SML is a graphical representation of the CAPM formula.

- **Perfect capital market:** This assumption means that all securities are valued correctly and that their returns will plot on to the SML. A perfect capital market requires the following: that there are no taxes or transaction costs, that perfect information is freely available to all investors who, have the same expectations, that all investors are risk averse, rational, and desire to maximise their own utility, and that there are a large number of buyers and sellers in the market. This includes that all investors are sufficiently similar across different countries in terms of their preferences and beliefs.

Following formulas express CAPM fundamentals, where r_f stands for the

$$r_e = r_f + \beta \cdot (r_m - r_f)$$

The above formula stands for the Market Risk Premium $MRP = r_m - r_f$

It is important to keep in mind that the CAPM only covers the systematic risk, and modification for size and unsystematic risk are possible. In practice the CAPM can be used by fund managers. They can use it for estimation of the return for given risk of a portfolio, and when the actual return is greater than the predicted value of the CAPM, it will demonstrate that value is being added, this is also true for projects.

4. LOCAL CAPM

Local CAPM is said to be the most common way used to estimate the cost of equity. Especially when we talk about managers. Local CAPM holds on the same assumptions that were described in the previous section.

The local CAPM is defined by the aggregate asset holdings of the all investors within a country. This model assumes that the assets of a country are held by the investors who reside in that country. For example, the beta for UK equities that is listed on the London Stock Exchange would be calculated when it is relative to the value-weighted market return on the London Stock Exchange. Moreover, the assumption that the assets are only held by individuals who reside in that country mean that there is no international diversification of risk, and countries' capital markets would be totally internationally segmented.

The cost of equity is then defined as:

$$E[r_{ix}] = r_{fx} + \beta_{ix}(E[r_{mx}] - r_{fx})$$

Where r_{fx} risk free rate in the country x ; $E(r_{mx})$ is expected return on the market x . Beta is the sensitivity of the returns on the asset i to the market x . All of the variables in this model are taken from the local country, or in other words, the country of investment. This model is theoretically sound; however, it has issues with dealing with the segmentation of emerging markets.

Some of the CAPM empirical failings are examined by Fama and French (1992) using cross-section regression analysis, where they confirm that the size, earnings-price, debt-equity, and book-to-market ratios all have an impact on the expected share price returns, which will in fact be influenced by the beta. These studies were performed on the US market. They also performed a further study, which illustrated similar results in a later paper by Fama and French (1996).

There was a simple empirical test of the CAPM performed on the UK data set by Yurtsever and Zahor (2007). They found evidence for the relationship between the expected return on a security and its risk non-linear for individual securities; however, no evidence was found for the portfolios. In addition, they

argued that the condition for higher risk is associated with higher expected return, and risk aversion is only applicable for securities and not portfolios. Therefore, they could find little evidence for the CAPM to be used. Reliable risk-free rate in a sense that we are used to may not exist in emerging markets. Either the government might not issue debt or there is some default risk. Other limitations of this model are incorporated in the difficulty of calculating the accurate beta and market returns. Calculation of beta can be constrained by finding comparable company. It is difficult to find companies in many lines of business since usually only a limited number of firms are traded in the stock markets. Additionally, emerging markets exhibit thin trading (lower trading frequency) and illiquidity, which may bias the results of regression due to information on prices which is infrequent and irregular and many prices (for the periods the securities were not traded) are unknown. In addition, short market histories and the past might not be representative of the future returns.

Calculation of market returns is constrained with difficulties with the short history of the markets. Additionally, as mentioned earlier, the stock indices are strongly biased towards a few stocks, which are weighted heavily in the market. Therefore, betas do not mirror risk with respect to the market, but with respect to a biased basket of securities.

5. INTERNATIONAL OR GLOBAL CAPM

The International CAPM is the central model for well-diversified international investors. This model presumes investors with hard currency consumption baskets.

$$E(R_{ix}) = R_f + \beta_i \cdot [E(R_M) - R_f]$$

Where $E(R_{ix})$ is the expected return (discount rate) in base currency of investment i in country x , R_f is the risk free rate of the base currency (e.g. the US dollar), β_i is the beta of investment i with respect to a proxy for the world market portfolio such as the MSCI (can be found by regression of unleveraged stock returns against the returns on the chosen index) and $E(R_M)$ is the expected return of the proxy for the world market portfolio.

One study by Mishra and O'Brien (2001) examined different costs of capital estimates focusing on local and global CAPMs. They found that on average the cost of equity in US dollars of the single-factor CAPM differed, from those of the local US-CAPM by 48 basis points for the sample of US stocks used. In their findings, they discover that the developed markets had a more significant difference than the emerging markets. Nonetheless, they conclude that "the different models do not make a substantial difference in cost of equity estimates" (Mishra and O'Brien, 2001). Nevertheless, the choice of model does make a significant economic difference in estimations of the cost of equity for a number of firms. The findings of O'Brien and Dolde (2000)¹ sum up the process of choosing the model stating that if investors diversify internationally, they should use the international CAPM; however, if investors do not diversify internationally, they should use the local CAPM.

5.1 MODIFICATIONS

Garcia-Sanchez and Preve (2010) argue that the CAPM does not reflect the impact of risk on a specific business. They recommend to start with the Global CAPM and estimate the unconditional cash flows, then using Monte Carlo simulation techniques to help considering different expected effects of country risk; this allows them to obtain a distribution of net present values instead of one single valuation. Garcia and Preve (2010) recognise the limitations of their approach as it does not solve the general criticism toward the CAPM; moreover, it still uses estimates for comparable companies in the developed economies.

Under the CAPM we use $Ke = Rf + \beta \cdot MRP$, where Rf stands for risk free rate, β accounts for the systematic risk, and MRP for the market risk premium. These parameters are arduous to estimate even for developed economies and even more challenging for the emerging markets. Moreover, a dilemma in relation to the set of information that one should use to calculate cost of equity is faced by both practitioner and scholars. The person performing the valuation has to choose between global market data or local data. However, several issues arise when choosing local data. Firstly, is the data available and dependable? Secondly, are the volumes of trade and liquidity on this market sufficient, and are prices and returns approaching the values which they would have under free market conditions?

