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Equity returns, risk, and market liberalization in emerging markets

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ABSTRACT

In this thesis, the effect of three country-level risk factors and the interaction of the country-level risk with market liberalization on equity returns in emerging markets are studied. A panel data of 24 countries between the periods 1990-2022 was collected and analysed through a Prais-Winsten regression model. I find that the Political Risk and Economic Risk and Financial Risk variables have significant effect on yearly equity returns. The results show that market liberalization increases the effect of Political Risk and Financial Risk on equity returns, and decrease the effect of Economic Risk on equity returns. The implication of these results are that country-level risk likely have explanatory power over equity returns, where Political and Financial Risk has higher positive effect in higher levels of Market Liberalization, and Economic risk has lower effect with higher levels of Market Liberalization.

Keywords: Emerging Markets, Country-level Risk, Equity Returns, Market Liberalization

JEL codes: G15, F52, G12

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CHAPTER 1 Introduction

The equity returns in emerging markets have different characteristics from the developed countries considering the process of contemporary market liberalization as well as different economic, political, and financial risks. With every country having a unique liberalization process over the last three decades, emerging market returns contain different levels of knowledge about the global markets and the country specific risks. Despite numerous studies having tested well-established asset pricing models in emerging countries, the literature still lacks an asset-pricing model that details the unique process of market liberalization these countries have been going through since the last thirty years (Atılgan et al. 2015). Explaining the effect of market liberalization on the explanatory power of country risk factors could provide an asset-pricing model that could be better suited for the emerging markets, and extend the scientific understanding about the equity markets in general. Finding such a relationship could also provide valuable insights on the financial discussion of predictability, with determining a circumstance where non-financial risks could be valuable information for investment decisions.

A fundamental idea of the modern finance was that investors are rewarded with higher expected return for the non-diversifiable risk they take, explained by the capital asset pricing model (Sharpe, 1964; Lintner, 1965). There is an extensive literature based on empirical findings on asset pricing models that cover the developed equity markets. Most famously, Fama and French (1996) explained the returns in the US equity markets with risk factors such as market, size, and value, extending on the CAPM. Fama and French (2015) then added two new factors profitability and investments to extend the original three-factor model. The Fama-French (2015) 5-factor model was tested over emerging economies by Foye (2018), Mosoeu and Kodongo (2020) and shown that the model explains some returns using the factor values from the investigated countries. De Santis and Gerard (1998) used CAPM to claim the equity premiums in every country apart from the United States were mostly explained by currency risk. Erb et al. (1996) found explanatory power of some country specific risks, namely political, economic, and financial over the equity returns of those countries. Harvey (2000) studied market liberalization as a one-time event to find a decrease in cost of capital. Lehkonen and Heimonen (2015) found that democracy moderates the explanatory power of political risk. These results indicate that the specific risk factors and liberalization have explanatory power over equity returns.

Despite these previous studies, the interaction of market liberalization with country specific risks on explaining equity returns in emerging markets has not been studied before, which is the aim of this study. The findings may reveal information about how non-financial risks may add to the predictability of asset pricing models, particularly for unorthodox contexts. Market liberalization is defined as the level of which the economy of a country is accessible to outside world, and the level of practice of free markets adhered in that country. Both country specific risks, and global factor models have some explanatory power on the emerging market equity returns (Erb et al., 1996)(Foye, 2018). De Jong and De Roon (2015) show that market liberalization has a positive association with equity returns in emerging markets. There is a strong evidence for market liberalization to impact how the country specific and global risks are priced in. De Santis and İmrohoroğlu (1997) show that the volatility is effected by country specific risk before liberalization, and no longer after the one-time liberalization event occurs. Furthermore it is possible to claim that market liberalization brings the emerging economies in a form closer to developed markets. As it is already established in the literature that the returns in emerging markets are explained by Fama Frech (2015) factors and not

country specific risk factors, it is logical that markets behaving similarly will have higher exposure to global equity model factors than country specific risk factors. Thus, this paper studies the following research question: How does market liberalization change the level of explanation of country specific political, economic, and financial risk and global equity factors on equity returns in the emerging markets?

To study the research question, I perform Prais-Winsten regression analysis with correlated panels corrected standard errors (PCSE) on 24 countries between the 1990-2022 periods based on data availability, as the returns are regressed in a time series model against risk factors, market liberalization score and an interaction term with all risk factors. The panel data will include market liberalization score, returns and risk factors for every month for Brazil, Chile, China, Colombia, Czech Republic, Egypt, Greece, Hungary, India, Indonesia, Malaysia, Mexico, Pakistan, Peru, Philippines, Poland, Qatar, Saudi Arabia, South Africa, South Korea, Taiwan, Thailand, Turkey, and United Arab Emirates. The dependent variable, equity returns, will be measured in percentage and will be based on the returns in terms of United States Dollars. The equity returns data will be operationalized with yearly returns of Morgan Stanley Capital International indexes of every country. The country specific factors will be measured based on three categories: political risk, economic risk, and financial risk. In order to measure political risk I will use World Bank's The World Governance Indicator (WGI) and operationalize political risk through the Political Stability and Absence of Violence/Terrorism measure. I will measure economic risk using unemployment rate variable found in the World Development Indicators database by the World Bank. For financial risk, I will use a composite score composed of Liquid Liabilities to GDP, Stock Market Volatility and Bank Z-score found in the Global Financial Development Database by the World Bank. This composite score will rake major financial risk from liquidity, volatility, and banking sector risk perspective to operationalize financial risk of the country. Lastly, I will use the Financial Development Index in of the IMF for measuring market liberalization, which operationalizes market liberalization through an aggregation of variables related to access, depth, and efficiency of financial markets and financial institutions.

I hypothesize that market liberalization will decrease the explanatory power of country specific risk factors on equity returns. This should be shown by the significance of the interaction terms between market liberalization score and country specific risk factors. The models that incorporate only the country specific factors have some explanatory power over equity returns, yet I expect that the regression models that take liberalization into account will result in finding a lower constant coefficient and a higher R-squared compared to previous research, which would show that the equity returns are better explained than previously. Despite that, it would be a question remaining whether the found interaction has left over circumstances specific to economic or financial practices of a country that could impact the information contained in equity returns about country risks and global risks. It would also remain as a question to what extend firm specific characteristics such size, book-to-market ratio or market returns would explain the unexplained returns as opposed to country risks not considered in this paper.

The remainder of this paper is structured as follows. Section 2 discusses relevant literature and previous research. Section 3 discusses the collection methods and characteristics of the data sample used in the study. Section 4 discusses the methodology followed in this paper. Section 5 includes the results of the research and its discussion. Section 6 includes a conclusion of the study.

CHAPTER 2 Theoretical Framework

2.1 Risk and Returns

Risk is considered as any uncertainty of future adverse event that would decrease the equity prices in a country. In the field of finance, risk is generally thought as a forward-looking indicator, measured through various backward-looking factors such as volatility, market exposure, or value at risk. Risk is usually thought in two separate ways: idiosyncratic risk or systematic risk.

Risk, in the field of finance, has been first studied by Sharpe (1964), Lintner (1965), and Black (1972). Their work has led to the first theory that modelled the relationship between risk and return, Capital Asset Pricing Model. This model distinguished two different kinds of risk, systematic risk and idiosyncratic risk. Systematic risk is accepted as the risk that an investment carries based on its exposure to market. The investors who take more market risks were rewarded with more return on average. The model was further developed by Fama and French (1992) with the addition of two factors, size of the firm, and book to market values. Fama and French (2015) then added two new factors of investment and profitability.

Equity returns are the periodic weighted average percentage changes in the prices of publicly listed stocks. It is a type of asset return that is generally accepted as more risky than its counterparts such as bonds and commodities. With the development in emerging markets, it is possible to find equity indexes that represent a portfolio of most highly capitalized firms in every country, which measures the stock market returns for a unit of country.

Predictability of equity returns has been an important question of financial economics ever since its first publications. The equity returns was theorised to be associated with various factors by different researchers through decades. One of the first developments of the financial economics was the introduction of efficient market hypothesis by Fama (1970). The efficient market hypothesis claimed that all available information is incorporated in equity prices in financial markets, and all stock prices represent the most rational expectation about future discounted cash flow from the underlying equity. Phenomenon that violated this hypothesis was studied ever since. Momentum strategy was shown to be profitable due to abnormal returns by Jegadeesh and Titman (1993), stocks with high idiosyncratic volatility was shown to underperform by Ang et al. (2006), and even stocks with lower beta was shown to outperform high beta by Frazzini and Pedersen (2013). The most comprehensive model of asset pricing was put forward by Fama and French (2015) where the five-factor model explained the returns better than any previous model for the American equity returns.

The Arbitrage Pricing Theory (APT) is a model developed by Ross (1976) that explains the relationship of multiple market risk factors on asset pricing. The APT models that return of any asset is predicted by a risk free rate, as well as the sum of all the factors given by risk premium of factor multiplied with risk exposure of the factor. The risk factors are theorised to be priced through the market, and that idiosyncratic risks are not considered as risk factors. Lehkonen and Heimonen (2015) uses the APT in order to build a multifactor model of political risk and democracy, where they show a significant negative relationship between political risk and returns.

