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MASTER THESIS

Time Series Variations of Stock Returns within Emerging Markets

An empirical study on the Capital Asset Pricing and Fama & French Three Factor Model

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Florian Jeschke

CPR: ----------

flje11ab@student.cbs.dk

Supervisor:	David Skovmand
	Dgs.fi@cbs.dk
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Abstract

Although considered as being more volatile, a general market sentiment urges investors to include stocks of emerging markets within their portfolios. The inclusion is justified based on two historical observations. Firstly, emerging markets' stocks have historically outperformed stocks of developed countries in terms of higher stock returns. Secondly, stock markets within emerging markets do not move exactly like stock markets within developed countries. Thus, investments within emerging markets experience low correlations with investments in developed countries. Thereby, diversification benefits are realizable by portfolio managers.

Based on historical data from 1990 to 2013, this research study finds mixed evidence concerning higher volatilities and higher returns within the emerging countries of India, Indonesia, Pakistan, Philippines and South Korea. In turn, this study shows clear benefits in terms of low correlations for investments within emerging markets. Therefore, this study argues that portfolio managers should generally include stocks from emerging markets within their portfolios.

When deciding to invest within emerging markets, the stock selection is the most crucial task for portfolio managers. Therefore, equity asset pricing models can be employed to understand the risk and return characteristics of stocks. Academic literature offers mixed results concerning the validity and performance of traditional asset pricing models within the context of emerging markets. Therefore, this study performs an empirical study on the time series variations of stock returns from 2003 to 2012 within the above mentioned emerging markets. By employing global as well as domestic versions of the Capital Asset Pricing Model and the Fama & French Three Factor Model, risk factors, like beta, size and value, are analyzed concerning their influence on stock returns.

In general, this study shows that domestic models outperform their global counterparts. However, the choice between the domestic Capital Asset Pricing Model and the domestic Fama & French Three Factor Model depends on the individual country. Furthermore, the domestic Fama & French Three Factor Model can be accepted as a statistically valid asset pricing model within the context of South Korea. Unfortunately, this study rejects the validity of the tested asset pricing models within the rest of the countries. Therefore, further research needs to engage in amending and improving the existing equity asset pricing models in order to improve their relevance.

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1. Introduction

Since the 2000's, investors have been exposed to a new investment area, which are emerging markets. These emerging markets, which are on the verge of becoming developed markets, are assumed to be the driver of global growth. Thus, higher expected returns within emerging markets, based on their growth potential, seem to be a general market sentiment nowadays. Therefore, a critical look from a portfolio management perspective is needed in order to analyze this market sentiment.

In fact, substantial amounts of investments have flowed into emerging markets, due to a low interest rate environment within developed countries like the US (Financial Times, 2013). While many developed countries are stuck in stagnation, emerging markets do offer better growth potentials. The World Outlook for 2013 from Deutsche Bank (2013) shows that emerging markets are expected to show an increase in GDP of 5.5% as compared to 1.2% for developed markets. Accelerated growth within emerging markets will mainly be based on increased trade between both emerging markets as well as with developed countries (Ernst & Young, 2013). In 2012, the Morgan Stanley Capital International (MSCI) Emerging Markets Index outperformed the MSCI World Index by 1.5%. Furthermore, the MSCI Emerging Markets Small Cap Index outperformed the World Index by 5.5% (Money Management, 2013). According to the International Institute of International Finance (2013), total capital inflow into emerging markets was $1113bn. in 2012. Based on the forecasts of the institute, a rise of $60bn. in 2013 and $96bn. in 2014 is expected. Based on these insights, there exists strong demand from investors within the topic of portfolio management in emerging markets. Therefore, this study offers investors a new perspective on the relevant tools, which can be used for improving their investments.

1.1 Relevance of the topic

As demonstrated within the above mentioned studies, emerging markets will experience more economical growth than developed markets. Furthermore, there is also evidence that investors and portfolio managers are increasing their stakes within emerging countries. However, these studies do not investigate the main motivation and the opportunities inherent within investments into emerging markets. Thus, this study also aims at investigating these questions. In fact, existing scientific research claims that the rise in investments within stocks of emerging markets is caused by three main attributes (Harvey, 1995a). Firstly, stocks of emerging markets have demonstrated sustained

outperformance over stocks of developed countries. Secondly, these high returns are usually accompanied by high volatilities, which proxy for the increased risk that investors are facing when investing within emerging markets. Thirdly, emerging markets have low correlations amongst each other and with other developed countries. This attribute is especially appealing to portfolio managers, who want to diversify globally in order to reduce the overall risk of their portfolio. When controlling for these three attributes with regards to an emerging markets peer group, consisting of India, Indonesia, Pakistan, Philippines and South Korea, this study finds especially strong historical evidence for the existence of low correlations. Concerning higher returns and higher volatilities, this study finds mixed evidence, which depends on the individual country.

Given the mixed results, investors and portfolio managers need to understand the specific risk and return relationships, when adding securities of emerging countries to their portfolio. In order to select the appropriate security, asset pricing models need to be employed to understand the variations in stock returns. Based on these asset pricing models, risk factors, which are impacting the individual return of the securities, can be analyzed in order to select the security with the appropriate risk and return relationship. Therefore, the validity of the asset pricing model is crucial for conducting correct investment decisions. In fact, existing academic literature has not been able to demonstrate the validity of these asset pricing models within the context of emerging markets. In most studies, asset pricing models have been tested within the context of developed countries (Fama & French, 2012; Griffin, 2002). Although, these studies did not specifically analyze emerging countries, they aimed at improving the tested asset pricing models by estimating the risk factor based on domestic inputs only. Thereby, these studies can demonstrate improved performance of the asset pricing models. Therefore, this study will test both global as well as domestic versions of asset pricing models within the context of emerging markets. Specifically, the empirical analysis part of this study aims at testing the validity of the two traditional asset-pricing models, namely the Capital Asset Pricing Model (CAPM) and the Fama & French Three Factor Model (FF3-Model). The empirical results of this study find that the domestic versions of the models do outperform the global versions. However, the domestic FF3-Model does not outperform the domestic CAPM in every country of the emerging markets peer group. In fact, the model should be selected on an individual country level.

1.2 Problem formulation

Based on the short overview of the topic and its relevance, the research question for this study can be formulated. Specifically, this research seeks to answer the following main question:

What recommendations can be given to foreign investors, who want to investigate time-series variations of stock returns within emerging markets based on global as well as domestic versions of the Capital Asset Pricing Model and the Fama & French Three Factor Model?

In order to answer this research question appropriately, several sub-questions have been formulated, which will assist in approaching the main research question. These sub-questions are outlined below.

- On the basis of which dimensions, are countries classified as being emerging markets?
- What are the historical opportunities and caveats for investments within emerging countries?
- How did an emerging market peer group historically perform when applying these opportunities and caveats on them?
- What is the theoretical fundament of asset pricing models like the CAPM and the FF3-Model?
- How can the historical performance of these two asset pricing models be evaluated in international capital markets?
- Do global or domestic versions of the CAPM and the FF3-Model perform better empirically in explaining the variations in stock returns of the countries from the emerging market peer group of this study?
- Are there any limitations or shortcomings prevalent within this empirical study?
- What are the main recommendations for foreign investors based on the empirical results?

1.3 Delimitations of this research study

Obviously, the field of international finance is rather wide. Therefore, certain delimitations of this study need to be mentioned. Firstly, this study takes the perspective of US investors or portfolio managers. This choice has several impacts on the kind of variables used within the empirical analysis. For example, the US risk free interest rate based on Treasury Bills will be used. Clearly, this study could have also taken a Scandinavian view, but the US view has been chosen due to its

central and prominent role within global financial markets. Furthermore, most of the existing research studies on this particular topic have been conducted from a perspective of US investors. Secondly, the empirical analysis focuses only on the countries, which have been defined to belong to the emerging markets peer group. This peer group will be selected based upon a framework, which will be introduced at a later point within this study. Hence, the results of this study might not be ultimately applicable to each and every emerging country. Thirdly, there exist numerous financial vehicles for investments within emerging markets. However, this study focuses only on direct investments into companies through the acquisition of company shares, which are traded on domestic financial markets. Hence, bonds, any form of funds or derivatives are not going to be discussed within this study. Next, the impact of exchange rates due to currency fluctuations is not covered within this research. Clearly, exchange rate fluctuations are impacting the returns on international investments. Nevertheless, this study focuses on the stock return as measured by the development in share price.

After that, this research study assumes that international capital markets are efficient. In order to test asset pricing models within these markets, this must be a credible assumption, otherwise the testing of these models would not add any value. Therefore, a discussion of the degree of efficiency within the emerging markets at hand will not be given by this research study. Subsequently, only two main asset pricing models are going to be employed in conducting the empirical analysis. Specifically, these models will be the CAPM and the FF3-Model. Thus, any other explanatory variables for the variations in stock returns, like momentum as included within the Carhart Four Factor Model (Carhart, 1997), are not going to be covered by this study. Additionally, this study only investigates the historical validity of these two asset pricing models within emerging markets. Forecasts of future returns for the stock of the emerging countries of the peer group are not going to be covered. This is motivated by the fact that this study aims at showing foreign investors the difficulty of identifying an asset pricing model, which is suitable to explain variations in stock returns. Finally, the empirical analysis of this research study is limited to the time period from 2003 to 2012. Although, the results might only be specific for this time period, a comparison with other time periods will only be given based on insights from other scientific studies.

1.4 Structure of this research study

In order to answer the before mentioned problem statement and the relevant sub-questions, this research is structured in six main sections. The first section of this study is an introduction section. The relevance of the topic is presented and the problem statement with its sub-questions is introduced. Additionally, the scope of this study is outlined. The second section of this research study is devoted to a general as well as study-specific definition of emerging markets. This section gives the reader an overview on general emerging markets characteristics and on dimensions that can be employed in order to classify countries as emerging economies. Economical development and domestic capital market structure are specific dimensions, which are going to be analyzed in a more detailed fashion, since they will be the main criteria for selecting countries for the emerging markets peer group of this study. Within the third section of this study, the selected countries of the emerging market peer group will be analyzed from a portfolio manager's perspective. Thus, main investment opportunities and caveats for foreign investors within emerging markets will be summarized in order to give the reader an overview on advantages and disadvantages. The section concludes by showing that, based on historical data, the emerging market peer group of this study offers clear investment opportunities for foreign investors. Having presented opportunities for investors to engage in emerging markets, the fourth section aims at introducing asset pricing models, which can be employed within the context of emerging markets. Specifically, the CAPM as well as the FF3-Model are going to be presented on a conceptual and performance related basis. Hence, this section builds the theoretical grounds for the subsequent empirical analysis. The fifth section empirically investigates the validity of the two asset pricing models within the context of the defined emerging markets peer group. In particular, global as well as domestic versions of the models are tested and their performance is evaluated. Thereby, investors are given recommendations concerning the appropriate selection of the models on a country basis. Lastly, the section outlines limitations and shortcomings of the empirical part of this study. Finally, section six summarizes the main findings and draws the main conclusion by answering the main research question.

2. Definition of Emerging Markets and Formation of Peer Group

The term "emerging market" has been formulized in 1981 by World Bank economist Antoine van Agtmael. An investment fund was set up, which focused on investing within third world countries. Since third world countries were not perceived as being lucrative investments, he labeled them as

emerging countries in order to convince investors of their growth prospects (Van Agtmael, 2007). Nowadays, the term "emerging market" is used for numerous countries. Therefore, it is necessary to formally define the concept of emerging markets. This guarantees that a common ground for the further analysis of this research study is established. Furthermore, this study aims at building a framework, which assists in selecting a sub set of these countries that allows investors to profitably invest within emerging markets. This set of countries will be used in order to conduct the empirical analysis part of this research study.

This section is structured in the following manner. Firstly, general dimensions for the classification of emerging markets are indentified. These general dimensions are important to be able to generally define emerging markets. Thus, the universe of different dimensions will be employed in order to filter specific dimensions, which allow the appropriate selection of countries for the sample of this study. Secondly, two main dimensions are selected. Therefore, specific focus will be put on economic conditions and domestic capital market structures within emerging markets. These two dimensions are the primary drivers for emerging market classification of this study. The focus on economic conditions resembles the country classification method of organizations like the World Bank or the International Monetary Fund. In turn, domestic capital market structure criteria are mostly used by investment services companies like Morgan Stanley Capital International (MSCI) or Financial Times Stock Exchange (FTSE). Hence, both views are going to be incorporated within the process of defining an emerging markets peer group for this study and they will play a key role within the framework of identifying the emerging markets peer group. Thirdly, a framework for emerging market classification will be defined, which allows the selection of countries for an emerging markets peer group of this study. As mentioned before, the dimensions of economic conditions and domestic capital market structures will be the primary dimensions employed within this framework. The resulting peer group will be used for further empirical analyses within this research study.

2.1 Overview on general dimensions for the classification of emerging markets

In the following, the various general dimensions on which emerging markets can be classified based on the existing academic literature are investigated. Thereby, two relevant dimensions can be identified, which will be incorporated within the framework for selecting the emerging markets. Mody (2004) claims that emerging markets can be classified based on their transitional status. More

specifically, transitions take place within the economical, political, social and demographic environment of an emerging market. Usually, economic liberalization processes accompany these transitions. Mody (2004) further clarifies that, besides being in transition, emerging markets tend to be classified by three more characteristics. Firstly, emerging markets offer high growth prospects. Secondly, emerging markets tend to be risky, especially for foreign investors. Political instability and its implications on economic policies within individual emerging markets can cause increased volatilities within the economic environment. The reasons for the increased volatility are diverse, since they can be caused by different events, such as expropriation, hyperinflation, trade barriers or financial restrictions. Thirdly, there has not been a long history of foreign investment within emerging markets. Actually, increased investments within emerging markets have only been witnessed since the 1990s. Thus, these markets are usually opening up in order to start importing foreign capital flows. Hoskisson, Eden, Lau & Wright (2000) support Mody (2004) and find the same characteristics, but the authors emphasize the fact that economic liberalization is one of the main drivers of growth for emerging markets.

Hence, emerging markets do not only need to liberalize their economic policies in order to allow foreign investors to invest into their economy, but they also need to introduce transparent rules as well as laws, which allow a transition from an informal to a formal system for all market participants. Aguiar & Gopinath (2007) explain that emerging markets tend to suffer from frequent regime changes. These changes become visible by frequent reversals within fiscal, monetary and trade policies. An example for such frequent reversal is the fact that emerging markets tend to have very varying interest rates, due to frequent policy changes. Kvint (1999) further adds the social and cultural dimension to the definition of emerging markets. According to his definition, emerging countries should also experience increasing standards of living and social stability.

Based on the presented views on how to define emerging markets, several dimensions have been identified that assist in classifying emerging markets. Foremost, the economical dimension needs to be analyzed in order to check for high growth prospects. Secondly, the development of the domestic capital market and its liberalization for foreign investments is a critical driver for countries, which can be regarded as emerging. Thirdly, emerging countries need to be in a transitional stage. This transition can be identified based on several dimensions of the society, the demography and an improving infrastructure. Since this research study focuses on investments within emerging

markets, a deeper look into existing classification schemes for emerging markets, based on economical and capital market viewpoints, is necessary. It is believed, that these two dimensions will be the center of focus for investors.

2.2 Classification of emerging markets based on economical and capital market dimensions

This part will focus on definitions of emerging markets, which are based on economical and capital market dimensions. Firstly, certain economical dimensions, as presented by the International Monetary Fund or the World Bank, are going to be presented. Secondly, this part focuses on the dimension of domestic capital markets, which is the main focus of investment services organizations like Morgan Stanley Capital International (MSCI) or Financial Times Stock Exchange (FTSE). Thirdly, the concepts of BRIC and Next Eleven, which have been developed by Jim O'Neil, a former economist at Goldman Sachs, are introduced. These two frameworks will act complementary to the other two dimensions. Finally, this part presents a long list of countries, which is built on the insights of the above mentioned organizations and frameworks. Subsequently, the next part will use this long list in order to apply a framework, which is built specifically for this study, in order to select the countries for the emerging markets peer group.

The country classifications of the International Monetary Fund and the World Bank do not aim at presenting investors valuable investment opportunities. Instead, both organizations intend to present a classification scheme, which shows the parts of the world that can be classified as developed and developing countries. This enables these organizations to focus on improving the overall situation within those countries that are classified as developing countries. Nevertheless, the logic behind the classification is valuable, as it benefits the definition of emerging markets for investing purposes. Therefore, this research study will incorporate this logic within the framework for classifying the emerging markets peer group.

The International Monetary Fund distinguishes, within its publication of the World Economic Outlook, between advanced countries and emerging & developing countries (Nielsen, 2011). The countries are classified based on three different criteria (World Economic Outlook, 2013). The first criterion is per capita income. Secondly, export diversification is taken into account, since per capita income shall not solely be based on one industry for advanced countries. Thirdly, the degree of integration within global financial markets is checked. Based on these rather broad criteria, the

International Monetary Fund classifies a total of 35 countries within the group of advanced countries. Obviously, the seven largest economies (United States, Japan, Germany, France, Italy, the United Kingdom, and Canada) are represented within this group. Thus, the rest of the countries are placed within the group of emerging & developing countries. The fact that the International Monetary Fund is using economical dimensions is very relevant for the formation of the emerging markets peer group of this study. Unfortunately, the group of emerging & developing countries is too large in order to identify a clear set of emerging countries.

The World Bank takes an equally broad approach in classifying countries. Nielsen (2011) shows that the World Bank classifies developed countries as high-income countries. In turn developing countries are labeled as low- and middle income countries. The World Bank's main and only criterion for classifying economies is gross national income (GNI) per capita (World Bank, 2013). Thereby, countries are classified based on certain thresholds that have been defined in 2011. The defined groups are almost equally large as the ones classified by the International Monetary Fund. Thus, there are no big differences between the organizations concerning the classification of emerging countries. Similarly, an outline of emerging countries does not provide any value added, since the group would be too large. Nevertheless, the economic development of the domestic economy will be incorporated within the framework used in this study for selecting emerging markets.

Besides focusing on the wealth of countries, a look at the quality of domestic capital markets is needed in order to offer foreign investors the transparency concerning the quality of the market within emerging markets. The Financial Times Stock Exchange (FTSE) (2012) uses a matrix structure in order to classify countries in developed, advanced emerging, secondary emerging or frontier countries. Concerning the two types of emerging countries, advanced emerging countries are developed further than secondary emerging countries. The classification matrix mainly consists of seven categories, which are checked in order to form a judgment of a country's classification. The first three categories, gross national product (estimated by the World Bank), creditworthiness (estimated by credit ratings) and market size, can be classified as macro economical dimensions, since they focus on the overall economical condition of the individual country. The other four categories, namely the dealing landscape and brokers, custody and settlement, regulation, and derivatives, focus on the quality of the domestic capital market. Each category is broken down into

factors, which allow an objective measurement and scoring. The overview of the categories and factors is presented in Appendix 1. Although not listed within the framework, factors for market size are the total market capitalization and the total number of listed companies. As can be seen from the categories of the country classification, FTSE (2012) takes a more holistic approach, which mainly aims at achieving transparency for foreign investors. Additionally, the country classification also aims at fostering capital market development within emerging countries, since these countries are constantly evaluated on an annual basis.

The Morgan Stanley Capital International (MSCI) organization takes a comparable approach like the FTSE organization. In fact, MSCI tries to balance the economic development and the accessibility to its market, when classifying countries (MSCI, 2013). Based on their classification framework, MSCI classifies countries as frontier, emerging or developed. Three main categories are tested within MSCI's country classification framework. These tree categories are economic development, size and liquidity requirements as well as market accessibility criteria. Similar to the approach by FTSE, certain factors have been defined, which allow the measurement of each category. Appendix 2 provides an overview of these factors. The thresholds for the market accessibility criteria appear to be of qualitative nature. But each factor has several sub-factors, which allow concrete measurements. For example, the openness to foreign ownership category has a sub-factor, which checks whether foreign investors have equal voting right as compared with domestic shareholders (MSCI, 2013). Interestingly, Greece has been downgraded from a developed country status to an emerging country in June 2013 by MSCI. The downgrade is justified based on the low quality of its domestic capital market (Reuters, 2013). Thus, MSCI's classification scheme can be regarded as flexible.

Moreover, the country classification of emerging markets by Jim O'Neil, former economist at Goldman Sachs, is introduced as well. O'Neil invented the concepts of BRIC and Next Eleven. BRIC refers to Brazil, Russia, India and China, which form a group of newly advanced economies (O'Neill, 2001). Additionally, the concept of Next Eleven identifies eleven countries, which have the potential to become the world's largest economies alongside the BRIC countries in the 21st century (O'Neill, 2007). The reason for the inclusion of these two concepts is the fact that they provide an additional lens for filtering the emerging countries with the most promising future outlook. In fact, the frameworks are specifically selecting emerging countries, which show great

macroeconomic stability and openness for trade and investment policies. Hence, the frameworks fit very well to the two dimensions, which are economic development and domestic capital market structures. Furthermore, Goldman Sachs acts as a large asset management player, which means that the inclusion of the BRIC and Next Eleven framework underpin the investor view on emerging markets.

Table 1 shows the country classifications of both FTSE and MSCI (FTSE, 2013; MSCI, 2013). As mentioned before, FTSE further distinguishes emerging countries in advanced and secondary emerging. Furthermore, the countries incorporated within the BRIC and Next Eleven frameworks are also displayed.

Table 1: Emerging markets classification by FTSE, MSCI and BRIC & Next Eleven

	FTSE		**MSCI**	**BRIC & Next Eleven**
	Advanced Emerging	Secondary Emerging	Emerging Market	
Bangladesh	**x**		**x**	**x**
Brazil	**x**		**x**	**x**
Chile		**x**	**x**	
China		**x**	**x**	**x**
Colombia		**x**	**x**	
Czech Republik	**x**		**x**	
Egypt		**x**	**x**	**x**
Hungary	**x**		**x**	
India		**x**	**x**	**x**
Indonesia		**x**	**x**	**x**
Iran				**x**
Malaysia	**x**		**x**	
Mexico	**x**		**x**	**x**
Morocco		**x**	**x**	
Nigeria				**x**
Pakistan		**x**		**x**
Peru		**x**	**x**	
Philippines		**x**	**x**	**x**
Poland	**x**		**x**	
Russia		**x**	**x**	**x**
South Africa	**x**		**x**	
South Korea			**x**	**x**
Taiwan	**x**		**x**	
Thailand	**x**		**x**	
Turkey	**x**		**x**	**x**
UAE		**x**		
Vietnam				**x**

Legend:

Country is listed in all three frameworks
Country is listed in two frameworks (incl. BRIC / Next Eleven)
Country is listed in two or less frameworks

A color coding is used in order to show, where the differences and similarities for the three classification schemes lie. Light blue highlights countries, which belong to all three frameworks. Grey shows countries, which are listed within two frameworks (including BRIC & Next Eleven). White shows countries that are listed by only two or less frameworks.

Table 1 illustrates a homogenous view on emerging markets. As a result, only four countries are described as emerging markets by only one organization. In order to select a peer group of emerging countries for this study, a long list needs to be developed. Based on this long list, this research study will then apply a framework, which will filter the countries that are going to be included within the emerging markets peer group. Based on the above shown list of countries the long-list will be established in the following manner. Firstly, all countries will be selected, which are classified as being emerging markets from all three organizations. These countries are Bangladesh, Brazil, China, Egypt, India, Indonesia, Mexico, Philippines, Russia and Turkey. Furthermore, two more countries are selected, which are classified by two organizations as an emerging market. These two countries are Pakistan and South Korea. The reason for their inclusion lies within the fact that they have been identified by the BRIC and Next Eleven frameworks. As mentioned before, these frameworks are evaluating emerging markets from an investor's perspective, which conform to the setup of this research study. Table 2 shows the countries, which belong to the long list of this study.

Table 2: Long list of emerging countries

Emerging Markets Long List	
Bangladesh	Mexico
Brazil	Pakistan
China	Philippines
Egypt	Russia
India	South Korea
Indonesia	Turkey

2.3 Definition of emerging markets peer group based on country classification framework

This part will present a framework in order to reduce the long list of emerging countries to a peer group of five countries. The reason for choosing five emerging countries lies within the argument that this amount of countries optimally satisfies the tradeoff between being able to recognize differences between emerging countries, while conducting a clearly arranged study. Specifically, the inclusion of more countries would deteriorate the possibility of drawing clear conclusions.

Furthermore, the discussion of more countries would go beyond the scope of this research study. The formation of the peer group is organized as follows. Firstly, the framework and its components are going to be introduced. Secondly, the framework will be applied in order to select the five emerging countries, which are going to be used for the further analysis of this research study.

Since this research report takes the perspective of investors, the framework that is going to be established, is specifically built to reflect the investors' specific needs. Therefore, three main dimensions have been chosen, to be analyzed for each of the countries on the long list. These three dimensions are the economic development, the development of the domestic capital market and the transitional status of the emerging country. Furthermore, each dimension is composed of different characteristics, which will facilitate the measurement of these dimensions.