In practice, due to the markets' segmentation and the deficiencies in local data, the global data is used and then it is usually adjusted for additional sources of risk.

6. CRITICAL VIEW OF CAPM

The original CAPM deals with non-diversifiable risk. Scholars agree that if the original CAPM was to be applied for the emerging economies, this method would not provide them with the effect of other risks which are specific to emerging markets. The most current way to deal with this problem is to introduce the country risk (CR). In most of the cases researchers use a sovereign bond spread, which is the spread between the sovereign bonds of the assessed country and US treasury bonds.

The Global CAPM formula after these adjustments appears as follows:

$$Ke = Rf + \beta_{indus} \cdot MRP + CR$$

In this formula, Rf represents the US risk free rate, β_{indus} is the beta for the comparable firm or the industry in the US, MRP is the US market risk premium, and CR is the country risk.

This method is often used as it is easy to compute and gives a more or less relevant image. Nonetheless, the limitations of this model consists in its costs and a few blind spots, more precisely the issues that arise from its assumptions. As was already discussed in the section above, the discounted cash flow technique is meant to be applied on unconditional expected cash flows, which are then discounted using the appropriate discount rate, which would account for the risks corresponding to these cash flows.

$$Value\ of\ company = \frac{Expected\ Cash\ Flows}{Rf + \beta \cdot MRP}$$

The formula above summarised the standard practice for valuing companies in developed markets. This approach as we see cannot properly reflect the probable impact of an economy-wide crisis. In the emerging markets, investors face other risks additionally to the standard volatility. They face such risks as risk of political, legal, social, and economic issues. As such, the impact cannot be reflected in an increase of volatility; rather it should be accounted for by a decrease in expected cash flows to reflect the costs of financial distress that would be expected in case of crisis. For this reason, the previous formula should be modified as follows:

$$Value\ of\ company = \frac{Expected\ Cash\ Flows\ | \ No\ Crisis\ Events}{Rf + \beta \cdot MRP}$$

In other words, instead of using the unconditional cash flows, we will be using the conditional expected cash flows; the cash flows that are expected assuming that no crisis will occur, which would be then adjusted by the CR. Nevertheless, in this case Garcia-Sanchez and Preve (2010) criticise this approach arguing that the implied assumption that all the businesses will be affected to the same extent is oversimplified. They add that for businesses whose income is mainly derived from export this CR should not be applied. Moreover, they argue that country risk may not in fact be well represented by the sovereign bond.

In summation the differences between the investing in developed and emerging economies are that the projects in emerging countries are perceived by investors as more risky in comparison to a comparable opportunity in the developed economy. Secondly, the impact of political, legal, social, and economic issues has to be added to the standard volatility. Thirdly, the lack of appropriate methods that would be fully adapted to the needs of emerging markets have not yet been developed. Even though, scholars tried to adapt the existing methods by adding a new factor to the discount cash flows that is supposed to capture the exposure to Country Risk. Fourthly, the oversimplifying the view on Country Risk, assuming that it will have the same impact across all industries and businesses or that sovereign bond spread will represent it correctly.

The simulation approach proposed by Garcia and Preve (2010) suggests to first estimate the unconditional cash flows applying the simulation technique using the following inputs: probability of crisis and the recovery value. Probability of crisis can be estimated using the default probability which is implied in sovereign bond pricing. Recovery value is what shareholders can expect to receive in case of a crisis. This value will strongly depend on the fundamentals of a particular business and the level of the government intervention. The recovery rate can be a number or assigned probability distribution.

One or more variables in this simulation will have to be defined as random. Their probability should be calculated using the binomial distribution with two possible outcomes: crisis and no crisis, where the probability of crisis is equal to the default probability. Once the unconditional cash flows are estimated, they should be discounted with a rate that accounts only for the market volatility risk, using a global CAPM rate. The simulation will then analyse thousands of possible outcomes and assigning the value of 1 of the scenario with crisis and 0 to a scenario with no crisis. In a no crisis scenario, the company will generate normal standard projected cash flows. In a crisis scenario, the cash flows will be projected reflecting the recovery value. The modelling process allows the recovery value can be modeled to capture analysts' assumptions. In each iteration of this process, there would be a particular value for Free Cash Flows (or flow to equity), when it is then discounted with an appropriate rate the equity value or NPV of the project can be estimated. The discount rate in this case does not include the Country Risk.

7. INSTITUTIONAL QUALITY INDEX

Institutional quality index measures several important aspects including political stability, regulatory quality, rule of law, control of corruption, voice and accountability, and effectiveness in governance affect capital structure decision and the value of investments in emerging markets (FPO, 2016). Differences in institutional quality indexes between countries can have a significant effect on how projects in that country are financed and ultimately will affect the value of investments. The equity risk premium depends on the investor's risk aversion (which we argue is correlated with IQI) and the average risk of the project (FPO, 2016).

When we are talking about CAPM, model institutional quality is reflected in equity risk premium. It is set to be that countries with higher institution quality have lower risk and therefore require lower return on the investment. According to FPO (2016), the most common factors included into the IQI are voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law, and

control of corruption. Firstly, voice and accountability (VA) measures the extent to which a country's citizens freely participate in selecting its government, freedom of association and media as well as freedom of expression. This relates to whether firms are usually informed by government officials about changes in policies affecting their industry; and whether newspapers can publish stories without fear of censorship or retaliation.

