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MSc. Financial Economics

Exploring the roots of the value anomaly in developing markets.

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Chapter 1: Introduction

Since the inception of the stock market, a wide variety of anomalies has occurred in the realm of stock pricing. These anomalies range from the obvious differences between small and large companies to the more unusual, such as signs that securities that start with the letter “A” tend to be analysed more diligently than those starting with letters found later on in the alphabet due to the habits of analysts (Ferson, Sarkissin & Simin, 1999). Four of such anomalies stand out due to their persistence and reliability and as such have been researched extensively as part of the Fama-French Five Factor Model (Fama, French, 2014). However, when it comes to in-depth knowledge, many authors limit themselves to proving the existence of the anomalies and determining the effects on their respective portfolios.

The purpose of this thesis is to expand upon the existing in-depth knowledge of the Fama-French Five Factor Model and more specifically the value anomaly. This is done following the requirements of the thesis assignment through an attempt at explaining the differences between the excess returns of the value anomaly in the US and those in developing countries between 1991 and 2014. The project aims to reach three objectives stated in the project description. The first objective is to set hypotheses regarding the risk factors that could explain the value premium at a country level. In this thesis, this is done by reviewing the effects of political, economic and legal circumstances using the variables that are used in the paper written by La Porta et al. (1998) as an example. All variables mentioned in the La Porta et al. (1998) paper are considered to be plausible explanations for the value premium. Additionally, possible independent variables involved in shaping the value premium in a specific country are its sovereign credit rating, its real effective exchange rate, its real GDP growth and its inflation rate. This thesis tests the hypotheses that any of the aforementioned variables can create a significant difference between the HML factor in developed markets and the HML factor in developed markets on a monthly basis.

The second objective for this thesis project is to test the significance of the value premium on a country level. This is accomplished through the use of a modified Fama-French Five-Factor model. Rather than using the MSCI World Indices as an estimator of the market

returns of the markets, this paper uses the returns of all available securities within a specific country as its market returns. While this non-standard approach does not allow for the use of a market returns variable since these returns are also the portfolio returns, a return variable based on the ROE of the securities in the portfolios takes over the role of determining the returns on the fair value of the securities. This decision means that the other variables that estimate the anomaly-based returns within the portfolios can still be used as such as the model is still controlled for the fair value of the securities. On the other hand, this methodology allows me to estimate the returns on value portfolios without having to use data generated using different and unknown datasets selected by third parties. As such, regardless of the data selection methods that are used to focus purely on the domestic markets, the betas seen in this paper are all compatible with each other as they are calculated from the same dataset. This level of compatibility would not be possible when using the traditional Fama-French model.

The third and final objective that this thesis aims to complete is to determine which risk factors that were deemed promising candidates in the first objective are truly capable of explaining the value premium in these developing markets. Due to the large number of variables that are to be tested in completing this objective, individual linear regressions are used in an attempt to find significant effects on the difference between the returns on value in the sample countries and the same returns in the US in the same month as published monthly by Kenneth R. French (2018). This gives the reader a clear understanding of which variables affect the value premium and if this differs between countries and regions.

Chapter 2 of this thesis provides an insight in the existing literature. A significant number of papers have already been published regarding this topic. However, this section shows that there may be potential for more in-depth research on the value anomaly that this paper aims to fulfil. Chapter 3 explains the methods used in this paper to complete the objectives of the project in greater detail. Its aim is to clarify the reasoning behind the choices made regarding the setup of the research. Chapter 4 of the paper continues with a data analysis that aims to answer any questions regarding my data selection methods. It explains the dataset with its strengths and its limitations and with that the methods that are used in this paper to

compensate for the limitations in the data. Chapter 5 shows the detailed results of the regression analyses used in an attempt to test the hypotheses of the project. It aims to provide the reader with a clear understanding of the outcome of the research. Finally, chapter 6 is meant to summarise the information that is obtained in the other sections and provide a concise answer to the objectives of the paper.

Chapter 2: Literature Analysis

Over the decades, substantial research has been done into both the size anomaly and the value anomaly. This research, however, has largely been done on data from developed markets and while these insights are certainly valuable, the presence of these anomalies in the rest of the world is not as well established. A paper written by Cakiki and Tan (2013) examines the hypothesis of whether or not these anomalies occur in less developed markets as well. The methodology of the authors consists mostly of a Generalized Method of Moments (GMM) model in order to estimate the coefficients of a Three Factor Model introduced by Fama and French (1993) and a Four Factor Model introduced by Carhart (1997). Their results show clear indicators for the existence of these anomalies in all examined regions in addition to giving strong evidence in favour of the existence of the momentum anomaly in Asia and South America. These findings are consistent with the results of a paper written by Rouwenhorst (1999) that states that while the returns observed in developing markets are largely independent from the developed markets, the popular HML and SMB factors still apply. Due to the fact that the sample used in the Cakiki and Tan (2013) paper contains data between 1991 and 2011 and the sample that is examined in this thesis research project covers data between 1991 and 2014, it is probable that despite the difference in methodology, the results of the tests done in this thesis project will reflect the aforementioned outcome.

In particular, the value anomaly has been in the sights of Fama and French for a little longer as the paper they published in 1992 attempts to explain the average returns on stocks and various ratios including the B/M ratio, the earnings-price ratio and the leverage ratio of the companies in the sample. This paper followed previous research by authors such as Chan, Hamao and Lakonishok (1991) that found a significant relation between the B/M ratio and the average stock prices in Japan among others. Since then the anomaly has been researched extensively as part of models such as the Fama-French Three Factor Model (Fama & French, 1993) and on its own and has since then been recognised as a persistent anomaly that is taught about in universities across the world.

In addition to the traditional anomalies such as size, value and momentum, authors such as Kouwenberg and Salomons (2005) have turned their eyes towards local and global risk factors in order to further ascertain the effects of these well-established anomalies. In their paper, the authors attempt to estimate the returns of a zero investment Long-Short portfolio based on the value anomaly. Their methods are based on the use of third-party country-level HML and SMB indices provided by S&P known as the S&P/IFCI indices to create linear regression models instead of calculating them themselves using market data. By creating a long portfolio of countries belonging to the top 25% countries based on the S&P/IFCI book-market ratio index and offsetting this to a short portfolio containing the bottom 25%, they were able to generate statistically significant returns of 20% on a yearly basis. After creating simple portfolios, the paper describes a regression analysis in an attempt to explain the returns of the portfolio. A Three Factor Model using the risk-free rate of the MSCI AC World Index and the HML and SMB factors as calculated by Fama and French (1996) as the independent variables was created initially. However, it did not have much explanatory power regarding the portfolio returns, although that may result from the fact that these factors are based on developed markets whereas the portfolio only includes shares traded in developing markets. On the other hand, their results regarding the local risk factors show that the sovereign credit ratings of the examined countries have a significant impact on the returns of their Long-Short portfolio. The other examined variables did not seem to have a significant effect, however.

While not focusing specifically on developing markets, a paper written by La Porta et al. (1998) may show a different explanation as to why research has shown such high returns on value portfolios in these markets. Their premise is that the different origins of the legal systems of countries can affect the respective national stock markets in their entirety through factors such as shareholder rights, political factors, debtor rights and accountancy standards. For instance, the authors find that shareholders investing in countries with a common law system tend to enjoy more legal protection as shareholders investing in countries with a French civil law system. The paper does not touch upon the direct effects of these country-specific factors on share prices directly, but rather points out that in markets where shareholder rights are lacking in comparison to other markets, the shareholder concentration tends to be higher and

smaller shareholders are less common. This signals that these shares may be less desirable than similar shares in more protected markets and that shareholders require more alternative forms of security before investing in these countries. By extent, it is possible that shareholders in such countries will hold a high book-to-market ratio in higher regard than in countries with better shareholder rights. The expectation for the results of the analysis done in this paper would therefore be an increase in the HML returns in such countries.

Chapter 3: Methodology

This paper aims to explain the nature and origin on the value premium in developing markets. Before it is possible to do so, it must first be established that such a value premium exists in the first place. For this purpose, a modified version of the Fama-French Three Factor Model will be used in conjunction with the calendar-time method that is designed to establish the stability of an anomalous factor. This model will then be expanded into a modified Five-Factor Model. The calendar-time method makes use of monthly country-level portfolios and an OLS regression with the monthly average returns of the portfolios that consist of all relevant listed companies minus the risk-free rate as the dependent variable and the monthly country-level HML and SMB factors as independent variables. These portfolios are calculated according to the same methods as used by Fama and French (1996) using six portfolios depending on the market capitalization and the Book-Market (B/M) ratio of the respective companies. The portfolios are separated by size into small and big stocks and by their B/M-ratio into value, neutral and growth stocks. The break point for the size portfolios lies at the median when ranking the companies by Market Capitalization and the break points for the B/M ratios lie at 30% and 70%. The returns on SMB and HML are creating using the following equations:

SMB = 1/3 (Small Value + Small Neutral + Small Growth) – 1/3 (Big Value + Big Neutral + Big Growth)

HML = 1/2 (Small Value + Big Value) – 1/2 (Small Growth + Big Growth)

As stated previously, the country-level portfolios consist of all shares within the country that meet the criteria that are further specified in the data section. As such, the modified Three Factor Model does not contain a market returns factor. An OLS regression is used to determine the statistical significance of the HML factor using the following model:

$$R_{c,t} - R_t^f = \alpha + \beta_{HML} HML_{c,t} + \beta_{SMB} SMB_{c,t} + \varepsilon_{c,t}$$

Where $R_{c,t}$ is the return of the country-level portfolio, R_t^f is the risk-free rate as listed on the website of Kenneth French (2018), $HML_{c,t}$ represents the returns on the value portfolio and $SMB_{c,t}$ represents the returns on the size portfolio.

As the first model may not provide an accurate representation of reality due to the limited number of independent variables, various forms of the Five-Factor model will be used as well. This model will use the same SMB and HML returns as used in the previous model, but three more factors will be added. Since different authors define liquidity variables and momentum variables in a number of different ways, nine different models have been created to accommodate the variety of liquidity and momentum variables mentioned previously. Fama and French (1996) divide the total sample of shares of a country into small portfolios containing only the shares of the correct size and value. However, this method increases the number of portfolios exponentially with every variable that is added. As such, the existing SMB and HML portfolios are not subdivided into additional portfolios, but rather the returns on liquidity, momentum and RoE will be calculated using individual portfolios based on the B/M portfolios with break points on 30% and 70%. While this should be a pure technicality to avoid working with 162 separate portfolios without any effect on the outcome, as it deviates from the original methodology of Fama and French (1996), it is worth mentioning as such. As with the modified Three-Factor model, OLS will be used here to determine whether the HML factor remains significant when exposed to additional independent variables using the following regression models:

$$R_{c,t} - R_t^f = \alpha + \beta_{HML}HML_{c,t} + \beta_{SMB}SMB_{c,t} + \beta_{WML(1)}WML(1M)_{c,t} + \beta_{IML}IML(S)_{c,t} + \beta_{ROE}ROE_{c,t} + \varepsilon_{c,t}$$

$$R_{c,t} - R_t^f = \alpha + \beta_{HML}HML_{c,t} + \beta_{SMB}SMB_{c,t} + \beta_{WML(1)}WML(3M)_{c,t} + \beta_{IML}IML(S)_{c,t} + \beta_{ROE}ROE_{c,t} + \varepsilon_{c,t}$$

$$R_{c,t} - R_t^f = \alpha + \beta_{HML}HML_{c,t} + \beta_{SMB}SMB_{c,t} + \beta_{WML(1)}WML(6M)_{c,t} + \beta_{IML}IML(S)_{c,t} + \beta_{ROE}ROE_{c,t} + \varepsilon_{c,t}$$

$$R_{c,t} - R_t^f = \alpha + \beta_{HML}HML_{c,t} + \beta_{SMB}SMB_{c,t} + \beta_{WML(1)}WML(1M)_{c,t} + \beta_{IML}IML(T)_{c,t} + \beta_{ROE}ROE_{c,t} + \varepsilon_{c,t}$$

$$R_{c,t} - R_t^f = \alpha + \beta_{HML}HML_{c,t} + \beta_{SMB}SMB_{c,t} + \beta_{WML(1)}WML(3M)_{c,t} + \beta_{IML}IML(T)_{c,t} + \beta_{ROE}ROE_{c,t} + \varepsilon_{c,t}$$

$$R_{c,t} - R_t^f = \alpha + \beta_{HML}HML_{c,t} + \beta_{SMB}SMB_{c,t} + \beta_{WML(1)}WML(6M)_{c,t} + \beta_{IML}IML(T)_{c,t} + \beta_{ROE}ROE_{c,t} + \varepsilon_{c,t}$$

$$R_{c,t} - R_t^f = \alpha + \beta_{HML}HML_{c,t} + \beta_{SMB}SMB_{c,t} + \beta_{WML(1)}WML(1M)_{c,t} + \beta_{IML}IML(C)_{c,t} + \beta_{ROE}ROE_{c,t} + \varepsilon_{c,t}$$

$$R_{c,t} - R_t^f = \alpha + \beta_{HML}HML_{c,t} + \beta_{SMB}SMB_{c,t} + \beta_{WML(1)}WML(3M)_{c,t} + \beta_{IML}IML(C)_{c,t} + \beta_{ROE}ROE_{c,t} + \varepsilon_{c,t}$$

$$R_{c,t} - R_t^f = \alpha + \beta_{HML}HML_{c,t} + \beta_{SMB}SMB_{c,t} + \beta_{WML(1)}WML(6M)_{c,t} + \beta_{IML}IML(C)_{c,t} + \beta_{ROE}ROE_{c,t} + \varepsilon_{c,t}$$