Following the intuition of the World Bank and the International Monetary Fund, a look at the economic development is necessary in order to classify a country as emerging. Thus, the macro economy is the first dimension, which will be analyzed. This dimension is composed of three different characteristics. Alike the World Bank and International Monetary Fund, the first characteristic is the gross national income per capita (GNI) of the countries. The gross national income is the sum of value added by all resident producers plus any product taxes not included in the valuation of output plus net receipts of primary income from abroad (Unicef, 2013). Gross national income development over time can show investors how the individual country has evolved. Specifically, emerging countries should experience high growth rates. The second characteristic is the inflation rate based on consumer prices. Inflation matters to investors, since it acts as a benchmark for their investments. If the return of an investment lies below the inflation rate, the buying power of the investment is reduced. Thus, the investor is really loosing money, since the value of money is growing slower as compared to the increase in consumer goods' prices. The last characteristic for the macro economy dimension is the credit rating of each individual country. Ozturk (2007) shows that credit ratings influence the sentiment of investors when investing in emerging markets. In fact, better ratings increase investors' willingness to devote funds into these countries, which will foster economic prosperity.

The second dimension, which is composed of two characteristics, investigates the development of the domestic capital market of the emerging countries. Thus, the first characteristic accounts for the

number of listed companies within an emerging country. Demirgüç-Kunt & Levine (1996) explain that this characteristic offers investors a view on how limited or broad a capital market is. Thereby, investors can better choose which markets to enter. The number of listed companies is supported by the ratio of domestic market capitalization to gross domestic product (GDP). Pagano (1993) shows that the ratio of market capitalization to GDP proxies for the size of a capital market. Generally, a greater market size will attract more foreign capital due to diversification benefits.

Lastly, the third dimension examines the transitional status of emerging countries based on two characteristics. These characteristics focus on the infrastructural developments within the industry of information and communication technologies. Quing, Rossotto & Kimura (2009), show that this industry is one of the main key drivers for growth within emerging markets. In fact, a 10% increase in mobile phone subscribers fosters a 0.8% increase in economic growth. Furthermore, a 10% increase in internet users achieves a 1.3% increase in economic growth. Hence, transitions within this industry induce investors to start investing, since they are associated with economic prosperity. Based on this evidence, the two characteristics for the transitional dimension are the number of internet as well as the number of mobile phone users (per 100 people).

The three dimensions are ranked in the following order. The economical development and the domestic stock market characteristics are more important than the transitional status. This is justified based on the investor's view on emerging markets. Hence, an investor is mainly concerned about profitable growth and the opportunities available within the stock market. Thus, the transitional status is deprioritized. Although, there are many more dimensions and characteristics, which can be investigated for the selection of emerging markets, it is believed that these dimensions can conveniently assist in reducing the long list of emerging countries to formulating the emerging markets peer group for this study.

The data for all characteristics, except for credit ratings, has been retrieved from the World DataBank (2013). The credit ratings have been retrieved from Fitch Ratings (2013). Appendices 3a & 3b show a complete overview of all characteristics from 2003 to 2011 for all emerging countries on the long list. It has been decided to display the development over time. In doing so, the actual development of the individual countries can be displayed best. Unfortunately, at the time of data retrieval, no data was available for the year 2012 yet. Thus, the data for the characteristics of the

emerging countries can only be displayed from 2003 until 2011. Besides the illustration within the appendices, table 3 displays five of the seven characteristics. The other two characteristics will be displayed within the following figures, since they are better presented in a graphical fashion. The values of the top three countries are highlighted for each category. For the development of gross national income and the mobile phone subscriptions, a compound annual growth rate has been calculated according to the following formula. The compound annual growth rate displays the year-of-year growth rate.

$$CAGR = \left(\frac{Value_{2011}}{Value_{2003}} \right)^{\left(\frac{1}{8}\right)} - 1$$

This compound annual growth rate is used in order to compare the annual growth rates of the characteristics among the emerging markets over the period of 2003 to 2011. Clearly, a characteristic cannot only be evaluated based on the CAGR alone. Hence, the CAGR is interpreted in connection with the actual level of a characteristic. For the inflation rate, the credit rating and the number of listed companies the value for 2011 is outlined. The disclosure of the development over time is not needed, since investors are interested in the most current rate or rating. For the number of companies only the recent number is shown, since the number has not fluctuated significantly from 2003 to 2011. The development of the market capitalization as a percentage of GDP and the development of internet user over time is shown in figures 1 and 2. It needs to be noted that only the five best performing countries of the respective characteristic are displayed within these figures in order to keep a simplistic overview within the graphs.

Table 3: Main criteria for emerging markets classification

	Macro Economy			**Capital Market**	**Transition**
	CAGR GNI (2003-11)	**Inflation Rate 2011**	**Credit Rating (Fitch) 2011**	**Number of listed companies 2011**	**CAGR Mobile subscriptions (2003-11)**
Bangladesh	4.40%	10.71%	BB-	216	**65.57%**
Brazil	3.37%	6.64%	**BBB**	366	21.74%
China	3.24%	**4.22%**	**A+**	393	15.42%
Egypt	2.97%	10.05%	BB	231	37.08%
India	**6.49%**	8.86%	BBB-	**5112**	**48.49%**
Indonesia	**4.72%**	5.36%	BBB-	440	36.03%
Mexico	1.54%	**3.41%**	**BBB**	128	13.96%
Pakistan	3.09%	11.92%	B-	**638**	**58.20%**
Philippines	**4.94%**	4.65%	BB+	251	16.37%
Russia	4.51%	8.44%	**BBB**	327	27.96%
South Korea	3.43%	**4.00%**	A+	**1792**	5.25%
Turkey	3.99%	6.47%	BB+	362	9.78%

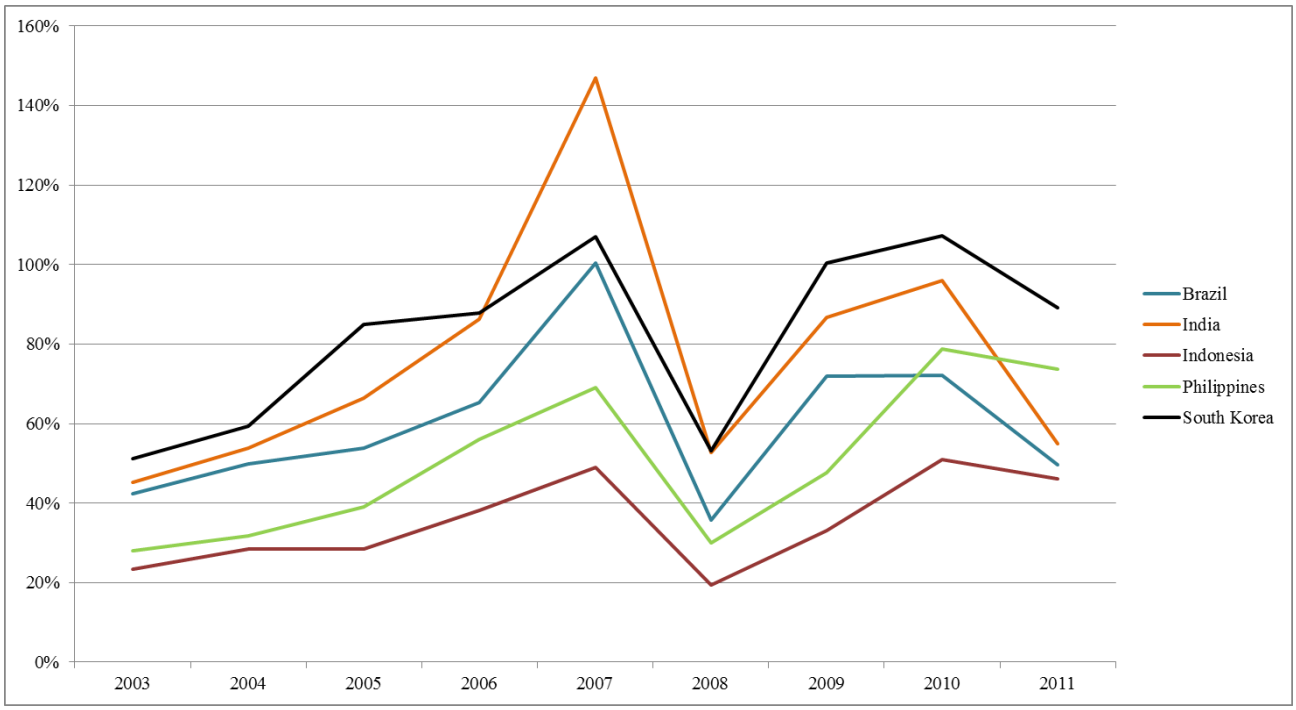

Figure 1: Market capitalization of listed companies (% of GDP)

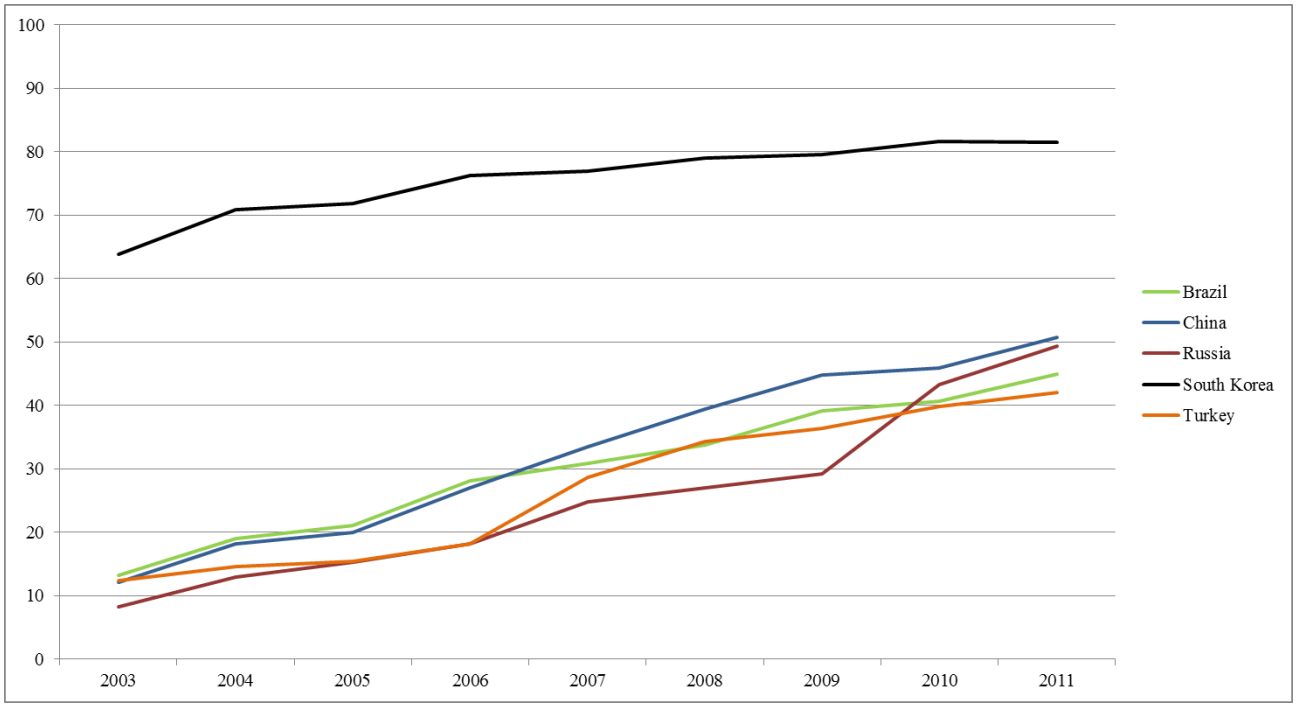

Figure 2: Internet users (per 100 people)

Based on the results, as presented within the table and graphs, two countries are clear picks for the peer group of this study. India demonstrates clear leadership positions within all three dimensions.

The country displays the highest compound annual growth rate in terms of gross national income. Concerning its domestic capital market, it has by far the highest amount of listed companies while being ranked third for the ratio of market capitalization to GDP. Additionally, India shows great strengths within the development of mobile phone subscriptions. In fact, 72 out of 100 Indians had a mobile phone subscription in 2012. Further, South Korea shows the second highest potential, displaying the second lowest inflation rate, which is very attractive for investors. Further, the country has the second highest number of listed companies, while reporting the highest ratio of market capitalization to GDP. Thus, the country has a particularly strong domestic capital market. Finally, South Korea shows great strength within the category of internet users, where it outperforms its competitors in absolute numbers by far. Concerning mobile phone subscriptions, an equally high number can be reported, which obviously limits the growth possibilities within this category.

The identification of the next countries is not so clear cut, as there are numerous countries, which are strong within one of the dimensions. Therefore, this study prioritizes the dimension of capital markets and the economical development as the most important ones. The argument for these dimensions is based on the fact that this study has been written from the investor's perspective and it is believed that these categories will be most important for them. Based on this prioritization, three more countries are selected to be part of the emerging market peer group of this study. These countries are Pakistan, Indonesia and the Philippines.

Pakistan shows the third highest amount of publicly listed companies, which offers great diversification benefits for investors. Furthermore, the people of Pakistan enjoy mobile phones, as displayed by a great growth rate for mobile phone subscriptions, which shows that the country has fairly good growth prospects. In fact, 62 out of 100 people within Pakistan had mobile phone subscriptions in 2012.

Moreover, Indonesia displays the fourth highest amount of listed companies while being ranked fifth based on the ratio of market capitalization to GDP. Consequently, the country is also fairly well positioned for this dimension. Furthermore, Indonesia performs also quiet well within the dimensions of its macro economic situation and transition. For example, the country has the third highest growth of GNI while having a low inflation rate and a good rating. In terms of transition,

the country is positioned fifth for the growth in mobile phone subscriptions. Actually, 98 out of 100 people in Indonesia are in possession of a mobile phone subscription. Therefore, the country performs very well overall and deserves a place within the peer group of this study.

Finally, the Philippines are selected to be part of the emerging market peer group. The country shows the second highest ratio of market capitalization to GDP, which is the main argument for the inclusion. In addition, the Philippines enjoy the second highest growth rate of GNI among the countries of the long list. Besides this high growth rate, the country also has a fairly low inflation rate, while showing a fairly stable credit rating. Although, the Philippines do not perform extraordinary well within the transitional dimensions in terms of growth, still a very high absolute number of mobile phone users can be reported (98 out of 100). Nevertheless, the other two dimension display the core strengths of the Philippines. Thus, the inclusion is well justified.

Obviously, the inclusion of other countries is debatable. For example, the inclusions of China or Brazil have well been taken into consideration. However, both countries do not show great strengths within the category of capital market, which has led to the exclusion of these countries from the peer group of this study.

Therefore, the final peer group of emerging countries for this research study is displayed in table 4. It will consist of India, Indonesia, Pakistan, Philippines and South Korea. These countries will subsequently be taken as examples when the following sections are discussing the opportunities as well as threats for investors within emerging markets or the application of equity asset pricing models.

Table 4: Emerging markets peer group

Emerging Markets Peer Group
India
Indonesia
Pakistan
Philippines
South Korea

3. A Portfolio Management's Perspective on Emerging Markets

Emerging markets, as defined within the prior section, have historically been described by offering high expected returns, while experiencing rather high levels of volatility, and low correlations with developed markets (Harvey, 1995a). These benefits have induced many investors to include stocks from these markets within their portfolios in order to improve the risk and return characteristics of their portfolios. Therefore, this research study engages in investigating the applicability of equity asset pricing models within emerging markets. As investors become increasingly engaged in emerging markets, the focus on asset pricing models in these markets is an important contribution to the emerging market discussion. In order to fully understand the reason why investors have started to diversify their portfolios internationally, a deeper look at the motivation for international portfolio management is needed. Firstly, historical investment opportunities within emerging equity markets will be analyzed. Specifically, existing academic literature concerning historical returns as well as correlations between emerging as well as developed countries is going to be outlined. Secondly, an overview concerning caveats for investments within emerging equity markets will be given. In particular, international investments in times of crises are going to be analyzed. Thirdly, investment barriers for countries, which are segmented from global financial markets, are going to be introduced. Finally, this research offers a critical perspective concerning the attractiveness of international investments within the peer group of emerging countries.

3.1 Investment opportunities within emerging equity markets

Two main arguments exist for investing into emerging markets. To start with, stock returns within emerging markets have historically been rather uncorrelated with stock returns of developed countries. Thus, investors have invested within emerging countries in order to reduce the risk of their portfolio by diversifying. Moreover, strong economic growth within emerging countries has offered investors ample opportunities to benefit from high returns (Henry & Kannan, 2008). This section will, therefore, focus on these two benefits by investigating existing academic literature. Firstly, the investment process of portfolio managers is briefly explained. Secondly, relevant research results concerning historical returns within emerging markets and correlations between emerging and developed markets are going to be presented. Thereby, the opportunities for investments in emerging markets are demonstrated. Clearly, caveats, like increased volatilities or investment barriers, are present in emerging markets. They will also be discussed within this section.

Before investigating the historical returns within emerging markets, it needs to be understood how rational portfolio managers make decision on what stock to invest in. In fact, portfolio managers add securities to their portfolio based on a risk and return tradeoff. Thus, understanding the expected return side of securities within emerging markets is equally important as understanding the accompanied volatilities, which proxy for the riskiness of securities (Michelfelder, 2005). Therefore, portfolio managers need to build strategies in order to select countries with high expected returns and rather low volatilities, where stocks can be picked that satisfy the required tradeoff between risk and return (Fernandez, 2005).

Arora & Jain (2009) show that emerging markets offer better risk adjusted stock returns as compared with developed countries. The authors claim that the higher stock returns are based on higher growth rates of GDP, a strong growth of domestic capital markets as measured by total market capitalization and an increase in the number of companies, which have gone public. In fact, these characteristics are reflected in the selection of emerging countries for the peer group of this study. Existing academic literature presents several specific examples for these characteristics. Total market capitalization of emerging countries within the S&P/IFC Emerging Market Index has increased from US$300 billion in 1998 to US$7,500 billion in 2008 (Arora & Jain, 2009). The increase in market capitalization has been even more extraordinary for individual countries. For example, Thailand's market capitalization rose by 4,731% from 1980 to 1992 (Kassimatis & Spirou, 1999). Additionally, the number of listed companies from emerging countries within the Emerging Market Indices have rose from 5,400 to 15,400 within the sample period from 1998 to 2008 (Arora & Jain, 2009). In terms of GDP growth, emerging markets clearly outperform developing countries by having a GDP growth rate of approximately 6% as compared with a GDP growth rate of 0.5% for developing countries (BlackRock, 2011).

Additional studies have supported the notion of higher stock returns within emerging countries. Using a similar argument, Bekaert & Urias (1999) demonstrated that in the medium- to long-run, emerging markets have outperformed developed markets in terms of stock returns. Furthermore, Keane (1993) reports excess returns of emerging market investments over developed markets. In fact, several researchers claim that the higher reported returns within emerging markets are not achieved due to strong growth prospects, but rather due to the fact that emerging financial markets seem to be more inefficient than markets in more developed countries. This makes returns within

emerging markets more predictable (Harvey, 1993), In turn, stocks from emerging markets are seen as better investment opportunities when compared with stocks in developed markets.

Besides investigating the fact that emerging markets experience higher stock returns, it is also necessary to have a look at the correlations of stock returns between emerging and developed countries. Bekaert, Harvey & Lundblad (2003) demonstrate that emerging markets have low correlations with developed and other emerging markets. Low correlations are attractive for portfolio managers because low correlations amongst assets within a portfolio lead to a low overall volatility of a portfolio (Markowitz, 1991). Since investors try to maximize portfolio returns by minimizing the risk of their portfolio, investors are highly interested in investing into assets that have low correlations amongst themselves. Thus, by investing into emerging market securities portfolio managers are able to diversify their portfolio even further. In fact, Solnik (1995) shows that an international well diversified portfolio is only one-tenth as risky as an individual US security or half as risky as a well diversified US portfolio with an equal amount of securities. Figure 3 portrays these diversification benefits. The vertical axis measures risk in terms of the variance of the stock returns. Moving along the horizontal axis from left to right, resembling an increase in the number of stocks within a portfolio, the risk for both depicted portfolios is clearly reduced. However, a well diversified portfolio of international stocks exhibits a lower risk level for any number of stocks than a well diversified portfolio, which is composed of US stocks only.

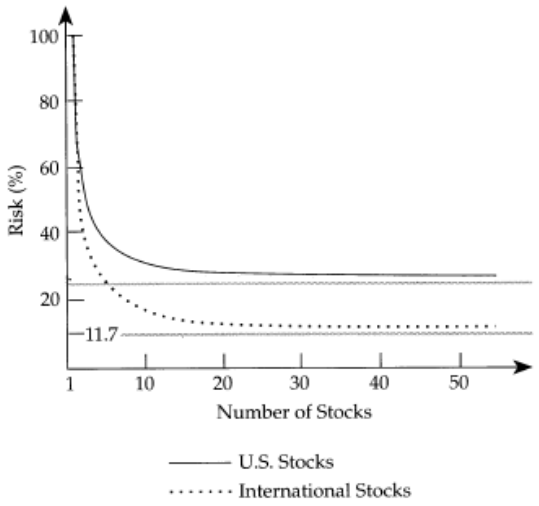

Figure 3: Diversification benefits[1]

[1] Source: Solnik, B. H. (1974). Why not diversify internationally rather than domestically?. *Financial Analysts Journal, 51* (1), 48-54.

Although Bekaert & Urias (1999) question that diversification within emerging markets is a free lunch for investors, they demonstrate that diversification benefits are in fact apparent. However, they further show that the level of diversification benefits strongly depends on the type of investment vehicle used. Goetzmann & Jorion (1999) support this view and argue that investing into emerging markets is justified on the basis of diversification. Their empirical analysis underpins the fact that emerging markets seem to have low correlations with developed markets. Having presented valid arguments for investments, caveats for investments within emerging markets exist as well.

3.2 Caveats for investing in emerging equity markets

In the following, potential caveats for investments within emerging markets will be reviewed critically in order to demonstrate a complete picture of emerging market investing. Specifically, investment barriers due to the segmentation of emerging markets from global financial markets, high volatilities and increased correlations with developed markets in times of crises will be discussed.

In order to fully benefit from the opportunities within an emerging market, it needs to be integrated within the global financial market. In fact, many emerging countries have financially been liberalized through the 1980-90's (Bekaert & Harvey, 2000). Yet, initiating a financial liberalization process does not automatically guarantee a seemingly integrated local financial market within global financial markets. Bekaert, Harvey & Lundblad (2003) explain that cases exist in which investors have even invested within emerging countries before their liberalization process. But, there also exists evidence for foreign investors, who did not believe in the liberalization reforms advocated by the local governments. Hence, no investments have flowed into such countries.

Generally, the financial liberalization process is very unique for each country. Therefore, investment barriers per country differ quiet substantially. Nonetheless, three main categories of investment barriers have been defined by Bekaert (1995). Firstly, there may be direct restriction on foreign ownership, which may mean that certain industries or sectors are not accessible for foreign investments. Secondly, emerging countries might impose capital or exchange controls. Specific examples for these controls would be a minimum investment period or a special tax for foreign investors. Both of these first two categories are described as direct investment barriers for foreign

investors. Additionally, public companies might restrict foreign ownership through registered shares with restricted transferability. Thirdly, there can be indirect investment barriers within emerging countries. This category mainly deals with the accounting and regulatory environment of emerging markets. Due to poor accounting standards, investors are unable to acquire information in order to understand the financial health of companies. Thus, they cannot make rational investment decisions. Additionally, information concerning settlement procedures on stock exchanges within emerging markets might be poor, which clearly hinders foreign investors to invest in such countries. Portfolio managers will only start investing within a country when these barriers are removed in a credible way. Thus, the process of liberalization needs to be closely analyzed and monitored by investors.

Besides investment barriers, volatilities accompanying high returns within emerging markets need to be analyzed. Volatilities are important for investors, since they are used as a measure of the risk inherent to securities (Mollah, 2009). Specifically, investors, confronted with high volatilities, face the following issues. The cost of capital increases for all market participants and investors might delay their investment decisions, since they want to avoid the highly volatile environment. By delaying investment decisions too long, financial markets do not have the opportunity to prosper. Therefore, investors need to understand the development and differences of volatilities within emerging markets, if they want to start investing within them. Harvey (1995b) shows that there is a significant difference between volatilities of stock returns in developed and emerging markets. In fact, the study shows that developed markets experience an annualized volatility of 16% to 41%. In turn, emerging markets display an annualized volatility of 19% to 105%. Hence, emerging markets are significantly more volatile as compared to developed markets.