Risk factors specific to a country could be understood as the risk elements that the entire financial market in a country is exposed to. In the context of country specific risk, the measure of risk is, similar to the rest of the field, an expectation about future based on past events that shape the behaviour of economic actors in the market. Historically country risk studies has been a focus of private credit rating agencies who aimed to best calculate the creditworthiness of governments and corporations given different risk factors. The term country specific risk indicates the additional exposure that investors gain to adverse events in a country when they are investing in the equity markets of that country.

The conceptionalization of equity returns is based on a sample portfolio, where these portfolios are created to represent some of the most highly capitalized stocks in a country. These portfolios represent the market of the country that they are traded in where the idea is that the portfolios consisting of such stocks have country specific information in common. That means that the factors such as momentum, beta, or price volatility disappear due to the randomness of these factors within a sample and only the information relating to entire stock market of the country remains. This makes the predictability of equity returns of country a question characterised by the unit of country.

2.2 Country-level Risk Factors

Harvey (1995) pursued the first study that reconceptionalized risk in emerging market equity based on country risk. The study aimed to answer the question whether global asset pricing models could explain equity returns in emerging markets. In the study, the effect of global market risk on a sample of 20 countries were studied, where the study showed that there is only a significant positive relationship between global market returns and emerging market equity portfolio returns in 7 countries and no significant result for the rest. Large variations and pricing errors are shown to be remaining as a result of the one factor and two factor world capital asset pricing model. The author argue that this result is due either to the fact that emerging markets are segmented from global markets, or that risk exposures of emerging markets are time variant. The relationship is studied by a regression analysis based on the CAPM model where emerging market returns are regressed against global market returns in the one-factor model, and also with foreign exchange returns in two-factor model. Comparing the result of the article with the original studies of Sharpe (1964) and Lintner (1965) it is evident that emerging equity market returns contain local information that the CAPM model cannot incorporate. As the results showed that the global asset pricing models fail to explain equity returns, the research put forward the idea that the local information is more probable to contain information about equity returns in emerging markets.

Erb et al. (1996) study the effect of such local information that is characterised as country risk on equity returns in emerging markets. The study that analysed 117 countries showed that economic and financial risk significantly explained the variation in equity returns, and political risk had marginal explanatory power. The authors explained that the local risk information has impact on the fundamental valuation measures, leading the changes on the stock prices. The authors studied two portfolios comparatively, those whose risk rating were increased and those who were decreased, in order to compare the returns of the two portfolios. Additionally, they conducted time series and cross sectional regression analysis of the risk factors against equity returns.

Dimic et al. (2015) study how the variables of political risk effect returns in emerging, developed, and frontier markets. The paper analyses 64 countries equity returns in order to distinguish how the

different variables that define political risk affect equity returns. The panel regression analysis show that composite political risk has a negative effect in the stock market returns in all sets where a government action is the main source that has the negative effect on the equity returns. Particularly for emerging countries, the authors show that military in politics, democratic accountability, corruption, and investment profile have greater effect. Comparing the results of Dimic et al. (2015) to the classical thought on risk and reward in the stock market, characterised by Sharpe (1964) and Lintner (1965), these results lead to question of an anomaly.

Clark and Kassimatis (2004) study the effect of change in financial risk on the equity returns for six Latin American countries. The study finds that the increase in financial risk premium has a negative effect to yearly equity returns of country indexes. The study performs a regression analysis of change in financial risk premium against yearly returns, controlling for country fixed effects and macroeconomic variables. The financial risk premium measures the rate of return a country needs to pay foreign debt based on the discounted flow of exports and it is considered a measure of cost of debt of the country. The study argues significant negative relationship of risk and return, which contradicts the classical financial models by Sharpe (1964) and Lintner (1965). Despite that, it is important to acknowledge that Clark and Kassimatis (2014) study the change in risk, which could explain that the results indicate a realization of the negative events rather than predictions about them.

Driesprong et al. (2008) study the effect of oil price increase to stock market returns. The study considers 18 country market indexes to show that oil price increases predict negative stock market returns. The paper argues that the increased oil prices would not be aligned with indication of future risk premium, as a positive relation between the potential risk factor and returns were not found. This explanation, as well as the behaviour of the stock market is similar to results of Dimic et al. (2015). In the study of Driesprong et al. (2008) it could be inferred that what is studied does not necessarily reflect the risk, but the realization of a negative shock that decreases stock prices. Furthermore, the explanation of Driesporong et al. (2008) could mean that country scaled economic or other factors that are studied in these papers may be the realization of negative events rather than forward-looking representations of risk.

Atilgan and Demirtas (2014) study the relationship of downside risk with expected returns. The paper studies 27 emerging and 25 developed markets to find the relationship with value-at-risk measure and national market index returns. The results show that there is a positive relationship of value-at-risk measure and market returns for both emerging and developed markets. Atilgan and Demirtas (2014) also show that the value-at-risk measure predicts returns better in emerging markets compared to developed markets. The study is done by calculating a value-at-risk, which reflects the possible negative returns based on previous low points, and regressing the variable against country market index, also including control variables of dividend yield and price-to-fundamental variables. Comparing the results of this study with Dimic et al. (2015) and Clark and Kassimatis (2004), a conflicting result could be seen as the risk predicts negative returns for these studies in country level whereas risk predicts positive returns in country level in the study by Atilgan and Demirtas (2014).

Emerging markets is a context where the variations in economic, political, and financial risks are more prominent than developed countries. With that said, anecdotal evidence may reveal that emerging markets have been changing over the last thirty years and the pricing of country risk is also changing with them. Despite this fact, the level of change is also different for all the different countries that belong to the emerging economies category. This is potentially interesting because the multiple layers of variation gives this research enough robustness on its samples as well as the ability to better identify

the difference in equity returns in unfamiliar contexts. Despite some previous empirical findings, the expectation of the research is to find a positive relationship of all country risk factors with equity returns given the normal behaviour of risk and return in financial markets.

2.2.1 Political Risk

Political risk is the exposure of investments in a country to the political and geopolitical landscape in a country, particularly the possibility of suffering negative returns due to the political or geopolitical change that impacts equity prices negatively. Political risk is a expected to be a risk factor that is incorporated as information in the prices of various asset classes traded in a country, in this way it could be viewed similar to systematic risk, but different in the sense that it effects both equity and bond pricing, it is unique factor to country, and that it is unlikely to be important in pricing of assets in developed countries. Diamonte et al. (1996) study political risk in relation to country-level equity returns. The study finds that the countries that had a negative change in political risk had higher equity returns for both emerging and developed markets, where the change in emerging markets are larger. The authors explain that through the period they study, the emerging markets become politically safer, and developed markets being riskier, which suggest a convergence in political risk.

Diamonte et al. (1996) suggest that emerging markets, which had higher but decreasing political risk, experienced higher equity returns. The logical conclusion is that the existing relationship between political risk and return is positive. Therefore based on the theory of risk and return and the empirical findings, the following hypothesis is studied in this paper:

H1: *Political risk has a positive effect on equity returns*

2.2.2 Economic Risk

Economic risk is a measure of possibility of adverse returns due to events relating to the economy of the country. These possible adverse reactions could be caused by different events from a negative demand shock to a energy price hike, and generalized as any kind of macroeconomic event that result in a decrease in stock prices listed in the country. Bali et al. (2014) study macroeconomic risk in relation to hedge fund returns. The study shows that hedge funds that have higher exposure to macroeconomic uncertainty earn higher returns. The authors explain the results by claiming that macroeconomic risk is an important determinant of hedge fund returns.

The empirical finding of Bali et al. (2014) on hedge fund level could also be expected in a country level study since the logical explanation of the results applies in country level. The higher macroeconomic risk should be priced in the stock valuations according to the theory, backed by the empirical research. Thus the following hypothesis is built:

H2: *Economic risk has a positive effect on equity returns*

2.2.3 Financial Risk

Financial risk is the exposure to the uncertainty of adverse returns that could be caused by various financial factors. These financial factors may include increase in cost of borrowing, exchange rates, and volatility among others. All publicly listed firms in the country are exposed to these risks which results in these risk factors to correlate for all listed equity prices, and make it a country risk factor.

Liang and Wei (2012) study liquidity risk in relation to country portfolio returns. The study finds a positive relation of liquidity risk with equity returns. The paper explains that both global and local liquidity risk is priced in the equity prices, as investors expect higher returns for the risk they bear.

The finding of Liang and Wei (2012) show an example financial risk positively effecting stock market returns based on country level information. This empirical finding strengthens the argument, which was based on the general financial theory that financial risk will affect returns positively. Based on this expectation, the following hypothesis is studied:

H3: *Financial risk has a positive effect on equity returns*

2.3 Market Liberalization

Market liberalization is an example of policy decision and is usually a part of more extensive reform programs (Bartolini & Drazen, 1996). Most previous research in the field of finance defines market liberalization with a focus on capital markets. Bekaert et al. (2002) focus on capital market liberalization measured by restrictions in capital inflows and outflows. Although capital market liberalization is part of the market liberalization, market liberalization is more broadly defined as adherence of free market economics, which includes competition in the economy, free international and national trade, as well as the free flow of capital in a country.