Where $WML(1M)_{c,t}$, $WML(3M)_{c,t}$ and $WML(6M)_{c,t}$ are the returns on momentum dating back one, three and six months respectively, $IML(S)_{c,t}$, $IML(T)_{c,t}$ and $IML(C)_{c,t}$ are the returns on liquidity based on the proportional bid-ask spread, the proportional amount of shares traded and a combined liquidity factor created by multiplying the proportional amount of shares traded by the inverse of the proportional bid-ask spread respectively and $ROE_{c,t}$ represents the returns on the ROE portfolio.

The second question to be answered is if country allocation affects the value premium. In order to test if this is the case, a two-sided t-test has been used to compare the HML returns of the sample countries to the benchmarks listed on the website of Kenneth French. These individual comparisons to the benchmark factors show a simple and comprehensive answer to whether or not a long-short portfolio based on the value anomaly is more or less effective in developing markets.

Finally, in order to determine the reasons behind the value premium, an OLS panel regression is used to determine the factors that affect any differences that can be found between the HML returns in developing markets and the benchmark values. The dependent variable of this OLS regression is the difference between the country-specific returns on the HML factor and the benchmark values. As there are a large number of independent variables to be tested, they are regressed against the dependent variable individually initially, after which the factors with statistically significant effects can be examined more closely in a more complete regression model to test for any interactions between the variables. As this regression is meant to distinguish the differences between the countries, the regression analysis examines their respective regions rather than individual countries. In addition to the regressions focusing on each of the three regions, another regression is done on the entire sample.

Chapter 4: Data analysis

In order to examine the nature of the value anomaly in developing markets, the dataset used in this paper contains common stock data from 23 developing markets in Asia, the EMEA and South America from 1991 to 2014. All stock data has been gathered using Thomson Reuters Datastream. I have chosen to focus greatly on country-specific data and therefore exclude certain stocks that can be considered indirect investment vehicles for stocks outside the portfolio's scope. This means that banks, ETFs, trusts, life insurance companies, non-life insurance companies and unclassified shares are excluded from the sample. While many of these unclassified shares may not be investment vehicles, language barriers and the sheer quantity of shares without adequate information make it all but impossible to determine which shares are and which ones are not.

As the country-level portfolios consist of all shares that meet the aforementioned criteria, the country-level portfolios are equal to the market portfolio for that respective country if the same selection criteria are to be used for the subsequent Five-Factor portfolios. While it would be possible to use an external index to represent the market returns, the available indices include the companies I have excluded as indirect investment vehicles in both companies outside the portfolio's country or companies that are already included in the country-level portfolio. As such, I do not use a market return variable in this analysis as one would then effectively compare two market portfolios, one that meets the selection criteria set in this paper and one that does not. Instead, the portfolios are created using the selected companies, which creates a form of compatibility between the variables that removes the possibility of comparing two completely different things without meaning to. After all, not using the selection methods that are used to create the SMB and HML portfolios for the creation of the market portfolio seems counterintuitive and as such the same selection standards will be used. As the primary exploratory model only uses the SMB and HML factors, care must therefore be taken when interpreting the results as the significance of these factors could very well be weaker if a market variable were to be added.

The years between 1991 and 2014 can be considered rather turbulent in the sample countries due to a number of financial crises. For instance, the Asian financial crisis of 1997 is likely to have a significant effect on the majority of the sample's companies in these countries and the majority of the effects of the global financial crisis of 2007 and 2008 also fall within the interval. In addition to such wide-spread crises, localized financial or currency crises have also occurred in Mexico (1995), Russia (1998), Brazil (1999) and Argentina (2002). (Kouwenberg & Solomons, 2006) As the financial markets are likely to be highly volatile in times of crisis, analysing the differences between companies with a high book value relative to the market value of their shares and glamour stocks seems significant. One would expect that glamour stocks would have trouble maintaining their status and with that their stock price in such times, while value stocks could either shine due to their intrinsic value or show significant weaknesses that are the heart of why their stock prices were low to begin with. As such, this paper aims to show the differences between the value anomaly in these potentially volatile markets and the more stable global market.

In order to research this anomaly, I have chosen to use monthly data due to the following reasons. As the value anomaly is based on the growth potential and the ability to remain solvent of companies with a relatively high book value of equity, it would make sense to look at a long-term growth figure. Daily growth figures could be used instead, but events that severely damage or improve the growth potential of a company or alter its solvency position will most likely still be reflected quite well in monthly data. On the other hand, daily data is likely to contain significant trader noise that does not reflect on the solvency or the growth potential of the companies in question. Additionally, the explanatory variables that are examined in this paper consist of monthly, quarterly, yearly and even constant data. Explaining daily returns using much lower-frequency data would not make much sense. On the other hand, using quarterly or yearly data could smooth out months of unusual performance, which may also be a sub-optimal solution. Using monthly data does create some complications with data where only low-frequency data is available, but it has been chosen as the least bad option regardless.

4.1: Five Factor Model

The primary model regresses the monthly returns of the portfolios against the Fama-French factors. The HML and SMB factors have been calculated using country-level portfolios of the developing markets included in the sample according to the example set by Kenneth French, using the very same methods listed he uses to create the benchmark values. This has been done to combat the irrelevance of the pre-calculated Fama-French factors listed on Kenneth French's website as they are based on US equities, whereas my paper focuses on equities in developing countries. By using local data, it also becomes possible to compare the local data to data from developed markets. For the modified five-factor models, momentum data and liquidity data is added. As with the HML and SMB factors, portfolios have been created in order to estimate the returns on these two factors. The momentum data consists of portfolio returns with a lag of one, three, and six months. The liquidity data is based on the bid-ask spread of the shares and the amounts of shares traded. In order to filter out the effects of the size of the companies and their current share prices, I am using the proportional bid-ask spread and the share turnover. Additionally, by multiplying the share turnover by one divided by the proportional bid-ask spread, a combination variable is created. The division is required as a high bid-ask spread indicates low liquidity while a high share turnover indicates high liquidity.

4.2: Macroeconomics

For the second regression model, macroeconomic data is required in order to examine the effects of macroeconomic factors on the difference between the value beta of the sample countries and the benchmark values. Unfortunately, there are some occurrences of missing data despite the use of multiple sources. The GDP factor is measured using quarterly real GDP growth data gathered from the IMF's International Financial Statistics (IFS) database. Data concerning Taiwan's GDP growth was not available in the IFS database and has therefore been obtained from the National Statistics Office of the Republic of China (Taiwan). While quarterly data is likely to be an imperfect representation of the higher-frequency changes that occur within a country's economy, I have chosen to regard variables that only provide lower-frequency data to be stable throughout the months represented in the data points. The

alternative would be data smoothing, which requires the assumption of stability of the changes within the growth factor, which is not much easier to defend than the assumption of the growth factor being stable itself. The difference lies in the fact that smoothing data requires one to simply make up data whereas assuming the stability of data that is supposed to represent the entire range of periods within the lower-frequency period does not.

The inflation data used in this thesis is month-over-month CPI inflation data gathered from the IMF Macroeconomic & Financial Data page. Unfortunately, this dataset was incomplete as well and it has been supplemented with yearly CPI inflation data provided by the World Bank. As the monthly data is a month-over-month growth rate, the yearly data has to be made compatible with the existing data. This will be done assuming constant inflation due to the lack of higher-frequency information.

As the IMF and the World Bank do not provide sufficient real exchange rate data, this paper uses real effective exchange rate data provided by the Bruegel Economic Think Tank. The database provides real CPI-based effective exchange rates in consideration of 41 trading partners. As all real effective exchange rate data is monthly data, smoothing or additions from other datasets are not required.

The Credit Rating data used in this paper is gathered from the Standard & Poor's Global Credit Portal. When this data was unavailable, credit ratings from Moody's were used instead. Any other missing data was filled in using Fitch sovereign rating data. All rankings have been converted to numerical values where lower numerical values represent a higher rating i.e. a value of 1 represents an AAA rating and a value of 21 indicates a default.

For the third regression stage, the variables that are used are the same as the ones used by La Porta et al. (1998). While authors such as Erb, Harvey & Viskanta (1996) have used more recent data made available in the International Country Risk Guide (ICRG) of the PRS Group, obtaining the privately-owned data required to cover all countries and years mentioned in this work is very unlikely to be cost-effective. As an alternative, the data used in this paper is taken directly from the La Porta et al. (1998) paper. However, as this thesis project is focused purely

on equity, the debt holder rights mentioned in the La Porta et al. (1998) paper are regarded as irrelevant and are excluded from the analysis.

One of the main indicators of the shareholder protection measures that one can expect in a country is the origin of its legal system. Common law countries tend to offer the strongest legal protection to both shareholders and creditors. This is in stark contrast to countries that have their legal origins in the French system. These are known to offer the least protection to shareholders and creditors. The level of protection offered in German civil law countries falls between the protection offered in the common law countries and the French civil law countries. The Scandinavian legal system offers protection comparable to that of the German civil law countries, but as my sample does not contain any countries with Scandinavian legal origins, this section will focus on legal systems of French, German or common law origins. While the German law countries do not offer the most protection, these countries do have the highest level of law enforcement in order to establish trust in the provided legal protection. Common law countries fall behind German civil law countries in terms of law enforcement, but still perform better than French civil law countries. In order to test if this concept translates to a difference in common share returns, dummy variables are introduced to the panel regression.

4.3: Shareholder rights

As risk is an integral part of the financial system, it is good to pay attention to shareholders as well; in particular the rights that come with equity ownership in the sample countries. This subsection is dedicated to these shareholder rights and the reasons why they can be expected to affect the returns of value portfolios and equity portfolios in general.

First off, this paper examines the one-share-one-vote rule that a number of sample countries are subject to. While at first glance this measure seems to put minority shareholders at a disadvantage due to their low number of votes, the one-share-one-vote rule is actually advantageous to shareholders. Due to the distribution of votes, it becomes impossible for insiders to divert cash flows to themselves with minimal investment as these practices will require the ownership of the majority of the shares in this case (La Porta et al., 1998). This measure protects outside shareholders and potentially other stakeholders from such

questionable practices. As one would expect companies where this occurs to enjoy little investor demand and with that a high B/M-ratio and high shareholder risk, it is possible to deduce that this measure should have a negative effect on the value anomaly. This is in accordance with the assumption that under ceteris paribus, the expected growth for high-B/M shares will be higher in countries where this problem is rampant due to the increased required returns on shareholder risk.