Secondly, political stability and absence of violence (PV) measures the likelihood that the government may be destabilised or overthrown by unconstitutional means or a coup d'état. Thirdly, government effectiveness measures the quality of public services and the degree of independence from political influence. Fourthly, regulatory quality, which measures the ability of the government to formulate, and implement policies that promote private investment including favourable tax policy on cash flows to debt holders and equity holders, and a free enterprise system. Since the seminal work of Modigliani and Miller (1963), tax treatment of income to debt holders and equity holders affects capital structure choices. Fifthly, rule of law measures the extent to which agents abide by the rules of society. La Porta, Lopez-de-Silanes, Shleifer and Vishny (1998) point out that common law countries offer external investors (both debt and equity) better protection than civil law countries and more so if the legal system has sufficient integrity. Thus, firms in common law countries will attract more external equity (FDI) and longer term debt than otherwise. However, a firm in a legally weak country may attract higher FDI and longer maturity debt by cross listing its security offerings in a stronger legal environment. Finally, control of corruption measures the extent to which public power is abused for private gain, the integrity, and enforceability of the law. We argue that short-term debt is used more often than equity-like financing in countries with a high corruption perception index. Demirgüç-Kunt and Maksimovic (1999) find that firms have longer-term debt in countries where the legal system has more integrity as measured by the law and order index prepared by the International Country Guide.

One of the most recent approaches to estimation of *ERP* argues that one cannot estimate *ERP* for emerging markets based on the historical data, but would rather have to combine future expectations of the investors. In this case, the common suggestion is to incorporate World Bank Indicators (WBI) that we are calling *IQI* into the calculation of *ERP*. Following this logic *ERP* can be estimated in the following way:

$$ERP = AvRP + IQI$$

Where *AvRP* refers to average market risk premium of key investors, therefore in this case *IQI* can be compared with the Country Risk Premium.

8. HARVEY, ERB AND VISKANTA CREDIT RATING MODEL

Until now, we have considered measuring systematic risk in emerging markets as similar issue to the measurements that are carried out in the developed economies. However, the studies performed by Harvey (1995) suggest that emerging market returns have no relationship with the betas measured in respect to world market portfolio (see Figure 6). When doing regression analysis between the average returns and average betas, it produced an R-squared equal to zero. The research has also found out that there were positive pricing errors, which means that the model predicted too low of an expected return in each country. As the result, one can conclude based on these findings that the realised return was much higher than the expected return predicted by the model. This study was performed in 1985-1992, after this period there were drastic changes in the emerging markets price levels, and Harvey revisited his conclusions in 2000. However, the conclusions stayed the same. Harvey (2000) suggested that the variance is much better measure of risk than beta in terms of explaining returns in the emerging markets. This serves as another argument against the CAPM.

RETURNS AND BETA - DEVELOPED AND EMERGING MARKETS

Period: January 1990 - March 1997, or inception if later.
Monthly Total Returns: MSCI & IFCG US\$ (Unhedged).

Figure 6: Returns and Beta Correlation

On this basis, Erb, Harvey and Viskanta (1995) have suggested a different approach to estimation the cost of equity, which was based on credit rating. According to Harvey (2001), this measure allowed to base the risk measures not only solely on the equity market as it was done previously, as well as allows receiving data that is more frequent than the macroeconomic data released irregularly and quite substantially revisited. The main source is the country credit rating that is based on a semi-annual Institutional Investor's survey of bankers. This survey is published twice a year in March and September and represents responses of approximately 75-100 bankers. The aim of the survey is to ask the bankers to give country a rating from 0 to 100, 100 being the least risky in terms of default.

Most of the time these bankers are part of the credit analysis staff; the aim of this department is to estimate the probability of a default on the loans. One of the parts of this analysis is estimation of sovereign credit risk. The logic follows that the higher is the credit risk of the borrower's country, the higher is the interest rate for borrowing money. There are many factors that are incorporated into credit rating such as political risk, inflation, exchange-rate volatility, etc., and as the result this measure of risk is not only focusing on equity market risks but also macroeconomic risks. The importance of each of the variables is changing through time. This approach also avoids previous misconceptions where past data is used to predict the future; in this case, credit risk is forward-looking.

The idea of the Erb, Harvey and Viskanta can be expressed in the following mathematical relationship:

$$R_j = a_0 + a_1 \log(CCR_j) + \epsilon_j$$

Where R_j is the expected semi-annual return in US dollars for country j ; $\log(CCR_j)$ is the natural logarithm of the country credit rating and ϵ_j regression residual. Many times this model is represented as a linear regression:

$$E(R_{ix}) = \gamma_0 + \gamma_1 \cdot CR_x$$

However, according to Harvey (2001, p. 10) it is crucial to use natural logarithm instead since once the credit rating gets really low, the expected return might rise much faster than a linear model suggests. Through empirical testing, it was proven that the lower credit rating results in higher expected return and vice versa (see Figure 7). As the result of the study, it has been concluded that approximately 40% of the equity variation can be explained through credit rating. The main advantage of this model is that one does not have to estimate beta. The model is therefore not based on historical data, but rather on the forward-looking credit rating information.

RETURNS AND COUNTRY RISK - DEVELOPED AND EMERGING MARKETS

Period: January 1990 - March 1997, or inception if later.
Monthly Total Returns: MSCI & IFCG US\$ (Unhedged).

Figure 7: Equity Returns and Country Credit Rating

However, several limitations are connected to this approach. Firstly, the credit rating has to be available for all 135 countries in a timely manner. Secondly, a credit rating might not be the best measure of risk due to the inclusion of qualitative variables that makes the measure quite sensitive to subjectivity. Furthermore, credit rating is not direct measure of equity risk and it does not take into consideration stock exposure to global and local movements. Finally, yet importantly, this measure cannot not be used on company level and does not give any specific risk adjustments. As a result, it can be used only on a countrywide level.

9. GODFREY AND ESPINOSA MODEL 1995-1996

The Godfrey and Espinosa Model is one of the most used and misinterpreted version of the CAPM. This model is often modified by adding extra premiums or adjusting beta coefficient. The original model suggested in 1995 was based on three types of risk:

- Political risk
- Business risk
- Currency risk

To account for currency risk, the model suggested to take risk free rate in a base currency such as for example the US dollar. The other two risks would then require changes in the CAPM that one can see in the formula below:

$$E(R_{ix}) = R_f + \beta_{adj} \cdot [E(R_M) - R_f] + CR_x$$

Where:

$E(R_{ix})$ is the expected return of investment i in country x

R_f is the risk free rate in the base hard currency

β_{adj} is an "adjusted beta" that can be expressed mathematically as:

$$\beta_{adj} = \frac{\sigma_x}{\sigma_M}$$

$E(R_M)$ is the expected return of the base currency stock market

CR_x is a credit (or "country risk") spread for country x (e.g. the spread of a long-term T-Bond issued by country x in US\$ over a long-term US T-Bond).