Vogiatzoglou (2016) studies the effect of market liberalization on foreign direct investment on emerging Asian countries. The research defines market liberalization with all necessities that incorporates a free market institutional system. Vogiatzoglou (2016) finds that more liberalization in markets result in attracting higher FDI in the emerging Asian economies. Although market liberalization is typically studied as abolishment of restrictions in the capital markets, such as Bekaert et al. (2002), the characterization of market liberalization that is closer to Vogiatzoglou (2016) could also explain behaviour financial markets as the direct connection with FDI in this case could be supplemented with research of Topaloglu et al. (2019) that builds causal effect of FDI in market returns.

Bekaert and Harvey (1998) study the relationship of foreign portfolio flows with equity returns. Their study shows that in countries with higher equity flows lower cost of capital and higher correlation with world markets are observed. The authors explain these changes to be resulting due to additional benefits that foreign portfolio investors cause in the emerging economies. Bailey et al. (1999) study the difference in returns between the stocks restricted and not restricted to international trade. The study conducted in the individual securities level showed that the stocks that are not restricted to international investors have lower required returns compared to those who are restricted to foreign investors. Henry (2000) studies the effect of stock market liberalization on the stock price index of countries. The study concludes that liberalization on average leads to abnormal returns in the stock price indexes due to the lowered cost of capital that result through the sharing of risk between local and international investors.

Although the economic theory and empirical evidence has shown that country risk has an affect on returns, the magnitude of that affect could diminish due to additional market liberalization levels unique to the country. Bekaery and Harvey (1998) shows that market liberalization increases the correlation of emerging local markets with the global market, which could be used to make the case that emerging economies that are more liberalized will have less exposure to their country risk. As

they would behave more similarly to developed market equity returns, the determinant factors would be more specific to firms and market portfolio (Fama and French 2015) than country risk.

Lehkonen and Heimonen (2015) study the effect of political risk on stock market returns. The study considers that the level of democracy in the country moderates the effect of political risk on the stock market performance. In the paper that panel data of 49 countries were studied, a result that interaction between democracy and political risk being significantly negative while interaction between democracy-squared and political risk being significantly positive was shown. The significance of the interaction is interpreted such that the level of democracy moderate political risk in explaining returns but parabolic interaction predicts a different exposure at different levels of democracy. The paper employed a pooled regression method and the model included the regression variables of political risk, democracy, squared democracy variable, interaction variables of political risk and democracy, and control variables. Given that the interaction variables are significant, democracy is shown to affect the exposure of local stock markets to the country political risk. Although market liberalization and democracy are different concepts, the results from Lehkonen and Heimonen (2015) still contain valuable information about possible moderators of country risks. Considering that democracy changes the behaviour of political risk closer to the developed countries, Bekaery and Harvey (1998) hypothesis about converging markets could be applicable to democracy.

The evidence suggests that reforms and policy that bring the emerging markets in a form closer to developed markets decrease the effect of country level risk on the equity return performance of the countries. This means that the interaction of market liberalization and related risk factors of political, economic, and financial risk would be negative. This is hypothesised as follows:

H4: *The effects of Political Risk on returns are moderated by market liberalisation such country risk factors will more strongly predict returns on lower levels of market liberalisation.*

H5: *The effects of Economic Risk on returns are moderated by market liberalisation such country risk factors will more strongly predict returns on lower levels of market liberalisation.*

H6: *The effects of Financial Risk on returns are moderated by market liberalisation such country risk factors will more strongly predict returns on lower levels of market liberalisation.*

CHAPTER 3 Data

I collected panel data on 24 countries that are classified as emerging markets by MSCI for the periods 1990-2022. The year 1990 was chosen to keep the sample period contemporary, particularly for studying the country risk in the aftermath of Cold War. The data availability before 1990 is also very limited as the developments of the emerging markets coincide with the last decade of the 20th century and the first decade of the 21st century. The 24 countries that are studied are as follows, Brazil, Chile, China, Colombia, Czech Republic, Egypt, Greece, Hungary, India, Indonesia, Malaysia, Mexico, Pakistan, Peru, Philippines, Poland, Qatar, Saudi Arabia, South Africa, South Korea, Taiwan, Thailand, Turkey, and United Arab Emirates. These countries represent a diverse set of emerging markets with different regional and local characteristics, which are all relatively easier to invest in by the foreign investors due to the existence of the MSCI index, which makes the country portfolios a realistic investment opportunity.

Equity Returns. The equity returns are characterised as the return that investors gain by investing in the country portfolio from the beginning of the year to the end. The returns are based on the price changes of MSCI indexes of the countries, which is shown in percentage terms where in the sample a value of 1 equals a 100% increase. The data on equity returns was obtained through the MSCI database. The end of the year price information of MSCI indexes for all 24 countries was collected and formulated to yearly percentage price change to by calculating the percentage change from the previous years end of the year index price. Not including the empty observations, 686 observations on return were collected. The average return of the sample of 24 countries through the sample period was 10.7%.

Political Risk. The variable aims to measure how much political risk exists in a country in a given year. In the previous studies the most common way to measure *political risk* was composite score, which incorporates different aspects of the variable (Lehkonen and Heimonen, 2015; Diamonte et al., 1996). Because *political risk* is subjective, difficult to quantify, and is highly extensive, it is in line with the previous research and the theory that *political risk* is measured through a index that proxies the overall riskiness based on the expectation of adverse political events. In order to measure *political risk* I use the Political Stability and Absence of Violence/Terrorism measure that is found in the World Governance Indicator database of the World Bank. The variable ranges from -2.5 to 2.5 where higher number means a smaller risk. The sample consists of 552 observations of 24 countries between the years 1996 to 2021. The average score of the sample was -0.24.

Economic Risk. The variable measures the level of risk based on expectations of future adverse events relating to the macroeconomic indicators of a country. *Economic Risk* covers a broad range of risk factors that is difficult to precisely measure, and the previous literature used either index scores (Bali et al., 2014) or singular macroeconomic variables (Driesprong, 2008) as a way to operationalize the risk factor. *Economic Risk* is therefore is measured through a proxy in this study. In order to proxy *Economic Risk* I use the unemployment rate variable that is collected from the World Bank Database. The variable measures what percentage of workforce is not employed. The variable ranges from 0 to 100 where higher number means higher economic risk. The logic behind this interpretation is that lower labour quantity present in a country predicts lower production and economic activity, which are possible determinants of a downturn in stock market. Unemployment also predicts lower economic activity usually associated with an economic crisis, which is arguably when country level economic

risk is the highest. The sample consists of 736 observations of 23 countries, between the years 1990 and 2022. The average of the sample was 6.73.

Financial Risk. This variable measures the level of risk that relates to the country's finances and its financial markets which includes topics including cost of borrowing, balance of payments, exchange rates, liquidity, and volatility. *Financial Risk* is thought to have impact on all economic actors in a country, the financial sector, private sector, government, and consumers. Usually *Financial Risk* is studied through the research of singular financial factors (Liang and Wei, 2012), but there are also examples from the literature that utilised composite scores to represent financial risk (Erb et al., 1996). In order to study *Financial Risk* I created a composite score based on three variables that I collected from Global Financial Development Database by the World Bank. In order to create the composite *Financial Risk* score, I multiplied stock price volatility and liquid liabilities to GDP variables and divided the bank Z-Score by its result. Volatility and liquid liabilities predict more *Financial Risk* as high volatility is generally used as a risk indicator in financial markets, and high liquid liabilities predicts that liquidity risk may be high in such country. Bank Z-score is by definition the Z-score of possibility of bank bankruptcies, so it has an inverse effect with *Financial Risk* of the country. The variable, as the previous variables, show lower risk with higher numbers. The sample of the score ranges between -0.07 and 29.58 where the average is 5.24. In total, 467 observations are collected which ranges between 2000 and 2021 for 23 countries as Taiwan had missing data for all periods.

Market Liberalization. This variable measures to which extent financial system in a country adheres to the principles of free market, and to what extent financial services industry is developed and free for use of the consumers. *Market Liberalization* has usually been studied as a one-time event that a policy decision triggered (Harvey, 2000)(De Santis & Imrohoroglu, 1997). Because I consider *Market Liberalization* as the variable that moderates the effect of country-level risk on equity returns, it is more informative to operationalize Market Liberalization as a continuous factor with varying levels. In order to do such, I collected the composite score from the Financial Development Index database of the International Monetary fund. The composite Financial Development Index score measures access, depth, and efficiency of both financial markets and financial institutions. Because both these factors are important signs of a functioning liberal market, this score is a good indicator of the extent of market liberalization the emerging countries have been through. For the *Market Liberalization* variable, 713 observations are collected between the years 1996 and 2020 from all 24 countries in the sample. The score that indicates higher levels of market development with increasing numbers ranges between 0 and 1. The mean of the sample is 0.42.

Control variables. Four control variables are determined to be included in the regression models as the panel data with yearly frequency incorporate large amount of information relating to the macroeconomic change and development that effect the pricing of the equity traded in stock markets. Previous empirical literature shows that macroeconomic variables have an effect on equity returns (Chen et al., 1986; Flannery and Protopapadakis, 2002), which is why similar control variables are also used in the context of explaining country-level equity returns (Lehkonen and Heimonen, 2015; Clark and Kassimatis, 2004). The four control variables studied alongside dependent, independent, and interaction variables are the following: *GDP per capita growth*, natural logarithm of *GDP per capita*, and *foreign exchange rates* in terms of United States Dollars, and *GDP Deflator*. *GDP per capita growth* measures the economic growth of the country. The *GDP per capita* measure controls for the current economic development of the country. *Foreign exchange rates* control for fluctuations on the capital and money inflow and outflows that are expected to represent the stability of an economy. The Exchange rate values collected from World Bank were divided by 10,000. Lastly, *GDP Deflator* is

used in order to control for inflation, which is widely believed to represent the monetary stability of a country.