The second shareholder rights variable that is considered in the analysis is the mail proxy rule. In some countries, shareholders are required to be present physically at shareholder meetings in order to vote (La Porta et al., 1998). Naturally, this raises a significant barrier for investors when it comes to making their voices heard, especially when they have a well-diversified portfolio. The ability to vote through mail or other means will generally allow shareholders to become more active in making their wishes known and monitoring the behaviour of the company's management. This measure could allow potential investors with diversified portfolios to invest in more risky ventures as it becomes easier to influence the use of the relatively substantial assets of high-B/M companies. This suggests that high-B/M companies may stand to gain more from the measure than low-B/M companies due to their growth potential and risky nature.

Financial markets in some countries also block shares from being traded for a number of days prior to and after shareholder meetings. This is done by requesting shareholders to deposit their shares either with the company or with a financial intermediary for this period of time. While La Porta et al. (1998) treats this measure as one that empowers directors and adversely affects shareholders, it protects companies from individuals or organisations that can purchase large volumes of shares right before a meeting and sell them afterwards to obtain far more voting power with minimal risk, protecting minority shareholders that may not have such funds at their disposal in the process. While these actions can affect companies with a high B/M-ratio as much as companies with a low B/M-ratio, the shares of a high B/M-ratio company are relatively cheap if liquidity is not an issue. This suggests a negative relation between the dummy variable and the B/M-ratio.

In addition to protecting and facilitating the voting process itself, a number of countries also allows cumulative director voting. In contrast to statutory voting, this system allows shareholders to forego their votes on certain decision topics during a meeting in order to use the number of unused votes for another decision in the same meeting. For example, if the board requires three new directors and a shareholder owns 300 shares, the number of total shares is multiplied by the number of candidates, allowing the shareholder in question to use all 900 shares to vote a candidate into a specific seat. This method is meant to give minority shareholders more possibilities to influence a shareholder meeting in their favour (La Porta et al., 1998). As an increase in the voting power of minority shareholders may instil confidence in investors, the overall returns in a country are likely to be affected positively. However, this does not necessarily mean that the returns on the value anomaly are increased with it as it benefits both high-B/M and low-B/M companies, although high-B/M companies are generally seen as unsafe and therefore require higher returns, which the existence measure would most likely alter while low-B/M companies already enjoy a relatively high level of investor confidence. This would then translate into a negative relation between the measure's dummy variable and the returns on an HML portfolio.

Minority shareholders can also be protected in a different manner. A number of countries in the sample have measures in place that protect these shareholders in the event that they perceive a level of oppression by directors, specifically through forced buybacks and possible legal action. The measures themselves differ between countries, but the common purpose is the protection of minority shareholders from certain decisions made by directors. As this is likely to instil confidence in investors, there is likely to be a negative impact on the returns on B/M. Besides that, a lower requirement of equity capital owned in order to call for an extraordinary shareholder meeting allows minority shareholders more possibilities to exert a form of influence onto the company. As the variable is measured as a percentage of the shares required to call for a meeting, a positive relation with the B/M returns is to be expected.

La Porta et al. (1998) combine the previous five variables into an ordinal anti-director rights variable that ranges from 0 to 5 through adding 1 for every measure that is in place or

when the percentages of shares required to call for a shareholder meeting is below or equal to 10%. While it would require a deeper analysis to examine the interactions between the variables, this anti-director rights variable allows an insight in whether or not a combination of these variables have a more defined effect on the portfolios than the measures separately. As such, a negative relation between the variable and the B/M portfolio returns is expected.

The final shareholder rights variable is unrelated to voting rights and the protection of minority shareholders, but rather looks at the level of mandatory dividends in the countries where such rules are in place. This level of mandatory dividends is measured in percentages of the net income that is to be distributed amongst ordinary shareholders. While in theory the cash flows from dividends and the corresponding decrease in share price are equal, there is a different kind of benefit to mandatory dividends. As dividend payments have to be made in accordance to the net income of a company, the company is less likely to overstate its profits due to the increase in the dividends the company will have to pay out. This form of forced transparency is likely to have a slight increase in the confidence in less popular shares and with that a decrease in the returns on B/M.

4.4: Law enforcement

In addition to the aforementioned shareholder rights and the excluded debtor rights, La Porta et al. (1998) also describe law enforcement standards that determine how well stakeholders are protected in the event that a company fails to meet its legal requirements. These law enforcement variables consist of several ways in which either the legal rights of shareholders and debt holders are enforced, but also a number of measures that show to which degree the local governments support business activities.

The first measure of the enforcement of stakeholder laws that is used in La Porta et al. (1998) is the level of efficiency of the judicial system. It is defined as “The assessment of the efficiency and integrity of the legal environment as it affects business, particularly foreign firms” and uses data produced by the risk rating agency named Business International Corporation (La Porta et al, 1998). The variable represents an investor’s view of the level of efficiency with which the judiciary powers of the country operates, where a lower rating

indicates less efficiency. As a higher level of efficiency protects shareholders from dubious management activities, it is likely that there is a negative relation between a country's judicial efficiency ranking and its returns on B/M portfolios.

The other direct measure that La Porta et al. (1998) use to quantify the quality of the law enforcement in the sample countries is called the "Rule of Law" variable. Where the previous judicial efficiency variable focused on the resolution of legal issues, the rule of law variable shows how capable the law enforcement institutions are when it comes to detecting and dealing with illegal activities that affect shareholders. As with the judicial efficiency measure, a lower score represents a less effective law enforcement system and is likely to show a higher return on the value anomaly due to uncertainty in the market leading to higher required returns.

A major indicator of how supportive a government is of its country's businesses is the level of corruption of its officials. La Porta et al. (1998) defines this as the likeliness that government officials demand special payments in the form of bribes connected to import and export licenses, exchange controls, tax assessments, policy protection and loans. Lower values for this variable indicates higher levels of corruption. As corruption affects all forms of business with possibly increasingly large bribes for more successful companies, it is difficult to form an expectation regarding the effects on B/M portfolios in particular. This is in contrast to the easily-made expectation that portfolios with a long position in such a country's companies will fare better in general. That said, a higher degree of safety overall is likely to decrease the required returns, decreasing the B/M returns in turn.

La Porta et al. (1998) also measure the risk of the forced nationalization of a company in a variable named "Risk of Expropriation". They use International Country Risk Guide (ICRG) data that measures the probability of private companies being confiscated by the national government. As with the corruption scale, it is ranked from 0 to 10 where a high score in the variable corresponds to a low risk of expropriation. As with the corruption measure, it is difficult to establish an expectation of which kind of companies would be more likely to be affected by this risk, but the general sense of safety provided by a lower risk of expropriation

can be expected to decrease the required returns and therefore the B/M portfolio returns in the respective markets.

The third and final direct government behaviour variable pertains to the risk of contract repudiation from the government's side. As a country's government is an entity that commissions projects for the good of the country with the use of private companies, it engages in numerous contracts pertaining to these projects. However, as political regimes have a tendency to change their priorities, either due to new elections or otherwise, it is possible that a government decides that certain projects are no longer desirable. The "Risk of Repudiation of Contracts by Government" variable found in the La Porta et al. (1998) paper measures the risk that governments scale down, postpone or even fully repudiate a contract it has engaged in. As government projects can be contracted to companies that are best suited to take on the task, it can be reasoned that contracts of this magnitude are more likely to be established with notable and profitable companies. As such, this variable is more likely to affect companies with a low B/M-ratio, potentially leading to an increase in such portfolio returns at higher risk levels.

The final variable pertains to the quality and the strictness of the accounting standards in the sample countries. In order to estimate the value of a share, investors frequently use accounting information. As such, obtaining a higher level of certainty over the quality of that information allows shareholders to gain more accurate pricing information. In addition to the simple improvements in the reliability of the provided accounting information, the La Porta et al. (1998) paper also mentions that due to a more precise statement of a company's income, investors can use this information in events where for instance a bond covenant requires immediate repayment when the respective company's income drops below a certain level. At this point the provided income level can be considered verifiable in court, which in turn allows such contracts to be enforceable by law. As such, shareholders are likely to be more confident in a market with good accounting standards, although it may become more difficult for companies with low incomes to generate more equity by overstating profits. While this also weeds out overpriced shares, these are likely to fall into a higher B/M category as a result in the

long run. As such, this measure is likely to be a net benefit to low B/M companies and thus lower the B/M returns.

Chapter 5: Results

The results section will be divided into three subsections according to the different tests performed to obtain the information required to answer the research questions of this paper. First and foremost, I will discuss the regression analysis of the Fama French 3-Factor model. Due to the sheer number of models, the full tables will not be shown in this paper. Instead, this section will show a summary of the relevant statistics.

5.1: Fama French 3-factor model

The first column shows the statistical significance of the HML factor on the total market returns, calculated by ranking the companies in the portfolios according to their B/M ratios. Any P-value below 5% is seen as significant. This statistic shows whether or not the HML factor exists to a significant degree in the form that is based on the B/M ratio. While this is a rather crude and simple model, it is a fairly good indicator of its existence. At first sight, there are a number of countries where the HML factor is prevalent on a country-level with a small majority of 14 countries where its presence is statistically significant against 9 where it is not. Additionally, on a regional level, it becomes clear that the factor has significant prevalence in Asia and South America, while this does not seem to be the case in the EMEA region.

The second column shows the differences between the monthly returns on the HML (B/M) factor in the sample countries as compared to the US benchmark returns on both a country level and a regional level. While existing literature shows indications that B/M returns should be positive and significantly greater in the sample, this does not appear to be the case. Instead, for nearly all countries the calculated returns on an HML portfolio appears to do worse than its US counterparts in a long-term panel setting at a 95% confidence level. Only in Colombia, the Czech Republic, Hungary, Peru and Venezuela, the returns are not significantly lower. This may be related to the sample size in these countries, however, as a small sample size is something that the countries in question have in common. In the case of Venezuela, the sample size was too small to even yield a B/M return value, although Venezuelan equities have been added to the South-America region sample for the analysis.

When examining the third column, it is possible to find an explanation for the surprisingly low returns on the value anomaly. Almost all countries show a significant degree of heteroskedasticity in the analysis. This may show that while in the short run the strategy may pay off extremely well, it will fail in the long run. This would correspond to an unstable variance as shown in the analysis.

In addition to the prevalent heteroskedasticity, the sample also shows significant autocorrelation in the returns of many of the sample countries and all regions across the full length of the tested lags of one to six months. This shows that the model would be more accurate in predicting the share returns if an autoregressive variable were to be added. This was to be expected due to the lack of a market returns variable that is generally a relatively stationary variable. Regarding the actual objective, however, the reduced effectiveness of the model is less relevant than the significance of the HML beta. While the results are not extremely conclusive in the sense that the HML variable is not significant in all countries, it does appear to have a significant presence. The only problem that should be considered is that there may be the problem of spurious relations that filter out when the model begins to incorporate more variables in the next subsection.

The fifth and final column examines the predictive value of the model in determining the price growth of the market portfolio, adjusted for the number of variables incorporated in the model. While a number of countries show a surprisingly high predictive power, i.e. Indonesia, Malaysia, Peru, Russia and Venezuela, the adjusted R^2 values of the model are generally less than impressive, especially on a regional level. In the case of Venezuela, however, it can be assumed that this is purely due to the sample size of the country.