Three main reasons can be identified, which cause the increased volatilities within emerging markets (Harvey, 1995b). Firstly, when volatilities of countries are estimated based on an index, the lack of diversification within this index might lead to high volatilities. Secondly, countries might have high risk exposure based on volatile macroeconomic factors. Thirdly, segmentation from world capital markets might cause the high volatilities. Furthermore, volatilities differ drastically across emerging markets (Bekaert & Harvey, 1997). The authors show that countries, which have open trade policies, as measured by the degree of foreign trade, have significantly lower volatilities. Additionally, the process of credible financial market liberalization also decreases volatilities. Another explanation for the differences in volatilities is provided by Cohen, Ness, Okuda, Schwartz

& Whitcomb (1976). They find that market thinness and share turnover significantly impact the level of volatilities. Thin markets experience either low amounts of buy and sell orders or the amount of listed companies is small. Thus, markets, which are extremely thin, will experience higher volatilities. Usually, these markets also tend to have low share turnover, which also increases volatilities. Generally, both these attributes fit well to the description of emerging markets. Consequently, it can be expected to observe high volatilities within these markets. Having shown that emerging markets tend to suffer from high volatility, it is unclear to what extent high volatilities impact the low correlations between emerging and developed markets.

One of the main opportunities for investing in emerging markets is the fact that emerging markets are described as having low correlation with developed markets. However, quite a substantial amount of academic literature exists, which questions the stable situation of low correlations in emerging markets. Solnik & McLeavey (1991) state, that correlations among international financial markets are not stable. In fact, they are evolving and increasing due to the financial market liberalization processes, which cause increased market integration. Similarly, Longin & Solnik (1995) reject the hypothesis of stable correlations within emerging markets. In fact, they show that correlations between international equity markets have risen during the 30 year time period from 1960 to 1990. Additionally, they show that correlations tend to increase even further for countries that experience high volatilities. Thus, emerging markets are particularly vulnerable to this finding. Bekaert, Erb, Harvey, & Viskanta (1997) support this notion and claim that the diversification benefits have decreased for investors within emerging markets. However, the authors still see the potential for reducing overall portfolio risk. Therefore, the attractiveness of emerging markets has been reduced, but it is still viable to invest there.

Another finding is especially harmful for investors, who want to diversify their portfolio within emerging markets based on low correlations. Erb, Harvey & Viskanta (1994) have studied correlations of emerging markets in times of crises. They find that correlations increase in down markets and recessions. Therefore, the diversification benefits are diminished during the scenarios of crises, where investors need them the most. Solnik, Boucrelle & Le Fur (1996) have noted that their study identifies a volatility contagion effect. This effect spreads volatility from one country to another, which naturally forces the correlation to go up during times of down markets or crises. A recent example of volatility contagion is the Asian financial crisis in 1997, which started in

Thailand and spread over many countries in Asia. This evidence underpins the notion that the benefits of international diversification diminish exactly during those times, when investors need it the most.

More caveats for investments within emerging markets exist. However, these caveats will not be discussed in detail, since this study takes on an equity asset pricing view and does not analyze the whole investment process. Therefore, this paragraph will give a short overview. Nevertheless, at least three more caveats can be identified, which might complicate investments within emerging markets. Firstly, foreign investors are naturally exposed to exchange rate risks, when investing abroad. For this reason, the development of currencies needs to be taken into consideration, when analyzing expected returns and potential risk factors. Since exchange rate risks have been categorized as out of scope for this study, they will not be discussed in a more detailed way. Secondly, transaction costs are significantly higher for international investments. Thus, transactions on global markets will reduce the return on investments more than transactions placed on domestic markets. Finally, illiquidity of small emerging capital markets might turn out to be problematic for foreign investors. Consequently, investors might face the problem of not having enough demand or supply for a particular security within an emerging market.

Having presented the main caveats for investments within emerging markets, it is necessary to critically evaluate those emerging countries that were selected for the peer group of this paper. In the following, the three main characteristics of emerging markets are going to be tested for the emerging markets peer group based on historical data. This approach is motivated by the fact that investors are mainly interested in increased returns and low correlations, which improve the risk and return relationship of their portfolios. Nevertheless, a critical view on volatilities needs to be taken as well, since increased volatilities might reduce the upside potential of emerging markets' stocks.

3.3 Judgment on investment opportunities within emerging markets

This following analysis is based on historical data of country indices, retrieved from Morgan Stanley Capital International (2013). Based on these indices, the three main characteristics of the emerging markets peer group of this research study are going to be illustrated. In order to make relevant comparisons, two regional indices, a World index and a European index, and two

developed country indices, US and Germany, have been extracted from Morgan Stanley Capital International (2013) as well. The selected sample period reflects the indices' behavior between the years 1990 to 2013. Furthermore, the sample will be split in order to see whether there have been different effects from 1990 to 2000 and 2001 to 2013. This procedure is done in order to eliminate effects from financial crises, like the global financial crisis in 2008/09.

Concerning historical returns and volatilities, interesting effects are noticeable. Table 5 displays the historical returns from January 1990 to May 2013.

Table 5: Monthly returns & standard deviations of indices from 1990 to2013

1990-2013	*Developed Region*		*Developed Countries*		*Emerging Countries*				
	World	**Europe**	**USA**	**Germany**	**India**	**Indonesia**	**Pakistan**	**Philippines**	**South Korea**
Mean Returns	0.62%	0.71%	1.48%	0.67%	1.51%	0.20%	0.44%	0.54%	0.41%
Standard Deviation	8.48%	12.22%	14.27%	13.73%	24.54%	7.02%	10.83%	12.65%	9.82%

In fact, India reported the highest average monthly return for the period of 1990 to 2013. But, India is also the country, which has the highest standard deviation of its mean monthly returns. Thus, the first two emerging capital markets characteristics are well documented for India. Interestingly, the US performed quiet well in terms of mean monthly returns. In fact, the performance has been better as compared with all other emerging market countries. Nevertheless, the reported standard deviation is also quiet high, although not as high as for India. The rest of the indices have been outperformed by India and the US. Strikingly, standard deviations of emerging markets, except for India, were not much larger than for indices from developed regions and markets. In effect, Pakistan and the Philippines have roughly the same standard deviation as Europe. Indonesia and South Korea are roughly on the same level as the World index. Interestingly, the US and Germany exhibit higher standard deviations compared to all emerging countries, except India. In conclusion, this study fails to validate the emerging markets' characteristic of higher volatilities. In terms of returns, both mean monthly returns as well as the return over the whole period from January 1990 to May 2013 needs to be analyzed.

Looking solely at mean monthly returns does not give a holistic picture of the development for the regions and countries. Thus, the development over the whole period needs to be analyzed as well. Figure 4 shows the development of the regional and country indices from 1990 to 2013. It needs to

be noted that the regional index of Europe and the two country indices of the US and Germany have been dropped in order to improve the readability of the graph.

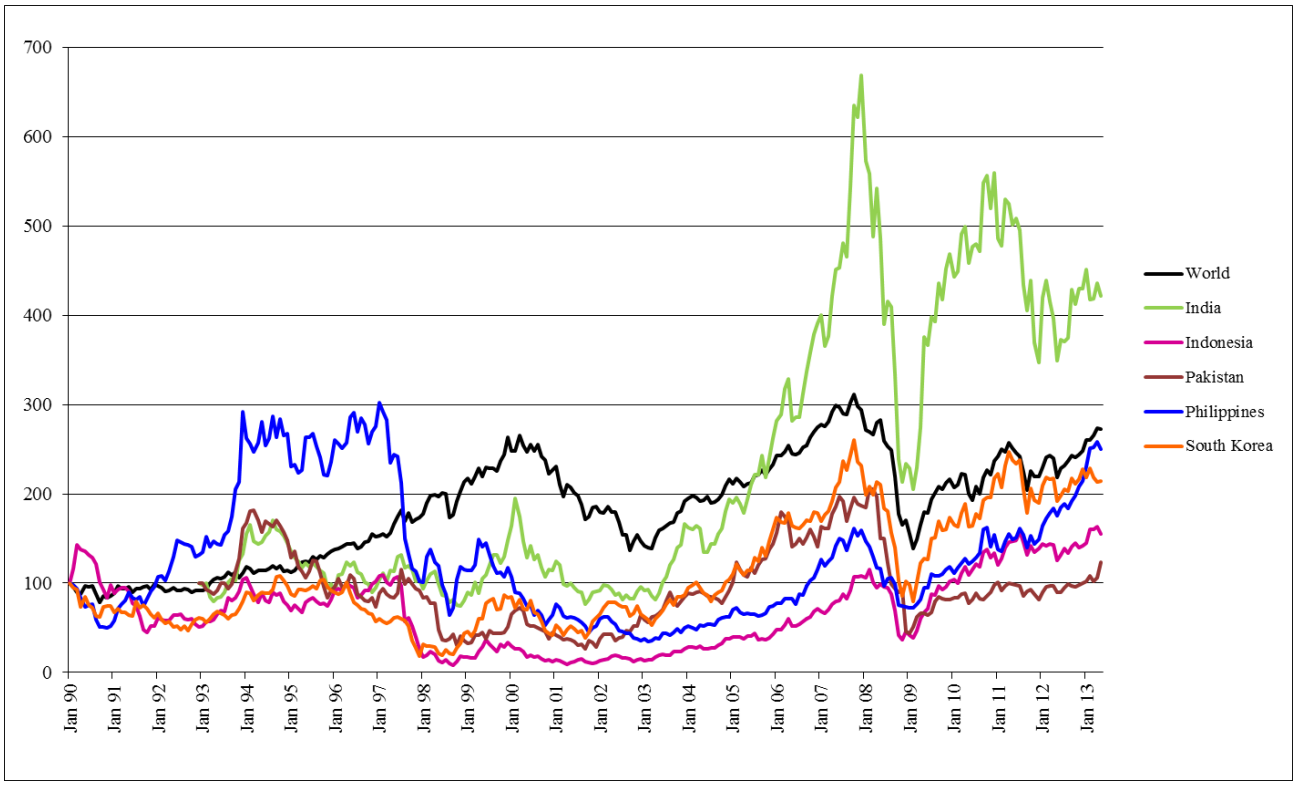

Figure 4: Development of indices from 1990 to 2013

The development of the individual country indices shows that India is the country with the highest return over the given period. Interestingly, the world index offers the second highest return, but is closely followed by South Korea and the Philippines. Indonesia and Pakistan provide the lowest returns. In fact, Pakistan barely offers a positive return over the given period. Overall, we cannot observe outperformance of any emerging country compared to the World index. Only India outperforms the world index and offers superior returns. Thus, given the data of this study the emerging market property of higher returns can only be justified for India. Being confronted with mixed evidence for higher returns and higher volatilities, the correlations of emerging markets with developed markets need to be tested for their validity.

In order to check for the existence of low correlations for emerging markets, correlations based on historical returns have been calculated for the time period from January 1990 to May 2013. Table 6 displays the correlations between the emerging markets of this study's peer group, two developed

regional indices and two indices from developed countries. In order to assist the readability of the table, a specific color scheme has been put in place. All correlations below 0.5 are highlighted green. The correlations between 0.5 and 0.75 are highlighted orange. Finally, all correlations above 0.75 are displayed in red. Obviously, the correlation of a country with itself is reported as one, which builds the diagonal of the table.

Table 6: Correlation of indices from 1990 to 2013

1990-2013	*Developed Region*		*Developed Countries*			*Emerging Countries*			
	World	**Europe**	**USA**	**Germany**	**India**	**Indonesia**	**Pakistan**	**Philippines**	**South Korea**
World	1								
Europe	0.933	1							
USA	0.939	0.812	1						
Germany	0.865	0.934	0.767	1					
India	0.563	0.607	0.463	0.589	1				
Indonesia	0.462	0.459	0.402	0.443	0.460	1			
Pakistan	0.142	0.158	0.114	0.139	0.338	0.135	1		
Philippines	0.361	0.330	0.327	0.320	0.297	0.565	0.182	1	
South Korea	0.664	0.642	0.569	0.615	0.607	0.476	0.191	0.278	1

Correlation < 0.5 | Correlation > 0.5 | Correlation > 0.75

Three main observations are possible when analyzing the correlation table. Firstly, clear correlations among developed country and developed regional indices are observable. As intuition suggests, these correlations are all well above the 0.75 level. Especially, Europe and the World indices seem to be highly correlated. This connection, although less strong, can also be seen for the US and Germany. Secondly, Pakistan displays by far the lowest correlations with all other indices. The low correlations almost imply that the returns for Pakistan follow a random walk, which means that they are uncorrelated from any of the other markets. Hence, there are clear diversification opportunities available for investors, who are willing to invest in Pakistan. Thirdly, the rest of the emerging countries display fairly low correlations. Indonesia and the Philippines display correlations in the range of 0.35 to 0.45. For India and South Korea slightly higher correlations are observed, which are around 0.55. Following this, all other emerging countries also provide different degrees of diversification benefits, which are clearly better than the developed countries and regions. The presence of low correlations amongst emerging markets and with developed countries and regions proves the third emerging markets characteristics with regard to the historical data for the selected peer group.

Next, in order to understand whether the presented correlations are constant over the whole period from 1990 to 2013, the sample period is split in two parts. Basically, the period from 1990 to 2000

can be described as a period of economic boom. In turn, the period from 2001 to 2013 has faced at least two crises, which clearly deteriorate the results for the overall period from 1990 to 2013. Thus, table 7 shows the correlations of average monthly returns for the two sub periods. In order to simplify the analysis, the same color coding scheme is applied as before. It can be expected that correlations are lower for the first sub-period, since this period is described as economic boom. In turn, the second period is expected to demonstrate increased correlations, due to the two crises that occurred within that period.

Table 7: Correlation of indices 1990-2000 &2001-2013

1990-2000	*Developed Region*		*Developed Countries*			*Emerging Countries*			
	World	**Europe**	**USA**	**Germany**	**India**	**Indonesia**	**Pakistan**	**Philippines**	**South Korea**
World	1								
Europe	0.854	1							
USA	0.894	0.680	1						
Germany	0.686	0.867	0.555	1					
India	0.117	0.141	0.055	0.120	1				
Indonesia	0.292	0.261	0.286	0.249	0.159	1			
Pakistan	0.066	0.045	0.064	0.044	0.702	0.130	1		
Philippines	0.325	0.304	0.268	0.277	0.089	0.543	0.195	1	
South Korea	0.418	0.249	0.322	0.113	0.152	0.174	0.095	0.150	1

2001-2013	*Developed Region*		*Developed Countries*			*Emerging Countries*			
	World	**Europe**	**USA**	**Germany**	**India**	**Indonesia**	**Pakistan**	**Philippines**	**South Korea**
World	1								
Europe	0.963	1							
USA	0.962	0.872	1						
Germany	0.924	0.953	0.853	1					
India	0.679	0.694	0.591	0.687	1				
Indonesia	0.629	0.642	0.534	0.616	0.674	1			
Pakistan	0.209	0.243	0.165	0.214	0.247	0.141	1		
Philippines	0.569	0.553	0.537	0.534	0.658	0.683	0.175	1	
South Korea	0.753	0.750	0.675	0.757	0.703	0.702	0.274	0.543	1

Correlation < 0.5 | Correlation > 0.5 | Correlation > 0.75

Two main points can be observed, when analyzing the returns and standard deviations of the two sub-periods. Firstly, the formulized expectations have been correct. Thus, the sub-period from 1990 to 2000 exhibits significantly lower correlations amongst emerging markets and with developed markets as compared to the sub-period from 2001 to 2013. Thus, the period from 1990 to 2000 has offered significantly better diversification benefits as the period from 2001 to 2013. Even for developed markets, the first sub-period produces lower correlations. Secondly, there still exist clear differences in correlations among the emerging markets for both sub-periods. Again, Pakistan demonstrates the lowest correlation during both sub-periods. In fact, it is the only country, which has correlations below 0.5 within both periods. In turn, South Korea reports high correlations, especially during the second sub-period. Hence, a clear investigation is needed by investors in order

to pick those countries that also provide fairly low correlations in times of crises. In general, the notion of low correlations for emerging markets can be supported based on the historical returns of this study. Of course, the second sub-period has shown that correlations tend to increase in times of crises. However, most of the emerging countries still present correlations that offer clear diversification benefits to investors, who want to diversify globally.

The judgment on investment opportunities within emerging markets is based on the three main characteristics of emerging markets. Concerning higher returns, which are accompanied by higher volatilities as measured by the standard deviation, mixed opportunities are available. India outperformed the developed country and regional indices both in terms of mean monthly returns and absolute development. In turn, the rest of the investigated emerging countries have been slightly below the mean monthly returns of the developed indices. But in terms of absolute development, the Philippines and South Korea have almost matched the performance of the World index. Interestingly, only the volatility of India has been significantly higher than the developed indices. The rest of the emerging countries have presented lower standard deviations as compared with developed indices. Actually, this encourages investments within emerging markets, due to the fact that returns do not vary too strongly within these countries. However, the main benefit for investments in emerging markets is based on the diversification benefits that are reported for all the emerging markets included in this study. In fact, for the whole period from 1990 to 2013, clear diversification benefits are available to investors.

However, differences in terms of correlations exist, when the period is split into two sub-periods. This study shows that crises on international stock markets have a definite effect on the correlations of emerging countries. The second sub-period from 2001 to 2013 shows increased correlations as compared with the first sub-period from 1990 to 2000. Although, these correlations are higher during the second sub-period, they still offer diversification benefits for investors. Consequently, the main motivation for investments in emerging markets lies within the opportunity to realize diversification benefits and the overall opportunity of reducing the risk of a portfolio.

Based on historical data, the returns of emerging markets are rather heterogeneous. Thus, the understanding of return variations within these countries is absolutely necessary for foreign investors in order to select the countries with the most optimal risk and return relationship. In fact,

when foreign investors understand the appropriate risk factors, which cause the variations in stock returns, a selective investment approach can be taken. Therefore, the use of equity asset pricing models is needed, since these models can be used as tools in order to engage in selective investments. Consequently, the following section introduces two equity asset pricing models, which assist investors in understanding the variations in stock returns within the context of emerging countries. These two models allow investors to select stocks within emerging countries in order to realize higher returns and benefit from the diversification opportunities available within emerging countries.

4. Equity Asset Pricing Models

The aim of this section is the introduction of the two asset pricing models employed within the empirical analysis of this study, and the review of prior empirical research on the performance of these models within international equity markets. In particular, the two asset pricing models are the Capital Asset Pricing Model and the Fama & French Three Factor Model. These models have been chosen, since they offer clear expectations about the interplay of risk factors and expected stock returns. Furthermore, the CAPM is incorporated within the FF3-Model. The interrelatedness of the two models allows a successive presentation as well as discussion. Being an extension of the CAPM, the FF3-Model is ideal in validating whether a more complete and extensive model is more suitable in order to be applied within the context of emerging markets, since these markets differ substantially from developed markets. Therefore, this section is positioned as the theoretical fundament for the empirical analysis and the performance analysis of the two models. Specifically, this section assists in formulating hypotheses as well as forming expectations concerning the results of the empirical analysis. Therefore, this section is structured in the following way. Firstly, the CAPM is introduced on a conceptual level. Secondly, the FF3-Model is also presented conceptually, while further outlining the differences between the models. Thirdly, the performance of these two models within developed countries, like the US, is outlined based on prior research studies. Finally, the performance of these models within the context of emerging countries is reviewed based on the evidence of previous research studies.

4.1 The Capital Asset Pricing Model

The CAPM has been developed simultaneously by Sharpe (1964), Lintner (1965) and Mossin (1966) during the 1960s and it established the field of asset pricing. However, the formulation of the

exact model has only resulted in one Nobel Prize for William F. Sharpe in 1990. Until today, the model finds wide application within the areas of estimating the cost of capital and evaluating the performance of portfolio managers (Fama & French, 2004).

The CAPM is based on the model of portfolio choice, which has been developed by Markowitz (1952). The model describes risk-averse investors, who are striving for mean-variance-efficient portfolios. This means that the investors only care about the mean return and the variance of their portfolio. Thus, by changing weights in assets, investors are seeking to minimize the variance of portfolio return, given expected return, or maximize expected return, given variance. Thereby, the risk-averse investor forms a mean-variance-efficient portfolio (Fama & French, 2004). Sharpe (1964) and Lintner (1965) have added two more assumptions to the portfolio choice model in order to derive the CAPM. Firstly, all investors are aware of the return distribution for all available assets. Secondly, investors can borrow and lend at the risk-free rate. Due to this transparency, all investors will invest in the same mean-variance-efficient portfolio, which automatically becomes the market portfolio then. The individual investor's risk preference is adjusted by borrowing (increasing variance) or lending (decreasing variance) at the risk-free rate (Mullins, 1982).

The underlying objective of the CAPM is to calculate the required rate of return of an asset that is going to be added to a well-diversified portfolio based on the non-diversifiable risk of the individual asset. Hence, within a well-diversified portfolio, like the market portfolio, only non-diversifiable risk (also termed systematic risk, market risk) is prevalent. Diversifiable risk (also called idiosyncratic risk) is eliminated in a well-diversified portfolio (Mullins, 1982). Therefore, the CAPM determines the required rate of return for an asset based on its sensitivity to the market risk.

The difference between the mean-variance analysis and the CAPM can be summarized as follows: Mean-variance analysis delivers optimal portfolios for given inputs (expected returns, variances and covariances are taken as given), whereas the CAPM is a model for expected returns. It attempts to explain why expected returns differ across assets.

The CAPM is built on several assumptions, which need to be introduced (Ross, 1977).

I. All investors want to maximize their expected utility within one period by choosing a portfolio with an ideal risk return tradeoff.
II. All investors can unlimitedly borrow or lend at the risk free rate, while facing no restrictions concerning short selling.
III. Homogenous expectations towards returns, variances and covariances for all assets are prevalent among all investors.
IV. All assets are marketable and they can be divided.
V. Investors neither face transaction costs nor taxes.
VI. Investors do not influence the market price of assets by their own trading behavior. Thus, the investor can be labeled as a price taker.
VII. The quantities of all assets are given and fixed.

The CAPM prices assets based on a risk-return relationship. In fact, investors are facing two types of risk, when investing in a new asset while being invested in the market portfolio. Firstly, the investor faces the risk of the time value of money. Secondly, the investor faces the risk of the asset's sensitivity to the market risk. In order to be compensated for the time value of money, the investor will receive the risk-free rate of return. The sensitivity of the asset to the market risk is calculated by the risk measure beta. Beta compares the development of the assets' returns in comparison to the developments of the market returns over time. Thereby, the asset will be assigned a beta, which is needed in order to calculate its expected rate of return (Lintner, 1965; Sharpe, 1964). Specifically, beta is calculated by dividing the covariance of the asset return with the market return by the variance of the market.

$$\beta_i = \frac{\mathrm{cov}(R_i, R_M)}{\sigma^2(R_M)}$$

Where:

R_i = Return of asset (i) R_M = Return of market portfolio β_i = Beta of asset (i)

The market portfolio has a beta of one, since the covariance of the market returns with the market returns equals the variance of the market returns. Based on this fact, investors require higher returns

for assets that have a beta greater than one, due to the fact that they are more risky than the market portfolio. Conversely, investors will require lower returns than the market portfolio for assets with a beta factor below one, since these assets are less risky than the market portfolio. As mentioned before, investors want to be rewarded for taking on risk as measured by beta. This compensation is the market risk premium, which equals the difference between the return of the market portfolio and the risk free rate. Overall, the CAPM calculates the expected return by rewarding the time value of money as well as the riskiness of the asset as measured by beta. Therefore, the formula for the CAPM can be derived as follows (Fama & French, 2004).

$$E(r_i) = r_f + \beta_i \left(E(r_M) - r_f \right)$$

Where:

$E(r_i)$	=	Expected return of asset (i)	r_f	=	Risk free rate
$E(r_M)$	=	Expected return of market portfolio	β_i	=	Beta of asset (i)

Figure 5 graphically represents the linear relationship incorporated into the formula of the CAPM. The depicted line is called the security market line, for which the slope is equal to the market risk premium. The market portfolio with its beta value can clearly be identified. Furthermore, the intercept with the y-axis equals the risk free rate, which shows, that assets that do not add any risk to the market portfolio (beta is equal to zero) will only return the risk free rate.

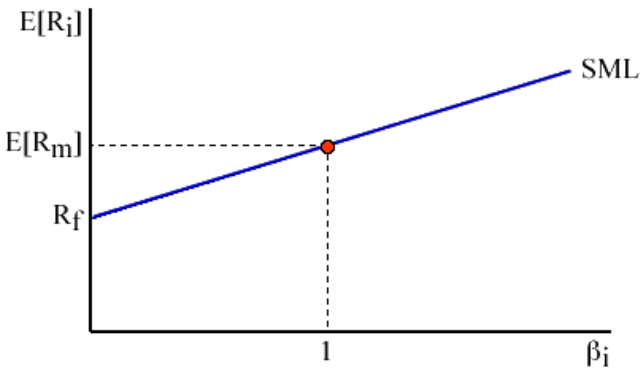

Figure 5: Security market line of CAPM[2]

[2] Source: http://www.zenwealth.com/BusinessFinanceOnline/RR/CAPM.html

The simple and intuitive linear relationship described by the CAPM is a key strength of the CAPM and one of the main reasons why it is widely used by academics and practitioners.