Table 1: Descriptive statistics

	Obs	Mean	Std. Dev.	Min.	Max.
Equity Returns	686	0.107	0.491	-0.745	7.451
Political Risk	552	-0.238	0.913	-2.810	1.261
Financial Risk	467	5.236	4.342	-0.066	29.585
Economic Risk	736	6.732	5.257	0.095	29.806
Market Liberalization	713	0.415	0.144	0.114	0.849
GDP per Capita Growth	741	2.457	4.306	-17.145	31.316
LN(GDP per Capita)	746	8.981	1.007	6.271	11.205
Exchange Rates	756	0.0568	0.204	0.000	1.485
GDP Deflator	746	79.399	47.424	0.001	707.413

CHAPTER 4 Method

To analyse the collected data, I will use two regression analysis using interaction terms for counting the moderation of *Market Liberalism.* I will perform a Prais-Winsten regression, correlated panels corrected standard error, with autocorrelation of AR(1) for errors, and a Prais-Winsten panel regression with lagged independent variables. Both regression models will utilise the panel data that is collected where the year variable is set as the time variable and country as the panel variable. For all regression analyses, the regressions will be performed firstly with only one independent variable, and later with all independent variables combined. The reasoning for this is due to the data collection as the variables on country-level risk had to be collected from separate data sources. Because of this situation, the hypotheses will be answered by looking at regressions with one independent variable.

The Prais-Winsten estimation is chosen as a baseline because there is strong possibility that variables studied in yearly intervals have autocorrelation, as returns tend to get affected from momentum and that it is likely that country-level variables are affected by their previous values. This regression type is also deemed fit for this context since it takes the panel characteristic of the data into account and is highly robust considering the time and country effects that would have to be assumed independent in a pooled regression. The Prais-Winsten model is applied to assess the significance of regression coefficients for the variables and interaction terms. Hypotheses 1,2,3, and 4 will be tested through generalized least squares regression model. Panel-corrected standard errors will be used for the estimations using Prais-Winsten model. The following regression equation is going to be assessed for assessing the significance of independent variables and the interaction variables on equity returns.

(1) $R_{i,t} = R_{i,t} = \beta_0 + \beta_1 POL_{i,t} + \beta_2 ECO_{i,t} + \beta_3 FIN_{i,t} + \beta_4 POL_{i,t} * ML_{i,t} + \beta_5 ECO_{i,t} * ML_{i,t} + \beta_6 FIN_{i,t} * ML_{i,t} + \beta_7 ML_{i,t} + \sum_{J=1}^{J} \Upsilon_j Z_{i,j,t} + \varepsilon_{i,t}$

Prais-Winsten model with lagged independent variables is the second model that is applied for assessing the hypothesis presented in this study. This model is applied to take into account the country-level risk may show its effect to equity returns with a lag of one year. This is suspected as the data collected on risk factors contain information related to previous year, which may be taken into account for the next year by the investors when investment decisions are made based on the risk expectations formulated through the observations from the previous year. The regression model provided in equation 2 is studied to assess the significance of independent variables and interaction terms.

(2) $R_{i,t} = \beta_0 + \beta_1 POL_{i,t+1} + \beta_2 ECO_{i,t+1} + \beta_3 FIN_{i,t+1} + \beta_4 POL_{i,t+1} * ML_{i,t} + \beta_5 ECO_{i,t+1} * ML_{i,t} + \beta_6 FIN_{i,t+1} * ML_{i,t} + \beta_7 ML_{i,t} + \sum_{J=1}^{J} \Upsilon_j Z_{i,j,t} + \varepsilon_{i,t}$

In the equations 1 and 2, R indicates yearly *Equity Returns*, POL *Political Risk*, ECO *Economic Risk*, FIN *Financial Risk*, and ML *Market Liberalization. Control variables* and their regression coefficients are denoted with the expression $\sum_{J=1}^{J} \Upsilon_j Z_{i,j,t}$. Country is shown by *i* and time variable is shown by *t*. Country fixed effect is shown by μ_i in equation 2.

The methodology of the fixed effect regression and pooled regression models could be found in Appendix A and Appendix C.

CHAPTER 5 Results & Discussion

5.1 Results

This study aims to answer the question: How does market liberalization change the level of explanation of country specific political, economic, and financial risk and global equity factors on equity returns in the emerging markets? The model shown in equation 1 was estimated by Prais-Winsten regression model. Although pooled regression is followed as the main model in the previous literature that analyse a similar context (Lehmonen and Heikonen, 2015) Prais-Winsten is chosen as the baseline model due to higher robustness and better fit to the panel data, as explained in the methodology section. Fixed effect model and pooled regression model is also discussed in this paper (see Appendix A, Appendix B, Appendix C, and Appendix D) as different assumptions robustness to the results found in this paper.

In order to interpret the results for all regression methods, $\beta_0$is considered as the average yearly returns that are not explained by the model, the OLS constant. β_1 β_2, and β_3 are the regression coefficients of the independent variables, which are interpreted as the effect of country level risk of their correspondence to yearly equity returns. β_4 β_5, and $\beta_6$are the OLS coefficients of the interaction terms, they are interpreted as the change in effect of the country-level risk factors on equity returns caused by the moderator term *Market Liberalization*. Lastly, β_7 is the coefficient of the moderating variable, which is interpreted as the effect of *Market Liberalization* on yearly equity returns.

5.1.1 Country-level risk factors and yearly equity returns following Prais-Winsten regression

In order to study the research question, the first action I take is to study the effect of country level risk factors on equity returns. The model is modified for each risk factor and a combined study such that the risk factors are first regressed individually shown in Prais-Winsten regression results 1 to 3, and then all together shown in Prais-Winsten regression 4, as explained in the Method section. The results of the estimated coefficients for independent and control variables based on Prais-Winsten regression are provided in Table 2.

Table 2: Prais-Winsten regression results for country level risk factors and yearly equity returns

	Prais-Winsten Regression (1)	Prais-Winsten Regression (2)	Prais-Winsten Regression (3)	Prais-Winsten Regression (4)
Political Risk	-0.0153			-0.0209
	(0.0122)			(0.0160)
Economic Risk		0.0033*		-0.0005
		(0.0019)		(0.0022)
Financial Risk			0.0062**	0.0047
			(0.0029)	(0.0031)
GDP per capita growth	0.0109	0.0087**	0.01120*	0.0111
	(0.0059)	(0.0042)	(0.0066)	(0.0070)
LN(GDP per capita)	-0.0142	-0.0147**	-0.0222*	-0.0216
	(0.0149)	(0.0078)	(0.0120)	(0.0188)
GDP Deflator	-0.0015*	-0.0012**	-0.001	-0.0019**
	(0.0008)	(0.0005)	(0.0008)	(0.0008)
USD Exchange Rates	0.0232*	0.0065	0.0425**	0.0336**
	(0.0120)	(0.0148)	(0.0186)	(0.0160)
Constant	0.3344**	0.2928***	0.3436**	0.4281**
	(0.1677)	(0.0842)	(0.1562)	(0.1968)
Number of Observations	489	643	440	423
R-squared	0.0650	0.0247	0.0633	0.1044

Note: Risk variables are studied separately for Prais-Winsten regressions 1, 2, and 3. Regression 4 studies all risk variables in a single regression model. The values represented are interpreted as percentage returns. Significance of the coefficients are shown as following, *** P-value < 0.01 ** P-value < 0.05 * P-value < 0.1

As shown in Table 2, the R-squared of the regression based on the most extensive model, Regression 4, is 0.1044. This means that the model is found to explain 10.44% of variance in yearly equity returns for the emerging markets. The coefficient for economic risk was found significant at 10% significance level in Regression 2, which could be interpreted that there is a positive effect of country-level Financial Risk on yearly equity returns, where 1 per cent increase in unemployment predicts 0.33% increase in equity returns. The effect of *Financial Risk* is also found significant at 5% significance level in Regression 3. The interpretation of results for *Financial Risk* is that 1-point increase in *Financial Risk* predicts 0.62% increase in equity returns. On the other hand, the coefficient of *Political Risk* was found insignificant as a result of Regression 1.

Based on these results, the hypothesis **H2** that stated Economic Risk has a positive effect on equity returns is not rejected at 10% significance level and **H3** that stated Financial Risk has a positive effect on equity returns is not rejected at 5% significance level based.

5.1.2 Market Liberalization and the effect of country-level risk following Prais-Winsten regression

The second action I take in order to answer the research question is to study how does *Market Liberalization* change the effect of country level risk factors on equity returns. The model that is shown in Equation 1 is studied through a Prais-Winsten regression analysis.

The model is modified for each risk factor in order to individually study the interaction of the risk factors with market liberalization for the regressions 5,6, and 7. The combined study shown at Regression 8 uses the formula given at Equation 1. Regressions 5,6, and 7 follow the OLS regression model as explained in the Method section, only taking one independent variable into account.