Initial Model	*HML Significance (α = 5%)*	*Compared to Benchmark*	*Comparison Sig. (α = 5%)*	*Heteroskedasticity (α = 5%)*	*Autocorrelation*	*Adjusted R2*
Argentina	0.0000	<	0.0000	0.0000	1,2,3,4,5,6	0.1182
Brazil	0.0008	<	0.0014	0.0000	1,2,3,4,5,6	0.0497
Chile	0.1978	<	0.0000	0.0000	1,2,3,4,5,6	-0.0002
China	0.0001	<	0.0000	0.0010	-	0.0935
Colombia	0.1482	=	0.0092	0.0000	1,2	0.0018
Czech Republic	0.0191	=	0.1108	0.6552	-	0.1339
Egypt	0.1294	<	0.0000	0.0000	1,2,3,4,5,6	0.0623
Hungary	0.0002	=	0.0078	0.0000	-	0.1092
India	0.0000	<	0.0000	0.0219	1,2,3,5,6	0.1420
Indonesia	0.0000	<	0.0000	0.0460	1,2,3,4,5,6	0.2619
Israel	0.0131	<	0.0000	0.1564	1,2,3,4,5,6	0.0350
Malaysia	0.0004	<	0.0000	0.0000	2,3,4,5,6	0.1934
Mexico	0.0000	<	0.0002	0.1620	1,2,3,4,5,6	0.0981
Peru	0.2930	=	0.0394	0.0000	1,2,3,4	0.1694
Philippines	0.0347	<	0.0000	0.0000	1,2,3,4,5,6	0.0116
Poland	0.0466	<	0.0000	0.0021	1,2,3,4,5	0.0234
Russia	0.0000	<	0.0002	0.0304	1,2,3,4,5,6	0.2765
South Africa	0.3164	<	0.0000	0.0000	1,2	0.0451
South Korea	0.0016	<	0.0000	0.0000	1,2,3,4,5,6	0.0288
Taiwan	0.0649	<	0.0000	0.0005	1,2,3,4,5,6	0.0055
Thailand	0.2872	<	0.0000	0.0000	1,2,3,4,5,6	0.0285
Turkey	0.0974	<	0.0000	0.0000	-	0.0152
Venezuela	0.0736	NA	0.1520	0.3930	-	0.1884
Asia	0.0001	<	0.0000	0.0000	1,2,3,4,5,6	0.0819
EMEA	0.1597	<	0.0000	0.0047	1,2,3,4,5,6	0.0550
South America	0.0001	<	0.0000	0.0000	1,2,3,4,5,6	0.0536

5.2: Fama-French 5-factor model

Once the model is converted, the optimistic image in regard to the significance of the HML beta changes. Especially when using the liquidity measure based on the proportional bid-ask spread, only a select few countries still show a significant impact from the HML beta on the market portfolio growth. This indicates that there is likely to be a case of spurious relations that have been counteracted by adding the new variables. In particular, the problem of autocorrelation should have been reduced significantly by adding the momentum variables. In addition to that, it appears that using the bid-ask spread method of determining the liquidity of the assets increases the P-value for the significance of the HML beta with Thailand and Turkey showing an exceptional opposing effect. In this extended model, the sample sizes for Colombia, the Czech Republic and Venezuela are insufficient to yield any results due to the limited number of equities with liquidity data in the original samples. On a regional level, only the Asian markets appear to be affected by the B/M ratio version of the value anomaly. Judging by the rest of the table, it is likely that this is mainly due to the substantial equity markets in India, Malaysia and South Korea showing significant signs that the value anomaly is present there.

HML Sig. (α = 0.05)	*Model 1BA*	*Model 3BA*	*Model 6BA*	*Model 1T*	*Model 3T*	*Model 6T*	*Model 1C*	*Model 3C*	*Model 6C*
Argentina	0.3856	0.4203	0.4015	0.0379	0.0574	0.0605	0.0229	0.0367	0.0419
Brazil	0.5937	0.9123	0.6121	0.0512	0.3093	0.0259	0.0739	0.3504	0.0393
Chile	0.3566	0.3000	0.2927	0.2068	0.1764	0.1813	0.2764	0.2260	0.2383
China	0.1815	0.1073	0.0913	0.5635	0.1847	0.1761	0.8375	0.7426	0.5762
Colombia	-	-	-	-	-	-	-	-	-
Czech Republic	-	-	-	-	-	-	-	-	-
Egypt	0.4847	0.6998	0.5877	0.8355	0.6538	0.7440	0.8225	0.5765	0.6926
Hungary	0.9815	0.8713	0.9873	0.9422	0.6896	0.9695	0.9833	0.7626	0.9877
India	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000
Indonesia	0.0913	0.1503	0.0579	0.2757	0.2921	0.2992	0.0243	0.0379	0.0163
Israel	0.0927	0.0844	0.1539	0.0020	0.0022	0.0003	0.0124	0.0137	0.0034
Malaysia	0.0013	0.0039	0.0047	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mexico	0.0000	0.0000	0.0000	0.0018	0.0014	0.0025	0.0007	0.0005	0.0012
Peru	0.4117	0.4888	0.7039	0.2143	0.3287	0.4092	0.4633	0.5224	0.7719
Philippines	0.6692	0.8290	0.4771	0.6343	0.5968	0.3329	0.6126	0.5891	0.3200
Poland	0.1474	0.0613	0.4854	0.0013	0.0001	0.0256	0.0015	0.0001	0.0223
Russia	0.9716	0.9688	0.3932	0.9597	0.9511	0.3521	0.9994	0.9425	0.3484
South Africa	0.4874	0.3366	0.5194	0.4417	0.5624	0.2002	0.9121	0.6932	0.9444
South Korea	0.5600	0.6050	0.4745	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Taiwan	0.1938	0.1698	0.2363	0.0266	0.0077	0.0280	0.1870	0.0750	0.2149
Thailand	0.0075	0.0072	0.0085	0.5441	0.3626	0.3053	0.9341	0.6833	0.6668
Turkey	0.0697	0.0151	0.0313	0.8845	0.4374	0.6669	0.6596	0.5492	0.8193
Venezuela	-	-	-	-	-	-	-	-	-
Asia	0.7555	0.5021	0.6514	0.0169	0.0094	0.0469	0.0149	0.0079	0.0457
EMEA	0.0531	0.0523	0.0285	0.3728	0.3770	0.4512	0.9388	0.9893	0.7779
South America	0.4688	0.2711	0.3289	0.1054	0.0488	0.0943	0.1764	0.0842	0.1340

In order to obtain information on which variables exactly affect the significance of the HML beta and the accuracy of the model, the difference between the models should be examined. A simple comparison of the adjusted R^2 values already shows a significant difference between the Three-Factor model and any of the Five-Factor models. The only exception to this would be the Russian market, which does not show much change in the adjusted R^2 regardless of the model that is used. The table also shows that the highest adjusted R^2 values are generally obtained using the Shares Traded variable to measure the returns on liquidity. The results regarding the momentum anomaly are not quite as clear, unfortunately. However, due to the presence of autocorrelation across all tested lags, this should not come as a surprise. In most countries, there are only minor differences between the effects of the chosen momentum variable on the explanatory power of the models with the exception of Brazil, Israel and Peru. This extends to a regional level where the Shares Traded models outperform the other models but show little variance in the R^2 values between them. This suggests that these three models are the most likely to show the actual presence of the value anomaly in these developing markets.

Adjusted R2	*Model 0*	*Model 1BA*	*Model 3BA*	*Model 6BA*	*Model 1T*	*Model 3T*	*Model 6T*	*Model 1C*	*Model 3C*	*Model 6C*
Argentina	0.1182	0.1680	0.1831	0.1685	0.5853	0.5876	0.5856	0.5806	0.5818	0.5810
Brazil	0.0497	0.1446	0.1642	0.1212	0.1389	0.1946	0.0491	0.1223	0.1753	0.0410
Chile	-0.0002	0.0690	0.0438	0.0437	0.4938	0.4956	0.4943	0.3951	0.3940	0.3915
China	0.0935	0.2209	0.2054	0.2055	0.4629	0.4345	0.4238	0.4309	0.4086	0.4081
Colombia	0.0018	-	-	-	-	-	-	-	-	-
Czech Republic	0.1339	-	-	-	-	-	-	-	-	-
Egypt	0.0623	0.4560	0.4535	0.4489	0.6317	0.6326	0.6296	0.5963	0.5969	0.5912
Hungary	0.1092	0.2530	0.2318	0.2312	0.2443	0.2219	0.2076	0.2398	0.2171	0.2062
India	0.1420	0.2254	0.2214	0.2206	0.6023	0.5400	0.5426	0.4999	0.4523	0.4584
Indonesia	0.2619	0.1645	0.2147	0.1827	0.5573	0.5570	0.5570	0.2644	0.2786	0.2762
Israel	0.0350	0.2434	0.1978	0.2702	0.4513	0.4511	0.5539	0.4185	0.4126	0.5349
Malaysia	0.1934	0.8158	0.8123	0.8138	0.8530	0.8510	0.8516	0.8472	0.8466	0.8469
Mexico	0.0981	0.3138	0.3107	0.3134	0.4358	0.4397	0.4309	0.4092	0.4088	0.3948
Peru	0.1694	0.2272	-0.0806	0.1294	0.3686	0.1901	0.2368	0.2070	-0.0890	0.0759
Philippines	0.0116	0.3065	0.3098	0.3025	0.5301	0.5232	0.5251	0.4667	0.4613	0.4658
Poland	0.0234	0.2201	0.2211	0.2380	0.4287	0.3927	0.4576	0.4170	0.3776	0.4343
Russia	0.2765	0.2711	0.2944	0.2927	0.2580	0.2735	0.2887	0.2541	0.2702	0.2843
South Africa	0.0451	0.0822	0.0387	0.0336	0.1619	0.1227	0.1444	0.0937	0.0432	0.0466
South Korea	0.0288	0.1251	0.1256	0.1239	0.5994	0.5995	0.5996	0.5403	0.5399	0.5398
Taiwan	0.0055	0.1448	0.1447	0.1407	0.5009	0.5600	0.5035	0.4323	0.5185	0.4340
Thailand	0.0285	0.5112	0.5110	0.5127	0.8273	0.8220	0.8183	0.7907	0.7837	0.7836
Turkey	0.0152	0.1754	0.2243	0.0983	0.4368	0.4074	0.3623	0.4311	0.3953	0.3451
Venezuela	0.1884	-	-	-	-	-	-	-	-	-
Asia	0.0819	0.2110	0.2018	0.2131	0.4384	0.4369	0.4485	0.3941	0.3922	0.4106
EMEA	0.0550	0.0451	0.0427	0.0318	0.2371	0.2353	0.2197	0.1659	0.1706	0.1475
South America	0.0536	0.0397	0.0305	0.0053	0.2072	0.2087	0.2090	0.1335	0.1310	0.1187

In order to examine if the Shares Traded models are indeed the best models to represent reality and with that give the most reliable view on the presence of the value anomaly, the individual significance of the variables incorporated in the model is measured. As such, the first table to be examined in this subsection is the significance of the liquidity variables used in the varying models. When comparing the liquidity significance table and the R^2 table, there seems to be a clear correlation between the significance of the liquidity and the predictive power of the models. As such, the models of the Russian market and the Hungarian market do not show much of an increase in predictive power due to the addition of any of the liquidity variables. The model of the Peruvian market, however, shows some strange results in the sense that the only model in which the Shares Traded shows statistical significance, the R^2 is lower than for the models that use the same liquidity variable, but a different momentum variable. It can be assumed that in these three markets, the returns on a liquidity portfolio is less reliable than in the other markets.

Liquidity Sig. (α = 0.05)	*Model 1BA*	*Model 3BA*	*Model 6BA*	*Model 1T*	*Model 3T*	*Model 6T*	*Model 1C*	*Model 3C*	*Model 6C*
Argentina	0.1329	0.0836	0.1473	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Brazil	0.0119	0.0785	0.0002	0.0216	0.0029	0.1853	0.1280	0.0229	0.5080
Chile	0.5766	0.5559	0.5539	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
China	0.0060	0.0073	0.0068	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Colombia	-	-	-	-	-	-	-	-	-
Czech Republic	-	-	-	-	-	-	-	-	-
Egypt	0.0018	0.0029	0.0014	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hungary	0.3102	0.2919	0.1617	0.5509	0.5451	0.6602	0.9437	0.9773	0.7682
India	0.0751	0.1197	0.0666	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Indonesia	0.0020	0.0021	0.0052	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Israel	0.2350	0.1074	0.0037	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Malaysia	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mexico	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Peru	0.5548	0.4979	0.3807	0.0897	0.0436	0.1200	0.8713	0.5471	0.8799
Philippines	0.1972	0.2712	0.1418	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Poland	0.0006	0.0008	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Russia	0.1227	0.0764	0.1937	0.3910	0.4965	0.2798	0.6132	0.8235	0.4365
South Africa	0.1312	0.0697	0.1041	0.0000	0.0000	0.0000	0.0321	0.0416	0.0235
South Korea	0.6927	0.6564	0.6389	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Taiwan	0.2755	0.1439	0.2183	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Thailand	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Turkey	0.0023	0.0127	0.0138	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Venezuela	-	-	-	-	-	-	-	-	-
Asia	0.6305	0.8035	0.6894	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
EMEA	0.3091	0.2808	0.4285	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
South America	0.9668	0.9822	0.6025	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Moving on to the momentum variables, the results are rather surprising. As there are only minor differences in the R^2 values between the Shares Traded models, one would expect this to be reflected in the statistical significance of the momentum variables. Instead, the three-month momentum variable and the six-month variable show far fewer instances in which they are significant than the one-month momentum variable. This could be explained by the nature of the autocorrelation found in the models. After all, the Three-Factor model shows that there is autocorrelation with all six previous months. This suggests a more intricate and probably non-linear form of autocorrelation that possibly is not fully compensated for with only one momentum variable. Peru and Russia appear to be exceptions to this as the models of Peru show a sharp increase in R^2 while also showing a steady significance of the one-month momentum variable, while the Russian market seems to be affected more by long-term momentum variables rather than the one-month momentum variable.