As one can see this model is based on two sets of data. Firstly, the risk free rate is taken from the home country, but later on the spread between the yield of EM sovereign bond denominated in USD and the yield of a comparable US bond is added to adjust for political and business risk. Notice that the model suggests adjustments to come that are equal to the following reformulation:

$$\beta_i = \frac{\sigma_{iM}}{\sigma_i \cdot \sigma_M} \cdot \frac{\sigma_i}{\sigma_M} = \rho_{iM} \cdot \frac{\sigma_i}{\sigma_M}$$

From that expression, it is clear that to arrive to adjusted beta that Godfrey and Espinosa suggest, we have to assume that the correlation coefficient between the base market and the local market has to equal to 1. Of course, this is quite an assumption since as we have seen previously advanced and emerging market returns are not correlated. Furthermore, we assume the above the model can double-count certain unsystematic risks in its Country Risk premium and the beta.

The model was therefore criticised for incorporating credit risk spread in its adjusted beta. In 1996, Godfrey and Espinosa acknowledged that there can be a correlation between the political and economic risk measures and the credit quality and therefore based on the research of Erb, Harvey and Viskonta (1995) suggest to reduce beta by 40% of previously estimated correlation between the two. The adjusted model can be seen below:

$$E(R_{ix}) = R_f + (0.60 \cdot \beta_{adj}) \cdot [E(R_M) - R_f] + CR_x$$

However, even the modified version of the model has common limitations with the original. One of the main limitations of this model is that country risk premium may not be the proper measure of equity risk. The credit risk assesses the ability of the government to meet its obligations; however, one should not forget that equity risks have other components incorporated such as general market movements. Looking at the country risk premium, one of the main concern is that it is not the same for all of the companies and projects. Some activities might have higher country risk such as for example agricultural business where governments often interfere through price controls and other policy measures, whereas certain industries do not experience heavy regulation.

Moreover, Country Risk is not fully systematic or non-diversifiable. Since public stock returns in emerging and developed markets are not sufficiently correlated, at least some portion of this risk can be diversified by including more assets into your portfolio. As the result, the idea of Country Risk premium goes against the main base of the CAPM that suggests that investors should not be compensated for unsystematic risk. The last, but not the least, important problem with the Country Risk premium has to do with its estimation. Not all of the countries issue debt denominated in dollars, which can complicate the calculation or even make it impossible. This was one of the reasons why Erb, Harvey and Viskanta suggested basing this difference on the country risk rating that is available for more countries.

Another problem of adding Country Risk into the equation is that usually managers also count it in the cash flow estimations. This is very common when making a cash flow forecast. Therefore, as the result the country risk is double-counted. In this model it is hard to estimate how much risk is double-counted as we adjust both beta and country risk premium. It is also important to remember that since we have adjusted beta, it represents the average local equity risk instead of firm specific risk. In addition, it is not clear how to make proper modifications to it.

10. SIMPLE APPROACH ESTRADA

The so-called 'Simple Approach' was suggested by Estrada in 2000 in his paper "The Cost of equity in Emerging Markets: A Downside Risk Measure". The main idea of the model was grounded on proving that beta is not a representative measure of risk, especially in emerging markets, due to the skewness of return distributions and so-called 'fat tails'. The model looks very similar to CAPM and is based on the Modern Portfolio Theory; however, there is one important addition, which is the notion of aversion to losses that come from behavioural finance. Estrada (2000, p. 20) argues that investors do not mind upward/positive volatility, but what they are concerned about is the downside volatility of the returns. Similar approaches can be seen in microeconomics when we are talking about utility measures. Investors would care more for losing 100\$ than gaining them. The model can be mathematically represented by the following equation:

$$RR_i = R_f + (RP_w)(RM_i)$$

All of the variables are the same except for the risk measure in this case represented by (RM_i). This model can be used for various measures of risk not only systematic such as beta, but for total risk measures (standard deviation) or downside risk measures such as semi-deviation, etc. Based on his research, Estrada identified the most well correlated mean return risk measures, which one can see below (total risk, systematic risk, and downside risk):

$$\begin{aligned} RM_{SR} &= \beta_i / \beta_w \Rightarrow CE_{SR,i} = R_f + (RP_w)\beta_i \\ RM_{TR} &= \sigma_i / \sigma_w \\ &\Rightarrow CE_{TR,i} = RR_{TR,i} = R_f + (RP_w)(\sigma_i / \sigma_w) \\ RM_{DR} &= \Sigma_{\mu,i} / \Sigma_{\mu,w} \\ &\Rightarrow CE_{DR,i} = RR_{DR,i} = R_f + (RP_w)(\Sigma_{\mu,i} / \Sigma_{\mu,w}) \end{aligned}$$

According to the study that was carried out between years 1997/1998 beta is the weakest measure of risk out of standard deviation and semi-deviation. The highest correlation with the mean returns was shown by the semi-deviation, or in other words the downside risk. After this paper was published in 2000, the model did not gain extreme popularity within business fields. However, Estrada published a few other papers in 2001 and 2004 that elaborated on this model to create a more comprehensive and empirically proven model called D-CAPM. This model has been acknowledged in a recent report on cost of equity produced by Duff and Phelps (2015) as one of the most reliable models for integrated and semi-integrated markets.