Table 3: Prais-Winsten regression results for country level risk factors and yearly equity returns, where regressions 5,6, and 7 include one country-level risk factor, interaction term, and market liberalization variable and with the regression 8 that shows the results for Equation 1

	Prais-Winsten Regression (5)	Prais-Winsten Regression (6)	Prais-Winsten Regression (7)	Prais-Winsten Regression (8)
Political Risk	-0.0163			-0.0455
	(0.0316)			(0.0373)
Economic Risk		0.0175***		0.0305***
		(0.0062)		(0.0113)
Financial Risk			-0.0054	-0.0192***
			(0.0061)	(0.0075)
Political Risk * Market Liberalization	-0.0032			0.0474
	(0.0827)			(0.1091)
Economic Risk * Market Liberalization		-0.0292***		-0.0616***
		(0.0113)		(0.1635)
Financial Risk * Market Liberalization			0.0302*	-0.0661***
			(0.0177)	(0.0233)
Market Liberalization	0.0351	0.1289	-0.1256	0.1545*
	(0.0833)	(0.0797)	(0.1057)	(0.0932)
GDP per capita growth	0.0117*	0.0095**	0.0123*	0.0103
	(0.0060)	(0.0043)	(0.0065)	(0.0069)
LN(GDP per capita)	-0.0149	-0.0022	-0.0234*	-0.0221
	(0.0168)	(0.0093)	(0.0128)	(0.0220)
GDP Deflator	-0.0014	-0.0017***	-0.0009	-0.0016
	(0.0009)	(0.0006)	(0.0009)	(0.0010)
USD Exchange Rates	0.0309**	0.0217	0.0419**	0.0272
	(0.0147)	(0.0159)	(0.0205)	(0.0186)
Constant	0. 3141*	0.1599	0.3823**	0.2917
	(0.1686)	(0.0890)	(0.1612)	(0.1813)
Number of Observations	467	597	421	404
R-squared	0.0623	0.0353	0.0628	0.1173

Note: Regression 5,6,7 are based on Equation 1, where only the independent variable, corresponding interaction term, and market liberalization variable are regressed. Regression 8 shows the results for Equation 1. The values represented are interpreted as percentage returns. Significance of the coefficients are shown as following, *** P-value < 0.01 ** P-value < 0.05 * P-value < 0.1

As shown in Table 3, the R-squared of the regression based on the most extensive model, Regression 8, is 0.1173. This means that the model is found to explain 11.73% of variance in yearly equity returns for the emerging markets. The coefficients for interaction terms corresponding to *Financial Risk* and *Economic Risk* were found significant at 1% significance level. The coefficient of the interaction term corresponding to *Political Risk* was found insignificant. To interpreted the significance of interaction terms, partial derivative of the regression equations are taken with respect to independent variables, for which the results are shown in Table 4.

Table 4: Results first order partial derivatives of country-level risk for Prais-Winsten regressions where the country-level risk variables are taken on first derivative keeping the Market Liberalization scores constant at 0, 0.5, and 1.

	Political Risk	Economic Risk	Financial Risk
At ML=0	-0.1634	0.0175***	-0.0055
	(0.0316)	(0.0062)	(0.0061)
At ML=0.5	-0.0179	0.0029	0.0097**
	(0.0189)	(0.020)	(0.0044)
At ML=1	-0.0195	-0.0117**	0.0248**
	(0.0560)	(0.0058)	(0.0126)
Number of Observations	467	597	421

Note: The values represented are interpreted as percentage returns. Significance of the coefficients are shown as following, *** P-value < 0.01 ** P-value < 0.05 * P-value < 0.1

The results provided in Table 4 show that although there are significant effects found for the independent variables *Economic Risk* and *Financial Risk*. There is an important difference between the results for *Economic Risk* and *Financial Risk*, however, which the effects increase with the level of *Market Liberalization* for *Financial Risk*, and decrease for *Economic Risk*. The effect of *Political Risk* remains insignificant for all levels of *Market Liberalization.* Based on these results hypothesis **H6** that stated that market liberalization decreases the effect of *Financial Risk* on equity returns is rejected. Hypothesis **H5** that stated that market liberalization decreases the effect of *Economic Risk* on equity returns is not rejected.

5.1.3 Country-level risk factors and yearly equity returns following lagged regression

The effect of country level risk factors on equity returns is studied through the lagged Prais-Winsten model to compare the results with the baseline model. The model is modified for each risk factor and a combined study such that the risk factors are first regressed individually shown in Lagged Prais-Winsten regression results 1 to 3, and then all together shown in Lagged Prais-Winsten regression 4. As explained in the Method section, this model is an adjustment to the previous model where independent variables are lagged for one year. The results of the estimated coefficients for independent and control variables based on Prais-Winsten regression are provided in Table 5.

Table 5: Lagged regression results for country level risk factors and yearly equity returns

	Lagged Prais-Winsten Regression (1)	Lagged Prais-Winsten Regression (2)	Lagged Prais-Winsten Regression (3)	Lagged Prais-Winsten Regression (4)
Political Risk	-0.0273*			-0.0115
	(0.0143)			(0.0111)
Economic Risk		0.0031*		-0.0010
		(0.0019)		(0.0017)
Financial Risk			0.0048**	0.0056**
			(0.0023)	(0.0025)
GDP per capita growth	0.0108*	0.0096**	0.01126**	0.0112**
	(0.0057)	(0.0041)	(0.0048)	(0.0025)
LN(GDP per capita)	-0.0278*	-0.0135*	-0.0445***	-0.0442***
	(0.0151)	(0.0078)	(0.0130)	(0.0156)
GDP Deflator	-0.0015**	-0.0011**	-0.0008*	-0.0010**
	(0.0005)	(0.0005)	(0.0004)	(0.0004)
USD Exchange Rates	-0.0024	0.0145	0.0204	0.0073
	(0.0135)	(0.0155)	(0.0163)	(0.0160)
Constant	0.4731***	0.2686***	0.5250***	0.5419***
	(0.1698)	(0.0878)	(0.1492)	(0.1685)
Number of Observations	493	633	443	426
R-squared	0.0696	0.0250	0.0766	0.0819

Note: Risk variables are studied separately for Lagged Prais-Winsten regressions 1, 2, and 3. Lagged Prais-Winsten Regression 4 studies all risk variables in a single regression model. The values represented are interpreted as percentage returns. Significance of the coefficients are shown as following, *** P-value < 0.01 ** P-value < 0.05 * P-value < 0.1 The values represented are interpreted as percentage returns. Significance of the coefficients are shown as following, *** P-value < 0.01 ** P-value < 0.05 * P-value < 0.1

As shown in Table 5, the R-squared of the regression based on the most extensive model, Lagged Regression 4, is 0.0819, which is smaller than the R-squared of the baseline regression found in Table 2, which was 0.1044. This means that the lagged model is found to explain less of the variance in yearly equity returns than the baseline model. The coefficient for all lagged risk factors was found significant at 10% significance level in Regressions 1,2, and 3. The effect of *Financial Risk* is also found significant at 5% significance level in Regression 3. As higher numbers for Political Risk variable indicate stability due to data collection, the interpretation should follow that positive relation of risk and returns was observed for all variables. Based solely on these results, the Hypothesis **H1** that stated Political Risk has a positive effect on equity returns, the hypothesis **H2** that stated Economic Risk has a positive effect on equity, and hypothesis **H3** that stated Financial Risk has a positive effect on equity returns is not rejected at 10% significance level.

5.1.4 Market Liberalization and the effect of country-level risk following lagged regression

Table 6: Lagged Prais-Winsten regression results for country level risk factors and yearly equity returns, where regressions 5,6, and 7 include one country-level risk factor, interaction term, and market liberalization variable and with the regression 8 that shows the results for Equation 2

	Prais-Winsten Regression (5)	Prais-Winsten Regression (6)	Prais-Winsten Regression (7)	Prais-Winsten Regression (8)
Political Risk	0.0238			-0.0188
	(0.0285)			(0.0360)
Economic Risk		0.0268***		0.0253***
		(0.0062)		(0.0093)
Financial Risk			-0.0042	-0.0133***
			(0.0054)	(0.0086)
Political Risk * Market Liberalization	-0.1662**			-0.0111
	(0.0749)			(0.0971)
Economic Risk * Market Liberalization		-0.0489***		-0.0539***
		(0.0113)		(0.0179)
Financial Risk * Market Liberalization			0.0168	0.0450*
			(0.0160)	(0.0250)
Market Liberalization	-0.0311	0.2530***	-0.1368	0.1344
	(0.0752)	(0.0765)	(0.1080)	(0.0917)
GDP per capita growth	0.0118**	0.0101**	0.0127***	0.0105**
	(0.0056)	(0.0043)	(0.0048)	(0.0052)
LN(GDP per capita)	0.0024	-0.0030	-0.0370***	-0.0311**
	(0.0182)	(0.0088)	(0.0120)	(0.0158)
GDP Deflator	-0.0032***	-0.0015**	-0.0017***	-0.0022***
	(0.0009)	(0.0006)	(0.0007)	(0.0008)
USD Exchange Rates	0.0408***	0.0260	0.0272	0.0156
	(0.0140)	(0.0159)	(0.0174)	(0.0187)
Constant	0. 3833**	0.0837	0.6248***	0.4771***
	(0.1691)	(0.0935)	(0.1413)	(0.1551)
Number of Observations	449	587	402	386
R-squared	0.1119	0.0380	0.1101	0.1339

Note: Regression 5,6,7 are based on Equation 2, where only the independent variable, corresponding interaction term, and market liberalization variable are regressed. Regression 8 shows the results for Equation 2. The values represented are interpreted as percentage returns. Significance of the coefficients are shown as following, *** P-value < 0.01 ** P-value < 0.05 * P-value < 0.1

As shown in Table 6, the R-squared of the regression based on the most extensive model, Lagged Regression 8, is 0.1339, which is higher than of the baseline model shown in Table 3, 0.1173. This means that the model is found to explain higher variance in yearly equity returns for the emerging markets. The coefficients for interaction terms corresponding to *Political Risk* and *Economic Risk* were found significant at 1% significance level. The coefficient of the interaction term corresponding to *Financial Risk* was found insignificant. To interpreted the significance of interaction terms, partial derivative of the regression equations are taken with respect to independent variables, for which the results are shown in Table 7.