Momentum Sig. (α = 0.05)	*Model 1BA*	*Model 3BA*	*Model 6BA*	*Model 1T*	*Model 3T*	*Model 6T*	*Model 1C*	*Model 3C*	*Model 6C*
Argentina	0.9271	0.2439	0.8244	0.6650	0.4398	0.6276	0.6005	0.4843	0.5509
Brazil	0.0339	0.0044	0.5839	0.0001	0.0000	0.9481	0.0002	0.0000	0.9059
Chile	0.1657	0.9054	0.9445	0.7569	0.5524	0.6925	0.4908	0.5568	0.8087
China	0.0602	0.6991	0.6709	0.0004	0.0620	0.6173	0.0054	0.2861	0.3134
Colombia	-	-	-	-	-	-	-	-	-
Czech Republic	-	-	-	-	-	-	-	-	-
Egypt	0.2371	0.3395	0.8981	0.4407	0.3511	0.9436	0.2482	0.2209	0.9873
Hungary	0.1273	0.4068	0.4230	0.0490	0.1410	0.2941	0.0714	0.2164	0.3959
India	0.1320	0.2647	0.3122	0.0000	0.1989	0.0968	0.0000	0.6504	0.1168
Indonesia	0.0550	0.0001	0.0055	0.7216	0.9414	0.9914	0.2189	0.0247	0.0346
Israel	0.0012	0.0295	0.0002	0.7585	0.8283	0.0000	0.2610	0.5932	0.0000
Malaysia	0.0662	0.4531	0.1820	0.1271	0.5989	0.3366	0.2153	0.3317	0.2686
Mexico	0.2949	0.5278	0.3142	0.2480	0.1234	0.9034	0.0527	0.0560	0.7329
Peru	0.0357	0.6445	0.0876	0.0483	0.3772	0.2170	0.0324	0.4362	0.1028
Philippines	0.2776	0.1614	0.6271	0.0772	0.3929	0.2362	0.1372	0.4556	0.1666
Poland	0.5251	0.4582	0.0899	0.0098	0.6770	0.0005	0.0071	0.5860	0.0012
Russia	0.0895	0.0218	0.0173	0.1055	0.0488	0.0106	0.1347	0.0586	0.0138
South Africa	0.0008	0.0916	0.1717	0.0011	0.1258	0.0084	0.0003	0.0770	0.0520
South Korea	0.6421	0.5816	0.9182	0.9300	0.8089	0.7670	0.6833	0.8710	0.9277
Taiwan	0.4818	0.4840	0.8445	0.6853	0.0005	0.4148	0.6633	0.0001	0.4891
Thailand	0.8534	0.9525	0.5244	0.0138	0.1165	0.8724	0.0412	0.6110	0.6197
Turkey	0.0002	0.0000	0.1085	0.0000	0.0004	0.0643	0.0000	0.0002	0.0543
Venezuela	-	-	-	-	-	-	-	-	-
Asia	0.0285	0.1363	0.0202	0.1750	0.2617	0.0154	0.1598	0.2551	0.0043
EMEA	0.0167	0.0224	0.0903	0.0287	0.0383	0.7255	0.0216	0.0111	0.3757
South America	0.0102	0.0275	0.6488	0.0259	0.0212	0.0203	0.0143	0.0192	0.0863

While the effect of the momentum factors on the market returns are limited, it is good to look back at the original Three-Factor model and remember the autocorrelation that plagued it. A simple comparison shows that the portfolio models of most countries show significantly less autocorrelation than the initial model. Strangely enough, however, the models for China and South Africa show far more autocorrelation in the errors than before. This seems to indicate that the estimated value created using the models are systematically inaccurate due to the expectation of autocorrelation where there is none or little in the original samples.

Autocorrelation	*Model 0*	*Model 1BA*	*Model 3BA*	*Model 6BA*	*Model 1T*	*Model 3T*	*Model 6T*	*Model 1C*	*Model 3C*	*Model 6C*
Argentina	1,2,3,4,5,6	1	1	1,2	-	-	-	-	-	-
Brazil	1,2,3,4,5,6	1,2,3,4	2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6
Chile	1,2,3,4,5,6	1,2,3,4,5	1,2,3,4,5	1,2,3,4,5,6	1	1	1	1	1	1
China	-	2,3,4,5,6	2,3,4,5,6	2,3,4,5,6	2,3,4,5,6	2,3,4,5,6	2,3,4,5,6	2,3,4,5,6	2,3,4,5,6	2,3,4,5,6
Colombia	1,2	-	-	-	-	-	-	-	-	-
Czech Republic	-	-	-	-	-	-	-	-	-	-
Egypt	1,2,3,4,5,6	-	-	-	-	-	-	-	-	-
Hungary	-	-	-	-	-	-	-	-	-	-
India	1,2,3,5,6	1,2	1,2,3,5,6	1,2,3,5,6	-	-	-	1,2,3,4,5,6	1,2,5	1,2,3,4,5,6
Indonesia	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4	1,2,3,4,5	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6
Israel	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,5,6
Malaysia	2,3,4,5,6	-	-	-	1	1,4,5,6	1,4,5,6	1	1,6	1,6
Mexico	1,2,3,4,5,6	-	-	-	-	-	-	-	-	-
Peru	1,2,3,4	-	3,5,6	6	-	1,6	6	-	3	-
Philippines	1,2,3,4,5,6	1,2	2	2	2,3,4,5	3,4,5	3,4,5	3	3	3
Poland	1,2,3,4,5	2,3	2,3	2,3	-	1,2	-	-	1,2	-
Russia	1,2,3,4,5,6	2	2,3	2	2	2,3	2	2	2,3	2
South Africa	1,2	1,2,3	1,2,3,4,5	1,2,3,4,5	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6
South Korea	1,2,3,4,5,6	-	-	-	-	-	-	-	-	-
Taiwan	1,2,3,4,5,6	1,2	1,2,3,6	1,2,6	-	1	-	1	1,2,3,4,5,6	1
Thailand	1,2,3,4,5,6	-	-	-	-	6	-	-	-	-
Turkey	-	-	-	-	-	-	-	-	-	-
Venezuela	-	-	-	-	-	-	-	-	-	-
Asia	1,2,3,4,5,6	2,3,4,5,6	2,3,4,6	2,3,4,5,6	2,3,4,5,6	2,3,4,5,6	2,3,4,5,6	2,3,4,5,6	2,3,4,5,6	2,3,4,5,6
EMEA	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6
South America	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5,6	1,2,3,4,5	1,2,3,4,5	1,2,3,4,5,6	1,2,3,4,5

While the autocorrelation is remedied to a degree through the addition of the new variables, the new models show less change in the presence of heteroskedasticity, unfortunately. While the errors may be less autocorrelated now, their distribution is still inconsistent. This may be explained by the turbulent years that a number of the sample countries have gone through and the development of the markets over time. Unfortunately, this makes it more difficult to predict the country portfolio returns using the model. For the purpose of completing the objectives of this paper, however, this is of less consequence as the main objective is to prove the effect of the value beta on the final returns. If anything, it shows that while it is most certainly present in many instances in which it was tested, it is not the only factor influencing the country portfolio returns.

Heteroskedasticity (α = 0.05)	*Model 1BA*	*Model 3BA*	*Model 6BA*	*Model 1T*	*Model 3T*	*Model 6T*	*Model 1C*	*Model 3C*	*Model 6C*
Argentina	0.0372	0.0799	0.0333	0.0155	0.0037	0.0079	0.0140	0.0032	0.0069
Brazil	0.0378	0.9375	0.7504	0.0000	0.0002	0.0037	0.0001	0.0040	0.0372
Chile	0.0065	0.3029	0.0021	0.1860	0.9928	0.0245	0.1928	0.8812	0.0227
China	0.0225	0.0013	0.0070	0.0000	0.0011	0.0183	0.0000	0.0000	0.0000
Colombia	-	-	-	-	-	-	-	-	-
Czech Republic	-	-	-	-	-	-	-	-	-
Egypt	0.0008	0.9313	0.0041	0.0478	0.6657	0.0128	0.0421	0.4837	0.0082
Hungary	0.9905	0.9915	0.9896	0.7140	0.6619	0.5070	0.6200	0.5825	0.6593
India	0.0000	0.0006	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Indonesia	0.0000	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Israel	0.0023	0.0082	0.0058	0.0002	0.0078	0.0302	0.0001	0.0028	0.1284
Malaysia	0.0007	0.2171	0.1349	0.0025	0.3374	0.1598	0.0088	0.4737	0.3787
Mexico	0.0729	0.0248	0.2153	0.0828	0.0889	0.0247	0.0111	0.0124	0.0014
Peru	0.3918	0.3918	0.3918	0.3918	0.3918	0.3918	0.3918	0.3918	0.3918
Philippines	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Poland	0.0000	0.0001	0.0003	0.0000	0.0000	0.0000	0.0003	0.0002	0.0000
Russia	0.0034	0.0561	0.0009	0.0021	0.0002	0.0035	0.0142	0.0009	0.0019
South Africa	0.0034	0.0000	0.0001	0.0110	0.0000	0.0000	0.0015	0.0000	0.0000
South Korea	0.0117	0.0002	0.0601	0.0003	0.0004	0.0007	0.0000	0.0001	0.0002
Taiwan	0.4148	0.2851	0.0049	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Thailand	0.0000	0.0000	0.0000	0.8416	0.1033	0.4853	0.8690	0.1684	0.7159
Turkey	0.0038	0.9568	0.0481	0.7486	0.9793	0.3172	0.5270	0.9629	0.3850
Venezuela	-	-	-	-	-	-	-	-	-
Asia	0.0000	0.0000	0.0000	0.0000	0.0001	0.0002	0.0001	0.0000	0.0001
EMEA	0.0478	0.0064	0.0003	0.0397	0.0070	0.0003	0.0089	0.0016	0.0003
South America	0.0213	0.2189	0.0318	0.0000	0.0000	0.0000	0.0008	0.0000	0.0000

The final variable in the adjusted Five-Factor model acts mostly as a control variable. As returns on anomalous factors are what define the other variables, the Return on Equity variable ranks the sample companies according to their actual performance. As such, a model that shows clear signs that the value anomaly is still present despite controlling for the expected growth of the market portfolio through the RoE variable is deemed more reliable than one that does not control for the performance of the expected returns as opposed to the unexpected returns due to the various anomalies. When inspecting the table more closely, two things stand out. Firstly, in Argentina, Egypt, Malaysia, South Korea and the EMEA region, the RoE variable is only significant when using the Bid-Ask Spread liquidity variable in the models. As this corresponds to far lower R^2 values in these models as compared to models using the other liquidity variables, one can interpret this as the RoE variable simply showing significance as a spurious relation as it is no longer significant in models where apparently superior liquidity variables are used. Secondly, it appears that with the exception of South Africa, the countries in which the RoE variable is significant at a 5% level in at least two of the three models using the Shares Traded variable, the R^2 values are above a respectable 0.4, regardless of the sample size of the respective country. It does appear to be the case that the variable loses its predictive power outside Asian markets as only Israel, Mexico, Russia and South Africa show significant

results outside the Asia region and the other regions do not show significant effects of the RoE variable on a regional level.