11. D-CAPM AND MEAN-SEMIVARIANCE BEHAVIOUR (MSB)

In the above sub-section, we have briefly discussed the main ideas behind measuring downside risk, in this section we will have a deeper look into the way the model has been developed and tested. D-CAPM suggests a new so-called mean-semivariance behaviour (MSB) approach where the utility of investor is defined as:

$$U = U(\mu_p, \Sigma_p^2)$$

Where the μ_p the mean returns and Σ_p^2 is the downside variance of the returns or semivariance. If we look at a single asset, then the risk would be measures by the downside standard deviation that can be stated as:

$$\Sigma_i = \sqrt{E\{\min[(R_i - \mu_i), 0]^2\}}$$

Or
$$\sigma_1^2 = E[(R_i - \mu_i)^2] = (1/T) \cdot \sum_{t=1}^T (R_{it} - \mu_i)^2$$

The above expression can be expressed in relation to any benchmark of returns. Therefore, it can be stated as:

$$\Sigma_{Bi} = \sqrt{E\{\min[(R_i - B), 0]^2\}}$$

In this expression, we replace the mean returns with any benchmark returns that we would like to achieve denoted by B . This allows adjusting the model according to the needs of the management or the investor. Similarly, as in MVB, we would like to see how the asset moves together with the market. In MSB, this relationship is represented by downside covariance or cosemivariance (Σ_{iM}).

$$\Sigma_{iM} = E\{\min[(R_i - \mu_i), 0] \cdot \min[(R_M - \mu_M), 0]\}$$

Since cosemivariance holds the same properties as variance (un-bounded and scale-dependent), practitioners prefer to use correlation or in this case downside correlation:

$$\Theta_{iM} = \frac{\Sigma_{im}}{\Sigma_i \cdot \Sigma_M} = \frac{E\{\min[(R_i - \mu_i), 0] \cdot \min[(R_M - \mu_M), 0]\}}{\sqrt{E\{\min[(R_i - \mu_i), 0]^2\}} \cdot \sqrt{E\{\min[(R_M - \mu_M), 0]^2\}}}$$

Downside correlation can be achieved by dividing cosemivariance of assets returns with the market by the product of their semi-deviations. Alternatively, we can divide cosemivariance by the markets semivariance to receive downside beta - β_i^D .

$$\beta_i^D = \frac{\Sigma_{im}}{\Sigma_M^2} = \frac{E\{\min[(R_i - \mu_i), 0] \cdot \min[(R_M - \mu_M), 0]\}}{E\{\min[(R_M - \mu_M), 0]^2\}}$$

Or
$$\beta_i^D = (\Sigma_i / \Sigma_M) \Theta_{iM}$$

As a result, the downside beta can be imbedded in a CAPM-like model to grant the following relationship:

$$E(R_i) = R_f + MRP \cdot \beta_i^D$$

To prove credibility of this model and the previous so-called 'Simple Approach', several empirical tests were conducted. The first one took place in 2000, when the first model was suggested, and the results of this research advocated that beta was the weakest measure out of total risk measures and downside risk measures. After this research, Estrada has written several other papers; in 2004 he published research on Internet Stock in the European Journal of Finance. The paper concluded that semi-deviation gives better explanation of cross-section of returns on Internet Stock than beta. Based on this conclusion, the author also argues since internet stock and emerging markets have similar characteristics, such as short market returns history and high volatility, and the model can be useful for both cases (Estrada, 2004, p. 249). In this paper, we are going to look at the results presented in the paper published in 2007.

11.1 EMPIRICAL TESTING

The data used in the study was taken from Morgan Stanley Capital Indices (MSCI) database for both DM and Ems dated 2001. At that time, the database included 23 DMs and 27 EMs monthly returns. Countries are classified into DM or EM based on the MSCI classification. The returns represented by this index are expressed in dollar terms and include both capital and dividend gains. As we know for calculation with need to know market returns; therefore, in this case study, this is represented by the MSCI All Country World Index. Since this index goes back as far as 1988, this year is used for all other returns as well. You can see all of the data in the following table.

Market	MR	σ	ρ	β	Σ	Θ	β^p	SSkw	Start
Australia	0.86	5.63	0.57	0.77	3.94	0.70	0.89	0.24	Jan/88
Austria	0.54	6.92	0.38	0.63	4.81	0.63	0.98	0.67	Jan/88
Belgium	1.05	4.94	0.58	0.69	3.44	0.70	0.78	1.46	Jan/88
Canada	0.83	5.15	0.72	0.89	3.86	0.79	0.98	-3.28	Jan/88
Denmark	1.17	5.37	0.59	0.76	3.81	0.72	0.89	0.13	Jan/88
Finland	1.65	9.74	0.55	1.29	6.66	0.67	1.43	0.95	Jan/88
France	1.13	5.66	0.69	0.94	4.01	0.79	1.02	0.12	Jan/88
Germany	1.00	6.04	0.65	0.95	4.46	0.79	1.14	-1.57	Jan/88
Greece	1.55	11.34	0.27	0.72	6.67	0.60	1.28	8.63	Jan/88
Hong Kong	1.44	8.45	0.59	1.19	5.80	0.67	1.26	1.37	Jan/88
Ireland	0.99	5.69	0.66	0.90	3.98	0.75	0.96	0.53	Jan/88
Italy	0.72	7.06	0.52	0.88	4.79	0.67	1.04	1.41	Jan/88
Japan	-0.01	7.06	0.76	1.29	4.71	0.80	1.21	2.14	Jan/88
Netherlands	1.18	4.50	0.76	0.82	3.42	0.82	0.90	-3.20	Jan/88
New Zealand	0.35	7.08	0.49	0.84	4.86	0.68	1.06	1.59	Jan/88
Norway	0.88	6.74	0.59	0.95	4.93	0.71	1.13	-2.22	Jan/88
Portugal	0.43	6.66	0.46	0.74	4.42	0.60	0.86	3.20	Jan/88
Singapore	0.94	8.55	0.64	1.32	6.06	0.73	1.42	0.45	Jan/88
Spain	0.96	6.36	0.70	1.07	4.48	0.83	1.19	-0.33	Jan/88
Sweded	1.39	7.37	0.72	1.27	5.33	0.81	1.40	-1.29	Jan/88
Switzerland	1.17	5.14	0.66	0.81	3.63	0.77	0.90	-0.25	Jan/88
UK	0.89	4.69	0.77	0.87	3.21	0.80	0.83	1.43	Jan/88
USA	1.22	4.09	0.81	0.79	3.04	0.88	0.86	-2.23	Jan/88