Nevertheless, several critics exist that question the validity of the CAPM for the following reasons. Firstly, several assumptions of the model do not hold in real-world financial markets. For example, investors face transaction costs and taxes. Besides, investors cannot borrow endless amounts of money in order to leverage their investment within the market portfolio. Secondly, the proxies for the risk free rate and the market portfolio are not realistic. Roll (1977) states, that a true market portfolio is practically unobservable. In fact, a true market portfolio would need to be composed of real estate, human capital and other investment opportunities besides financial assets. Incorporating these specific types of assets is practically impossible for investors. Nevertheless, an approximation by financial indices is not appropriate for estimating the returns of the market portfolio. Thirdly, investors do not have homogenous beliefs towards returns, variances and covariances of all assets. In fact, Daniel, Hirshleifer and Subrahmanyam (2001) argue that investors have biased expectations due to behavioral finance arguments. Thus, the investor's mindset deteriorates her rational behavior, which causes biases for the homogenous beliefs. Finally, certain market anomalies are prevalent, which cannot be incorporated within the CAPM. The FF3-Model, which will be discussed next, incorporates these anomalies in order to price assets more acucrately.

4.2 The Fama & French Three Factor Model

As mentioned before, certain market anomalies have been identified by researchers, which are challenging for the CAPM. Specifically, two anomalies will be introduced that have led towards the creation of the FF3-Model. Firstly, Banz (1981) and Reinganum (1981) have identified a negative relation between security returns and the size of a firm, as measured by the market value of the common equity (market capitalization). In fact, the authors convey that size enjoys more explanatory power as compared to the beta coefficient, which is incorporated into the CAPM. Thus, an alternative asset pricing model should account for this significant size effect. Secondly, Rosenberg, Reid & Lanstein (1985) and DeBondt & Thaler (1987) have identified, that stocks with higher book-to-market equity ratios experience significantly higher returns as compared to stocks that have lower book-to-market equity ratios. Book value of equity is measured by the accounting value of common equity of a firm and market value of equity is measured by the number of shares outstanding times their market value. Hence, the CAPM ignores that book-to-market equity ratios

capture the cross-sectional variation in stock returns. Therefore, this value effect also needs to be incorporated into a multi-factor asset pricing model. The evidence of both the size and the value effect is underpinned by Hawawini and Keim (2000), who have been able to identify these effects in several studies over different time periods and for different country samples.

Similar to the CAPM, Fama & French's multi-factor model aims at predicting the expected returns based on two risk factors besides the market factor beta. As mentioned before, the two authors integrated the size and the value effect within their asset pricing model. The result of this integration is the FF3-Model, which includes, besides market beta, size and the book-to-market equity ratio as explanatory variables (Fama & French, 1992, 1993). Both effects are captured by employing portfolios of stocks. Stocks are double sorted based on size and book-to-market equity ratios. In that way, the size and the value effect can be captured best. The negative size effect is obtained by subtracting the returns of portfolios with big stocks from the portfolios with small stocks. Thereby, the variable SMB ("small minus big") is built. A similar procedure is applied to the value effect, which is a positive effect. The returns of portfolios with stocks of low book-to-market equity ratio are subtracted from the portfolios with the stocks of high book-to-market equity ratios. The result is the variable HML ("high minus low"). Similar to the CAPM, stocks have different sensitivities to these factors. Hence, the coefficients for these variables will influence the expected returns of the individual stocks, since they are multiplied by the risk premium of the respective risk factor. The complete FF3-Model is shown below.

$$E(r_i) = r_f + \beta_i \left(E(r_M) - r_f\right) + \gamma_{i,SMB} SMB + \gamma_{i,HML} HML$$

Where:

$E(r_i)$	=	Expected return of asset (i)	SMB	=	Size premium
$E(r_M)$	=	Expected return of market portfolio	$\gamma_{i,SMB}$	=	Size coefficient
r_f	=	Risk free rate	HML	=	Value Premium
β_i	=	Beta of asset (i)	$\gamma_{i,HML}$	=	Value coefficient

Basically, the CAPM is extended by the size and value effect. These two effects are displayed within figure 6, which shows that small stocks with high book-to-market ratios have an increased risk resulting in higher expected returns.

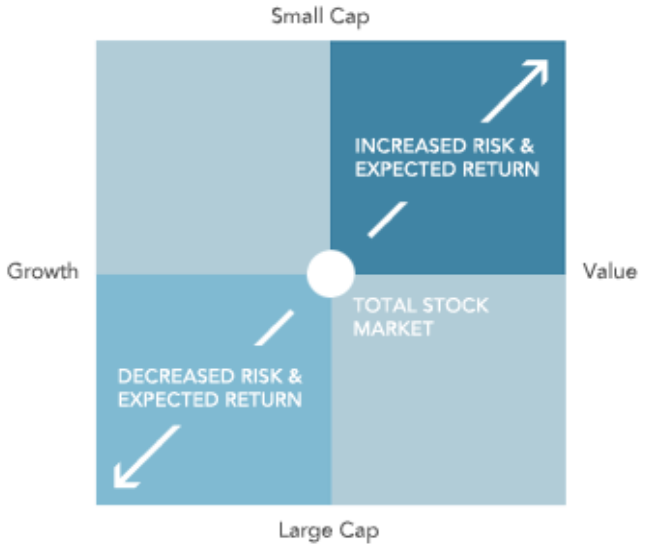

Figure 6: Size and value effect within FF3-Model[3]

This higher expected return has also been labeled distress premium, since small companies with high book-to-market ratios usually tend to be in distress (Fama & French, 1993). Therefore, investors need to be compensated with higher returns in order to take on this risk. Furthermore, Fama & French (1992) demonstrate that beta alone does not explain variations in expected returns. Nevertheless, in conjunction with SMB and HML, market beta remains significant in explaining variations in returns.

Actually, Fama & French (1996) have shown that their Three Factor Model produces five times less pricing errors, when applied to their double sorted portfolios, as compared to the CAPM. However, alike the CAPM, there exists considerable doubts about the validity and usefulness of the FF3-Model. Three main arguments exist, which are questioning the validity of the FF3-Model. Firstly, Lakonishok, Shleifer & Vishny (1994) as well as Haugen (1995) contend that investors do not act rationally in response to corporate news. In fact, investors exaggerate based on corporate news, which leads to overestimation of bad as well as good news. Therefore, the development of companies is over- or underpriced respectively. Secondly, attribute-sorted portfolios, such as the ones of Fama & French (where stocks are double sorted based on their size and book-to-market ratio), might be unrelated to risk (Ferson, Sarkissian & Simin, 1999). In turn, these risk factors

[3] Source: http://www.dfaus.com/images/charts/multifactor.png

should be identified based on a cross-sectional analysis. Daniel & Titman (1997) claim, that firm characteristics, such as size or book-to-market equity ratio, describe stock returns better than factor loadings of portfolios within the FF3-Model. Hence, the authors reject the applicability of the FF3-Model. However, in a response Davis, Fama & French (2000) show that the rejection is only based on the very short sample period employed by the authors. By extending the sample period, Davis, Fama & French (2000) are able to underpin the validity of the FF3-Model. Thirdly, Kothari, Shanken & Sloan (1995) claim that the value effect is overstated due to survivorship bias, since Fama & French's data set includes only distressed stocks that survived and not the ones which have gone bankrupt.

Having presented the theoretical background and the main critiques of the CAPM and the FF3-Model, a deeper look into the performance of these two models is needed in order to give an opinion about their validity. Therefore, the next two sections discuss the results of prior research studies concerning the validity of the CAPM as well as the FF3-Model within developed and emerging international markets.

4.3 Performance analysis of Capital Asset Pricing Model in international markets

This section investigates existing academic literature concerning the validity of the CAPM in international markets. Besides investigating the validity in developed countries, special attention will also be directed towards the validity of the CAPM within emerging markets. The studies that analyze the performance of the CAPM within developed countries focus mainly on three dimensions. Firstly, researchers are comparing actual returns with expected returns based on beta formed by the CAPM. Secondly, researchers have investigated the stableness of betas for companies over time. Thirdly, the CAPM is performed based on a regression analysis. Thus, this group of researchers analyzes whether there exist significant alpha coefficients, which are higher than the risk-free rate.

Belonging to the first group, several studies criticize the CAPM when stocks are sorted based on accounting variables. These studies have primarily been conducted based on U.S. data. Basu (1977) argues that stocks, which are sorted based on earnings-to-price ratio, experience higher returns than forecasted by the CAPM. Bhandari (1988) finds the same evidence for stocks that are sorted based on leverage ratios, since stocks that have a high debt-to-equity ratio tend to encounter higher returns

as predicted by their beta coefficients. Similarly, sorts of stocks based on book-to-market equity ratio reveal that stocks, which have a high book-to-market ratio experience too high expected returns, which cannot be captured by their betas (Rosenberg, Reid & Lanstein, 1985).

Secondly, several researchers investigated whether betas have been stable over time. As explained before, investors choose assets based on their riskiness. Hence, assets with high betas are more risky and they will earn higher returns according to the CAPM. However, if betas change over time, investors will make a wrong choice when adding assets to their portfolios, since the riskiness of the asset varies over time. In fact, several researchers have shown that betas have not been stable over time (Blume, 1971; Baesel, 1974; Roenfeldt, Griepentrog & Pflaum, 1978). Thus, the performance of the Capital Asset Pricing can highly be questioned based on these insights.

The third group of researchers, which focuses on the regression analysis of the CAPM, finds the following evidence. Miller & Sholes (1972) show that intercepts within the regression analysis based on the CAPM are significantly higher as compared to the risk-free rate. Thus, the CAPM is not able to explain variations in returns without any noise. Several other researchers have illustrated this increased alpha, which shows the misconception of the CAPM (He & Ng, 1994; Davis, 1994; Miles & Timmermann, 1996). Equally, Fama & MacBeth (1973) experience the same larger intercepts as compared with the risk-free rate. Nevertheless, the authors find that the linear relationship between beta and expected returns holds, especially in the long-run. In turn, Fama & French (1996) as well as Jagadeesh (1996) prove that beta is statistically insignificant in explaining returns.

Based on the insights from research studies within developed countries, like the U.S., this research study also aims at indentifying the applicability of the CAPM within emerging countries. Hence, an overview of the performance of the model based on prior research studies will be given. In order to apply the CAPM within emerging countries, a new market portfolio is needed, which is called the world market portfolio and which allows investors to diversify globally. This global version of the CAPM implicitly assumes that all financial markets, developed as well as emerging, are integrated (Estrada, 2000). Hence, most studies question the validity of the CAPM within emerging countries due to the fact that there does not seem to be a significant empirical relationship between the expected returns and beta coefficients based on a violation of this assumption.

Harvey (1995) claims that stocks within emerging countries experience high expected returns without showing great exposures to risk factors, such as beta. The reason for this is based on the fact that emerging countries are not fully integrated into global financial markets. Hence, this observation clearly violates the assumptions of the CAPM and deteriorates its performance within emerging countries. In fact, stocks in segmented markets, which are markets that are not fully integrated into global financial markets, are sensitive to both a global market portfolio as well as to the specific market of the individual country (Bekaert & Harvey, 1995). Thus, two betas should explain the variations in expected returns, one for the global financial market and one for the local market. However, the weighting of these two betas is not clear, since emerging markets are integrated or segmented to a different degree within international capital markets. Thus, alternative risk factors that proxy for country risk might be more powerful in estimating expected returns (Erb, Harvey & Viskanta, 1995). The authors show that asset pricing models based on country risk factors, like credit ratings, are more powerful than the CAPM. Alternatively, political risk factors can be used, since emerging countries are characterized as being rather politically instable as compared to developed countries (Diamonte, Liew & Stevens, 1996). However, the difference in political stability is narrowing, which does not offer a beneficial perspective for equity pricing models based on political risk factors. Godfrey & Espinosa (1996) also show that the CAPM does not seem to hold in emerging countries. Therefore, they extend the model by incorporating political risk, which is approximated by the difference in yields between a country's sovereign bond denoted in US Dollars and a comparable US sovereign bond. Furthermore, they use an adjusted beta, which is weighted by 60% and which is estimated by the ratio of the volatility of the market from the individual country with the volatility of the US market. Finally, Estrada (2000) observes two main issues, which question the validity of the CAPM. Firstly, stock returns within emerging markets are uncorrelated with systematic risks as measured by beta. Secondly, stocks seem to be rather correlated with total risk as measured by their standard deviation.

Thus, a plain application of the CAPM within the setting of emerging markets will not yield accurate results. Therefore, some form of adjustment is needed in order to reach more reliable results. Stulz (1995) argues that a local version of the CAPM should be used within segmented emerging markets. In fact, research studies have demonstrated that a CAPM built on local market factors is superior as compared to an international or global version (Fama & French, 2012; Hou, Karolyi & Kho, 2011).

4.4 Performance analysis of Fama & French Three Factor Model in international markets

Having presented evidence for the validity of the CAPM within an international context, the performance of the FF3-Model is going to be presented next. Alike the prior section, the validity of the FF3-Model is going to be analyzed both in developed as well as in emerging countries based on prior research studies. Firstly, insights from studies within developed markets are presented. Actually, the FF3-Model has rarely been tested on other than U.S. data. Secondly, research studies, which have been performed within emerging countries, are going to be discussed.

Within developed markets, such as the US, the FF3-Model performs better than the CAPM (Rahim & Nor, 2006). In fact, Fama & French (1996) show that beta alone does not suffice in order to explain variations in stock returns. The authors demonstrate that their multi-factor model captures the variations in returns. The existence of the value effect in different countries around the world disabled the CAPM to accurately explain the variations in stock returns within international capital markets. Thus, the FF3-Model is more suitable to explain the variations, since it is built to capture this value effect (Fama & French, 1998). Much of the empirical evidence for the validity of the Fama & French Model is based on U.S. data. Thus, a look into other developed markets is needed in order to get a holistic overview on the performance within international markets.

Research studies that have tested the FF3-Model in Australia come to a different conclusion concerning the validity of the model. Halliwell, Heaney & Sawicki (1999) identify a significant size effect in Australia, but they cannot identify an equally strong value effect based on book-to-market ratios. Thus, the model is partially supported within their study. Building on the prior study, Gaunt (2004) identified the same size effect, but additional evidence of a book-to-market effect can be identified as well. Within the study of Faff (2001), the significance of the FF3-Model is outlined for the Australian stock market. However, the author identifies a negative premium for the size effect, which is contrary to the findings by Fama & French (1993). All in all, these studies show the superiority of the FF3-Model over the CAPM for Australia. Apart from the Australian stock market, tests of the model within other developed countries have led to mixed findings. Within the stock market of the United Kingdom, inconsistency concerning the significance of SMB and HML coefficient has been found (Gregory & Michou, 2009). Hence, the superiority of the FF3-Model over the CAPM is questionable. Although having identified a significant value effect within the Japanese stock market, Daniel, Titman & Wei (2001) reject the validity of the FF3-Model. Two

studies conducted on stock market data in New Zealand, which have employed different data sets and sample periods, identified different results. On the one hand, Vos & Pepper (1997) have identified a significant size effect while not being able to show a significant book-to-market effect. On the other hand, Bryant & Eleswaparu (1997) could identify a significant book-to-market effect, while not being able to show an equally significant size effect. Thus, this evidence shows that the FF3-Model and equity asset pricing models in general are very dependent on the type of data sample and sample period used.

Besides empirical studies for developed countries, there exist also some research studies, which have been conducted within emerging countries. Drew & Veeraraghavan (2002) show that for Malaysia a significant size and value effect is evident. Thus, the Fama & French Model delivers accurate results within this market. In another study by Drew & Veeraraghavan (2003), the authors investigate the performance of the FF3-Model in the stock markets of Hong Kong, South Korea, Malaysia and the Philippines. Again, significant size and value effects are identifiable. Thus, the authors claim that the FF3-Model outperforms single-index models like the CAPM. Taneja (2010) tested the FF3-Model within India and found a significant size as well as value effect. Furthermore, he concluded that the model performs better than the CAPM. Lieksnis (2011) investigated the performance of asset pricing models within three Baltic countries in Europe, which are Latvia, Estonia and Lithuania. The author finds both size and value effects and shows that the FF3-Model is generally applicable within these markets. Nevertheless, the FF3-Model does not seem to be optimal for each and every country. Thus, the model could be improved in order to increase its significance.

Therefore, Griffin (2002) claims that a FF3-Model, which is built upon domestic risk factors, is significantly better in explaining variations in stock returns. Especially within countries that can be described as being segmented from global financial markets, this approach is a valuable alternative to the FF3-Model, which is based on global risk factors. Thus, this approach will also be incorporated within the empirical section of this study.

Being confronted with mixed evidence in terms of the validity of the presented asset pricing models, this research study contains an empirical analysis adding new insights to the discussion. Both the CAPM as well as the FF3-Model will be tested within the environment of the emerging

markets peer group in a global and domestic version. The aim of this analysis is to give investors advice concerning the applicability of the appropriate asset pricing model to emerging markets.

5. Empirical Analysis

Having presented the CAPM as well as the FF3-Model on a conceptual and performance related level, uncertainty remains regarding their validity in explaining average returns within emerging markets. In order to investigate this issue, this section presents an empirical study that applies both a global as well as a domestic version of the CAPM and the FF3-Model to an emerging markets peer group. Therefore, the validity of these asset pricing models within the emerging markets peer group, which has been defined earlier in this study, is going to be tested. In particular, the empirical study is structured as follows. Firstly, the data and the formation of country specific stock portfolios will be introduced in order to present the sample of this study. Next, summary statistics concerning the performance and accounting data of the portfolios will be presented. Subsequently, four types of asset pricing models will be employed in order to test their validity in explaining average excess returns of country stock portfolios. After that, the results of the four models will be compared and recommendations concerning their validity will be given. Finally, potential limitations as well as shortcomings will be outlined, which serve as the guidelines for further research recommendations.

5.1 Data and variables

In order to conduct the empirical analysis, stock prices and accounting data are needed for the selected emerging countries from section two, which are India, Indonesia, Pakistan, the Philippines and South Korea. The data was retrieved from the financial database Thomson Reuters DataStream (2013). The data retrieval was set to select data as far back in time as possible, e.g. June 1991 for India. This procedure allows a selection of an adequate sample period, which is influenced by the tradeoff between the number of observations per company over time and the number of companies available to be included within the sample. Hence, a sample period of ten years was chosen, which ranges from January 2003 to December 2012, as it satisfies the mentioned tradeoff best. Over this period, specifically three variables, which will be introduced next, have been retrieved for each company on a monthly basis. For the calculation of stock returns, stock prices have been extracted. Apart from stock prices, the accounting data variables encompass the number of shares outstanding and the book value of equity for each company. In order to reduce the noise within the sample, monthly observations have been chosen instead of daily observations.

Next, the initial samples of companies per country had to be cleansed in two steps. Firstly, all companies were dropped that did not display a stock price, the number of shares outstanding or the book value of equity for one of the monthly observations within the sample period. In fact, a lot of companies needed to be dropped due to the fact that there was no information given regarding their book value of equity. This was the main reason for dropping many companies especially in smaller financial markets, such as Pakistan and the Philippines. Secondly, all companies that displayed the same stock price for more than three months in a row were dropped from their samples. Displaying the same stock price for more than three months is a clear sign of illiquidity. Usually, these stocks are either very small stocks, as measured by their market capitalization, or they are state owned companies, in which no trading is taking place. Therefore, they are clearly not influenced by risk factors, which are underlying the equity asset pricing models. Table 8 shows the final number of companies forming each country's sample.

Based on the extracted stock prices and accounting data, three variables are built which will be employed in subsequent statistical regression analyses. These three variables are going to be the risk factors for the CAPM and the FF3-Model. Firstly, based on the extracted stock prices, monthly equity returns are built according to the following formula.

$$r_{January} = \frac{Stock\_price_{End\_January}}{Stock\_price_{Beginning\_January}} - 1$$

Over the sample period of ten years (2003-2012), there will be 119 monthly time point observations. The second variable is the size of the companies, which is measured by the market capitalization of each company within a country sample. Market capitalization is calculated on a company basis by multiplying the shares outstanding with the respective stock price of that month. The third variable is the book-to-market ratio, which is estimated by dividing the book value of equity by the market value of equity, whereby the market value of equity is approximated by the market capitalization. Following the approach by Fama & French (1992), the size and book-to-market variables will be used in order to sort the stocks for aggregating them into homogenous portfolios.

In order to assure high explanatory power of the statistical analyses, the number of stocks should be significantly lower than the amount of time point observations. Specifically, risk factors can be more precisely estimated by using portfolios instead of individual securities (Fama & MacBeth, 1973). Thus, the individual securities within each country will be sorted based on the following logic. Fama & French (1992) demonstrated that there exists a negative relationship between the average returns on stocks and size, as well as a strong positive relationship for the book-to-market equity ratio. Following these insights, the stocks within each country sample are double-sorted. Within the first sort, the stocks are assigned to three different size portfolios ranging from "1" (stocks with smallest market capitalization) to "3" (stocks with largest market capitalization). Subsequently, the second sort is conducted based on the book-to-market equity ratio within the three size samples. Again, three portfolios are formed ranging from "1" (stocks with lowest book-to-market equity ratio) to "3" (stocks with highest book-to-market equity ratio). This approach allows the formation of nine portfolios per country sample, based on a 3x3 double sort. In order to account for developments of the individual companies over time, like the issuance of new shares or a buyback of shares outstanding, portfolio formation is conducted every year at the end of July. This means that individual stocks might move from one portfolio to another every single year during the sample period. This procedure further supports the homogeneity of the portfolios within the country samples. Due to the differences within the absolute size and book-to-market values among the different countries, no fixed breakpoints for the portfolio borders have been set. Instead, the portfolio breakpoints have been set flexible in order to ensure an almost equally distributed amount of stocks per portfolio. This approach offers the benefit of having enough stocks per portfolio in order to ensure an adequate amount of variability in stock returns as well as their risk factors.

5.2 Summary statistics

Table 8 displays the summary statistics for each country's. Besides outlining the overall mean for each country's sample, mean values for each of the nine country portfolios are presented. The first number of the portfolio description is related to the size sort and the second number is related to the book-to-market equity sort. Hence, the label "P1_3" describes the portfolio containing the smallest stocks within the country sample. Furthermore, amongst these small stocks, the ones with the highest book-to-market equity ratio are included within this portfolio.

Table 8: Summary statistics of emerging markets peer group

India

	Number of stocks	Mean returns	Mean size	Mean book-to-market
P1_1	25	3,903%	60.042.152	0,27
P1_2	26	3,170%	68.423.779	0,62
P1_3	25	2,175%	38.497.416	1,52
P2_1	25	4,559%	1.949.782	0,59
P2_2	26	3,279%	1.584.138	1,41
P2_3	25	1,750%	1.714.521	3,32
P3_1	25	4,613%	221.567	0,94
P3_2	26	3,246%	203.871	2,21
P3_3	25	2,094%	181.057	5,14
Average*	**228**	**3,199%**	**19.202.032**	**1,78**

Indonesia

	Number of stocks	Mean returns	Mean size	Mean book-to-market
P1_1	14	5,022%	39.879.004.779	0,29
P1_2	15	2,698%	17.177.935.866	0,55
P1_3	14	2,377%	8.412.839.081	1,64
P2_1	14	4,288%	1.268.742.396	0,52
P2_2	15	3,782%	1.145.650.925	1,28
P2_3	15	1,816%	1.195.850.329	2,86
P3_1	14	3,078%	206.261.765	0,98
P3_2	15	2,108%	206.044.856	2,31
P3_3	14	2,452%	130.424.935	6,79
Average*	**130**	**3,069%**	**7.735.861.659**	**1,91**

Pakistan

	Number of stocks	Mean returns	Mean size	Mean book-to-market
P1_1	9	3,101%	39.298.871	0,11
P1_2	8	1,991%	31.009.098	0,26
P1_3	9	1,331%	34.578.661	0,62
P2_1	9	2,490%	6.814.451	0,19
P2_2	8	1,770%	6.424.805	0,42
P2_3	9	1,420%	6.395.961	1,04
P3_1	9	2,137%	1.590.231	0,43
P3_2	8	1,851%	1.209.582	0,96
P3_3	9	1,036%	918.003	2,14
Average*	**78**	**1,903%**	**14.248.851**	**0,69**

Philippines

	Number of stocks	Mean returns	Mean size	Mean book-to-market
P1_1	9	3,161%	179.851.624	0,22
P1_2	10	2,572%	103.966.598	0,69
P1_3	9	2,556%	48.629.997	1,49
P2_1	9	4,461%	8.661.688	0,52
P2_2	10	2,908%	8.276.191	1,28
P2_3	9	1,886%	9.026.852	2,86
P3_1	9	4,533%	970.962	0,19
P3_2	10	2,299%	1.064.149	1,60
P3_3	9	0,886%	863.443	4,16
Average*	**84**	**2,807%**	**40.145.723**	**1,45**

South Korea

	Number of stocks	Mean returns	Mean size	Mean book-to-market
P1_1	26	3,627%	1.081.038.744	0,30
P1_2	27	2,510%	1.027.028.415	0,83
P1_3	26	1,202%	714.113.989	2,00
P2_1	26	3,030%	95.664.735	0,61
P2_2	27	1,824%	94.802.552	1,35
P2_3	26	1,263%	95.127.680	2,74
P3_1	26	2,627%	27.177.451	0,91
P3_2	27	1,086%	31.110.019	1,69
P3_3	26	0,236%	25.906.983	3,53
Average*	**237**	**1,934%**	**354.663.396**	**1,55**

*Sum for "Number of stocks"

On a country basis, there exist several differences. Overall, India with 3.199% and Indonesia with 3.069% offer the highest mean monthly stock returns over the sample period. The Philippines follow them closely with stock returns of 2.807%. In turn, Pakistan with 1.903% and South Korea with 1.934% display the lowest mean monthly stock returns. In order to compare the mean company size, table 9 shows the mean market capitalization expressed in US$. The exchange rate on December 31, 2012 for each individual currency has been retrieved from Bloomberg (2013). As can be seen from the table, the Philippines have the largest mean market capitalization. In turn, the listed companies within Pakistan have the lowest market capitalization on average.