ROE Sig. (α = 0.05)	*Model 1BA*	*Model 3BA*	*Model 6BA*	*Model 1T*	*Model 3T*	*Model 6T*	*Model 1C*	*Model 3C*	*Model 6C*
Argentina	0.0001	0.0001	0.0001	0.0422	0.0523	0.0517	0.0436	0.0548	0.0563
Brazil	0.9974	0.8309	0.8162	0.2881	0.1707	0.0600	0.4286	0.2990	0.0966
Chile	0.1597	0.1392	0.1200	0.5116	0.6479	0.5868	0.6285	0.7873	0.7087
China	0.0000	0.0000	0.0000	0.0007	0.0006	0.0001	0.0099	0.0074	0.0022
Colombia	-	-	-	-	-	-	-	-	-
Czech Republic	-	-	-	-	-	-	-	-	-
Egypt	0.0000	0.0000	0.0000	0.1504	0.1130	0.1701	0.3750	0.2704	0.4170
Hungary	0.0583	0.1424	0.1115	0.0777	0.2308	0.1898	0.0720	0.2060	0.1692
India	0.0021	0.0008	0.0006	0.2679	0.0195	0.0177	0.0183	0.0013	0.0012
Indonesia	0.0002	0.0126	0.0003	0.0477	0.0463	0.0395	0.0001	0.0029	0.0003
Israel	0.0001	0.0009	0.0008	0.0156	0.0213	0.1338	0.0008	0.0022	0.0175
Malaysia	0.0000	0.0000	0.0000	0.3737	0.3107	0.3956	0.0739	0.1187	0.1275
Mexico	0.0405	0.0469	0.0672	0.0086	0.0075	0.0128	0.0157	0.0172	0.0316
Peru	0.3080	0.4220	0.5134	0.3305	0.4978	0.4752	0.2486	0.3811	0.3984
Philippines	0.0000	0.0000	0.0000	0.0046	0.0028	0.0016	0.0004	0.0003	0.0001
Poland	0.2344	0.5630	0.1338	0.6803	0.2144	0.6174	0.5013	0.2722	0.7782
Russia	0.0057	0.0005	0.0050	0.0035	0.0007	0.0034	0.0046	0.0012	0.0046
South Africa	0.0269	0.0588	0.0213	0.0260	0.0619	0.0124	0.0568	0.1342	0.0421
South Korea	0.0000	0.0001	0.0001	0.0805	0.0664	0.1541	0.0993	0.0690	0.1207
Taiwan	0.0001	0.0001	0.0002	0.0146	0.0009	0.0108	0.0417	0.0042	0.0336
Thailand	0.6463	0.6559	0.6716	0.0199	0.1649	0.0647	0.0896	0.2591	0.1979
Turkey	0.0079	0.6406	0.1164	0.1742	0.9543	0.6360	0.0533	0.7450	0.3651
Venezuela	-	-	-	-	-	-	-	-	-
Asia	0.0000	0.0000	0.0000	0.0002	0.0010	0.0086	0.0000	0.0001	0.0018
EMEA	0.0244	0.0321	0.0153	0.6245	0.6967	0.5406	0.2419	0.3185	0.1792
South America	0.1163	0.0483	0.0868	0.1934	0.0903	0.0796	0.1629	0.0719	0.0818

Using the information from the aforementioned tables, it is now possible to make a prediction regarding the existence of the value anomaly in the markets. The R^2 values of the different models show that the most reliable model for estimating the returns of the market portfolios is the group of models using the Shares Traded liquidity variable. The momentum variables do not provide as clear an image, but fortunately it also means that the models do not seem to vary much in other aspects of significance. As such, these models will be examined in order to obtain more information regarding the presence of the value beta in developing markets. The table shows that the value anomaly as measured using the BM-ratio is present in fewer countries than expected as only India, Israel, Malaysia, Mexico, Poland, South Korea and Taiwan show a significant effect of the anomaly on the market returns on a country level and only in Asia does it appear statistically significant on a regional level. Additionally, Argentina only shows a statistically significant effect when the one-month momentum variable is used, Brazil shows a statistically significant effect when the six-month momentum variable is used, and South America does the same on a regional level, but only when using the three-month momentum variable. While autocorrelation in the errors for these models only really appears to

be a problem in Israel and Malaysia, heteroskedasticity is most certainly present in the models. This may be an explanation of why authors of previous papers are able to find such astounding returns on portfolios based on the value anomaly while this research shows that over an extended period, the returns on the BM-ratio are significantly lower than those of a similar portfolio in developed markets. While outliers most certainly exist, the strategy is simply not reliable in the long run and is very likely to cause significant losses when it is used for an extended period of time.

In order to determine which of the proposed variables affect the value anomaly, the difference between the returns on the value portfolios of the sample countries are regressed against said variables individually. While this method makes the analysis susceptible to spurious relationships, the number of variables is too large to allow for a reliable model. Even if the analysis takes the form of a panel analysis, the required sample size would pose a problem for the EMEA sample and the South America sample. A significant positive effect in the results implies that the returns on the value portfolios made in a certain region increase in comparison to the benchmark portfolio resulting from differences between countries or changes within countries of the corresponding variable.

All Years (1991-2014)	**Full Sample**		**Asia**		**EMEA**		**South America**	
	β	c	β	c	β	c	β	c
Credit Rating	*-0.111249	-1.915	**-0.1519549	-1.844	0.0336635	-3.159	-0.1783362	-0.742
Real Effective Exchange Rate	0.0131188	-4.300	-0.0066814	-2.660	0.0138520	-4.254	0.0399621	-6.442
Real GDP Growth (YoY)	0.0483653	-3.240	0.0422209	-3.480	0.1431912	-3.508	0.0249735	-2.732
Inflation	-0.2700584	-2.893	-0.3000194	-3.182	-0.2341808	-2.691	-0.7789516	-2.205
French Origin Dummy	-0.5443306	-2.519	-	-4.305	-	-2.185	-	-2.605
German Origin Dummy	-		**1.786067		-		-	
English Origin Dummy	-0.6015534		**1.322219		*-1.165476		-	
One Share, One Vote	0.2623376	-3.088	*0.9652792	-3.576	-	-2.819	-0.9995371	-2.090
Mail Proxy	-0.8038351	-2.917	-	-3.300	**-2.09566	-2.082	-0.0361091	-2.600
Shares Blocked Before Meetings	0.7184817	-3.131	0.3491555	-3.332	-	-2.819	0.8314521	-3.000
Cumulative Director Votes	-0.3485692	-2.937	-0.3520667	-3.175	-	-2.819	0.3536931	-2.675
Minority Power	-0.3865726	-2.779	0.5065593	-3.626	*-1.165476	-2.185	-1.3643070	-1.736
Extra Shareholder Meeting Percentage	2.937829	-3.322	*-9.583673	-2.365	**41.91319	-6.273	4.0931940	-3.177
Anti-Director Rights	**-0.4049596	-1.966	-0.1159935	-2.993	**-0.962761	-0.031	-0.3334113	-1.886
Mandatory Dividends	-1.06978	-2.924	-0.3558737	-3.273	-	-2.819	-3.2821370	-1.923
Judicial Efficiency	**0.3267512	-4.983	**0.3540004	-5.344	0.1648561	-3.872	1.0053100	-8.793
Rule of Law	0.0564027	-3.307	0.1148427	-3.885	0.7239670	-6.173	-0.5866567	0.787
Corruption	0.0615586	-3.352	**0.325505	-4.827	*-0.3224732	-0.617	-1.2020760	4.068
Risk of Expropriation	0.167619	-4.239	0.336225	-5.809	0.3934574	-5.594	-0.5108397	1.042
Risk of Contract Repudiation	0.0610415	-3.426	0.2340069	-4.914	-0.6551316	1.597	0.0557159	-2.950
Accountancy Standards	**-0.0334158	-0.851	-0.0403388	-0.338	**-0.0393335	-0.674	0.0011234	-2.666
Asia Dummy	-0.694722	-2.605	-		-		-	
EMEA Dummy	-0.2138862		-		-		-	
South America Dummy	-		-		-		-	

5.3: Macroeconomic variables

In examining the model, the first step is to simply use the full dataset in order to establish the effect of all variables on the returns on the value anomaly individually over the required timeframe. Examining the dataset, however, it becomes clear that many of the listed companies in the country portfolios lack stock data from the first number of years examined in the analysis. While it is not among the objectives of the thesis project, it would be interesting to see if the effects of the variables mentioned in the La Porta et al. (1994) paper remain as they are in the original sample from 1991 to 2014 if the companies included in the sample's market portfolio are more stable, allowing the models to be controlled for the changes in the portfolio size, hopefully reducing the heteroskedasticity problems in the models in the process. As such, the same analysis has been done for the years 2000 to 2014 and 2005 to 2014.

2000-2014	**Full Sample**		**Asia**		**EMEA**		**South America**	
	β	c	β	c	β	c	β	c
Credit Rating	*-0.0949567	-2.060	**-0.1642752	-1.852	0.0437773	-3.166	-0.1377585	-1.029
Real Effective Exchange Rate	0.0138056	-4.346	-0.0049634	-2.899	0.0222639	-5.023	0.0193787	-4.321
Real GDP Growth (YoY)	0.028616	-3.144	0.075222	-3.754	0.1004045	-3.248	-0.0289428	-2.398
Inflation	-0.1813995	-2.907	-0.501084	-3.213	-0.174072	-2.634	-0.2491798	-2.316
French Origin Dummy	0.274254	-3.188	**-1.518286	-2.722	*1.06565	-3.250	-	-2.450
German Origin Dummy	0.4664374		-		-		-	
English Origin Dummy	-		-0.4284237		-		-	
One Share, One Vote	0.1531706	-3.027	0.61023	-3.556	-	-2.727	-0.7420841	-2.053
Mail Proxy	-0.7814107	-2.892	-	-3.381	**-2.140768	-2.082	-0.2240626	-2.412
Shares Blocked Before Meetings	0.6854288	-3.097	0.4450374	-3.428	-	-2.727	0.5693532	-2.709
Cumulative Director Votes	-0.2499749	-2.925	-0.0376291	-3.367	-	-2.727	0.162432	-2.484
Minority Power	-0.3818911	-2.746	0.52312	-3.731	*-1.06565	-2.185	-1.23253	-1.631
Extra Shareholder Meeting Percentage	2.756732	-3.268	*-8.329594	-2.563	**42.81536	-6.364	3.697717	-2.935
Anti-Director Rights	*-0.3680614	-2.027	0.0577919	-3.535	**-0.9479429	-0.063	-0.3079557	-1.755
Mandatory Dividends	-0.2558958	-2.962	0.6207424	-3.426	-	-2.727	-2.550953	-1.903
Judicial Efficiency	**0.3069233	-4.828	**0.3282857	-5.256	0.1564352	-3.730	0.7865175	-7.301
Rule of Law	0.006524	-3.019	0.0490018	-3.636	0.6005985	-5.519	-0.5056313	0.481
Corruption	0.0521821	-3.269	*0.2609256	-4.620	*-0.302418	-0.711	-1.022513	3.256
Risk of Expropriation	0.0509606	-3.357	0.200886	-4.887	0.3564206	-5.245	-0.3435731	-0.002
Risk of Contract Repudiation	-0.0431763	-2.696	0.1372511	-4.339	-0.5792043	1.154	0.097298	-3.049
Accountancy Standards	**-0.0367535	-0.638	-0.0582169	0.744	*-0.0368684	-0.761	0.003415	-2.631
Asia Dummy	-0.6537468	-2.727	-		-		-	
EMEA Dummy	-		-		-		-	
South America Dummy	0.2773967		-		-		-	