Table 7: Results first order partial derivatives of country-level risk for Lagged Prais-Winsten regressions where the country-level risk variables are taken on first derivative keeping the Market Liberalization scores constant at 0, 0.5, and 1.

	Political Risk	Economic Risk	Financial Risk
At ML=0	0.0238	0.0268***	-0.0042
	(0.0285)	(0.0062)	(0.0054)
At ML=0.5	-0.0594***	0.0023	0.0042
	(0.0215)	(0.0019)	(0.0035)
At ML=1	-0.1425***	-0.0222***	0.0126
	(0.0540)	(0.0061)	(0.0111)
Number of Observations	449	587	402

Note: The values represented are interpreted as percentage returns. Significance of the coefficients are shown as following, *** P-value < 0.01 ** P-value < 0.05 * P-value < 0.1

The results provided in Table 7 show mostly significant effects for *Political Risk* and *Economic Risk* variables and insignificant effects for *Financial Risk* variable. Political variable show that as market liberalization increases, the effect becomes more negative. The interpretation of this results is that market liberalization increases the positive effect of Political Risk to equity returns, given the political variable has a reverse measurement as explained in the data section. On the other hand, the *Economic Risk* variable shows that the effect of the risk factor decreases with higher *Market Liberalization*. The effect for *Financial Risk*, remains insignificant for all levels of the interaction term, yet it could be seen that the coefficient increases with *Market Liberalization* which supports the findings at Table 4.

Following solely these results **H4** that stated that market liberalization decreases the effect of *Political Risk* on equity returns, and **H6** that stated that market liberalization decreases the effect of *Financial Risk* on equity returns are rejected. **H5** that stated that market liberalization decreases the effect of *Economic Risk* on equity returns is not rejected.

5.2 Discussion

The results from the baseline model found that the country-level risk factor of *Political Risk* do not have an effect on equity returns, whereas *Economic Risk* and *Financial Risk* have effects of 1.34% and 1.21% increase of returns predicted by 1 point increase in their respective score. This finding is similar to Erb et al. (1996) for the results relating to *Financial Risk* and *Political Risk as Financial Risk* was found to be a country-level risk factor that has explanatory power over equity returns, whereas *Political Risk* was found insignificant. The *Political Risk* variable is found significant when it was regressed with equity returns with one-year lag, which is interpreted such that 1 unit increase in political risk on average leads to 2.73% increase in equity returns the next year. In the wider context of predictability of equity returns, these results would likely to indicate that political risk factors are likely to be related to equity returns with one year lag whereas country-level *Economic Risk* and *Financial Risk* could have an explanatory power over equity returns with immediate effects.

The results found on analysis of risk factors against equity returns is similar, although not identical, to the initial expectations that were based on the theory of risk and returns, where the financial equity pricing models first developed by Sharpe (1964), Lintner (1965), and Black (1972) suggests a positive causal relationship of systematic risk and returns.

My results following the Prais-Winsten regression 3 and Lagged Prais-Winsten regression 3 show that there is a positive effect of *Financial Risk* on equity returns on country level. The finding is similar to previous studies that studied the effect of *Financial Risk* on returns on country level, such as Liang and Wei (2012) and Erb et al. (1996). The robustness test results provided in Appendix A also support the finding.

The results following the Prais-Winsten regression 2 and lagged Prais-Winsten regression 2 show that Economic Risk is significant at 10% significance level on explaining equity returns. The previous literature does not have a scientific consensus about whether country-level economic risk has a positive effect on equity returns. Driesprong et al. (2008) studies a similar context, although with a different variable where they find that oil price changes do not have an effect on equity returns. On the contrary, Erb et al. (1996) finds that *Economic* Risk does have an effect on equity returns. Another previous study that finds a positive causal effect of Economic Risk on equity returns comes from Bali et al. (2014) which differs from this study regarding the context as the equity returns were considered in hedge-fund return level instead of country level in this previous empirical study. An explanation on why Economic Risk could be significant in this study but not in some previous studies may be due to the data analysed. In this paper, unemployment is chosen as a proxy for *Economic Risk*, which possibly performed better than the *Economic Risk* variable used by the previous researchers. Most previous research collects country-level risk through International Country Risk Guide (ICRG) database (Erb et al., 1996; Diamonte et al. 1996; Lehkonen and Heimonen, 2015), which provides the same country risk factors studied in this paper from one source for researchers. Instead of using this database, I had to collect the data from non-profit sources, which does not provide all of these variables, leading me to collect the data from separate sources. It is logical that unemployment had a good explanatory power as a *Economic Risk* factor as it predicts the economic crisis situations where the markets are generally in a risky situation where the risk is easily priced in the market due to its visibility thus direct effect on investor sentiment. The economic risk factors studied in the previous research tend to give over-emphasis on factors that relate to the choices of economic policy, which has a more indirect effect to the stock market performance. Another explanation of this difference in results is the model used in this paper. The Prais-Winsten model corrects for autocorrelation.

Autocorrelation could cause important bias in coefficient estimation, and autocorrelation is expected to be a problem for economic risk, as economic risk in one year is not expected to be completely independent of risk in previous year.

Baseline regression results I found regarding political risk indicate that in country level there are no significant effects of political risk on equity returns in emerging markets, whereas the lagged results show a positive significant relationship. This result is partially different from previous literature where Lehkonen and Heimonen (2015) found that the effect of political risk was positive and significant in most regressions. This variance presented by the previous literature indicate that finding the effect of political risk might be subjective to certain regression models and political risk measures, which concludes that the main difference between my study and the previous literature in that regard is the difference in the models. Results in Appendix A show that country fixed effect model without autocorrelated error term predict insignificant results for political risk, and results in Appendix C show that pooled regression analysis predict insignificant results so it could be assumed that correcting for autocorrelation is important to avoid bias in coefficient estimates. Furthermore, lagging political risk factor one year gives a significant result which means that the data I have in this study is corrected to show that Political Risk do have a positive effect on equity returns. It is important to note that there is no consensus on whether Political Risk has an effect on equity returns, as the study by Erb et al. (1996) demonstrate that effect of Political Risk on explaining equity returns was only marginal. Therefore, my results should move the debate into considering political risk do have an effect on equity returns, but the efficiency of this information is possibly lower since it was only found significant when the variable was considered with one-year lag.

The expectation about the effect of market liberalization on moderating country-level risk is found different than what was initially expected. The expectation was based on the fact that *Market Liberalization* was the main factor that differentiated emerging markets and as this differentiation decrease, county-level risk would lose its explanatory power over equity returns. From the results provided in Table 4 and Table 7, it could be seen that Market Liberalization moderates the *Financial Risk* and Pol*itical Risk* to have higher effect on equity returns on higher market liberalization, in contrast to initial expectation, where the effect of *Political Risk* is observed only with one-year lag. No moderating effect was observed using pooled regression (see Appendix D), and similar results are only observed for financial risk variable using country fixed-effect regression (see Appendix B). On the other hand, *Economic Risk* has a more negative effect on equity returns on high market liberalization and vice versa based on results provided in Table 4 and Table 7. These results show that Market Liberalization decrease the positive effect of Economic Risk, but increase the positive effect of Political and Financial Risk.

These results show an interesting contrast to initial expectations where I formulated the Hypothesis 4, 5, and 6 based on the expectation that market liberalization would bring emerging markets to a behavior similar to developed markets, where country-level risk does not have an effect on returns. Only not rejecting H6, the results show that this expectation is only true for *Economic Risk*. Market liberalization policies would result in companies in emerging countries to increase their reach globally with regards to production, supply chain, and customer base which would mean that they are less exposed to country-level risks regarding economic policy uncertainty and country-specific economic shocks. This then would cause the expected effect of equity returns being explained better by firm-specific characteristics rather than the country-level economic risk.