Table 9: Mean market capitalization of emerging markets peer group

	India	Indonesia	Pakistan	Philippines	South Korea
Mean Market Capitalization (local currency)	19,202,032 INR	7,735,861,659 IDR	14,248,851 PKR	40,145,723 PHP	354,663,396 KRW
1$ in local currency (31st December 2012)	54.995 INR	9,793.000 IDR	97.138 PKR	41.005 PHP	1,064.400 KRW
Mean Market Capitalization (US$)	$349,160	$789,938	$146,687	$979,045	$333,205

In terms of book-to-market equity ratios, all countries, except for Pakistan, are displaying ratios above one. This means that the stocks within these countries can be described as value stocks, since the book value of their equity is larger as the market value of their equity (Capaul, Rowley & Sharpe, 1993). In turn, Pakistan exhibits a book-to-market ratio below one, which means that Pakistan's stocks on average can be described as growth stocks. Growth stocks typically experience book-to-market ratios below one, where the market equity is larger than the book equity (Capaul, Rowley & Sharpe, 1993). Furthermore, there is another clear book-to-market equity ratio pattern among all the countries of this analysis that needs to be mentioned. Stocks with the largest market capitalization, which are the ones situated within the P3 portfolios, are showing significantly lower book-to-market ratios in comparison to stocks with the lowest market capitalization, which are the ones situated within the P1 portfolios. For example, India's P3_1 portfolio has a significantly lower book-to-market ratio compared to India's P2_1 and P1_1 portfolios.

Besides comparing companies on an overall level, the individual portfolios within each country also need to be analyzed in order to get a deeper understanding of these different markets. Table 10 shows the mean monthly stock returns for the nine portfolios of each country, which are sorted on size and book-to-market equity ratios. The arrows show in which direction the respective sorts are increasing.

Table 10: Mean monthly returns of country portfolios sorted on size and book-to-market equity ratio

India

Size ↓ \ Book-to-Market →	1	2	3
1	4.61%	3.25%	2.09%
2	4.56%	3.28%	1.75%
3	3.90%	3.17%	2.17%

Indonesia

Size ↓ \ Book-to-Market →	1	2	3
1	3.08%	2.11%	2.45%
2	4.29%	3.78%	1.82%
3	5.02%	2.70%	2.38%

Pakistan

Size ↓ \ Book-to-Market →	1	2	3
1	2.14%	1.85%	1.04%
2	2.49%	1.77%	1.42%
3	3.10%	1.99%	1.33%

Philippines

Size ↓ \ Book-to-Market →	1	2	3
1	4.53%	2.30%	0.89%
2	4.46%	2.91%	1.89%
3	3.16%	2.57%	2.56%

South Korea

Size ↓ \ Book-to-Market →	1	2	3
1	2.63%	1.09%	0.24%
2	3.03%	1.82%	1.26%
3	3.63%	2.51%	1.20%

The nine portfolios of India demonstrate two clear patterns. Firstly, the returns are strictly decreasing with the size of the stocks. Secondly, the returns of the portfolios are strictly decreasing with an increase in book-to-market equity ratios.

For South Korea there also exist two patterns, which are clearly distinguishable. Firstly, the stock returns are increasing with the size of the stocks within the portfolios. However, there exists one exception for the nine portfolios of South Korea. Portfolio P2_3 has higher returns than P3_3. Since this is the only exception for this country related to the size effect, P2_3 is treated as an outlier. Additionally, South Korea displays the same book-to-market effect as India. Thus, stock returns are decreasing with a rise in book-to-market ratios.

For the other three countries, it is rather difficult to identify clear size trends. Though, it is possible to describe book-to-market equity ratio effects. Pakistan's nine portfolios show a weak relation between size and returns. Actually, larger stocks, belonging to the third size group, are outperforming stocks belonging to size group one in terms of their stock returns. Yet, two portfolios are not conforming to the general size effect within Pakistan. P1_2 exhibits higher returns than P2_2 and P3_3 has lower returns than P2_3. As mentioned before, the book-to-market equity ratio effect is prevalent in Pakistan. Hence, portfolios with high book-to-market ratios are experiencing lower returns as compared to portfolios with lower ratios. Controlling for size, this effect is true for all nine portfolios.

Similar to Pakistan, Indonesia's stock portfolios within size group three are outperforming the portfolios of size group one. Additionally, Indonesia also shows two outliers which are related to the size effect. P2_2 has higher returns than P3_2 as well as P1_2 and P2_3 has lower returns than P1_3, but P1_3 has higher returns than P3_3. Thus, these two portfolios do not allow the identification of a clear size trend within Indonesia. In terms of the book-to-market equity ratio effect, there seems to be a clear trend, which is identical to the countries analyzed before. Portfolios with higher book-to-market ratios have lower returns as compared to portfolios with low ratios. Nevertheless, there exists another outlier, which decreases the validity of this trend for Indonesia. Explicitly, P1_2 has lower returns than P1_3, a portfolio with a higher book-to-market equity ratio.

When analyzing the summary statistics of the nine country portfolios for the Philippines, no clear size trend is analyzable. Controlling for book-to-market ratios, the portfolio returns within the first third are increasing with a decrease in size. In turn, the returns of the last third are decreasing with a decrease in size. Nevertheless, there is a clear book-to-market equity ratio trend recognizable, when controlling for size. All portfolio returns are increasing by moving to portfolios with a higher book-to-market ratio.

Overall, the summary statistics for the five countries analyzed above are contrary to the findings by Fama & French (1992). Based on a sample of US stocks, the authors showed that returns increased with book-to-market ratios when controlling for size. Furthermore, they demonstrated that returns experience a negative size effect. According to this study, only India displays this negative size effect. In turn, a positive size effect is recognizable for the rest of the countries within this study. In another study by Fama & French (2012), the authors are confronted with the same positive size effect. Portfolios of stocks, sorted on size and book-to-market equity ratios within the regions of Europe, Japan and North America, are displaying the same positive size effect. Concerning the book-to-market effect, this study shows complete opposite findings. The countries experience a decrease in returns with an increase in book-to-market ratios. The influence of these differences in summary statistics with prior studies is going to be further analyzed within the subsequent statistical analyses.

5.3 Capital Asset Pricing Model including a global market factor

The main goal of this study is to test the validity of two asset pricing models within the context of emerging markets. These two models are the Capital Asset Pricing Model and the Fama & French Three Factor Model. This study will set up and test both models in a global and domestic version. Within this section, the validity of a global single factor regression model is going to be tested for each individual country that is analyzed within this study. This single factor regression model follows the CAPM approach by W. F. Sharpe (1964). According to this model, the risk premium for a stock is based on its systematic risk. As discussed, the systematic risk is approximated by the beta coefficient.

In order to estimate this beta coefficient, excess returns of the stocks within the country samples and market returns are needed. Excess returns for the stocks have been built by subtracting the risk-free

rate from the individual returns of the stocks. The risk-free rate is approximated by the one-month Treasury Bill yield curve rates, which have been retrieved from the U.S. Department of the Treasury (2013). Treasury-Bills have been chosen, since this study investigates investments from the perspective of U.S. investors. Since the one-month Treasury-Bill yields are quoted on an annual basis, they need to be transformed into monthly rates. The following formula shows the procedure for this.

$$r_{f\_monthly} = (1 + r_{f\_annual})^{\frac{1}{12}} - 1$$

The mean monthly risk free rate within the period of 2003 to 2012 is 0.132%. Based on the excess returns, an average is built in order to compute the mean monthly excess returns on a portfolio level within each country. Besides estimating excess returns, market returns are needed for estimating the beta coefficient. The market is defined as the global stock market which is approximated by the Morgan Stanley Capital International (MSCI) All Country Weighted Index (2013). This index is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of developed and emerging markets. 45 country indices are representing this index. These 45 country indices are split into 21 emerging country and 25 developed country indices. The MSCI All Country Weighted Index has been chosen, since it includes the broadest range of countries, which are participating on the global financial markets. Furthermore, four out of five countries analyzed within this study (India, Indonesia, Philippines and South Korea) are represented within the index. The returns of the index are required for the CAPM since they will serve as the independent variable within the regression analysis. Following the same procedure of forming excess returns on an individual stock level, excess returns on the market portfolio are built as well. Thereby, 119 excess returns of the market portfolio are regressed on 119 excess returns of every portfolio in order to test the CAPM. This procedure is resembled within the following regression equation of the single factor model, which is employed for every individual portfolio per country.

$$R_i - r_f = \beta_i (R_{Global\_Market\_Portfolio} - r_f) + \varepsilon_i$$

R_i	=	Return of portfolio (i)	r_f	=	Risk free rate
$R_{Global\_Market\_Portfolio}$	=	Return of market portfolio	β_i	=	Beta of portfolio (i)
ε_i	=	Error term of portfolio (i)			

Each regression uses the excess returns on the portfolio as the dependent variable and the excess returns on the market portfolio as the independent variable. The hypothesis underlying this single factor regression model is related to the acceptance of the validity of the CAPM within the context of emerging markets. Hence, in order to be a reliable model for one country, there should not be any positive or negative alpha present (positive or negative intercept). Merton (1973) notes that regressions based on excess returns should produce intercepts that are statistically indistinguishable from zero, when the model is considered as being valid. Since the empirical analysis of this research study investigates the validity of asset pricing models within the context of emerging markets, the first hypothesis is formulated in the following manner.

H_1: On a country level, the intercepts of the Capital Asset Pricing Model regressions are jointly zero ($\alpha = 0$).

This hypothesis is tested by performing the CAPM regressions per country. In fact, nine individual regressions are performed for each country, due to the availability of the double sorted portfolios. In case, the joint intercepts would be significantly different from zero, the CAPM would accurately explain the variations in average excess returns on the portfolios. As a result, the validity of the asset pricing model would need to be rejected. This rejection could stem from two potential sources. Firstly, the independent variable is not significant at all in explaining the variations in portfolio returns. Secondly, the independent variable might be significant in explaining the variations in portfolio returns, but there need to be additional variables in order to eliminate the positive or negative intercept and to increase the R^2 values.

Table 11 displays the results of the tests for the first hypothesis of this study. Specifically, the table shows the average results of the nine regressions for each country in terms of the values of R^2, alpha as well the corresponding t-statistic and beta as well as the corresponding t-statistic.

Table 11: Results of regression analysis for CAPM with global market factor

	R Square	Alpha	t-stat Alpha	Beta	t-stat Beta
India	0.311	0.025	2.746	1.340	7.303
Indonesia	0.343	0.024	3.698	1.070	7.873
Pakistan	0.069	0.016	2.056	0.460	2.915
Philippines	0.213	0.023	2.946	0.822	5.560
South Korea	0.293	0.014	2.039	0.907	6.984

The R^2 values are fairly low for all countries. For Indonesia, a R^2 value of 0.343 means that the beta-coefficient is able to explain only 34.3% of the time-series variations of the portfolio returns. On the lower end, Pakistan only reports a R^2 value of 0.069, which means that the beta-coefficient alone does not seem to perform an appropriate job in explaining the development in portfolio returns. Although, there is quite a large amount of variation in values for beta-coefficients, the beta-coefficients are almost all statistically significant well beyond the 99.9% significance level (all t-statistics of beta-coefficients are above 3.2905). The only exception is Pakistan, but the t-statistic is still quite high, which guarantees a significance level of 99% (t-statistic is above 2.3263). The low R^2 values, especially for Pakistan, show that beta-coefficients alone are not able to explain the variations in stock returns for the peer group of emerging markets within this study. The inclusion of further relevant variables is needed in order to increase the model's performance.

Furthermore, the statistical significance of the beta coefficient is linked to the R^2 value for each country in a positive way. Indonesia, the country with the highest R^2 value, reports also the most significant beta-coefficient with a t-statistic of 7.873. In turn, the t-statistic of Pakistan's beta coefficient is the lowest with a value of 2.915. In terms of the absolute values for the beta-coefficients, there are also differences noticeable. Pakistan reports the lowest value of 0.460 for its beta coefficient. In turn, India has the highest beta-coefficient with a value of 1.340.

Concerning the results for the intercept statistics (alphas), mixed evidence is prevalent. On the one hand, countries like India, Indonesia and the Philippines display alpha values which are significantly different from zero at a significance level of 99% (all t-statistics of alpha-coefficients are above 2.3263). On the other hand, Pakistan's and South Korea's alpha values are only slightly less significantly different from zero. In fact, the alpha-coefficients show that the intercepts are significant at a level of 95%.

Overall, all averages of the country regressions display positive values for the alpha-coefficients, which are significantly different from zero well beyond a 95% significance level. This leads to the fact that the above mentioned first hypothesis needs to be rejected, due to the fact that intercepts of the CAPM regressions are not jointly zero on a country level observation. Moreover, the alpha coefficients are estimated based on monthly excess returns. Hence, the CAPM produces an annualized intercept of almost 17% for South Korea, the country with the lowest alpha-coefficient

of the countries analyzed within this sample. This large pricing error clearly shows that alpha is significantly different from zero, which leads to the rejection of the first hypothesis. Having rejected the first hypothesis on a country level, a deeper look into the individual portfolios within each country is necessary in order to identify any common patterns that might by insightful.

The beta-coefficients for the individual country portfolios are displayed in appendix 4. In terms of the beta-coefficients, no clear pattern within the country portfolios is identifiable among most of the countries of this study. In fact, only the Philippines show two very clear patterns. When controlling for size, beta-coefficients are increasing with higher book-to-market equity ratios. Additionally, when controlling for book-to-market equity ratios, beta-coefficients are positively related to the size of the stocks within the portfolios. On average, smaller stocks are experiencing lower beta-coefficients as compared to larger stocks within the country portfolios of the Philippines. For Indonesia and Pakistan weaker, yet identifiable, patterns are existent. Indonesia is experiencing similar effects for beta-coefficients, like the Philippines, when controlling for size and book-to-market ratios. But these trends are not as coherent as for the Philippines. P2_1 and P2_2 do not follow the trend of decreasing beta-coefficients, when controlling for book-to-market equity ratios. Furthermore, P1_2 seems to be an outlier for increasing beta-coefficients for an increase in book-to-market ratios, when controlling for size. Pakistan is exposed to different trends in terms of its beta-coefficients. Controlling for book-to-market equity ratios, beta-coefficients are increasing with an increase in size. Additionally, beta-coefficients are decreasing with an increase in book-to-market ratios, when controlling for size. But, there are also exceptions prevalent. For example, the portfolios of the second book-to-market group do not fit coherently to the trends mentioned before, which are identifiable for Pakistan. Besides analyzing the beta-coefficients, it is also necessary to review the alpha-coefficients within the individual country portfolios.

Appendix 5 displays the individual alpha-coefficients of the nine portfolios per country. Country portfolios of India, Pakistan and South Korea are showing clear trends, when controlling for size. The alpha-coefficients are decreasing with the increase in book-to-market equity ratios. Furthermore, South Korea also displays a clear trend, when controlling for book-to-market equity ratios. With a decrease in size, alpha coefficients are also declining. This trend is not observable within India and Pakistan. When controlling for size in Indonesia and the Philippines, alpha-coefficients generally tend to decrease with an increase in book-to-market ratios. Nevertheless,

some portfolios within these countries are not following this trend. Thus, there is no clear coherence observable. Also, there does not seem to be a trend observable when controlling for book-to-market ratios within these two countries.

Since the CAPM leads to big intercepts when applied within the context of the emerging countries analyzed within this study, the first hypothesis is rejected. Thus, the CAPM should not be used confidently by investors in order to explain variations in excess returns for the countries of this study. Besides the large alpha-coefficients for the individual countries, there is also largely room for improving the R^2 statistics. Hence, the asset pricing model for pricing equity returns within the context of emerging markets needs to be improved in order to decrease the alpha-coefficients and to increase the R^2 statistics.

5.4 Fama & French Three Factor Model including a global market factor

This study rejects the validity of the CAPM within the context of the emerging countries analyzed within this study. Thus, the CAPM is extended by the Fama & French risk factors, which are based on the accounting variables size and book-to-market equity ratio. As mentioned before, the beta coefficients have been quite significant on an average level. Thus, these beta coefficients will be kept and the model will be extended to a multiple regression with a total of three independent variables, which are based on size and book-to-market equity ratio as well as beta. In fact, small stocks, as measured by their market capitalization, tend to have higher returns than large stocks. This evidence is shared by Banz (1981), who also found evidence that stocks with lower market capitalization have higher average returns. Thus, there is an expected negative size premium for the size variable. Furthermore, value stocks, which are stocks with high book-to-market equity ratios, tend to have higher returns than growth stocks, which are stocks that have low book-to-market equity ratios. Similarly, DeBondt & Thaler (1985) find evidence that stocks with a high ratio of fundamental to price, like book-to-market equity ratio, enjoy higher returns than stocks with low ratios. Hence, the book-to-market variable should experience a positive premium. It is believed that the extension of the asset pricing model will be superior to the CAPM analyzed before.

Clearly, these expectations concerning the size and value premium are posing challenges to the data of this research study. As mentioned before, the average returns of double-sorted portfolios based on size and book-to-market ratios do not clearly follow the trends, which have been found by the

researchers mentioned before. Actually, most countries of this study display a positive size effect in average returns. For example, when controlling for book-to-market ratios, average returns are increasing with the size of stocks for the portfolios in South Korea as displayed in table 10. Additionally, the table also shows a negative book-to-market effect for returns in South Korea. Hence, portfolios with a high book-to-market ratio, display lower returns than portfolios with a low book-to-market ratio. This evidence shows a reversed effect to the expectations by Fama & French (1992). In turn, some countries of this study either satisfy the negative size expectation or the positive book-to-market expectation. But, there exists no country that adheres to both of these expectations. Therefore, the trends of this study are expected to pose challenges on the traditional Three Factor Model by Fama & French.

The independent variables of the FF3-Model are constructed as follows. Firstly, beta-coefficients will be derived by regressing the portfolios' excess returns on the excess returns of the market. Alike the CAPM regressions, returns of the market portfolio are approximated by the MSCI All Country Weighted Index. Like for the CAPM, a global market portfolio has been chosen in order to cover the influence of the global stock market. The beta-coefficients will proxy the market factor within the average returns of the portfolios. As mentioned before, a global market factor is chosen, due to the significance of the beta coefficient within the regression analysis for the CAPM. Thus, the beta coefficient will be the global component of this model.

Secondly, the size and the book-to-market effects are approximated by the help of factor mimicking portfolios. Following the intuition by Fama & French (1993), the nine double-sorted portfolios are used to form portfolios that mimic the underlying risk factors for size and book-to-market equity ratio. This study constructs these risk factors on a country level on purpose. Numerous studies have shown that domestic variables for size and book-to-market provide more meaningful results as compared with global versions of these variables. For example, Hou, Karolyi & Kho (2011) find that local versions of the CAPM and the FF3-Model perform better as compared with their global version. Specifically, the domestic models report higher R^2 values and lower alpha coefficients, which demonstrate their superiority. As discussed before, Fama & French (1992) identified a negative size trend in average returns. Hence, small stocks are experiencing higher average returns as compared with large stocks. Therefore, the risk factor is mimicked by a portfolio where the average returns of portfolios of big stocks are subtracted from portfolios of small stocks. In fact, this

risk factor portfolio for size is formed in the following way. On a country level, the returns of small stock portfolios (P1_1, P1_2 and P1_3) and the returns of big stock portfolios (P3_1, P3_2 and P3_3) are averaged. Afterwards, the averaged returns of the big stock portfolios are subtracted from the small stock portfolios. Thereby, average monthly returns are yielded for the risk factor small-minus-big (SMB). The risk factor for the size portfolio should be free of any bias by the book-to-market equity ratio, since for both the small as well as big stocks all three variations in book-to-market equity ratios are prevalent.

Analogous, the risk factor portfolio for book-to-market equity is formed. Again, on a country level, returns of high book-to-market ratio portfolios (1_3, 2_3, 3_3) and the returns of low book-to-market ratio portfolios (1_1, 2_1 and 3_1) are averaged. Subsequently, the averaged returns of low book-to-market portfolios are subtracted from high book-to-market portfolios. In that way, the risk factor high-minus-low (HML) is built in order to represent the variations in average portfolio returns due to the risk factor resembled in book-to-market equity ratios. Yet again, this factor should vice versa be free of any size effect, since all three size groups are represented for both high and low book-to-market portfolios.

The summary statistics of the three independent variables are displayed in table 12. The excess returns of the market portfolio are slightly positive, due to the fact that the mean return of the market within the sample period amounts to approximately 0.6%. By subtracting the monthly mean of the risk-free rate (1-Month T-Bill rate) of approximately 0.132%, the mean excess returns are positive with a value of 0.46%. It needs to be noted, that the mean excess returns for the market are the same for all the countries, which are analyzed within this study, because the market portfolio is estimated by the Morgan Stanley Capital International (MSCI) All Country Weighted Index and this index is used for all countries equally. This underpins the global orientation of the FF3-Model. Clearly, there exists more variation for SMB und HML variables among the countries of this study, due to the fact that they are built based on the returns of their country portfolios. Hence, the SMB and HML variables are representing the domestic part of the FF3-Model.

Concerning the different country SMB portfolios, it can be noted that four countries (Indonesia, Pakistan, Philippines and South Korea) display negative mean returns during the sample period. In turn, India is the only country that reports a positive mean return on its SMB portfolio, but the

standard deviation for this return is also by far the greatest with 7.66%. Thus, there is considerable variability within the returns of this portfolio. The negative average returns on the SMB portfolios have been expected due to the discussion within the summary statistics section, where it has been shown that most countries are experiencing a positive size trend in terms of their returns. For example, the portfolios of large stocks in Indonesia have significantly higher average returns than the portfolios of lower returns. Hence, the average return on a SMB portfolio needs to be negative for Indonesia. The average returns of the HML portfolios are all negative.

Table 12: Summary statistics of independent variables for FF3-Model

	Excess-Market Returns	St. Dev. Excess-Market-Returns	SMB	St. Dev. SMB	HML	St. Dev. HML
India	0.46%	4.85%	0.23%	7.66%	-2.35%	3.36%
Indonesia	0.46%	4.85%	-0.81%	4.66%	-1.92%	4.39%
Pakistan	0.46%	4.85%	-0.48%	4.95%	-1.31%	4.74%
Philippines	0.46%	4.85%	-0.18%	6.84%	-2.28%	6.77%
South Korea	0.46%	4.85%	-1.13%	4.14%	-2.19%	5.03%

Table 13 shows the correlation tables for the excess returns on the market portfolio and the mean returns of the factor mimicking portfolios SMB as well as HML on a country level. In general, correlations are fairly low, but clear differences between the countries of this study are apparent.

Table 13: Correlation tables for independent variables of FF3-Model

India

	Market	SMB	HML
Market	1		
SMB	0.007	1	
HML	-0.027	-0.132	1

Indonesia

	Market	SMB	HML
Market	1		
SMB	-0.203	1	
HML	0.295	-0.072	1

Pakistan

	Market	SMB	HML
Market	1		
SMB	0.072	1	
HML	-0.128	-0.054	1

Philippines

	Market	SMB	HML
Market	1		
SMB	-0.023	1	
HML	0.068	-0.458	1

South Korea

	Market	SMB	HML
Market	1		
SMB	-0.078	1	
HML	0.004	-0.224	1

In terms of low correlations, Pakistan, South Korea and India perform best. The correlations of excess returns on the market, SMB and HML are all very close to zero. Thus, these correlations are best described by following a random walk. This seems ideal for the subsequent regression analysis, since the portfolios will mimic individual risk factors, which should have an own impact on the dependent variables. The correlations do not signal any strong doubts about the applicability of the Fama & French Model. Hence, the analysis proceeds by outlining the regression equation and underlying hypothesis.