2005-2014	**Full Sample**		**Asia**		**EMEA**		**South America**	
	β	c	β	c	β	c	β	c
Credit Rating	-0.0643344	-2.162	**-0.1853689	-1.639	0.0092072	-2.767	-0.0605416	-1.411
Real Effective Exchange Rate	0.0043266	-3.199	-0.0200168	-1.200	0.0228465	-5.110	-0.0053927	-1.470
Real GDP Growth (YoY)	0.0497572	-2.995	0.1172427	-3.791	0.0918634	-3.113	-0.0027961	-2.048
Inflation	-0.3001218	-2.626	-0.3354847	-3.111	-0.3127122	-2.508	-1.114753	-1.490
French Origin Dummy	0.1648013	-2.882	**-1.72317	-2.601	0.4050201	-2.878	-	-2.009
German Origin Dummy	0.2809243		-		-		-	
English Origin Dummy	-		-0.2833096		-		-	
One Share, One Vote	0.2330089	-2.817	0.548602	-3.374	-	-2.677	-0.7402882	-1.623
Mail Proxy	-0.6975463	-2.671	-	-3.226	**-1.691028	-2.258	-0.7898305	-1.846
Shares Blocked Before Meetings	*0.8717315	-2.921	0.6628016	-3.322	-	-2.677	0.5527531	-2.266
Cumulative Director Votes	-0.1096528	-2.728	0.356635	-3.374	-	-2.677	-0.4196027	-1.902
Minority Power	-0.1643521	-2.652	*0.9040306	-3.846	-0.4050201	-2.473	*-1.671082	-0.874
Extra Shareholder Meeting Percentage	*4.87101	-3.249	-5.127687	-2.733	**33.82056	-5.640	*5.569391	-2.701
Anti-Director Rights	**-0.3947103	-1.724	0.2431946	-3.878	-0.6102793	-0.998	*-0.4842823	-0.868
Mandatory Dividends	-0.0144351	-2.755	0.3633194	-3.251	-	-2.677	-2.329514	-1.552
Judicial Efficiency	**0.2917729	-4.535	**0.3267492	-5.093	0.1697902	-3.799	0.3275432	-4.052
Rule of Law	0.0885613	-3.223	0.1527975	-4.044	0.6427111	-5.676	-0.4626915	0.659
Corruption	0.1175008	-3.404	**0.3460073	-4.901	-0.1360358	-1.778	*-1.165643	4.466
Risk of Expropriation	0.1208903	-3.640	0.2631319	-5.218	0.518135	-6.371	0.0045629	-2.041
Risk of Contract Repudiation	0.0305804	-2.962	0.2293758	-4.852	-0.1361272	-1.764	0.3260546	-4.001
Accountancy Standards	-0.0200281	-1.393	-0.0441498	0.031	-0.0168331	-1.788	0.0496996	-4.616
Asia Dummy	-0.5486765	-2.6773	-		-		-	
EMEA Dummy	-		-		-		-	
South America Dummy	0.6679837		-		-		-	

Adjusted R2	**Full Sample**			**Asia**			**EMEA**			**South America**		
	1991-2014	2000-2014	2005-2014	1991-2014	2000-2014	2005-2014	1991-2014	2000-2014	2005-2014	1991-2014	2000-2014	2005-2014
Credit Rating	0.0021	0.0017	0.0008	0.0048	0.0074	0.0103	-0.0016	-0.0015	-0.0024	0.0025	0.0010	-0.0013
Real Effective Exchange Rate	0.0003	0.0004	-0.0006	-0.0007	-0.0009	0.0001	-0.0002	0.0030	0.0033	0.0019	-0.0011	-0.0025
Real GDP Growth (YoY)	0.0001	-0.0003	0.0003	-0.0003	0.0004	0.0041	0.0036	0.0010	0.0007	-0.0019	-0.0020	-0.0026
Inflation	0.0001	-0.0003	0.0002	0.0001	0.0004	-0.0004	-0.0012	-0.0016	-0.0008	-0.0011	-0.0021	0.0004
Legal Origin Dummy	-0.0003	-0.0005	-0.0011	0.0095	0.0080	0.0162	0.0068	0.0060	-0.0011	-	-	-
One Share, One Vote	-0.0002	-0.0004	-0.0003	0.0033	0.0011	0.0007	-	-	-	0.0008	-0.0004	0.0009
Mail Proxy	0.0008	0.0009	0.0010	-	-	-	0.0240	0.0253	0.0154	-0.0020	-0.0020	0.0000
Shares Blocked Before Meetings	0.0008	0.0009	0.0030	-0.0007	-0.0005	0.0006	-	-	-	-0.0001	-0.0011	-0.0007
Cumulative Director Votes	-0.0001	-0.0003	-0.0006	-0.0003	-0.0010	-0.0003	-	-	-	-0.0018	-0.0021	-0.0017
Minority Power	0.0002	0.0002	-0.0005	0.0004	0.0006	0.0051	0.0068	0.0060	-0.0011	0.0029	0.0021	0.0130
Extra Shareholder Meeting Percentage	0.0005	0.0004	0.0037	0.0030	0.0032	0.0009	0.0240	0.0253	0.0154	0.0014	0.0008	0.0106
Anti-Director Rights	0.0029	0.0025	0.0044	-0.0007	-0.0010	-0.0004	0.0172	0.0172	0.0060	0.0010	0.0006	0.0107
Mandatory Dividends	0.0003	-0.0005	-0.0007	-0.0008	-0.0007	-0.0013	-	-	-	0.0042	0.0021	0.0040
Judicial Efficiency	0.0071	0.0072	0.0098	0.0134	0.0143	0.0182	0.0009	0.0009	0.0022	0.0011	0.0001	-0.0017
Rule of Law	-0.0004	-0.0005	-0.0002	-0.0001	-0.0008	0.0014	0.0001	-0.0005	-0.0004	0.0017	0.0011	0.0039
Corruption	-0.0002	-0.0003	0.0008	0.0064	0.0048	0.0124	0.0102	0.0095	0.0002	0.0055	0.0038	0.0118
Risk of Expropriation	0.0000	-0.0005	-0.0003	0.0021	0.0003	0.0017	-0.0002	-0.0004	0.0020	-0.0007	-0.0014	-0.0026
Risk of Contract Repudiation	-0.0004	-0.0005	-0.0006	0.0014	0.0000	0.0025	0.0034	0.0026	-0.0022	-0.0020	-0.0021	-0.0011
Accountancy Standards	0.0023	0.0035	-0.0006	0.0003	0.0021	0.0008	0.0101	0.0096	0.0004	-0.0020	-0.0021	-0.0002
Region Dummy	0.0008	0.0025	0.0067	-	-	-	-	-	-	-	-	-

The first variable that is examined in this section of the paper is the Credit Rating variable. While it does not seem to have a significant effect in the EMEA region and in South America, it does show a significant impact on the value beta in Asia, which translates into the presence a significant effect when the full sample of countries is examined. The table shows that countries with a riskier sovereign credit rating show increased returns when a Book-Market strategy is employed in the aforementioned models. This seems to correspond to the expectations made according to the pre-existing literature that developing markets are more likely to show significant returns on an investment strategy based on the value anomaly (Kouwenberg & Salomons, 2006).

Unlike the credit rating variable, the real effective exchange rate does not seem to have a significant effect on the difference between the returns on the value portfolio in the sample and the benchmark values. As such, the trade position of a country does not seem to affect the performance of its value stocks over its glamour stocks much. The same sentiment is shown by the GDP growth variable and the inflation variable. This indicates that as long as the credit rating of the country's sovereign debt is unaffected, macroeconomic fluctuations do not appear to have much of an effect on the difference between the HML portfolio returns, adjusted for the international benchmark values. This suggests that there is either strong co-movement with the US market that is used as the benchmark or that across the time series, the sample portfolios themselves are not very vulnerable to macroeconomic shocks. In either case, it

suggests that it would be viable to create a long-short portfolio by buying US value stocks and glamour stocks in developing markets while going short in US glamour stocks and value stocks in developing market as the returns on the HML portfolios in developing markets are consistently lower than the returns on the HML portfolios in the US benchmark portfolio. The main concern is that there will be considerable spread, making the strategy less useful for traders using short-term strategies. Additionally, the sovereign credit ratings of the developing markets must be observed as the returns will be correlated with them as lower credit ratings show higher HML returns in the sample countries, particularly in Asia. This would correspond to lower returns on the aforementioned strategy in the same situation.

When examining the legal heritages of the sample countries, something unexpected occurs. While in Asia, countries that are subject to a legal system that descends from the French system appear to show lower returns on the HML portfolio, adjusted for the benchmarks, than portfolios in countries with a German or a British Commonwealth legal system, this is in a direct contradiction with the findings from the EMEA region, where only countries with a Commonwealth legal system or a French legal system exist in the sample. This contradiction provides a likely explanation for why the full sample model does not show a significant effect between the countries across the sample. As the La Porta et al. (1998) paper suggests that the French systems provide less legal protection to shareholders than Commonwealth systems, one can infer that such legal protection measures provide more benefits to Asian value stock companies than to glamour stock companies in the same country. The inverse is implied in the EMEA region, where shareholder protection appears to benefit companies with a low B/M-ratio more strongly in comparison to companies with a high B/M-ratio. Analysing individual rights will show if this general statement is true and which variables are responsible for this effect. Sadly, it is more difficult to make hypotheses regarding what affects the HML portfolio returns in South America as all sample countries in the region have a French legal system.

5.4: Shareholder rights

With these hypotheses in mind, the individual legal measures can be examined. As the first variable to be examined, the “One share, One vote” measure indeed follows the reasoning

that in Asia the HML returns are higher in countries with better shareholder protection. Unfortunately, none of the sample countries in the EMEA region have the measure in effect, which means that its effects can only be measured in Asia, South America and the full sample. The measure does not seem to have any effect in South America, however. This may be caused by the similarities in the legal systems in the region. Subsequently, the variable also fades into the background in the full sample as it is no longer significant once all countries are added to the sample. At least to a degree, the results appear to be in line with the expectations made in the data section as the measure appears to protect high-B/M companies from majority shareholders with ill intent.

The second shareholder rights variable has a similar problem to the previous variable in the sense that none of the countries in Asia allow for a mail proxy to be used. While it does not seem to adhere to the expectations in the data section, it does follow the same reasoning that the legal origins dummy variables introduced. As such, the measure appears to benefit low B/M companies more than it does high-B/M companies in the EMEA region, leading to a decrease in the returns on the HML portfolio rather than the expected increase following the expectations made previously. A noteworthy discovery here is that the only country to employ mail proxies is South Africa, suggesting that using HML portfolios in the South African market is significantly less profitable than elsewhere in the region.

The following two measures regarding shares being blocked before meetings and cumulative director votes appear to be insignificant when it comes to the returns on HML portfolios in the sample countries. While La Porta et al. (1998) suggests that there may be an effect on the total returns of shares in general, the hypotheses regarding the nature of the measures mentioned in the data section, namely that blocking the shares may not be as beneficial in environments where it is difficult to buy and/or sell shares in large quantities in order to affect the outcome of shareholder meetings as expected or that cumulative director votes may benefit low-B/M companies as much as it benefits high-B/M companies appear to be supported indirectly.

The next shareholder rights variable that is to be examined is the minority power variable, i.e. the presence of any alternative methods for minority shareholders to protect their interests. While once again the variable does not seem to have much effect on the full market or in this case Asia and South America as well, it shows a significant effect in the EMEA region, reducing the returns on the HML portfolio if such measures are present. While the negative impact the variable has on the B/M returns does not follow the initial hypothesis that an overall increase in investor confidence increases B/M returns, it does appear the support the hypothesis that low-B/M companies see more returns on their shares resulting from stronger shareholder positions than high-B/M companies do.

While at first glance, the extra shareholder meeting percentage value appears to contradict the hypothesis of the varying reactions between Asian markets and EMEA markets, it is important to remember that a high percentage corresponds to more limited shareholder rights. As such, it also supports the hypothesis by showing a positive effect in the EMEA region and a negative effect in Asia. As expected, this leads to insignificant effects in the aggregated market. The South American market still does not appear to be affected in any way by any of the measures.

The first anomalous finding in regards to the hypothesis that the EMEA region and the Asia region react differently is found in the anti-director rights variable. While it shows that the returns on HML portfolios in the EMEA region react poorly to increased shareholder rights in accordance to the hypothesis, it also shows that the effects of the aforementioned anti-director measures in the EMEA region overpower the positive effects on the HML portfolios in Asian markets. This is shown through the significance of the anti-director rights variable in the full sample. The following mandatory dividends has less spectacular results as none of the regions show a significant effect on the HML returns. A plausible explanation for this is a lack of countries with mandatory dividends in the sample as these are only in place in Chile and the Philippines within the sample restrictions.