A possible alternative explanation of this contrast could be that market liberalization instead increases the efficiency of capital markets to the level that both local and international investors could diversify the country-level Political and Financial risk and adjust their investments based on risk and return. This increased efficiency would indeed mean that country-level risk is priced as a systematic risk factor, explaining its positive effect on returns on higher levels of market liberalization. If this alternative explanation holds, it would be expected that Political and Financial Risk factors would also have effect in developed markets. The study by Diamonte et al. (1996) show some results that support this claim where they found the effect of political risk on returns exists for developed countries, although the effect is less in developed markets compared to emerging markets. This suggests that there may be other factors that explain the effect of country-level risk on equity returns. An explanation possibly applicable to these findings is that market liberalization initially increases the effect of country-level risk due to increased market efficiency caused by the flow of international traders, who consider such country-level risk in investment decisions. As political risk decrease, which coincides with an emerging market turning into a developed market, investors still consider this effect, but not the same extent as a high risk emerging market and instead divert their attention to firm-level characteristics.

Another alternative explanation of this contrast could be due to political and financial risk factors being explained by different country-level characteristics that coincide with the market liberalization process. Market liberalization process itself may have an effect on political and financial risk factors. Market liberalization coincides with various political and financial reforms that aim to increase the efficiency of the markets, institutions, and economy as a whole. A reform of allowing foreign traders, strengthening banking institutions, strengthening the legal system may have positive effects on the valuation of equity traded in the country. At the same time, market liberalization may cause significant changes in the political system and financial system, which may cause instability and risk. Looking at the political economic theory behind market liberalization closely, Kapstein (2000) argues that there are groups negatively affected by economic globalization, which can be thought as an inherent result of market liberalization. Considering that these events are growing inequality, and adverse circumstances for blue-collar workers, a political risk arises due to the growing income inequality that tend to spark strikes and protests. Controlling for these unique events is very difficult for a study that extends the analysis to multiple countries, as each of the countries would have a different history on how market liberalization was implemented and how was the effect of the reforms observed for political and financial atmosphere in those countries at the time. Furthermore, it is important to keep in mind stability and security concerns in both political and financial context should be separately analyzed for individual countries for future research as these events form a link between equity returns, country-level risk, and market liberalization that is outside the scope of the model studied in this paper.

A final alternative explanation of the contrast between initial expectations and results on the effect of market liberalization on explaining the positive effect of political and financial risk factors to equity returns is due to data collection. The data collected for this study is different from the previous literature as data for market liberalization was collected through a separate source than the risk variables; gaps on observations were a problem while performing regression analyses. Furthermore, this limitation could have possible effects to skew the results given that data for earlier periods were more difficult to obtain which could create a systematic bias. For further research, it is advised that data collection should be more complete which could be achieved by using providers of country-level risk data such as credit rating agencies and other private organizations.

CHAPTER 6 Conclusion

The purpose of this study was to explain the predictability of stock market returns with country-level risk using market liberalization. The literature of financial economics establishes a positive relationship of risk and returns, although the previous researches of country-level risk shown different results without a consensus on the cause of this difference in results. This study aimed to explain the differences in these results by suggesting that the effect of country-level risk on yearly equity returns would be decreased with market liberalization, as no research had previously studied the effect of market liberalization policy on predictability of country-level equity returns. Therefore, the research question that this paper followed was: How does market liberalization change the level of explanation of country specific political, economic, and financial risk and global equity factors on equity returns in the emerging markets?

In order to answer this research question, panel data of yearly equity returns, country-level risk factors, and market liberalization scores were collected for 24 emerging markets between the 1990-2022 period. The panel data was studied through Prais-Winsten regression analysis and lagged Prais-Winsten regression analysis in order to assess the significance of country-level risk factors and the interaction of these factors with market liberalization. The results of the regression models have shown significant relationship of political, economic, and financial risk and returns, where political risk had an effect with one year lag and economic and financial risk had immediate effect. Market liberalization was found significant on explaining effect of country-level economic risk decrease over equity returns, and effects of political and financial risk increase over equity returns.

This paper therefore concludes that all country-level risk factors likely have explanatory power over equity returns and that market liberalization does change the magnitude of those effects. Considering the previous research and the results found in this study, it is likely that political and financial risk has other underlying factors that explain the magnitude of their positive effect on equity returns, whereas market liberalization explains economic risk sufficiently.

The practical implications of this study for risk management and investment professionals would be to put higher emphasis on analysing economic risk with market liberalization rather than other country level risks for modelling predictability of their returns on emerging market investments. Recommendations for investors would be to consider political risk and financial risk holistically looking at the market liberalization reform process.

The main limitation that this research faced is due to availability of data of emerging markets. There are limited data available provided by non-profit organisation that limited the accuracy of this research. The fact data on risk had to be collected through different sources, which may also have caused a bias towards a certain risk factor on the results. Furthermore, there is no established model that studies the predictability of returns based on country-level risk factors, which limits the theory behind this paper to be based on more generalized assumptions of field of financial economics. Although the empirical results found in this paper indicate a new direction to research, an established model of predictability and better collection of historical and future data through the emerging markets could lead to more accurate research on this topic. The future researchers interested in this topic is also suggested to look into frontier markets, which are considered to be less integrated to global markets where country-level risk and market liberalization process could be more informative.

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APPENDIX A Fixed Effect Tests for Country-Level Risk

In order to increase the robustness of the results, fixed effect regression model is studied for the panel data. This model is applied for the constant term to vary across different countries, which is chosen, as there is a possibility of systematic differences between equity returns in different markets that are caused by characteristics not studied in this paper. Because this model allows for this variation, this model is considered to be more robust than pooled regression, which is studied at Appendix C. The model is modified for each risk factor and a combined study such that the risk factors are first regressed individually shown in Fixed-Effect regression results 1 to 3, and then all together shown in Fixed-Effect regression 4, as explained in the Method section. The results of the estimated coefficients for independent and control variables based on Fixed-Effect regression are provided in Table 8.

Table 8: Fixed Effect Regression analysis based on the regression of country-level risk variables following the fixed effect regression model: $R_{i,t} = \beta_0 + \beta_1 POL_{i,t} + \beta_2 ECO_{i,t} + \beta_3 FIN_{i,t} + \beta_4 POL_{i,t} * ML_{i,t} + \beta_5 ECO_{i,t} * ML_{i,t} + \beta_6 FIN_{i,t} * ML_{i,t} + \beta_7 ML_{i,t} + \sum_{J=1}^{J} \Upsilon_j Z_{i,j,t} + \mu_i + \varepsilon_{i,t}$

	Fixed-Effect Regression (1)	Fixed Effect Regression (2)	Fixed Effect Regression (3)	Fixed Effect Regression (4)
Political Risk	-0.0663			-0.0819
	(0.0537)			(0.0614)
Economic Risk		0.0134		-0.0074
		(0.0088)		(0.0088)
Financial Risk			0.0121*	0.0090
			(0.0072)	(0.0076)
GDP per capita growth	0.0032*	0.0086	0.0086	0.0077
	(0.0047)	(0.0057)	(0.0049)	(0.0051)
LN(GDP per capita)	-0.0858	-0.1548*	-0.0657	-0.0612
	(0.1009)	(0.0939)	(0.1115)	(0.1295)
GDP Deflator	-0.0011	-0.0010	-0.0010	-0.0018**
	(0.0007)	(0.0006)	(0.0008)	(0.0009)
USD Exchange Rates	0.1322	0.2631	-0.2364	0.0519
	(0.2951)	(0.2171)	(0.3589)	(0.3825)
Constant	0.9168	1.4357*	-0.7070	0.6717
	(0.8657)	(0.8220)	(0.9553)	(1.1428)
Number of Observations	489	643	440	423
Number of Countries	23	23	23	23
Overall R-squared	0.0179	0.0119	0.0272	0.0421

Note: The values represented are interpreted as percentage returns. Significance of the coefficients are shown as following, *** P-value < 0.01 ** P-value < 0.05 * P-value < 0.1

The results show that coefficient of *Financial Risk* is significant at 10% significance level where the coefficient can be interpreted such that 1 unit increase in *Financial Risk* score increases equity returns by 1.21%. The result strengthens not rejecting **H3**, which states that *Financial Risk* has a positive effect on the equity returns. The results contrasting with the baseline model show that country fixed effects may explain some variation in equity returns that was previously explained by political and economic risk.