The regression equation for the Fama & French Three Factor, based on a global market factor, is outlined below. Resembling the CAPM approach, the independent variables will be regressed on the dependent variable, which are the 119 excess returns of the individual country portfolios within the sample period. The three independent variables consist of the excess global market returns, the returns of the domestic factor portfolio for size (SMB) as well as the returns of the domestic factor portfolio for book-to-market equity (HML).

$$R_i - r_f = \beta_i (R_{Global\_Market\_Portfolio} - r_f) + \gamma_s SMB_{domestic} + \gamma_v HML_{domestic} + \varepsilon_i$$

R_i	=	Return of portfolio (i)	γ_s	=	Coefficient for risk factor size
$R_{Global\_Market\_Portfolio}$	=	Return of market portfolio	γ_v	=	Coefficient for risk factor value
r_f	=	Risk free rate	ε_i	=	Error term of portfolio (i)
β_i	=	Beta of portfolio (i)			

The regression equation will be applied for each country individually. Thus, there will be nine different regressions per country, one for each individual country portfolio. Similar to the hypothesis for the CAPM, the performance of this regression analysis will be used in order to test the validity of the FF3-Model within the context of the emerging markets of this study. An asset pricing model can be considered as being valid when its slope and coefficients capture the cross-section of expected returns in order to have intercepts, which are statistically indistinguishable from zero (Fama & French, 2012). For this reason, the second hypothesis of this study can be formulized in the following way.

H_2: On a country level, the intercepts of the Fama & French Three Factor Model regressions are jointly zero ($\alpha = 0$).

Due to the differences in summary statistics of this research study compared to prior results by Fama & French (1992), it is expected that there is likely going to be an intercept that is statistically distinguishable from zero. Furthermore, there are probably going to be different risk factor loadings for the SMB and HML portfolios as expected by prior research studies, since the trends in summary statistics of this study have been quite different to prior studies. However, having outlined some varying trends among the portfolios sorted on size and book-to-market ratios, it is expected that the independent variables of the FF3-Model will partly be significant, although the risk factor loadings might be different as compared to the findings by Fama & French (1993).

The results of the regression analysis for the FF3-Model are displayed in table 14. This table shows the averages for all nine regressions performed on the portfolios of each country. Specifically, the adjusted R^2 values, alpha coefficients and the risk factor loadings for beta, SMB and HML as well as their accompanying t-statistics are outlined. Adjusted R^2 values have been chosen, since the model encompasses more than one independent variable.

Table 14: Results of regression analysis for FF3-Model with global market factor

	Adjusted R Square	Alpha	t-stat Alpha	Beta	t-stat Beta	SMB	t-stat SMB	HML	t-stat HML
India	0.573	0.026	3.006	1.333	9.203	0.781	8.403	0.129	0.610
Indonesia	0.444	0.031	4.585	1.051	7.934	0.245	1.847	0.253	1.802
Pakistan	0.177	0.019	2.516	0.485	3.247	0.048	0.322	0.229	1.530
Philippines	0.362	0.020	2.926	0.840	6.214	0.223	1.953	-0.115	-0.518
South Korea	0.450	0.003	0.475	0.910	7.914	0.019	0.116	-0.508	-4.366

The regression analysis yields quite high adjusted R^2 values for India, Indonesia, Philippines and South Korea. For all of these four countries the values are approximately between 0.35 and 0.6. For Pakistan, only an adjusted R^2 value of 0.177 can be reported. Thus, the independent variables can only explain 17.7% of the variations in excess returns of the country portfolios. Overall, all adjusted R^2 values have been improved for the countries analyzed within this study. This clearly shows that the FF3-Model explains more variation in average returns as compared to the CAPM. Especially, the model seems to be good in explaining the results for India, which has an adjusted R^2 value of 0.573.

Nevertheless, the alpha coefficients have not improved across the board of the countries. Apart from the Philippines and South Korea, all countries' alpha coefficients have slightly increased. Indonesia has the highest alpha coefficient of 0.031 and a t-stat well above the 99.99% significance level, which clearly leads to a rejection of the formulated second hypothesis. In fact, an annualized alpha of approximately 40% clearly shows the misfit of the model. The same applies to India and Pakistan, for which this misfit is not as extreme, but enough to reject the model. As mentioned before, the alpha coefficients for the Philippines and South Korea decreased. Unfortunately, the decrease in alpha is far smaller for the Philippines as compared to South Korea. Thus, the Philippines still exhibit an alpha of 0.02, which is still too large, because the t-stat is too significant with a value of 2.926. Hence, the second hypothesis and the Fama & Franch Three Factor Model need to be rejected too for the Philippines, when applied within the context of this study. Furthermore, the alpha coefficients for India, Indonesia and the Philippines are significantly different from zero at a confidence level of almost 99%. The alpha coefficient for Pakistan has increased and it is significantly different from zero at a 95% level. Thus, there is also almost clear evidence that the Fama & French Model is not applicable to Pakistan. Finally, South Korea displays the lowest alpha coefficient of 0.003%, which yields an annualized value of approximately 2.1%. Therefore, this value is almost indistinguishable from zero, which can be interfered from the low t-statistics. Hence, the second hypothesis cannot be rejected for South Korea, meaning that the Fama & French Model seems to be appropriate as an asset pricing model at first glance within the country context of South Korea.

Besides investigating adjusted R^2 values and alpha coefficients, it is also necessary to investigate the risk factor loadings on the independent variables and their t-statistics. When comparing the beta coefficients of this regression analysis with the ones of the CAPM, one can see that there is no big difference in the absolute coefficients and the corresponding t-statistics. Still, all beta coefficients are significant at a confidence level of 99.9%. The high significance of the beta coefficients within all the countries of this study underpins the results within the prior section concerning the regression analysis for the CAPM. As expected, the beta coefficients remained significant within the regression analysis for the FF3-Model. In fact, the increase in t-statistics in conjunction with the HML and SMB variable shows the power of this variable within the asset pricing model and empowers its valid position in equity asset pricing models within the context of emerging markets.

Concerning the risk factor loadings on the SMB portfolios, different observations can be made. The risk factor loading is not significant at all for Pakistan and South Korea. Hence, the impact of the factor is non-existent or equal to zero. For Indonesia and the Philippines, the risk factor is significantly different from zero only at a 90% level. Thus, there exists some impact of the factor on the excess returns of the country portfolios. India's SMB risk factor is the highest within the sample of this study with a value of 0.781. Furthermore, this factor is highly significant at a level of over 99.99%. Therefore, it can be inferred that the returns are largely driven by beta and size effects. Interestingly, no negative values for the SMB risk factors can be identified. Hence, there does not seem to be a negative relation between size and average returns within the context of this research study for emerging markets. This clearly contradicts the study by Fama & French (1992).

Like the SMB risk factor loadings, the HML variables also display different characteristics for the countries in this research study. In terms of absolute values for HML, positive coefficients can be observed for India, Indonesia and Pakistan. In turn, the Philippines and South Korea are experiencing negative coefficients. When looking at the significance of these coefficients, it can be noted that the coefficients for India and Philippines do not seem to be different from zero, since their t-statistics are far too low in order to show any significance. Therefore, HML does not seem to be appropriate for forecasting excess returns on the country portfolios. For Indonesia and Pakistan, the HML coefficients are significant at an 85-90% level. Thus, they seem to be significantly different from zero and they seem to play a role when explaining the excess returns of the country portfolios. Nevertheless, the rather weak significance at an 85-90% level signals that this risk factor needs to be treated with care. Finally, South Korea's HML factor shows very strong significance with a t-statistic of -4.366, which demonstrates a significance of over 99.99%. Hence, this factor plays a crucial role in explaining the variations in excess returns of South Korea's country portfolios. Having outlined the averages of the regression analysis per country, it is further important to investigate the results for the individual country portfolios in terms of alpha coefficients and risk factor loadings.

Appendix 7 shows the individual alpha coefficients for the nine portfolios per country of this research study. There does not seem to be any particular trend in alpha coefficients identifiable for any of the countries, even not for South Korea, the country with the smallest intercept. The only observation, which can be made, is that all countries do not seem to have any outliers within their

nine portfolios. Thus, the intercepts are fairly even distributed around the mean of the intercepts. Since South Korea displays the lowest alpha coefficient on average, the alpha coefficients of the individual portfolios are far lower than for the other countries. In terms of beta coefficients, a similar outline is given in appendix 6. No clear trends are given for any country, which means that beta coefficients are not varying in a clear trend with the portfolios sorted on size and book-to-market equity ratios. Like the absolute values of alpha coefficients, the beta values of the portfolios fluctuate around the country average. This leads to the inference that beta coefficients within the countries of this sample are not dependent on a size and book-to-market equity sort. Thus, stocks within these countries might need to be sorted in another fashion in order to display clear trends.

Having outlined clear differences among the countries on an average level for the risk factor loadings on the SMB and HML portfolio, it is possible to show clear trends among the nine portfolios per country. The values for SMB are shown in Appendix 8. Clearly, for all country portfolios SMB values are increasing with a decrease in the size of stocks within the portfolio. Hence, controlling for book-to-market ratios, portfolios of smaller stocks always have higher SMB coefficients than portfolios consisting of larger stocks. Furthermore, in all countries except for India, the SMB risk factor loadings are negative for large stock portfolios. Thereby, the large SMB coefficient for India can be explained.

When looking at the HML coefficients for the individual portfolios for the countries in appendix 9, eminent differences between the countries can be observed. Controlling for size within each of the countries, a clear positive trend between HML coefficients and the increase in book-to-market ratios can be seen. This trend holds for all portfolios for each country. Furthermore, all portfolios of lowest book-to-market ratios display a negative HML coefficient, which strengthens the trend of the HML coefficient. Although South Korea experiences a positive trend of its HML coefficient, the coefficients are not reaching a positive level for the highest book-to-market portfolios. Hence, the coefficient for South Korea is negative on an average level. This deteriorates the overall trend for the HML variable, since a positive trend is expected, due to the fact that value stocks should experience higher returns than growth stocks. In fact, the high significance of the average HML coefficient for South Korea induces a negative trend for book-to-market ratios and returns. A similar, though not so extreme, observation is possible for the Philippines. Equally to South Korea, the Philippines also have a negative HML coefficient on average. This negative overall coefficient

is based on the fact that the high book-to-market portfolios on average display slightly positive HML coefficients. Therefore, the strongly negative coefficients are influencing the overall coefficient in a negative fashion. Nevertheless, this negative trend for HML coefficients and book-to-market ratios in the Philippines should not be overvalued. In fact, the average HML coefficient is not significant for the Philippines, which means that it should not be taken into account for explaining returns of stocks for portfolios sorted on size and book-to-market equity ratios.

Overall, two different HML trends for three countries are important to be summarized. Indonesia and Pakistan are experiencing strong positive trends for HML, when controlling for size. This leads to positive HML coefficients which are significant at a 90% level. For South Korea a similar positive trend can be observed when controlling for size. But the coefficients are all negative for all portfolios. Hence, the observed average HML coefficient is negative, but significant at a level of 99.99%.

The results of the regression analysis for the FF3-Model within the context of the emerging markets of this study can be summarized as follows. Firstly, the application of the model yielded different results for each county of this study. Hence, a general application of the model cannot be advised in order to explain variations in the returns of stock portfolios. In terms of adjusted R^2 values, the model should fit best for India. But only two of the three factors, beta and SMB, are significant which means that HML does not proxy any risk factors that are priced within the returns of stock portfolios. Additionally, the alpha coefficient did not decrease from the CAPM towards the FF3-Model. It actually increased slightly and it is still too large on an annual level in order to accurately explain the returns for stocks in India. In terms of the lowest alpha coefficient, South Korea seems to be the best country in order to apply Fama & French's model. Yet, only beta and HML are significant variables for the returns of this country. The SMB factor shows no significance, which means that it is irrelevant for explaining the returns of the portfolios.

Secondly, this study struggles with observing the same return structure of the portfolios sorted on size and book-to-market equity ratios as outlined by Fama & French (1992). Thus, there is no common negative size trend available amongst the portfolios for most of the countries. Actually, positive trends for the countries of this study are observable. Concerning the risk factor HML, mixed evidence is prevalent for the countries. On the one hand, there seems to be a positive trend

between book-to-market ratios and returns for countries like India, Indonesia and Pakistan. On the other hand, this trend is negative for countries like the Philippines and South Korea.

Thirdly, the FF3-Model cannot generally be applied to each and every country, due to the fact that not all coefficients of the model are always significant in explaining variation of the returns of the stock portfolios of the countries of this study. Clearly, the beta coefficients are significant for all the countries, but there is large variation for SMB and HML. For every country, except for Indonesia, only one of these two variables is significant in explaining the variation in returns of the stock portfolios. Concerning Indonesia, both SMB and HML are significant. However, the level of significance is not too high, since the variables are only significant at a level of 90%. Furthermore, the rather high alpha coefficient does not validate the model as being appropriate for explaining the returns for Indonesia.

Overall, the results of the regression analysis for the CAPM and the FF3-Model do not allow the acceptance of the models as appropriate equity pricing models. Hence, there is room for adjustments in order to increase their appropriate use.

5.5 Domestic version of Capital Asset Pricing Model and Fama & French Three Factor Model

As outlined before, both the CAPM and the FF3-Model are built upon a global market portfolio risk factor, which is approximated by the Morgan Stanley Capital International (MSCI) All Country Weighted Index (2013). When comparing the development of this index with the Morgan Stanley Capital International (MSCI) country indices for India, Indonesia, Pakistan, Philippines and South Korea (2013), as shown in figure 7, the appropriateness of the All Country Weighted Index within this study is questioned.

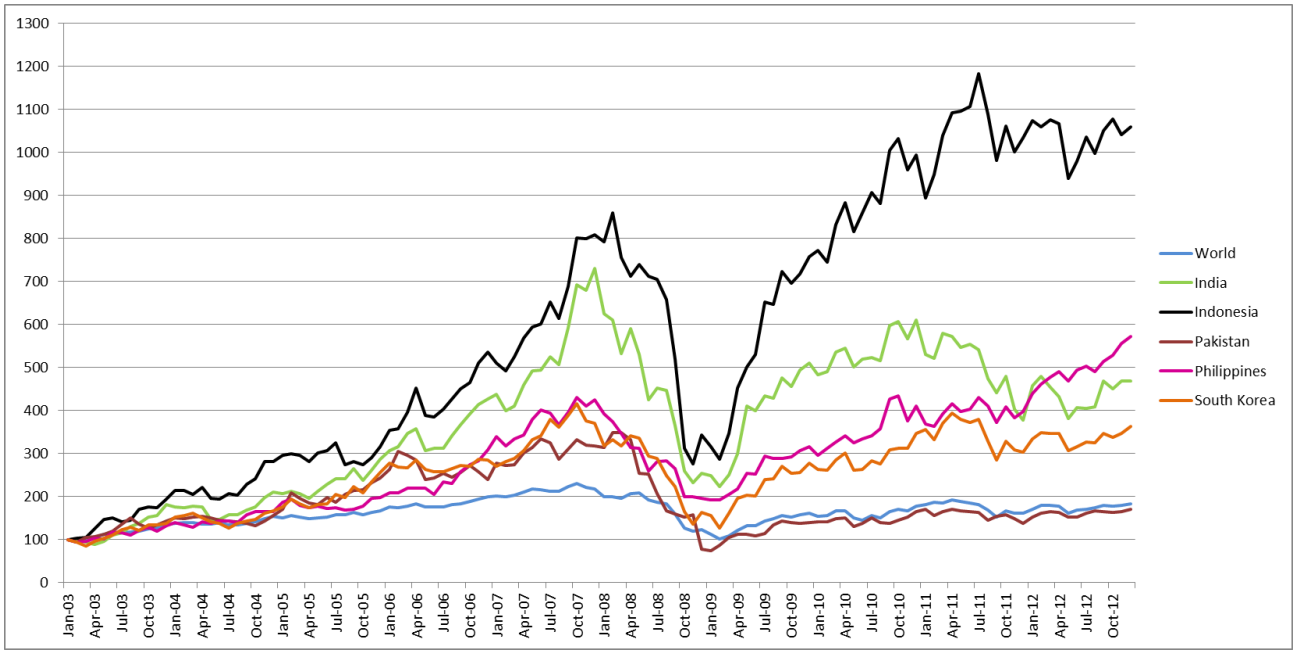

Figure 7: Return development of world index and country indices

Specifically, three observations can be made from the development of the indices. Firstly, Indonesia's country index illustrates the highest increase amongst the indices of figure 7. Hence, using the world market index in order to estimate beta coefficients for Indonesia within the equity pricing models is definitely deteriorating the results of the regression analysis. The same observation applies to the other countries, although in a slightly weaker fashion. Secondly, there is a certain correlation between the world index and the other country indices shown in table 15. For example, this can be seen by the increase in indices value until the end of 2007 and by the huge dip during the financial crisis in 2008/09. Thirdly, there seems to be great variety within the correlations between the different countries and the world index. On the one hand, Indonesia tends to vary more extreme compared to the world market index. On the other hand, the variation of Pakistan is only slightly different as compared to the development of the world market index. In order to have a more concrete view on the exact relation between the developments of the indices, table 15 displays the mean monthly returns of the indices for the sample period from 2003 to 2012 and the correlations between them.

Table 15: Mean monthly returns and correlation of world index as well as country indices

	World	India	Indonesia	Pakistan	Philippines	South Korea
Mean Returns	0.60%	1.70%	2.33%	0.84%	1.74%	1.41%

	World	India	Indonesia	Pakistan	Philippines	South Korea
World	1					
India	0.768	1				
Indonesia	0.567	0.854	1			
Pakistan	0.810	0.415	0.084	1		
Philippines	0.669	0.839	0.941	0.238	1	
South Korea	0.873	0.913	0.870	0.516	0.899	1

As outlined before, the mean returns of the All Country Weighted Index, which is used for approximating the world market portfolio, shows low returns of 0.6% per month. Pakistan's index shows an almost equally low monthly return of 0.84%. In turn, Indonesia's index demonstrates the highest average return of 2.33% per month. Due to the clear differences among the absolute values of the returns, the use of a world market index for all countries can be questioned. The general use of the world index as the market portfolio is further undermined by the interpretation of the correlation table. Although, the approximation of the market portfolio by the world index seems to be a good fit for South Korea, India and Pakistan (correlations are above 0.75 with world market index), there is still room for improvements. This observation is even worse for Indonesia and Philippines, where the correlation is lower. Therefore, this underpins the argumentation that the deployment of the world index for all countries is not appropriate. Instead, the individual country indices will be used for approximating the respective market portfolio. Thereby, the validness of the asset pricing models is expected to increase.

When looking at the regression equations for the CAPM and the FF3-Model, excess returns on the global market portfolio have been used thus far. For the above mentioned arguments, the global market portfolio returns will be exchanged by domestic market portfolio returns. Hence, the regression equation can be rewritten in the following manner. The CAPM adopts the new domestic market returns in order to incorporate excess returns of the domestic market.

$$R_i - r_f = \beta_i (R_{Domestic\_Market\_Portfolio} - r_f) + \varepsilon_i$$

The same adaptation is done for the FF3-Model, where the global market portfolio returns are exchanged by domestic market portfolio returns. The already domestic independent variables SMB and HML are kept.

$$R_i - r_f = \beta_i (R_{Domestic\_Market\_Portfolio} - r_f) + b_s SMB_{domestic} + b_v HML_{domestic} + \varepsilon_i$$

With these amendments of the models, almost truly domestic equity asset pricing models have been built. Certainly, the risk free rate is still approximated by US T-Bills, but employing this rather stable and liquid vehicle offers the possibility to prevent incorporating biases from domestic risk free rates, which might be fluctuating too much. Furthermore, this study takes the perspective of a US investor, who borrows and lends at the U.S. risk free rate.

Due to the formation of two adapted equity pricing models, two new hypothesis need to be formalized. Regression analyses will be performed in order to test the acceptance of the models for explaining the variations in average returns of the stock portfolios from the countries of this study. Hence, the intercepts or alpha coefficients of the two new asset pricing models should not be significantly different from zero in order to be accepted as valid equity pricing models. The following two hypotheses are therefore formalized for the domestic versions of the CAPM and the FF3-Model.

H_3: On a country level, the intercepts of the domestic Capital Asset Pricing Model regressions are jointly zero ($\alpha = 0$).

H_4: On a country level, the intercepts of the domestic Fama & French Three Factor Model regressions are jointly zero ($\alpha = 0$).

Concerning the results of the regression analysis for the domestic CAPM, it is expected that the alpha coefficient will be significantly closer to zero than the CAPM based on a global market portfolio. Thereby, the alpha coefficients will be less significantly different from zero. Furthermore, higher R^2 values are expected to be observed, which are based on beta coefficients that are even more significant for the domestic model compared to the globally oriented one. The expectations

for the domestic version of the FF3-Model are identical to the ones for the domestic CAPM. However, it is expected that the SMB and HML are not going to be influenced significantly by the new market variables.

Table 16 displays the results of the regression analysis for the domestic CAPM. Specifically, the table shows the average results for the values of R^2, alpha as well the corresponding t-statistic and beta as well as the corresponding t-statistic.

Table 16: Results of regression analysis for domestic CAPM

	R Square	Alpha	t-stat Alpha	Beta	t-stat Beta
India	0.552	0.016	2.278	0.926	12.579
Indonesia	0.457	0.015	2.509	0.631	10.251
Pakistan	0.470	0.013	2.433	0.639	10.887
Philippines	0.385	0.015	2.074	0.765	8.971
South Korea	0.460	0.010	1.636	0.648	10.133

The results for the domestic Asset Pricing Model are promising. Average R^2 values increased for all countries of this study. Furthermore, alpha coefficients decreased or remained equal for the domestic models compared to the global oriented models. In most cases, even the t-statistics of the alpha coefficients decreased, which signals that the intercepts are less significantly different from zero. In terms of beta coefficients, most coefficients values decreased for the domestic model as compared to the global model. This decrease is naturally justified by the fact that the mean return of the world market portfolio is lower than the mean returns for the individual country portfolios. Additionally, t-statistics of the beta coefficients drastically increased, which shows the even stronger influence of beta in explaining the variation in average returns of the country portfolios. The expectations for the results of the regression analyses for the domestic CAPM have therefore been confirmed.

In terms of the formulated third hypothesis, a more individual look at the different countries is necessary. The country with the lowest alpha coefficient is South Korea with an alpha value of 1% per month. When annualizing this value, the domestic CAPM yields an alpha coefficient of 12% per year. Although displaying a rather low t-statistic of only 1.636, which means that the significance level is roughly 85%, the annual pricing error of 12% is quite severe. Thus, the hypothesis cannot clearly be rejected for South Korea. In terms of the average R^2 value, the domestic CAPM seems to fit best for India, which displays an average value of 0.552. But this value needs to be treated with

care, because the accompanying alpha coefficient is 1.6% on a monthly and therefore 19.2% on an annual level. This clearly, diminishes the rather high R^2 value and leads to the rejection of the hypothesis for India. This rejection is further supported by the fairly high t-statistic of 2.278 of the alpha coefficient, which stands for a significance level of over 95%. The regression results for Indonesia, Pakistan and the Philippines are comparable with the results for India. Although showing quite high R^2 values, the countries all experience alpha coefficients and t-statistics, which are drastically different from zero on an annual level. Thus, the third hypothesis is also rejected for these countries. Overall, the third hypothesis is rejected for all countries. There might be some evidence that the Domestic CAPM captures some degree of the variations for South Korea, but the alpha coefficient is quite large and significantly different from zero, which does not allow a support of the hypothesis.

The results of the regression analysis for the domestic FF3-Model are displayed in table 17. The table shows the same content as for the domestic CAPM, except that the table displays adjusted R^2 values. Furthermore, the risk factor loadings SMB and HML and their accompanying t-statistics are outlined as well.