5.5: Law enforcement

When examining the legal measures, it becomes clear that the judicial efficiency measure is a noteworthy counterpart to the anti-director rights variable. While it does not seem to have a significant effect in South America and the EMEA region, it appears to have enough of an effect in Asia to translate into a significant effect across the entire sample. This appears to show that while indeed the general minority shareholder position has a positive effect on the HML portfolio returns in Asia and a negative effect in the EMEA region, there are more nuances to the matter than the origin dummy variables imply. For instance, the next variable that is to be examined, the rule of law measure, does not appear to have any kind of significant effect on any of the portfolios. The corruption variable, on the other hand, is a strong confirmation of the hypothesis, showing strong signs that the effects of the position of shareholders on the B/M portfolio returns transcends regulations benefiting the position of shareholders and extends through law enforcement as well. This is shown through a positive effect on the B/M portfolio in Asia while the same variable has a negative effect on the EMEA portfolio.

Moving forward, the existence of a risk of expropriation of property or the risk of contracts being repudiated unfortunately does not say much about the portfolio returns. As with a fair number of the aforementioned variables, there may an impact on the returns of shares in the respective markets in general, but high-B/M companies do not appear to react significantly differently to low-B/M companies according to the results.

As the final country-level variable, the effects of the accountancy standards of the sample countries on the regional portfolios are examined. Following the expectations mentioned in the data section, it indeed appears that stricter accountancy standards benefit low-B/M companies more than they benefit high-B/M companies due to the compliance costs and the stricter limitations regarding the income statements. This may explain why, unlike other measures that increase the well-being of shareholders, there does not seem to be a significant positive impact on the portfolio returns in Asia, leading to a significant negative effect on the B/M returns of the full-sample portfolio.

The final step in the analysis is to examine if there is a difference between the regions themselves in a full-sample portfolio. While there is significant evidence pointing towards the confirmation of the hypothesis that regional portfolios react differently to different shareholder rights, law enforcement measures and judicial standards, the B/M returns of the regional portfolios do not differ significantly from each other.

As stated previously, the analysis is been repeated using smaller sections of the time series sample that contains a more consistent number of companies in the cross section in order to test if the previously detected heteroskedasticity provides a skewed view of the more recent years when the samples of the included companies become more consistent. The first step is to reduce the time series sample size to the years 2000 to 2014. This reduces the number of monthly observations to 180 per country, which will suffice for any of the regressions used in the analysis as the variables are tested individually. The results show that there are only minimal differences between the two sets of regression models. The main difference between these two sets of models is that the one-share-one-vote measure is no longer responsible for a significant effect on the B/M returns in Asia as opposed to showing such an effect in the complete panel. Additionally, the legal origin dummy variables and the regional dummies use different benchmarks, which appears to indicate that there is no significant difference between Asian countries with German legal origins and countries where the legal system originated from the English system in regards to the returns on B/M portfolios. This is still in contrast to the lower returns shown in portfolios containing shares from countries with French legal origins.

A different image is shown when one compares the full panel to the panel ranging between 2005 and 2014. While the main conclusions are largely the same using this timeframe as improved shareholder conditions still affect the B/M returns positively in Asia and negatively in the EMEA region, the South American portfolios begin to show significant effects as well. In contrast to South America, the EMEA portfolio appears to become slightly less predictable as fewer variables appear to show a significant effect in the reduced models. Only the mail proxy variable and the shareholder percentage required to call for an extraordinary shareholder

meeting still seem to have an impact on the returns of the EMEA B/M portfolio, which is in stark contrast to the number of significant variables in the 1991-2014 models. The prediction of the Asian B/M portfolio returns appears to be impacted less, but some changes are still noticeable as the percentage of shares required to call for an extraordinary shareholder is no longer significant as well as the one-share-one-vote rule that is only significant in the full time series. Surprisingly, however, is that the minority protection measures now seem to have a significant positive effect on the B/M returns where they previously did not. When examining the South American results, it is striking that the region acts similarly to the EMEA region as opposed to the Asian region. This is shown through significantly negative effects on the B/M portfolio returns from a number of measures, namely the minority protection measures, the minimum share percentage, the overarching anti-director rights and finally the corruption measure. Finally, these changes also translate in differences between the different models containing all sample countries. Interestingly enough, the credit rating variable loses its significance, which could possibly be explained by the fact that the raw data shows that the credit ratings of Asian economies appear to have stabilized at fairly safe levels in more recent years as opposed to South American and EMEA economies that appear to experience a greater degree of spread in these years, possibly due to the onset of the global financial crisis in 2007-2008. This may also translate into a plausible explanation why the B/M returns in the EMEA region seem to be more difficult to predict in the more recent years. Additionally, the blocked shares mechanism appears to have a positive effect on the B/M portfolio returns, but as this is reflected in none of the regions and the measure is not used at all in the EMEA region, it is difficult to establish a possible reason why this occurs. The minimum share percentage, on the other hand, quite possibly becomes significant in the full sample as the variable loses its significant effect in Asia. Similarly, the accounting standard variable loses its significant effect on the portfolio returns as it loses its effect in the EMEA region.

Chapter 6: Conclusion

In this paper, I have attempted to achieve three objectives. First and foremost, a number of hypotheses were made regarding the nature of the value anomaly. Secondly, an attempt was made to find evidence supporting the existence of the value anomaly on a country basis. Finally, an analysis was done with the purpose of determining which variables influence or possibly even explain the value anomaly in developing markets.

In creating the hypotheses, the current literature expects to find high returns on B/M portfolios in developing markets due as these markets are unlikely to be as safe and stable as established markets such as the US and most of Europe. This can be explained as a simple return on risk that is required for investors to step into a more dangerous market. As such, the initial expectations for the variables would be a negative relation between the existence of measures in place to benefit and safeguard shareholders and the returns on B/M portfolios in the respective countries. However, as the measures also grant benefits to companies in the lower ranges of the Book/Market ratio rankings, seeing share returns as a sign of investor confidence rather than a simple return on risk makes it far more difficult to make effective expectations regarding the effects of the aforementioned measures. As such, all variables that benefit the stabilization of the market and increase overall investor well-being are expected to have a negative effect on the B/M returns with the exception of the government repudiation variable.

As the second objective was to examine the existence of the HML beta in these markets, expecting a rather significant presence, the Fama-French models were used for that purpose. The initial Three-Factor model, modified to accommodate the portfolio returns that would be equal to the market returns as the same selection stock selection methods would be used, excluding financial intermediaries and other direct or indirect investment vehicles, showed a significant presence of the anomaly, but only in a select number of sample countries. Surprisingly, Chile, Colombia, Egypt, Peru, South Africa, Taiwan, Thailand, Turkey and Venezuela did not show a significant presence of the anomaly throughout the sample period. Additionally, the results showed significant proof that while it is possible to make significant short-term

profits in accordance to the findings of Kouwenberg & Solomons (2006), a long-term HML portfolio as defined by Fama and French (2018) systematically shows significantly lower returns than a similar portfolio than the benchmarks values that are documented on the dataset maintained by Kenneth French (2018). As Kouwenberg & Solomons (2006) show significant positive results for their portfolio, it is safe to assume that these profits are balanced out by equally substantial or even greater losses over time, making it a risky endeavour for long-term investors to partake in. This conclusion is strengthened by the following Five-Factor models that are used to test the HML variables in the presence of control variables. When the additional factors are added, the results show that the value anomaly loses even more of its explanatory power over the market portfolio returns, now only reliably showing significant effects in only nine of the twenty markets that have a large enough sample to allow for proper modelling of the returns and the factors that affect them. However, as the returns of the B/M portfolios in the sample countries are significantly lower in all remaining countries than the returns of the benchmark portfolios, it is still interesting to see what influences that difference.

When examining the variables proposed by Kouwenberg & Solomons (2008), the results show that only the credit rating variable appears to have a significant effect and even then, only in Asia and the complete sample. While the results are less convincing that anticipated, they do appear to support the hypothesis that poor shareholder conditions correspond to higher returns on B/M portfolios. Looking deeper into the matter using the variables introduced by La Porta et al. (1998) shows a different outcome, however. When comparing the legal origins of the sample countries, the analysis shows indications that the initial hypothesis does in fact not hold in Asia as B/M portfolios in markets with French legal origins are significantly outperformed by portfolios from German or English markets, the former of which showing significantly reduced shareholder rights. As such, good shareholder conditions appear to correspond to higher B/M returns in Asia, while the opposite is true in the EMEA region. In the full time series, none of the aforementioned variables appear to show any significant explanations for the lower B/M returns in South America, making the initial hypothesis questionable at best.

Upon examination of the individual variables suggested in the La Porta et al. paper (1998), it becomes clear that there indeed is a difference between how the variables interact with the returns on B/M portfolios between the regions included in the sample. In particular, the use of the measure of one share, one vote, a low shareholder percentage requirement for additional shareholder meetings, high judicial efficiency and low corruption significantly increase the returns on a B/M portfolio in Asia. This is contrasted by the results shown by the EMEA models as these markets show a significant negative impact on the B/M portfolio resulting from improved shareholder positions in accordance to the initial hypotheses. In particular, the mail proxy, the minority empowerment measures, a low percentage requirement for additional shareholder meetings, the combination of anti-director rights, the absence of corruption and the presence of strict accountancy standards all have a significant negative impact on the B/M portfolio returns. Different still from the two other regions is the South American B/M portfolio, which does not see any impact from any of the individual variables. The final portfolio is the combination of the three regional portfolios, which shows different significant reactions to different variables. However, due to the differences between how Asian markets respond to the measures and how the EMEA markets react to them leads to the conclusion that the significant effects due to the presence of the combination of anti-director rights, heightened judicial efficiency and high accountancy standards only reflect which variables only affect one regional portfolio as opposed to multiple. As such, I cannot state with confidence that these significant values in particular reflect the effects of shareholder positions on the returns of B/M portfolios across the entire region and would propose that one would look at the effects on the individual regional portfolios, rather than the portfolio of all countries combined for guidance in creating such a portfolio.

The information gathered from the steps taken in this research project, of course, comes with implications for any investor interested in creating a B/M portfolio in developing markets after reading papers such as the one written by Kouwenberg and Solomons (2006), expecting significant returns. While the data initially does not seem very promising as the models show a long-term return between two and four percent under the benchmark model, this information can be used to create a more intricate portfolio that consists of a long position

in a B/M portfolio in a developed market and a short position in the developing market segments that yield the lowest B/M returns. Alternatively, investors can create a long position in low-B/M companies in developed markets, offset by a short position in high-B/M companies in developing markets. In particular, these short portfolios should be focused on Asian companies in countries that have comparatively poor shareholder rights and companies from the EMEA region in countries with comparatively good shareholder positions. While the predictive power of the models regarding the actual differences between the returns of the B/M portfolios made in the developing markets and the returns of the benchmarks is low, such a mixed portfolio would likely warrant a stable monthly return of 3.3 percent in Asia if the B/M portfolio includes all Asian sample countries or upwards to roughly 4.3 percent when either the legal origin dummy or the judicial efficiency variable is used for the prediction and the stock selection. Similarly, a portfolio with a long position in the benchmark portfolio and a short position in a B/M portfolio that includes all EMEA countries has an expected return of 2.8 percent or up to 4.2 percent if the returns are estimated using the mail proxy variable as the stock selection method. While this was not the expected method with which to obtain such profits, these numbers appear to even exceed the returns estimated by Kouwenberg and Solomons (2006) in their paper. While in their paper they state that they find that their long/short portfolio results in a return of roughly 2.7 percent on a monthly basis with a long position in countries with a high B/M ratio and a short position in countries with a low B/M ratio (Kouwenberg & Solomons, 2006), my analysis shows that it is highly unlikely that these returns are due to the B/M ratios in the country, but are more likely resulting from liquidity and momentum factors as B/M portfolios in the sample markets generate a significantly lower return than similar portfolios in developed markets. That said, while the explanatory power of the individual factors regarding to the economic state of the countries, their shareholder rights and their legal system is practically non-existent, there are definite signs that some of these variables affect the difference between B/M portfolios in these markets and similar portfolios in developed markets, potentially allowing investors to benefit from these differences greatly.

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