Argentina	2.96	18.19	0.15	0.66	10.17	0.56	1.82	10.78	Jan/88
Brazil	2.91	17.37	0.35	1.44	11.55	0.58	2.16	2.51	Jan/88
Chile	1.74	7.56	0.32	0.57	5.27	0.56	0.95	-0.42	Jan/88
China	-0.72	12.72	0.37	1.13	7.92	0.54	1.39	4.27	Jan/93
Colombia	0.29	9.68	0.14	0.32	6.55	0.38	0.81	1.41	Jan/93
Czech Rep.	0.24	9.28	0.30	0.66	6.59	0.69	1.29	0.23	Jan/95
Egypt	0.46	8.69	0.25	0.53	5.18	0.61	0.90	4.94	Jan/95
Hungary	1.68	11.84	0.54	1.53	8.17	0.82	1.91	0.94	Jan/95
India	0.42	8.88	0.26	0.54	6.04	0.56	1.10	1.09	Jan/93
Indonesia	1.26	17.08	0.24	0.97	9.88	0.50	1.60	10.38	Jan/88
Israel	0.76	7.13	0.37	0.63	5.42	0.49	0.87	-2.01	Jan/93
Jordan	0.16	4.45	0.11	0.11	3.11	0.32	0.32	-0.80	Jan/88
Korea	0.93	12.56	0.41	1.25	7.68	0.54	1.34	6.83	Jan/88
Malaysia	0.95	10.09	0.42	1.02	6.87	0.60	1.33	3.16	Jan/88
Mexico	2.40	10.41	0.45	1.12	7.67	0.60	1.47	-2.23	Jan/88
Morocco	0.70	4.95	-0.10	-0.12	3.35	0.41	0.39	1.62	Jan/93
Pakistan	-0.02	12.08	0.17	0.49	7.91	0.39	1.00	1.96	Jan/93
Peru	0.97	9.47	0.33	0.74	6.55	0.56	1.19	0.76	Jan/93
Philippines	0.71	10.36	0.44	1.10	6.94	0.63	1.40	2.78	Jan/88
Poland	2.59	17.86	0.39	1.66	10.03	0.62	2.02	11.00	Jan/93
Russia	3.59	22.22	0.50	2.69	15.27	0.65	2.85	0.56	Jan/95
South Africa	0.78	8.20	0.56	1.10	6.02	0.68	1.33	-1.90	Jan/93
Sri Lanka	0.10	10.44	0.24	0.61	6.67	0.51	1.11	4.16	Jan/93
Taiwan	1.27	12.47	0.29	0.87	8.19	0.57	1.49	2.44	Jan/88
Thailand	0.72	12.73	0.46	1.41	8.80	0.62	1.75	1.25	Jan/88
Turkey	2.34	18.90	0.23	1.04	11.86	0.56	2.13	4.47	Jan/88
Venezuela	1.33	14.65	0.24	0.85	10.18	0.44	1.46	-0.23	Jan/93

Avg. DMs	0.97	6.53	0.61	0.93	4.54	0.74	1.06	0.43	N/A
Avg. EMs	1.17	11.86	0.31	0.92	7.77	0.55	1.38	2.59	N/A
Avg. all	1.08	9.41	0.45	0.93	6.28	0.64	1.24	1.60	N/A
World	0.78	4.17	1.00	1.00	3.11	1.00	1.00	-2.14	Jan/88

Figure 8: Monthly Stock Returns

After the data was collected, the first step is to find the average return for each of the markets for a given period (1988-2001), and here we are going to use arithmetic mean. The results can also be seen in the first column in Figure 8 represented as "MR". From the Table #, we can also see respective standard deviation, semi-deviation, correlation coefficient, and beta and downside beta, and downside correlation. What is important to highlight here is the difference between the beta and downside beta coefficients. As one can see even for developed economies downside beta is most of the times higher than standard beta. We can also see that the main justification why this can be so is due to a much higher downside correlation with the market.

We can also see the same pattern in emerging markets where on average downside beta is higher than standard beta by 0.46 points. In the developed markets, the difference is a bit smaller, 0.13. However, important conclusion can be made that downside beta is at least as good measure of risk as beta. Since the relationship between the data (returns) and risk measure can be measured by correlation coefficient, it is crucial to consider this in the study. Below one can see results for all four measure that are going to be used:

- MVB standard deviation and beta
- MSB semi-deviation and downside beta

As one can see, two measures are coming from the mean-variance model and the other two from the mean-semivariance model.

As one can see from Figure 9, the highest correlation with the mean returns is represented by downside beta, followed by semi-deviation. It is also essential to highlight that standard deviation in this case better explains returns than beta. The final step would be to use results for beta and downside beta calculated for all of the markets to estimate cost of equity by using standard CAPM and comparing results with the D-CAPM. One can find results in Figure 10.

	MR	σ	β	Σ	β^D
MR	1.00				
σ	0.58	1.00			
β	0.54	0.53	1.00		
Σ	0.59	0.98	0.59	1.00	
β^D	0.69	0.88	0.83	0.90	1.00

Figure 9: Correlation Matrix

The results received prove the argument made by Estrada that downside beta and D-CAPM give higher cost of equity results for emerging markets. It can also be seen that the same implies to developed economies where the difference between the results is sufficient, 0.72 points. With the emerging markets the situation is even more advanced the average difference in the required return is 2.54.

As a result, one can conclude that this model is a plausible measure of cost of equity in emerging markets and represents more precise results than the original CAPM. However, it still carries similar limitation as the original model due to the assumptions of integrated and efficient markets as well as estimation of beta is still based on the historical data opposed to future estimations. As to the results, this means that the results can still be biased by the past data and short history of the markets. The model can be further developed by looking at additional premiums.