Table 17: Results of regression analysis for domestic FF3-Model

	Adjusted R Square	Alpha	t-stat Alpha	Beta	t-stat Beta	SMB	t-stat SMB	HML	t-stat HML
India	0.781	0.015	2.364	0.888	16.686	0.708	10.599	-0.019	-0.087
Indonesia	0.570	0.019	3.021	0.673	10.916	0.390	3.341	0.064	0.559
Pakistan	0.669	0.015	3.223	0.774	14.301	0.624	6.118	-0.044	-0.396
Philippines	0.569	0.013	2.298	0.829	10.887	0.376	4.094	-0.056	0.128
South Korea	0.596	0.004	0.681	0.638	11.266	0.160	1.305	-0.377	-3.677

Likewise, adjusted R^2 values have increased across the board for all the countries of this study for the regression analyses of the domestic FF3-Model. Besides, alpha coefficients have decreased for India, Indonesia, the Philippines and Pakistan. However, for South Korea they have increased slightly. T-statistics of alpha coefficients have developed accordingly, meaning that they decreased for India, Indonesia, Philippines as well as Pakistan. Since the coefficient increased slightly for South Korea, the corresponding t-statistic has increased quite a bit. Similar to the domestic CAPM, beta coefficients have all become more significant for the domestic version of the FF3-Model. All beta coefficients decreased within the results of the domestic version. In fact, the SMB variables changed quite drastically in some cases. Especially for Indonesia, Pakistan and South Korea a sharp increase in absolute SMB values is noticeable. For India a slight decrease and for the Philippines a

slight increase is recognizable. Besides the changes in absolute values of the SMB coefficients, the accompanying t-statistics have all significantly increased. For all countries, except for South Korea, the SMB coefficient is significant at a 99.9% level. The significance level of the t-statistic of the SMB coefficient for South Korea has increased, but it is only significant at an 80-90% level. Interestingly, quite some opposite effects are noticeable for the HML risk factors. Actually, the HML coefficients have decreased for India, Indonesia and Pakistan. In fact, for India and Pakistan they even turned negative for the domestic version of the FF3-Model. For the Philippines and South Korea HML coefficients have increase, but they are still negative. Generally, the HML coefficients have moved more towards zero, as compared to the global version of the FF3-Model. This fact is also resembled within the corresponding t-statistics of the HML coefficients. All coefficients turned less significant. Only for South Korea, HML remains very significant at a level of over 99.9%. Overall, the expectations concerning adjusted R^2 values, alpha as well as beta coefficients have proven to be right. In turn, the expectations for the SMB and HML did not turn out to be right. Instead of no influence, the SMB variables turned out to be more significant and the HML coefficients turned out to be less significant.

The fourth hypothesis states that the domestic FF3-Model will be accepted as valid when the average intercepts are indistinguishable from zero. In order to accept or reject this hypothesis, a deeper look into the individual countries is necessary. The only intercept that is not statistically different from zero is the one of South Korea with a value of -0.4% per month. Thus, the model yields an average annual intercept of 4.8%, which is fairly good. Therefore, the domestic FF3-Model seems to be a valid asset pricing model within the country context of South Korea. But this result needs to be treated with care, since the SMB variable is less significant compared to the HML variable. Hence, it might be the case that the SMB variable is not really a good proxy for explaining the variations of average returns for country portfolios of South Korea. When looking at the rest of the countries and their alpha coefficients, unfortunately the fourth hypothesis needs to be rejected. All other countries are displaying alpha coefficients, which are statistically different from zero. Hence, the domestic Fama & French Model does not qualify for being valid within these countries. The reason for this potentially stems from the fact that the HML variable is not relevant at all in explaining the average returns for these countries. In fact, the HML coefficient is not statistically different from zero, which demonstrates that there is no impact by book-to-market ratios on average returns for these countries. Having described the results of the regression analysis for the domestic

versions of the CAPM and the FF3-Model, a comparison with their global counterparts is needed in order to conclude which version is more valid in explaining average excess returns of stock portfolios within the countries of this study.

5.6 Recommendations based on comparison of results for global and domestic models

This section compares the results of the global and domestic versions of the CAPM as well as the FF3-Model. The aim of this section will be to give a recommendation concerning the validity of both the global and domestic version of the equity asset pricing models.

Before formulating actual recommendations, the results of the regression analyses for the equity asset pricing models, which have been analyzed within this study, need to be compared. Three parameters will be employed for the comparison of the global and domestic versions of the two models. These three parameters are the R^2 values (adjusted R^2 values for FF3-Model), the alpha coefficients and their respective t-statistics. Table 18, shows these three parameters for the four models of every country.

Table 18: Comparison of regression results for global and domestic Equity Asset Pricing Models

India

	R Square*	Alpha	t-stat Alpha
Global CAPM	0.311	0.025	2.746
Global FF3-Model	0.573	0.026	3.006
Domestic CAPM	0.552	0.016	2.278
Domestic FF3-Model	0.781	0.015	2.364

Indonesia

	R Square*	Alpha	t-stat Alpha
Global CAPM	0.343	0.024	3.698
Global FF3-Model	0.444	0.031	4.585
Domestic CAPM	0.457	0.015	2.509
Domestic FF3-Model	0.570	0.019	3.021

Pakistan

	R Square*	Alpha	t-stat Alpha
Global CAPM	0.069	0.016	2.056
Global FF3-Model	0.177	0.019	2.516
Domestic CAPM	0.470	0.013	2.433
Domestic FF3-Model	0.669	0.015	3.223

Philippines

	R Square*	Alpha	t-stat Alpha
Global CAPM	0.213	0.023	2.946
Global FF3-Model	0.362	0.020	2.926
Domestic CAPM	0.385	0.015	2.074
Domestic FF3-Model	0.569	0.013	2.298

South Korea

	R Square*	Alpha	t-stat Alpha
Global CAPM	0.293	0.014	2.039
Global FF3-Model	0.450	0.003	0.475
Domestic CAPM	0.460	0.010	1.636
Domestic FF3-Model	0.596	0.004	0.681

*Adjusted R Square values for FF3-Model

In terms of (adjusted) R^2 values, the FF3-Model outperforms the CAPM for both the global as well as the local versions of the models. Thus, together the variables of the FF3-Model, which are the market factor (beta), the factor for size (SMB) as well as the book-to-market ratio factor (HML),

can explain more variations in excess returns than the single market factor of the CAPM. Although being superior in terms of (adjusted) R^2 values, the alpha coefficients present a different picture. For the global versions of the models, a smaller alpha coefficient for the FF3-Model can only be observed for the Philippines and South Korea. For the other countries, the reversed observation is be made. Interestingly, the observations slightly change when looking at the domestic versions of the models. Only for India, the Philippines and South Korea a smaller alpha coefficient is identifiable. Concerning Indonesia as well as Pakistan, a smaller alpha coefficient for the domestic Capital Asset Pricing can be indentified. The contrary effects of (adjusted) R^2 values and alpha coefficients for the models within the same version, e.g. global or domestic, are troubling clear interpretations of the results.

Hence, a look on both versions at the same time is needed. Concerning (adjusted) R^2 values, the domestic versions of the equity asset pricing models are clearly outperforming their global counterparts. This can be seen by higher (adjusted) R^2 values, which demonstrate greater explanation of the excess returns. As identified before, the domestic FF3-Model still clearly outperforms the domestic CAPM. For alpha coefficients slightly different observations are present. The domestic versions of the models have lower alpha coefficients as compared to the global versions. However, the domestic FF3-Model does not always have lower alpha coefficients as compared to the domestic CAPM. Actually, this is only the case for India, the Philippines and South Korea. Nevertheless, the t-statistic of the alpha coefficient for India's domestic FF3-Model is slightly higher as compared with the one of India's domestic CAPM. Hence, the superiority in terms of the absolute alpha coefficient can be questioned. Thus, the choice between the CAPM and the Fama & French Three Factor seems to be country specific.

The following recommendations are given on a country basis. Firstly, this section has shown that domestic models outperform their global counterparts. Thus, domestic models should be used for explaining the variations in stock returns within the context of the emerging markets at hand. Secondly, the choice between CAPM and FF3-Model is country specific. Hence, the domestic FF3-Model is recommended for India, the Philippines and South Korea, due to higher (adjusted) R^2 values and lower, as well as less significant, alpha coefficients. Concerning Indonesia and Pakistan, the domestic CAPM should be selected, because the model achieves lower, as well as less significant, alpha coefficients. Overall, no single model within this research study has proven to be

the optimal solution for all countries. In fact, as countries differ from each other, they require the application of different equity asset pricing models.

5.7 Limitations

Although, this research study was prepared carefully and responsibly, it entails some limitations and shortcomings, which need to be discussed. These limitations are mainly situated within the construction of the sample, the sample period and the selection of equity asset pricing models. The concrete factors will shortly be described and their respective impact will be outlined.

Concerning the construction of the sample for this research study, two main limitations can be mentioned. Firstly, the country samples are not exhaustive in terms of the available number of listed companies. Hence, the database offered more companies, but not all companies could be used for this study, due to the fact that the database lacked information on certain variables, e.g. book value of equity, for the dropped companies. Thus, the impact of this matter might be that real equity properties of each individual country might not be properly reflected within the empirical analysis. Specifically, the size and book-to-market trends within the descriptive statistics part might potentially not reflect the real situation. Secondly, there exists a great variety of companies within the countries. For example, the mean size (measured by market capitalization) of the portfolio with the largest stocks for Pakistan is roughly forty times larger than the portfolios, which contains the smallest stocks. Hence, the portfolio has not been cleansed for micro stocks, which might potentially biases the sample towards very small companies. Unfortunately, these small companies could not have been dropped, due to the fact that the number of companies within each country would have significantly been reduced.

Apart from the sample construction, another potential source of bias resides within the choice of the sample period. The period from the beginning of 2003 to the end of 2012 clearly incorporates the financial crisis from 2007 to 2008. Considered by many economists as the most severe financial crisis since the great depression in the 1930s, this crisis obviously has an impact on the results of this research study. It is to a great deal responsible for the very low average monthly returns of this study. Additionally, the crisis might also be responsible for the rather high absolute alpha coefficients at present within this study, since the equity asset pricing models might not work appropriately in times of crises.

Finally, there are also two potential shortcomings lying within the selection and application of existing equity asset pricing models to the data of this research study. Firstly, this research study does not cover any equity asset pricing models beyond the CAPM and the FF3-Model. Hence, the validity of other models, like the Carhart Four Factor Model (Carhart, 1997) for example, has not been investigated. Potentially, other models are able to achieve even higher (adjusted) R^2 values, less significant and lower absolute alpha coefficients. The results of this study could even be taken in order to adjust existing models. Secondly, besides the focus on the two mentioned models, no truly global version of the FF3-Model has been tested. The SMB and HML factor have been constructed in a domestic fashion from the start of this research study. This has been done based on the insights from prior studies. Nevertheless, a truly global version with global SMB and HML factors might be able to deliver more accurate results, which is however not expected. Nonetheless, the setup of a truly global FF3-Model could be done in order to outline differences to the results of this study.

Despite these limitations, this study still adds value concerning the explanation of average excess returns within the countries analyzed in this study. Nevertheless, the shortcomings also point towards different approaches or sample formation, which could be implemented in order to conduct further research.

6. Summary & Conclusion

Over the course of this research, five emerging markets were selected on the basis of a country classification framework, which incorporates the dimension of economical development, the development of the domestic capital market and the transitional status of the respective emerging country. This emerging markets peer group consists of India, Indonesia, Pakistan, Philippines and South Korea. The investigation of historical data in order to understand the positive potential of these emerging countries identified two motivating aspects. Firstly, mean monthly returns are heterogeneous amongst the emerging markets and they have historically not been higher than developed markets for all countries, except India. Secondly, the main benefit for investments within emerging markets is grounded within the availability of low correlations, which allows investors to diversify the risk of their portfolios. In order to profit from low correlations, investors need to select those markets that offer the best risk and return relationship. Thus, the understanding of the risk factors, which cause the variations in stock returns, is crucial. Therefore, investors use equity asset

pricing models, like the Capital Asset Pricing Model and the Fama & French Three Factor Model, in order to comprehend the risk and return relationship. Unfortunately, existing academic literature provides mixed evidence concerning the validity of these models. Nevertheless, equity asset pricing models, which are built upon domestic risk factors, have outperformed their global counterparts within prior research studies. Thus, the empirical analysis of this study incorporates these findings. Therefore, both global and domestic versions of the Capital Asset Pricing Model and the Fama & French Three Factor Model are tested within the context of the emerging markets peer group.

Based on the empirical analysis of the four equity pricing models applied within the context of the emerging markets peer group, this paragraph answers the main research question.

What recommendations can be given to foreign investors, who want to investigate time-series variations of stock returns within emerging markets based on global as well as domestic versions of the Capital Asset Pricing Model and the Fama & French Three Factor Model?

Specifically, two recommendations are formulated for foreign investors. Firstly, domestic versions of equity asset pricing models outperform their global counterparts. This means that the utilization of domestic models is recommended when aiming at explaining the variations in stock returns. In fact, the domestic versions of the Capital Asset Pricing Model and the Fama & French Three Factor Model have performed better within this study, as compared to their global counterparts. Generally, the (adjusted) R^2 values are higher and the alpha coefficients lower, as well as less significant. Thus, investors should engage in considering domestic versions of equity asset pricing models, when explaining variations within the excess returns of the countries within this study. These models are more appropriate, since they are employing a country specific market factor. As shown in figure 8, domestic markets have developed differently over the sample period of this study. For this reason, the excess returns of the world market do not perfectly correlate with the excess returns of the individual countries. Consequently, the utilization of country indices in order to proxy for country market returns is well justified and the regression results show their valid position within the asset pricing models. Secondly, the appropriate domestic equity pricing model needs to be selected for each of the countries, which are analyzed within this study. Hence, country specific recommendations are given.

Based on higher (adjusted) R^2 values and lower, as well as less significant, alpha coefficients, the domestic Fama & French Three Factor Model is recommended for India, the Philippines and South Korea. For Indonesia and Pakistan, the domestic Capital Asset Pricing Model should be favored, because of the lower alpha coefficients and their corresponding lower t-statistics. Thus, no single model within this research study has proven to be the optimal solution for all countries. In fact, as countries differ from each other, they require the application of different equity asset pricing models.

Overall this study shows that equity asset pricing models based on domestic risk factors tend to outperform models based on global risk factors. The choice between the domestic Capital Asset Pricing Model and the domestic Fama & French Three Factor Model is country specific. However, both models do not seem to be a perfect fit for explaining the variations in excess returns within the countries at hand. Only for South Korea, the domestic Fama & French Three Factor can be accepted as a valid asset pricing model, due to the insignificant alpha coefficient. For the rest of the countries, significant absolute alpha coefficients are remaining which might be eliminated by more appropriate asset pricing models that take into account other or additional risk factors.

7. References

7.1 Scientific journal articles

Arora, R.K. & Jain, P.K. (2009). Behavior of stock returns in selected emerging markets. *Journal of Financial Management and Analysis, 22* (2), 13-25.

Aguiar, M., & Gopinath, G. (2007). Emerging market business cycles: The cycle is the trend. *Journal of Political Economy, 115* (1), 69-102.

Baesel, J. B. (1974). On the assessment of risk: Some further consideration. *Journal of Finance, 29* (5), 1491-1494.

Banz, R.W. (1981). The relationship between return and market value of common stocks. *Journal of Financial Economics, 9* (1), 3-18.

Basu, S. (1977). Investment performance of common stocks in relation to their price-earnings ratios: A test of the efficient market hypothesis. *Journal of Finance, 32* (3), 663-682.

Bekaert, G. (1995). Market integration and investment barriers in emerging equity markets. *World Bank Economic Review, 9* (1), 75-107.

Bekaert, G. & Harvey, C.R. (1995). Time-varying global market integration. *Journal of Finance, 50* (2), 403-444.

Bekaert, G. & Harvey, C.R. (1997). Emerging equity market volatility. *Journal of Financial Economics, 43* (1), 29-77.

Bekaert, G., Erb, C.B., Harvey, C.R., & Viskanta, T.E. (1997). What matters for emerging equity market investments. *Emerging Markets Quarterly, 1* (2), 17-46.

Bekaert, G. & Urias, M.S. (1999). Is there a free lunch in emerging market equities?. *Journal of Portfolio Management, 25* (3), 83-96.

Bekaert, G., Harvey, C.R. (2000). Foreign speculators and emerging equity markets. *Journal of Finance, 55* (2), 565-614.

Bekaert, G., Harvey, C.R. & Lundblad, C.T. (2003). Equity market liberalization in emerging markets. *Journal of Financial Research, 26* (3), 275-299.

Bhandari, L.C. (1988). Debt/equity ratio and expected common stock returns: Empirical Evidence. *Journal of Finance, 43* (2), 507-528.

Blume, E.M. (1971). On the assessment of risk. *Journal of Finance, 26* (1), 1-10.

Bryant, P.S. & Eleswaparu, V.R. (1997). Cross-sectional determinants of New Zealand share market returns. *Accounting & Finance, 37* (2), 181-205.

Capaul, C., Rowley, I., & Sharpe, W. F. (1993). International value and growth stock returns. *Financial Analysts Journal, 49* (1), 27-36.

Carhart, M.M. (1997). On persistence in mutual fund performance. *Journal of Finance, 52* (1), 57-82.

Cohen, K. J., Ness, W. L., Okuda, H., Schwartz, R. A., & Whitcomb, D. K. (1976). The determinants of common stock returns volatility: An international comparison. *The Journal of Finance, 31* (2), 733-740.

Daniel, K.D., Hirshleifer, D. & Subrahmanyam, A. (2001). Overconfidence, arbitrage, and equilibrium asset pricing. *Journal of Finance, 56* (3), 921-965.

Daniel, K.D. & Titman, S. (1997). Evidence on the characteristic of cross-sectional variation in stock returns. *Journal of Finance, 52* (1), 1-33.

Daniel, K.D., Titman, S., Wei, K.C.J. (2001). Explaining the cross-section of stock returns in Japan: Factors or characteristics?. *Journal of Finance, 56* (2), 743-766.

Davies, J. (1994). The cross-section of realized stock returns: The pre-compustat evidence. *Journal of Finance, 49* (5), 427-465.

Davies, J., Fama, E.F. & French, K.R. (1992). Characteristics, covariances and average returns: 1927-97. *Journal of Finance, 55* (1), 389-406.

DeBondt, W.F.M. & Thaler, R.H. (1985). Does the stock market overreact?. *Journal of Finance, 40* (3), 793-805.

DeBondt, W.F.M. & Thaler, R.H. (1987). Further Evidence on Investor Overreactions and Stock Market Seasonality. *Journal of Finance, 42* (3), 557-581.

Demirgüç-Kunt, A., & Levine, R. (1996). Stock market development and financial intermediaries: Stylized facts. *The World Bank Economic Review, 10* (2), 291-321.

Diamonte, R.L., Liew, J.M. & Stevens, R.L. (1996). Political risk in emerging and developed markets. *Financial Analysts Journal, 52* (3), 71-76.

Douglas, G.W. (1969). Risk in the equity markets: An empirical appraisal of market efficiency. *Yale Economic Essays, 9* (1), 3-45.

Drew, M. E., & Veeraraghavan, M. (2002). A closer look at the size and value premium in emerging markets: Evidence from the Kuala Lumpur Stock Exchange. *Asian Economic Journal, 16* (4), 337–351.

Drew, M. E., Naughton, T., & Veeraraghavan, M. (2003). Firm size, book-to-market equity and security returns: Evidence from the Shanghai Stock Exchange. *Australian Journal of Management, 28* (1), 119–139.

Erb, C. B., Harvey, C. R., & Viskanta, T. E. (1994). Forecasting international equity correlations. *Financial Analysts Journal, 50* (6), 32-45.

Erb, C.B., Harvey, C.R. & Viskanta, T.E. (1995). Country Risk and Global Equity Selection. *Journal of Portfolio Management, 21* (2), 74-83.

Estrada, J. (2000). The cost of equity in emerging markets: A downside risk approach. *Emerging Markets Quarterly, 4*, 19-30.

Faff, R. (2001). An examination of the Fama and French three-factor model using commercially available factors. *Australian Journal of Management, 26* (1), 1-17.

Fama, E.F. & French, K.R. (1992). The cross-section of expected stock returns. *Journal of Finance, 47* (2), 427-465.

Fama, E.F. & French, K.R. (1993). Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics, 33* (1), 3-56.

Fama, E.F. & French, K.R. (1996). Multifactor explanations of asset pricing anomalies. *Journal of Finance, 51* (1), 55-84.

Fama, E.F. & French, K.R. (1998). Value versus growth: The international evidence. *Journal of Finance, 53* (6), 1975-1999.

Fama, E.F. & French, K.R. (2004). The capital asset pricing model: Theory and evidence. *Journal of Economic Perspectives, 18* (3), 25-46.

Fama, E.F. & French, K.R. (2012). Size, value, and momentum in international stock returns. *Journal of Financial Economics, 105* (3), 457-472.

Fama, E.F. & MacBeth, J.D. (1973). Risk, return, and equilibrium: Empirical tests. *Journal of Political Economy, 81* (3), 607-636.

Fernandez, N. (2005). Portfolio disaggregation in emerging market investment. *Journal of Portfolio Management, 31* (2), 41-49.

Ferson, W.E., Sarkissian, S. & Simin, T. (1999). The alpha factor asset pricing model: A parable. *Journal of Financial Markets, 2* (1), 49-68.

Gaunt, C. (2004). Size and book to market effects and the Fama French three factor asset pricing model: Evidence from the Australian stock market. *Accounting & Finance, 44* (1), 27-44.

Godfrey, S. & Espinosa, R. (1996). A practical approach to calculating costs of equity for investments in emerging markets. *Journal of Applied Corporate Finance, 9* (3), 80-90.

Gregory, A. & Michou, M. (2009). Industry cost of equity capital: UK evidence. *Journal of Business Finance & Accounting, 36* (5), 679-704.

Halliwell, J., Heaney, R. & Sawicki, J. (1999). Size and book to market effects in Australian share markets: A time series analysis. *Accounting Research Journal, 12*, 122-137.

Harvey, C. R. (1993). Portfolio enhancement using emerging markets and conditioning information. *World Bank Discussion Papers*. 110-110.

Harvey, C.R. (1995a). Predictable risk and returns in emerging markets. *The Review of Financial Studies, 8* (3), 773-816.

Harvey, C.R. (1995b). The cross-section of volatility and auto-correlation in emerging markets. *Finanzmarkt und Portfolio Management, 9* (1), 12-34.

He, J. & Ng, L.K. (1994). Economic forces, fundamental variables, and equity returns. *Journal of Business, 67* (4), 599-609.

Hoskisson, R. E., Eden, L., Lau, C. M., & Wright, M. (2000). Strategy in emerging economies. *Academy of Management Journal, 43* (3), 249-267.

Hou, K., Karolyi, G.A. & Kho, B.C. (2011). What factors drive global stock returns?. *Review of Financial Studies, 24* (8), 2527-2574.

Jegadeesh, N. (1992). Does market risk really explain the size effect?. *Journal of Financial and Quantitative Analysis, 27* (3), 337-351

Kothari, S.P., Shanken, J. & Sloan, R.G. (1995). Another look at the cross-section of expected stock returns. *Journal of Finance, 50* (1), 185-224.

Lakonishok, J., Shleifer, A. & Vishny, R.W. (1994). Contrarian investment, extrapolation, and risk. *Journal of Finance, 49* (5), 1541-1578.

Lieksnis, R. (2011). Momentum in the Baltic stock market. *Economics and Management, 16*, 1164-1169.

Lintner, J. (1965). Security prices, risk and maximal gains from diversification. *Journal of Finance, 20* (4), 587-615.

Longin, F., & Solnik, B. (1995). Is the correlation in international equity returns constant: 1960-1990?. *Journal of international money and finance, 14* (1), 3-26.

Markowitz, H. M. (1959). Portfolio Selection. *Journal of Finance, 7* (1), 77-91.

Markowitz, H. M. (1991). Foundations of portfolio theory. *The Journal of Finance, 46* (2), 469-477.

Merton, R. (1973). An intertemporal capital asset pricing model. *Econometrica, 41* (5), 867-887.

Michelfelder, R.A. (2005). Volatility of stock returns: Emerging and mature markets. *Managerial Finance, 31* (2), 66–86.

Miles, D., & Timmermann, A. (1996). Variation in expected stock returns: Evidence on the pricing of equities from a cross-section of UK companies. *Economica, 63* (251), 369-382.

Mody, A. (2004). *What is an emerging market?*. International Monetary Fund.

Mollah, S.A. (2009). Stock return and volatility in the emerging market of Bangladesh. *Journal of Academy of Business and Economics, 9* (1), 98-104.

Mossin, J. (1966). Equilibrium in a capital asset market. *Econometrica, 34* (4), 768-783.

Mullins, D. W. (1982). Does the capital asset pricing model work. *Harvard Business Review, 60* (1), 105-114.

Ozturk, H. (2007). Foreign direct investment and private sector external financing: Do credit ratings matter?. *Afro Eurasian Studies, 1* (2), 4-24.

Pagano, M. (1993). The flotation of companies on the stock market: A coordination failure model. *European Economic Review, 37* (5), 1101-1125.

Qiang, C. Z. W., Rossotto, C. M., & Kimura, K. (2009). *Economic impacts of broadband. Information and Communications for Development 2009: Extending Reach and Increasing Impact*, 35-50.

Rahim, R.A. & Nor, A.H.S.M (2006). A comparison between Fama and French and liquidity-based three-factor models in predicting the portfolio returns. *Asian Academy of Management Journal of Accounting and Finance, 2* (2), 43-60.