APPENDIX B Fixed Effect Tests With Interaction Terms

Table 9: Fixed-Effect regression results for country level risk factors with interaction terms and market liberalization, where regressions are based on the following model given by $R_{i,t} = \beta_0 + \beta_1 POL_{i,t} + \beta_2 ECO_{i,t} + \beta_3 FIN_{i,t} + \beta_4 POL_{i,t} * ML_{i,t} + \beta_5 ECO_{i,t} * ML_{i,t} + \beta_6 FIN_{i,t} * ML_{i,t} + \beta_7 ML_{i,t} + \sum_{J=1}^{J} \Upsilon_j Z_{i,j,t} + \mu_i + \varepsilon_{i,t}$

	Fixed Effect Regression (5)	Fixed Effect Regression (6)	Fixed Effect Regression (7)	Fixed Effect Regression (8)
Political Risk	-0.0627			-0.1513
	(0.1231)			(0.1394)
Economic Risk		0.0180		0.0246
		(0.0219)		(0.0250)
Financial Risk			-0.0276	-0.0355
			(0.0246)	(0.0257)
Political Risk * Market Liberalization	-0.0123			0.1365
	(0.2861)			(0.3226)
Economic Risk * Market Liberalization		0.0002		-0.0328
		(0.0439)		(0.0496)
Financial Risk * Market Liberalization			0.1085*	0.1192*
			(0.0636)	(0.0659)
Market Liberalization	0.3834	0.3596	-0.1186*	0.0102
	(0.4011)	(1.5025)	(0.5260)	(0.7020)
GDP per capita growth	0.0098*	0.0107*	0.0098	0.0082
	(0.0051)	(0.0063)	(0.0054)	(0.0058)
LN(GDP per capita)	-0.1411	-0.0167	-0.0975	-0.0611
	(0.1255)	(0.1375)	(0.1414)	(0.1629)
GDP Deflator	-0.0012	-0.0032***	-0.0008	-0.0017
	(0.0009)	(0.0011)	(0.0009)	(0.0011)
USD Exchange Rates	0.1800	0.4451*	-0.1956	0.1763
	(0.3186)	(0.2458)	(0.3902)	(0.4215)
Constant	1.2333	0.1861	1.0000	0.5999
	(1.010)	(1.0902)	(1.1133)	(1.3038)
Number of Observations	467	597	421	404
Number of Countries	23	23	23	23
R-squared	0.0177	0.0185	0.0301	0.0484

Note: The values represented are interpreted as percentage returns. Significance of the coefficients are shown as following, *** P-value < 0.01 ** P-value < 0.05 * P-value < 0.1

The results of Fixed Effect regression models with interaction terms are shown in Table 6, the R-squared of the regression based on the most extensive model, Fixed Effect Regression 8, is 0.0484. This means that the model is found to explain 4.84% of variance in yearly equity returns for the emerging markets. Comparing this to the Prais-Winsten model, the previous model has more explanatory power with 11.73%. The coefficients for interaction terms corresponding to *Political Risk* and *Economic Risk* were found insignificant at 10% significance level. The coefficient of the interaction term corresponding to *Financial Risk* was found significant at 10% significance level. To interpreted the significance of interaction terms, partial derivative of the regression equations are taken with respect to independent variables for Fixed Effect regressions 5, 6, and 7, for which the results are shown in Table 7.

Table 10: Results first order partial derivatives of country-level risk for Fixed Effect regressions where the country-level risk variables are taken on first derivative keeping the Market Liberalization scores constant at 0, 0.5, and 1.

	Political Risk	Economic Risk	Financial Risk
At ML=0	-0.0627	0.0180	-0.0276
	(0.1231)	(0.0219)	(0.0246)
At ML=0.5	-0.0689	0.0181*	0.0267**
	(0.0652)	(0.0010)	(0.0112)
At ML=1	-0.0750	0.0182	0.0810**
	(0.1851)	(0.0261)	(0.0408)
Number of Observations	467	597	421

Note: Significance of the coefficients are shown as following, *** P-value < 0.01 ** P-value < 0.05 * P-value < 0.1

The results provided in Table 7 show that the effect of *Political Risk* remains insignificant for all levels of *Market Liberalization*. For *Economic Risk* only a marginal variation is present on the effect of *Economic Risk* to equity returns in given *Market Liberalization* levels, with *Economic Risk* only being significant at 10% significance level when *Market Liberalization* is kept at 0.5. These results are different from the findings based on Prais-Winsten regression where market liberalization shown to decrease the effect of *Economic Risk* on equity returns. Similar findings to Prasis-Winsten model are found in the Fixed Effect model regarding the effect of Market Liberalization on explaining the effect of Financial Risk on equity returns, where the effects increase with the level of *Market Liberalization* for *Financial Risk.*

APPENDIX C Pooled Regression Tests for Country-Level Risk

In order to further increase the robustness of the results, pooled regression model is studied for the panel data, as this method was used in previous literature. The model is modified for each risk factor and a combined study such that the risk factors are first regressed individually shown in Pooled regression results 1 to 3, and then all together shown in pooled regression 4. The results of the estimated coefficients for independent and control variables based on pooled regression are provided in Table 11.

Table 11: Pooled regressions analysis based on the regression of country-level risk variables following the fixed effect regression model: $R_{i,t} = \beta_0 + \beta_1 POL_{i,t} + \beta_2 ECO_{i,t} + \beta_3 FIN_{i,t} + \beta_4 POL_{i,t} * ML_{i,t} + \beta_5 ECO_{i,t} * ML_{i,t} + \beta_6 FIN_{i,t} * ML_{i,t} + \beta_7 ML_{i,t} + \sum_{J=1}^{J} \Upsilon_j Z_{i,j,t} + \varepsilon_{i,t}$

	Pooled Regression (1)	Pooled Regression (2)	Pooled Regression (3)	Pooled Regression (4)
Political Risk	-0.0117			-0.0203
	(0.0209)			(0.0223)
Economic Risk		0.0036		-0.0002
		(0.0039)		(0.0030)
Financial Risk			0.0065	0.0049
			(0.0049)	(0.0054)
GDP per capita growth	0.0079*	0.0068	0.0090**	0.0082*
	(0.0044)	(0.0045)	(0.0044)	(0.0046)
LN(GDP per capita)	-0.1420	-0.0189	-0.0235	-0.0207
	(0.0202)	(0.0188)	(0.0190)	(0.0238)
GDP Deflator	-0.0012***	-0.0011	-0.0012**	-0.0017***
	(0.0004)	(0.0007)	(0.0005)	(0.0005)
USD Exchange Rates	0.0232	0.0022	0.0432	0.0345
	(0.0715)	(0.0686)	(0.0727)	(0.0741)
Constant	0.3027*	0.0329**	0.3518*	0.3922
	(0.1921)	(0.1658)	(0.0449)	(0.2455)
Number of Observations	489	643	440	423
R-squared	0.0293	0.0206	0.0272	0.0578

Note: The values represented are interpreted as percentage returns. Significance of the coefficients are shown as following, *** P-value < 0.01 ** P-value < 0.05 * P-value < 0.1

The results show that coefficient of all risk factors are insignificant at 10% significance level. The results contrasting with the baseline model show that autocorrelation may cause some bias in coefficient estimates for pooled regression results.

APPENDIX D Pooled Regression Tests With Interaction Terms

Table 12: Pooled regression results for fixed effect model of country level risk factors and yearly equity returns

	Pooled Regression (5)	Pooled Regression (6)	Pooled Regression (7)	Pooled Regression (8)
Political Risk	-0.0202			-0.0669
	(0.0674)			(0.0746)
Economic Risk		0.0174		0.0324**
		(0.0186)		(0.0156)
Financial Risk			-0.0083	-0.0238
			(0.0180)	(0.0214)
Political Risk * Market Liberalization	0.0116			0.0985
	(0.1815)			(0.2002)
Economic Risk * Market Liberalization		-0.0286		-0.0654**
		(0.0326)		(0.0289)
Financial Risk * Market Liberalization			0.0391	0.0805
			(0.0458)	(0.0546)
Market Liberalization	0.0740	0.1393	-0.1255	0.1944
	(0.1454)	(0.1980)	(0.1736)	(0.2345)
GDP per capita growth	0.0090*	0.0077*	0.0102**	0.0080
	(0.0049)	(0.0051)	(0.0048)	(0.0051)
LN(GDP per capita)	-0.0169	-0.0054	-0.0259	-0.0254
	(0.0258)	(0.0199)	(0.0204)	(0.0293)
GDP Deflator	-0.0011	-0.0018***	-0.0009	-0.0012
	(0.0007)	(0.0007)	(0.0006)	(0.0008)
USD Exchange Rates	0.0310	0.0203	0.0451	0.0275
	(0.0790)	(0.0784)	(0.0807)	(0.0832)
Constant	0.2809	0.1947	0.4002*	0.2580
	(0.2146)	(0.2090)	(0.2271)	(0.3140)
Number of Observations	467	597	421	404
R-squared	0.0691	0.0312	0.0460	0.0713

Note: The values represented are interpreted as percentage returns. Significance of the coefficients are shown as following, *** P-value < 0.01 ** P-value < 0.05 * P-value < 0.1

The results of pooled regression models with interaction terms are shown in Table 12, the R-squared of the regression based on the most extensive model, Pooled Regression 8, is 0.0713. This means

pooled regression model explained more variation than the fixed effect model but less than the Prais-Winsten model. The coefficients for interaction terms corresponding to *Political Risk, Economic Risk* and *Financial Risk* were found insignificant at 10% significance level. To interpreted the significance of interaction terms, partial derivative of the regression equations are taken with respect to independent variables for Fixed Effect regressions 5, 6, and 7, for which the results are shown in Table 7.

Table 13: Results first order partial derivatives of country-level risk for Pooled regressions where the country-level risk variables are taken on first derivative keeping the Market Liberalization scores constant at 0, 0.5, and 1.

	Political Risk	Economic Risk	Financial Risk
At ML=0	-0.0202	0.0174	-0.0083
	(0.0674)	(0.0186)	(0.0180)
At ML=0.5	-0.0144	0.0031	0.0113
	(0.0358)	(0.0039)	(0.0078)
At ML=1	-0.0086	-0.0111	0.0309
	(0.1204)	(0.0147)	(0.0291)
Number of Observations	467	597	421

Note: Significance of the coefficients are shown as following, *** P-value < 0.01 ** P-value < 0.05 * P-value < 0.1

The results provided in Table 13 show that the effect of all risk factors remains insignificant for all levels of *Market Liberalization* based on the pooled regression model.