Market	β	β^D	CAPM	Alternative	Difference
Australia	0.77	0.89	9.28	9.93	0.65
Austria	0.63	0.98	8.49	10.43	1.94
Belgium	0.69	0.78	8.81	9.30	0.49
Canada	0.89	0.98	9.93	10.43	0.50
Denmark	0.76	0.89	9.19	9.92	0.73
Finland	1.29	1.43	12.13	12.89	0.76
France	0.94	1.02	10.22	10.62	0.40
Germany	0.95	1.14	10.24	11.28	1.04
Greece	0.72	1.28	9.00	12.06	3.06
Hong Kong	1.19	1.26	11.57	11.95	0.38
Ireland	0.90	0.96	9.97	10.32	0.34
Italy	0.88	1.04	9.86	10.73	0.87
Japan	1.29	1.21	12.14	11.67	-0.47
Netherlands	0.82	0.90	9.55	9.99	0.44
New Zealand	0.84	1.06	9.64	10.88	1.24
Norway	0.95	1.13	10.25	11.24	0.99
Portugal	0.74	0.86	9.08	9.76	0.68
Singapore	1.32	1.42	12.28	12.82	0.55
Spain	1.07	1.19	10.93	11.59	0.66
Sweden	1.27	1.40	11.99	12.72	0.73
Switzerland	0.81	0.90	9.48	9.96	0.48
UK	0.87	0.83	9.82	9.60	-0.22
USA	0.79	0.86	9.40	9.77	0.37

Argentina	0.66	1.82	8.64	15.06	6.42
Brazil	1.44	2.16	12.96	16.92	3.95
Chile	0.57	0.95	8.18	10.25	2.08
China	1.13	1.39	11.24	12.67	1.43
Colombia	0.32	0.81	6.80	9.49	2.69
Czech Rep.	0.66	1.29	8.68	12.15	3.47
Egypt	0.53	0.90	7.93	9.98	2.05
Hungary	1.53	1.91	13.42	15.52	2.10
India	0.54	1.10	8.02	11.06	3.04
Indonesia	0.97	1.60	10.37	13.85	3.48
Israel	0.63	0.87	8.49	9.82	1.33
Jordan	0.11	0.32	5.66	6.77	1.11
Korea	1.25	1.34	11.89	12.42	0.53
Malaysia	1.02	1.33	10.65	12.34	1.69
Mexico	1.12	1.47	11.21	13.12	1.91
Morocco	-0.12	0.39	4.38	7.18	2.80
Pakistan	0.49	1.00	7.74	10.54	2.80
Peru	0.74	1.19	9.12	11.60	2.47
Philippines	1.10	1.40	11.06	12.73	1.67
Poland	1.66	2.02	14.16	16.12	1.97
Russia	2.69	2.85	19.82	20.69	0.87
South Africa	1.10	1.33	11.10	12.34	1.24
Sri Lanka	0.61	1.11	8.37	11.14	2.76
Taiwan	0.87	1.49	9.79	13.25	3.46
Thailand	1.41	1.75	12.79	14.64	1.85
Turkey	1.04	2.13	10.77	16.74	5.97
Venezuela	0.85	1.46	9.69	13.07	3.38

Avg. DMs	0.93	1.06	10.14	10.86	0.72
Avg. EMs	0.92	1.38	10.11	12.65	2.54
Avg. all	0.93	1.24	10.12	11.83	1.70

Figure 10: Required Returns on Equity

CONCLUSIONS

In the current world of globalisation and financial integration where deregulation has played a crucial role in stimulating free movement of capital, one can observe increasing relevance of modifications of current methods of estimation of cost of equity. This paper aimed at providing comprehensive overview of the key approaches that are currently used by practitioners and are suggested by academics. It specifically focused on the most well-known and popular business valuation approach – income approach. Under which the main methods called Discounted Cash Flow methods are used to perform firm valuation as well as project and stock valuation. From the paper, it can be concluded that one of the key factors that influence the preciseness of the results is the discounting factor that is used to discount cash flows to the present value. In a great majority of the cases, practitioners as well as academics suggest to use WACC as the estimation of the discount rate. As a result, we are facing an issue of proper estimation of cost of equity, which is the main focus of this paper.

At the moment, we can see a trend of using CAPM as the main method of cost of equity estimation in advanced economies. However, this tool is very controversial when it comes to estimation of cost of equity in emerging markets. As we have seen, emerging markets have different macroeconomic, political, and financial backgrounds that are particularly famous for higher volatility, thin trading, illiquidity, mispricing of assets, and last but not least important, asymmetric and non-normally distributed equity returns. As a result of these, factors of the CAPM that are based on symmetric return assumption as well as perfect markets usually yields lower expected returns and cost of equity for the emerging markets than it would be required. We have seen that the averages provided by Estrada's research are even lower than for advanced economies, which contradicts the main assumption behind any financial model that higher risk has to yield higher returns.

As we have seen in this paper, to adjust to the country specific risk, there were several variations of the CAPM that were suggested such as Local CAPM, International CAPM, and Godfrey and Espinosa model; however, all of these models still share the issue of assumption of fully integrated markets or fully segmented markets as in the case of Local CAPM. They have also used a standard systematic risk measure beta that according to the research performed by Harvey in 1995 and 2000 has zero correlation with the equity returns and as the result is not representative measure of risk in emerging markets. On the other hand, the model suggested by Harvey, Erb and Viskanta (1995) tried to move away from the CAPM structure and variables such beta and risk free rate also showed its limitations (Credit Rating Model), that were mainly connected to subjectivity of the credit rating measure, and its countrywide application that did not adjust for the company specific risk.

Lastly, this paper considered a new approach to risk assessment that was based on behavioural finance and tried to incorporate the difference between the upward and downward volatility. This approach was suggested by Estrada in 2000, and it argued that due to being risk-averse, the investors are not against upward volatility; what matters to them is only downward volatility. As the result of this argument, the author developed so called 'Simple Approach' that was based on downside risk measures such as semi-standard deviation, cosemivariance, and later on emerged into so-called D-CAPM based on downside beta. As one of the main advantages of downside beta over the standard beta was that it took into account 'fat tails', or in other words, asymmetric returns distribution and skewness. Moreover, it provided the same quality results for normally distributed returns. As the result of the research done by Estrada in 2004, it can be concluded that D-CAPM and downside beta are plausible risk measures and are better estimates than the standard models. Furthermore, it can be concluded that standard deviation as a measure of total risk, proves to be more relevant than beta. However, one has to keep in mind that D-CAPM is still based on the same assumption as CAPM, meaning we are still applying beta risk measures that are based on historical data, that as we have seen can be biased in case of emerging markets as well as the risk free rate that is hard to estimate. Therefore, this model is plausible for integrated or semi-integrated markets. Currently, there is no one way or method that academics and practitioners can agree has superior advantage over other methods, but as this paper has shown downside risk measures might become one of them. ■