Reinganum, M. (1981). A misspecification of capital asset pricing: empirical anomalies based on earnings yields and market values. *Journal of Financial Economics, 9* (1), 19-46.

Roenfeldt, R.L., Griepentrog, G.L. & Pflaum, C.C. (1978). *Journal of Financial and Quantitative Analysis, 13* (1), 117-121.

Roll, R. (1977). A Critique of the Asset Pricing Theory's Tests. *Journal of Financial Economics, 4* (2), 129-176.

Rosenberg, B., Reid, K. & Lanstein R. (1985). Persuasive evidence of market inefficiency. *Journal of Portfolio Management, 11* (3), 9-17.

Ross, S. A. (1977). The capital asset pricing model (CAPM), short - sales restrictions and related issues. *The Journal of Finance, 32* (1), 177-183.

Sharpe, W. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk. *Journal of Finance, 19* (3), 425-442.

Solnik, B. H. (1974). Why not diversify internationally rather than domestically?. *Financial Analysts Journal, 51* (1), 48-54.

Solnik, B., Boucrelle, C., & Le Fur, Y. (1996). International market correlation and volatility. *Financial Analysts Journal, 56* (5), 17-34.

Spyrou, S. I., & Kassimatis, K. (1999). Did equity market volatility increase following the opening of emerging markets to foreign investors. *Journal of Economic Development, 24* (1), 39-51.

Stulz, R.M. (1995). Globalization of capital markets and the cost of capital: The case of Nestle. *Journal of Applied Corporate Finance, 8* (3), 30-38.

Taneja. P (2010). Revisiting Fama French three-factor model in Indian stock market. *The Journal of Business Perspective, 14* (4), 267-274.

Tinic, S.M. & West, R.R. (1984). Risk and return: January vs. the rest of the year. *Journal of Financial Economics, 13* (4), 561-574.

Vos, E. & Pepper, B. (1997). The size and book to market effects in New Zealand. *The New Zealand Investment Analyst, 18*, 35-45.

7.2 Books

Hawawini, G. & Keim, D. (2000). The cross section of common stock returns: a review of the evidence and some new findings. In Keim, D.B. and Ziemba, W.T. (Eds.), *Security Market Imperfections in Worldwide Equity Markets* (3-43). Cambridge, England: Cambridge University Press.

Henry, P. B., & Kannan, P. (2008). Growth and returns in emerging markets. In Ito, T. & Rose, A.K. (Eds.), *International Financial Issues in the Pacific Rim: Global Imbalances, Financial Liberalization, and Exchange Rate Policy* (241-265). University of Chicago Press.

Keane, S. M. (1993). *Emerging markets: the relevance of efficient market theory*. Chartered Association of Certified Accountants.

Kvint, V. (2009). *The global emerging market: strategic management and economics*. Taylor & Francis.

Miller, M.H. & Sholes, M. (1969). Rates of return in relation to risk: a re examination of some recent findings. Jensen, M.C. (Eds.), *Studies in the theory of capital markets* (79-121). United States: Praeger Publishers.

Nielsen, L. (2011). *Classifications of Countries Based on Their Level of Development: How it is done and how it could be done*. International Monetary Fund.

Solnik, B. H., & McLeavey, D. W. (1991). International investments (Vol. 3). Reading, MA: Addison-Wesley.

Van Agtmael, A. (2007). The *emerging markets century: how a new breed of world-class companies is overtaking the world*. Free Press.

7.3 Databases

Bloomberg. (2013). Data retrieved February 25, 2013, from Bloomberg database.

Datastream. (2013). Data retrieved February 25, 2013, from Thomson Reuters DataStream.

Morgan Stanley Capital International. (2013). Data retrieved February 25, 2013, from http://www.msci.com/products/indices.

U.S. Department of the Treasury. (2013). Data retrieved February 25, 2013, from www.treasury.gov/resource-center/data-chart-center/interest-rates.

World DataBank. (2013). Retrieved June 17, 2013, from http://databank.worldbank.org/data/views/variableSelection/selectvariables.aspx?source=world-development-indicators.

7.4 Internet sources

BlackRock. (2011). Are emerging markets the next developed markets?. Retrieved June, 15, 2013, from: https://www2.blackrock.com/webcore/litService/search/getDocument.seam?venue=PUB_IND&source=GLOBAL&contentId=1111146576.

Deutsche Bank. (2013). *World Outlook 2013*. Retrieved June, 15, 2013, from: https://www.db.com/en/media/Deutsche_Bank_-_World_Outlook_2013.pdf.

Ernst & Young. (2013). *Ernst & Young Rapid-Growth Markets Forecast 2013*. Retrieved June, 15, 2013, from: http://emergingmarkets.ey.com/wp-content/uploads/downloads/2013/04/EMEIAMAS-1489_RGM-Forecast_Spring2013_v8_ LR_3mb.pdf.

Financial Times. (2013. *Indonesia rate rise unlikely to set precedent for emerging markets*. Retrieved June 24, 2013, from http://www.ft.com/intl/cms/s/0/298f991e-d440-11e2-a464-00144feab7de.html#axzz2X8dN53dA.

Fitch Ratings. (2013). *Complete sovereign rating history*. Retrieved June 17, 2013, from http://www.fitchratings.com/web_content/ratings/sovereign_ratings_history.xls.

FTSE. (2012). *FTSE Country Classification Process*. Retrieved June 17, 2013, from http://www.ftse.com/Indices/Country_Classification/Downloads/Sept%202012/FTSE_Country_Classification_Paper_August_2012.pdf.

International Institute of Finance. (2013). *Capital Flows to Emerging Market Economies*. Retrieved June, 15, 2013, from: http://www.iif.com/emr/resources+2523.php.

Money Management. (2013). Emerging markets exceed expectations. Retrieved June, 15, 2013, from: http://www.moneymanagement.com.au/analysis/investment/2013/emerging-markets-exceed-investor-challenges-remain.

MSCI. (2013). *MSCI Market Classification Framework*. Retrieved June 17, 2013, from http://www.msci.com/resources/products/indices/global_equity_indices/gimi/stdindex/MSCI_Market_Classification_Framework.pdf.

O'Neill, J. (2001). *Building Better Global Economic BRICs*. Retrieved June 18, 2013, from http://www2.%20goldmansachs.%20com/ideas/brics/book/99-dreaming.%20pdf.

O'Neill, J. (2007). *The N-11: More Than an Acronym*. Retrieved June 18, 2013, from http://www.chicagobooth.edu/alumni/clubs/pakistan/docs/next11dream-march%20'07-goldmansachs.pdf.

Reuters. (2013). *MSCI lowers Greece to emerging market status*. Retrieved June 26, 2013, from http://uk.reuters.com/article/2013/06/11/uk-msci-equity-reclassifications-idUKBRE95A18X20130611.

Unicef. (2013). *Basic Indicators*. Retrieved June 17, 2013, from http://www.unicef.org/infobycountry/stats_popup1.html.

World Bank. (2013). Retrieved April 7, 2013, from http://data.worldbank.org/about/country-classifications.

World Economic Outlook. (2013). Retrieved June 17, 2013, from http://www.imf.org/external/pubs/ft/weo/ faq.htm#q4b.

8. Appendix

Appendix 1: FTSE country classification matrix

Criteria	DEVELOPED	ADVANCED EMERGING	SECONDARY EMERGING	FRONTIER
World Bank GNI Per Capita Rating 2011				
Market and Regulatory Environment				
Formal stock market regulatory authorities actively monitor market (eg. SEC, FSA, SFC)	X	X	X	X
Fair and non-prejudicial treatment of minority shareholders	X	X		
Non or selective incidence of foreign ownership restrictions	X	X		
No objection to or significant restrictions or penalties applied to the investment of capital or the repatriation of capital and income	X	X	X	X
Free and well-developed equity market	X	X		
Free and well-developed foreign exchange market	X	X		
Non or simple registration process for foreign investors	X	X		
Custody and Settlement				
Settlement – Rare incidence of failed trades	X	X	X	X
Custody-Sufficient competition to ensure high quality custodian services	X	X	X	
Clearing and settlement – T + 3, T + 5 for Frontier	X	X	X	X
Stock Lending is permitted	X			
Settlement – Free delivery available	X			
Custody – Omnibus account facilities available to international investors	X	X		
Dealing Landscape				
Brokerage – Sufficient competition to ensure high quality broker services	X	X	X	
Liquidity – Sufficient broad market liquidity to support sizeable global investment	X	X	X	
Transaction costs – implicit and explicit costs to be reasonable and competitive	X	X	X	
Short sales permitted	X			
Off-exchange transaction permitted	X			
Efficient trading mechanism	X			
Transparency – market depth information / visibility and timely trade reporting process	X	X	X	X
Derivatives				
Developed Derivatives Market	X			

Source: FTSE (2012)

Appendix 2: MSCI country classification matrix

Criteria		Frontier	Emerging	Developed
A Economic Development				
A.1	Sustainability of economic development	No requirement	No requirement	Country GNI per capita 25% above the World Bank high income threshold* for 3 consecutive years
B Size and Liquidity Requirements				
B.1	Number of companies meeting the following Standard Index criteria	2	3	5
	Company size (full market cap) **	USD 449 mm	USD 898 mm	USD 1796 mm
	Security size (float market cap) **	USD 33 mm	USD 449 mm	USD 898 mm
	Security liquidity	2.5% ATVR	15% ATVR	20% ATVR
C Market Accessibility Criteria				
C.1	Openness to foreign ownership	At least some	Significant	Very high
C.2	Ease of capital inflows / outflows	At least partial	Significant	Very high
C.3	Efficiency of the operational framework	Modest	Good and tested	Very high
C.4	Stability of the institutional framework	Modest	Modest	Very high

* High income threshold for 2010: GNI per capita of USD 12,276 (World Bank, Atlas method)
** Minimum in use for the May 2012 Semi-Annual Index Review, updated on a semi-annual basis

Source: MSCI (2013)

Appendix 3a: Overview on criteria for emerging market classification (2003-2011)

		2003	2004	2005	2006	2007	2008	2009	2010	2011
Bangladesh	GNI per capita	420,80	439,43	458,34	488,82	518,72	550,48	577,35	606,87	637,68
	Inflation, consumer prices (annual %)	5,67%	7,59%	7,05%	6,77%	9,11%	8,90%	5,42%	8,13%	10,71%
	Market cap. of listed companies (% of GDP)	3,12%	5,86%	5,04%	5,83%	9,93%	8,38%	7,91%	15,63%	21,05%
	No. of Listed domestic companies	247	250	262	269	278	290	302	209	216
	Mobile cellular subscriptions (per 100 people)	1	2	6	13	24	31	36	46	56
	Internet users (per 100 people)	0	0	0	1	2	3	3	4	5
	Credit Rating	BB-	BB-	BB-	BB-	BB-	BB-	BB-	BB-	BB-
Brazil	GNI per capita	3612,42	3780,69	3862,12	3988,31	4208,13	4370,67	4335,72	4627,96	4707,84
	Inflation, consumer prices (annual %)	14,72%	6,60%	6,87%	4,18%	3,64%	5,66%	4,89%	5,04%	6,64%
	Market cap. of listed companies (% of GDP)	42,46%	49,77%	53,80%	65,30%	100,32%	35,66%	71,98%	72,12%	49,62%
	No. of Listed domestic companies	367	357	381	392	442	432	377	373	366
	Mobile cellular subscriptions (per 100 people)	26	36	46	53	64	79	90	104	123
	Internet users (per 100 people)	13	19	21	28	31	34	39	41	45
	Credit Rating	B+	BB-	BB-	BB	BB+	BBB-	BBB-	BBB-	BBB
China	GNI per capita	1930,18	2061,47	2184,70	2270,39	2295,37	2525,37	2436,45	2469,38	2491,67
	Inflation, consumer prices (annual %)	2,16%	6,35%	5,04%	7,26%	8,40%	12,35%	2,75%	2,44%	4,22%
	Market cap. of listed companies (% of GDP)	8,49%	11,09%	17,60%	31,09%	51,75%	17,09%	14,63%	15,24%	15,42%
	No. of Listed domestic companies	356	332	331	347	369	399	398	390	393
	Mobile cellular subscriptions (per 100 people)	45	61	81	107	130	137	139	136	141
	Internet users (per 100 people)	12	18	20	27	34	40	45	46	51
	Credit Rating	A-	A-	A	A	A+	A+	A+	A+	A+
Egypt	GNI per capita	1525,74	1556,84	1596,38	1687,35	1781,47	1873,77	1913,92	1939,60	1928,97
	Inflation, consumer prices (annual %)	4,51%	11,27%	4,87%	7,64%	9,32%	18,32%	11,76%	11,27%	10,05%
	Market cap. of listed companies (% of GDP)	32,65%	48,85%	88,83%	86,97%	106,75%	52,75%	47,60%	37,69%	21,21%
	No. of Listed domestic companies	967	792	744	603	435	373	305	213	231
	Mobile cellular subscriptions (per 100 people)	8	10	18	24	39	53	69	87	101
	Internet users (per 100 people)	4	5	12	13	16	18	24	30	36
	Credit Rating	BB+	BB+	BB+	BB+	BB+	BB+	BB+	BB+	BB

Appendix 3b: Overview on criteria for emerging market classification (2003-2011)

		2003	2004	2005	2006	2007	2008	2009	2010	2011
India	GNI per capita	501,60	533,00	573,66	617,17	670,34	685,29	731,38	786,62	829,81
	Inflation, consumer prices (annual %)	3,81%	3,77%	4,25%	6,15%	6,37%	8,35%	10,88%	11,99%	8,86%
	Market cap. of listed companies (% of GDP)	45,19%	53,75%	66,30%	86,28%	146,86%	52,73%	86,64%	95,94%	54,94%
	No. of Listed domestic companies	5644	4730	4763	4796	4887	4921	4955	4987	5112
	Mobile cellular subscriptions (per 100 people)	3	5	8	14	20	29	43	61	72
	Internet users (per 100 people)	2	2	2	3	4	4	5	8	10
	Credit Rating	BB	BB+	BB+	BBB-	BBB-	BBB-	BBB-	BBB-	BBB-
Indonesia	GNI per capita	793,11	816,64	850,96	892,68	940,87	993,39	1028,78	1088,83	1147,34
	Inflation, consumer prices (annual %)	6,59%	6,24%	10,45%	13,11%	6,41%	9,78%	4,81%	5,13%	5,36%
	Market cap. of listed companies (% of GDP)	23,28%	28,52%	28,48%	38,10%	48,98%	19,36%	33,02%	50,90%	46,07%
	No. of Listed domestic companies	333	331	335	344	383	396	398	420	440
	Mobile cellular subscriptions (per 100 people)	8	14	21	28	40	60	69	88	98
	Internet users (per 100 people)	2	3	4	5	6	8	7	11	18
	Credit Rating	B+	B+	BB-	BB-	BB-	BB	BB	BB+	BBB-
Mexico	GNI per capita	5607,71	5786,70	5870,78	6078,25	6201,59	6219,34	5783,32	6043,65	6337,44
	Inflation, consumer prices (annual %)	4,55%	4,69%	3,99%	3,63%	3,97%	5,13%	5,30%	4,16%	3,41%
	Market cap. of listed companies (% of GDP)	17,50%	22,63%	28,17%	36,58%	38,39%	21,25%	38,71%	43,89%	35,44%
	No. of Listed domestic companies	159	152	151	131	125	125	125	130	128
	Mobile cellular subscriptions (per 100 people)	29	37	44	51	61	68	74	81	82
	Internet users (per 100 people)	13	14	17	20	21	22	26	31	36
	Credit Rating	BBB-	BBB-	BBB	BBB	BBB	BBB+	BBB	BBB	BBB
Pakistan	GNI per capita	549,07	574,27	606,53	631,67	654,74	654,37	670,00	688,09	700,38
	Inflation, consumer prices (annual %)	2,91%	7,44%	9,06%	7,92%	7,60%	20,29%	13,65%	13,88%	11,92%
	Market cap. of listed companies (% of GDP)	19,92%	29,60%	41,91%	35,70%	49,08%	14,33%	20,54%	21,63%	15,59%
	No. of Listed domestic companies	701	661	661	652	654	653	651	644	638
	Mobile cellular subscriptions (per 100 people)	2	3	8	21	38	53	55	57	62
	Internet users (per 100 people)	5	6	6	7	7	7	8	8	9
	Credit Rating	B	B	B	B+	B+	B	B-	B-	B-
Philippines	GNI per capita	1098,43	1152,09	1182,00	1212,66	1275,96	1315,00	1305,67	1386,84	1421,27
	Inflation, consumer prices (annual %)	2,29%	4,83%	6,52%	5,49%	2,90%	8,26%	4,13%	3,88%	4,65%
	Market cap. of listed companies (% of GDP)	28,08%	31,68%	38,96%	55,95%	69,11%	30,01%	47,60%	78,82%	73,58%
	No. of Listed domestic companies	234	233	235	238	242	244	246	251	251
	Mobile cellular subscriptions (per 100 people)	27	39	41	49	65	76	82	86	92
	Internet users (per 100 people)	5	5	5	6	6	6	9	25	29
	Credit Rating	BB	BB	BB	BB	BB	BB	BB	BB	BB+
Russia	GNI per capita	2059,62	2236,40	2379,16	2567,01	2810,84	2965,38	2712,71	2820,16	2931,86
	Inflation, consumer prices (annual %)	13,68%	10,86%	12,68%	9,68%	9,01%	14,11%	11,65%	6,86%	8,44%
	Market cap. of listed companies (% of GDP)	53,63%	45,34%	71,80%	106,79%	115,64%	23,91%	70,46%	67,53%	42,87%
	No. of Listed domestic companies	214	215	296	309	328	314	279	345	327
	Mobile cellular subscriptions (per 100 people)	25	51	83	105	119	139	161	166	179
	Internet users (per 100 people)	8	13	15	18	25	27	29	43	49
	Credit Rating	BB+	BBB-	BBB	BBB+	BBB+	BBB+	BBB	BBB	BBB
South Korea	GNI per capita	12777,90	13346,18	13791,48	14470,88	15143,61	15461,01	15394,67	16242,01	16729,91
	Inflation, consumer prices (annual %)	3,51%	3,59%	2,75%	2,24%	2,53%	4,67%	2,76%	2,96%	4,00%
	Market cap. of listed companies (% of GDP)	51,20%	59,37%	85,01%	87,75%	107,09%	53,11%	100,29%	107,32%	89,08%
	No. of Listed domestic companies	1563	1573	1620	1694	1767	1789	1778	1781	1792
	Mobile cellular subscriptions (per 100 people)	72	78	82	85	93	96	100	105	109
	Internet users (per 100 people)	64	71	72	76	77	79	80	82	81
	Credit Rating	A	A	A+	A+	A+	A+	A+	A+	A+
Turkey	GNI per capita	4156,66	4503,17	4827,20	5089,73	5264,37	5227,73	4902,05	5303,33	5684,57
	Inflation, consumer prices (annual %)	25,30%	10,58%	10,14%	10,51%	8,76%	10,44%	6,25%	8,57%	6,47%
	Market cap. of listed companies (% of GDP)	22,57%	25,07%	33,45%	30,59%	44,28%	16,15%	36,73%	41,94%	26,04%
	No. of Listed domestic companies	284	296	302	314	319	317	315	337	362
	Mobile cellular subscriptions (per 100 people)	42	52	64	76	89	93	87	85	89
	Internet users (per 100 people)	12	15	15	18	29	34	36	40	42
	Credit Rating	B-	B+	BB-	BB-	BB-	BB-	BB+	BB+	BB+

Appendix 4: Beta coefficients from regression analysis of Capital Asset Pricing Model with global market factor

India

Size \ Book-to-Market	1	2	3
1	1.368	1.236	1.226
2	1.582	1.451	1.398
3	1.139	1.247	1.411

Indonesia

Size \ Book-to-Market	1	2	3
1	0.221	0.343	0.289
2	0.292	0.293	0.348
3	0.319	0.456	0.480

Pakistan

Size \ Book-to-Market	1	2	3
1	0.563	0.475	0.406
2	0.512	0.498	0.468
3	0.511	0.374	0.336

Philippines

Size \ Book-to-Market	1	2	3
1	0.085	0.177	0.189
2	0.069	0.213	0.248
3	0.192	0.355	0.326

South Korea

Size \ Book-to-Market	1	2	3
1	0.870	0.900	0.878
2	0.899	0.959	0.805
3	0.939	0.872	1.038

Appendix 5: Alpha coefficients from regression analysis of Capital Asset Pricing Model with global market factor

India

Size \ Book-to-Market	1	2	3
1	0.039	0.025	0.014
2	0.037	0.025	0.010
3	0.033	0.025	0.014

Indonesia

Size \ Book-to-Market	1	2	3
1	0.026	0.015	0.018
2	0.037	0.031	0.012
3	0.045	0.020	0.016

Pakistan

Size \ Book-to-Market	1	2	3
1	0.017	0.015	0.007
2	0.021	0.014	0.011
3	0.027	0.017	0.010

Philippines

Size \ Book-to-Market	1	2	3
1	0.039	0.018	0.004
2	0.040	0.024	0.013
3	0.027	0.020	0.020

South Korea

Size \ Book-to-Market	1	2	3
1	0.021	0.005	-0.003
2	0.025	0.013	0.008
3	0.031	0.020	0.006

Appendix 6: Beta coefficients from regression analysis of Fama and French Three Factor Model with global market factor

India

Size \ Book-to-Market	1	2	3
1	1.342	1.229	1.223
2	1.569	1.445	1.400
3	1.130	1.244	1.419

Indonesia

Size \ Book-to-Market	1	2	3
1	0.989	1.069	1.044
2	1.165	1.112	0.969
3	0.982	0.996	1.129

Pakistan

Size \ Book-to-Market	1	2	3
1	0.496	0.467	0.461
2	0.446	0.527	0.547
3	0.508	0.474	0.442

Philippines

Size \ Book-to-Market	1	2	3
1	1.157	0.751	0.665
2	0.686	0.778	0.966
3	0.737	0.873	0.949

South Korea

Size \ Book-to-Market	1	2	3
1	0.919	0.931	0.911
2	0.906	0.955	0.807
3	0.904	0.849	1.010

Appendix 7: Alpha coefficients from regression analysis of Fama and French Three Factor Model with global market factor

India

Size \ Book-to-Market	1	2	3
1	0.020	0.032	0.026
2	0.030	0.027	0.020
3	0.024	0.024	0.029

Indonesia

Size \ Book-to-Market	1	2	3
1	0.024	0.027	0.041
2	0.031	0.041	0.027
3	0.039	0.027	0.027

Pakistan

Size \ Book-to-Market	1	2	3
1	0.015	0.021	0.021
2	0.018	0.019	0.018
3	0.022	0.019	0.016

Philippines

Size \ Book-to-Market	1	2	3
1	0.020	0.025	0.016
2	0.020	0.023	0.020
3	0.019	0.020	0.023

South Korea

Size \ Book-to-Market	1	2	3
1	0.008	0.002	0.000
2	0.000	0.001	0.008
3	-0.001	0.010	-0.001

Appendix 8: SMB coefficients from regression analysis of Fama and French Three Factor Model with global market factor

India

Size \ Book-to-Market	1	2	3
1	1.249	1.317	1.302
2	0.804	0.806	0.679
3	0.277	0.244	0.349

Indonesia

Size \ Book-to-Market	1	2	3
1	0.726	0.647	0.836
2	0.204	0.263	0.331
3	-0.143	-0.271	-0.384

Pakistan

Size \ Book-to-Market	1	2	3
1	0.377	0.522	0.641
2	0.233	0.184	-0.047
3	-0.445	-0.600	-0.429

Philippines

Size \ Book-to-Market	1	2	3
1	1.214	0.652	0.638
2	-0.277	0.120	0.181
3	-0.272	-0.099	-0.153

South Korea

Size \ Book-to-Market	1	2	3
1	0.673	0.442	0.492
2	0.028	-0.093	0.030
3	-0.608	-0.361	-0.430

Appendix 9: HML coefficients from regression analysis of Fama and French Three Factor Model with global market factor

India

Size \ Book-to-Market	1	2	3
1	-0.680	0.387	0.617
2	-0.201	0.174	0.520
3	-0.324	0.005	0.658

Indonesia

Size \ Book-to-Market	1	2	3
1	-0.337	0.377	0.802
2	-0.373	0.376	0.598
3	-0.244	0.430	0.652

Pakistan

Size \ Book-to-Market	1	2	3
1	-0.313	0.238	0.816
2	-0.387	0.337	0.604
3	-0.282	0.447	0.598

Philippines

Size \ Book-to-Market	1	2	3
1	-0.920	0.240	0.455
2	-0.863	-0.054	0.304
3	-0.318	-0.018	0.140

South Korea

Size \ Book-to-Market	1	2	3
1	-0.944	-0.400	-0.120
2	-1.128	-0.500	-0.009
3	-1.140	-0.245	-0.083