REFERENCES

- ACCA (2015) *The Capital Asset Pricing Model*. Available at: <http://www.accaglobal.com/an/en/student/exam-support-resources/fundamentals-exams-study-resources/f9/technical-articles/CAPM-theory.html> (Accessed: 26 April 2016).
- Bekaert, G. and Harvey, C. (1995) *The Cost of Capital in Emerging Markets*. Available at: https://faculty.fuqua.duke.edu/~charvey/Research/Working_Papers/W16_The_cost_of.pdf (Accessed: 26 April 2016).
- Duff and Phelps (2010) *Cost of Capital Estimation in Emerging Markets What you need to know*. Available at: <http://www.duffandphelps.com/insights/publications/cost-of-capital/cost-of-capital-estimation-in-emerging-markets> (Accessed: 26 April 2016).
- Duff and Phelps (2015) *Estimating Cost of Capital- Issues Confronting the Practitioner*. Available at: https://fmc.home.pl/upload/news/pdf_news_1429864830.pdf (Accessed: 26 April 2016).
- Erb, C., Harvey, C. and Viskanta, T. (1995) 'Country risk and global equity selection', *Journal of Portfolio Management*, pp. 74–83. [Online]. Available at: https://faculty.fuqua.duke.edu/~charvey/Research/Published_Papers/P26_Country_risk_and.pdf (Accessed: 26 April 2016).
- Estrada, J. (2000) *The Cost of Equity in Emerging Markets: A Downside Risk Approach*. Available at: https://faculty.fuqua.duke.edu/~charvey/Teaching/BA456_2001/Estrada.pdf (Accessed: 26 April 2016).
- Estrada, J. (2004) 'The cost of equity of Internet stocks: a downside risk approach', *The European Journal of Finance*. [Online]. Available at: <http://web.iese.edu/jestrada/PDF/Research/Refereed/CoE-IStocks.pdf> (Accessed: 26 April 2016).
- Estrada, J. (2005) 'Mean-semivariance behavior: Downside risk and capital asset pricing, International Review of Economics and Finance', *ELSEVIER* [Online]. Available at: <http://web.iese.edu/jestrada/PDF/Research/Refereed/MSB2.pdf> (Accessed: 26 April 2016).
- Fama, E. and French, K. (2004) 'The Capital Asset Pricing Model: Theory and Evidence', *Journal of Economic Perspectives*. [Online]. Available at: http://www.maths.usyd.edu.au/u/UG/IM/MATH2070/r/FamaFrench_JEP2004.pdf (Accessed: 26 April 2016).
- Finance Train (2015) *Standard Deviation and Variance of a Portfolio*. Available at: <http://financetrain.com/standard-deviation-and-variance-of-a-portfolio/> (Accessed: 26 April 2016).
- FPO (2010) *Capital structure, institutional quality index and valuation of projects in emerging markets*. Available at: <http://www.freepatentonline.com/article/Journal-International-Business-Economics/237358536.html> (Accessed: 26 April 2016).
- Goldman Sachs (2006) *Emerging Markets Equity: Structural Opportunities for Investors*. Available at: http://www.goldmansachs.com/gsam/pdfs/USTPD/education/core_ememarkets_structural.pdf (Accessed: 26 April 2016).
- Harvey, C. (1995a) 'Predictable risk and returns in emerging markets', *Review of Financial Studies*, 8, pp. 773–816. [Online]. Available at: https://faculty.fuqua.duke.edu/~charvey/Research/Published_Papers/P32_Predictable_risk_and.pdf (Accessed: 26 April 2016).
- Harvey, C. (1995b) 'The risk exposure of emerging markets', *World Bank Economic Review*, pp. 19–50. [Online]. Available at: https://faculty.fuqua.duke.edu/~charvey/Research/Published_Papers/P30_The_risk_exposure.pdf (Accessed: 26 April 2016).
- Harvey, C. (2001) *12 Ways to Calculate the International Cost of Capital*. Available at: (https://faculty.fuqua.duke.edu/~charvey/Teaching/BA456_2006/Harvey_12_ways_to.pdf) (Accessed: 26 April 2016).
- Jenner, M. (2008) 'Calculating the cost of equity in emerging markets', *The Finsia Financial Journal*. [Online]. Available at: http://webpage.pace.edu/pviswanath/articles/aeg4e43/riskreturn/emerging_mkts_costofequity.pdf (Accessed: 26 April 2016).
- J.P. Morgan (2010) *Non-normality of Market Returns: A framework for asset allocation decision-making*. Available at: [file:///C:/Users/Tamara/Downloads/AM_Non-normality_of_market_returns%20\(2\).pdf](file:///C:/Users/Tamara/Downloads/AM_Non-normality_of_market_returns%20(2).pdf) (Accessed: 26 April 2016).
- LaPorta, R., Lopez-de-Silanes, F., Shleifer, A. and Vishny, R.W. (1998) 'Law and Finance', *Journal of Political Economy*, 106 (6), pp. 1113–1155.
- Mishra, D. and O'Brien, T. J. (2001) 'A Comparison of Cost of Equity Estimates of Local and Global CAPMs', *The Financial Review*, Eastern Finance Association, 36(4), pp. 27–47.
- O'Brien, T. and Dolde, W. (2000) 'A currency index global capital asset pricing model', *European Financial Management*, March, pp. 7–18.
- Sabal, J. (2003) *The Discount Rate in Emerging Markets: A Guide*. Available at: http://proxymy.esade.edu/gd/facultybio/publicos/1311607688642The_Discount_rate_in_emerging_markets_A_guide.pdf (Accessed: 26 April 2016).
- Yurtsever, C. and Zahor, T. (2007) *Empirical Test of CAPM using UK Stock Market*.