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Determinants of Cross-Country Differences in the Equity Risk Premium: A Cross-Sectional Analysis

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Abstract

The equity risk premium (ERP) is a critical factor in financial decision-making and allocating capital for the future. The ERP can indicate the aggregate risk in an economy and thereby the price agents attach to that risk. Understanding the factors that determine ERPs across countries is important for understanding investors' actions in a globalized environment. This study will focus on long-run measures of the ERP across countries while applying four common measures. Variations in the size of the ERP across countries and across measures will be examined. Then, country-specific determinants of the long-run ERP will be investigated. These determinants include macroeconomic factors such as the volatility of GDP growth and inflation volatility as well as political and cultural factors such as property rights, trust and ethnic fractionalization. This study will not only contribute to the understanding of risk and return in a globalized investment environment but will also identify those factors which reduce or increase a country's equity risk premium.

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Introduction

"Equity risk premiums are a central component of every risk and return model in finance and are a key input in estimating costs of equity and capital in both corporate finance and valuation," (Damodaran, 2013). The equity risk premium (ERP) aids firms in allocating capital for the future as it is a central variable in computing the appropriate price of capital. Furthermore, it allows investment banks and hedge funds to make informed decisions on capital allocation. In addition to its direct practical applications within the financial industry, ERPs can also be understood as an aggregate representation of the risk present in an economy as well as the price agents attach to that risk. Considering ERPs as representative of aggregate risk, research demonstrates that they vary across countries. Understanding the varying risk across countries is vital while acting within the globalized financial environment, the importance of which was demonstrated starkly through the 2008 Financial Crisis.

While using ERPs is relatively commonplace in the industry, the proper methods of computation, magnitudes and determinants of international ERPs is anything but unified within both industry and academia. Gaining insight into the macroeconomic as well as political/cultural determinants of ERPs across countries would allow firms and financial institutions to more accurately predict the return required from an investment given country-specific conditions. I have chosen this subject because the

ERP is a practical variable within the financial industry which I believe deserves further economic investigation. Thereby I prefer to combine my research interests of macroeconomics as well as political/cultural factors within development economics to provide a better understanding of the ERP. For these reasons, I will explore the three primary methods for computing the ERP as well as the magnitudes and determinants of international ERPs.

To do so, I will continue with a Theoretical Background in order to present the fundamental aspects of this subject. Then I will offer a current state of the literature in order to validate the inclusion of the relevant dependent as well as independent and control variables in my model. In Chapter 1. Theoretical Background, I demonstrate and compare the three most popular methods by which to compute the ERP: the Historical, Implied and Survey methods. Then I will perform multiple cross-sectional multivariable regression analyses using data on a broad set of countries in order to provide perspective on the long term factors affecting the ERP. The dependent variables will be the four ERP measures. The independent variables will include macroeconomic factors, such as the volatility of GDP and the volatility of inflation, as well as political/cultural factors such as property rights, trust and ethnic fractionalization. Thereby I will also control for latitude, as a geographical reference, in each regression model.

I hypothesize that higher levels of GDP, inflation volatility as well ethnic fractionalization will work to increase the ERP across countries. On the other hand, greater levels of property rights' enforcement and trust will decrease the ERP. Thereafter I will discuss my results and their potential implications. This work will contribute to the

further understanding of risk and return in the globalized investment environment and shed light on the research question: what are the macroeconomic and political/cultural determinants of equity risk premiums?

Chapter 1. Theoretical Background

What is the Equity Risk Premium?

Simply stated, a risk premium is the compensation required to invest in a relatively risky asset compared to a risk-free asset. In other words, it is the additional reward for taking on risk. In the specific instance of the equity risk premium, the relatively risky asset is an equity and the relatively risk free asset is one with a guaranteed rate of return, such as a government-backed security. In its simplest form, it is computed as:

$$R_{Premium} = R_{Equity} - R_{Risk\ Free}$$

Figure 1.1 Equity Risk Premium Equation

where $R_{Premium}$ is the risk premium, R_{Equity} is the average rate of return expected from an equity investment and $R_{Risk\ Free}$ is the average rate of return expected from an investment with a guaranteed rate of return.

I will now extend the explanation of this most simple example further. First, researchers in both academia and the financial industry most often compute R_{equity} by observing the average historical return on a broad index of stocks such as the S&P 500. Then $R_{risk\text{-}free}$ can be calculated by computing the average return on either Treasury Bills or Bonds over the same time period as the stock index. The returns of both indicators can be averaged either arithmetically or geometrically.

Intuitively, this method of ERP computation is called the Historical Returns method, as one employs the historical performance of stocks and bonds to compute the premium. Historical Returns is one of three methods which I will address in this thesis, the others being the Implied method and the Survey method. Already at this early state, potential pitfalls are visible; how far back does reliable data exist for these historical returns? Additionally, is it appropriate to compute the average returns over a 100, 50, 20, 10 or 5 year span? As one can imagine, the data source as well as the span over which one averages returns could significantly affect the final value which one decides to be an "appropriate" ERP. This seemingly simple and practical concept is nevertheless significantly affected by the input parameters of one's choosing, Against this backdrop I strive to gain a clearer perspective of its macroeconomic and political/cultural determinants through this thesis.

What is Risk?

Thus far, I have demonstrated that the ERP reflects the necessary price agents deem appropriate for taking on risk. As we now understand how to calculate the variable in its most straightforward form, I will next explain its most popular uses as well as their broader implications. In order to do this, I must first provide a fundamental understanding of a term which I use throughout this thesis: Risk.

Risk in the economic and financial sense is the variance in actual returns around an expected level of returns. In this way, a riskless investment is one in which the actual returns are the same as the expected returns. Considering modern portfolio theory, the

only risk that matters is that which the investment contributes to a diversified portfolio. Hereby the correlations among the securities within a portfolio as well as their sensitivity to market movements are important in computing this contributed risk to the overall portfolio. It is this contributed risk which should be measured and for which should be compensated in thoughtful investment. Market risk, however, is not diversifiable and should therefore be rewarded; in this sense, this market risk is the additional reward required for taking on risk (Brealey, Myers, & Allen, 2014)

Having addressed risk, premiums and the "reward" for taking on risk, it is appropriate to elaborate on the fundamentals of pricing and a premium. First of all, an asset's price and its expected return are negatively correlated, meaning that a higher price implies a lower return on the investment and vice versa. So if the premium on an investment is high then the price that an agent is willing to pay for it is low. In this way, we could say that the ERP is estimated at too high of a magnitude if equity prices have been too high to reflect this. This basic understanding will be necessary when I discuss the Equity Risk Premium Puzzle as well as the influential book called "Triumph of the Optimists" (Dimson, Marsh, & Staunton, 2002; Mehra & Prescott, 1985).

The Capital Asset Pricing Model

With this better understanding of risk, I will now explain the most common uses of the ERP. One of its most fundamental applications is for finding the appropriate price of an asset. The standard method by which to compute such values uses the cornerstone of modern finance in textbooks and the boardroom: Sharpe, Lintner and Treynor's *Capital*

Asset Pricing Model (CAPM) (Lintner, 1965; Sharpe, 1964) As the name suggests, this model predicts the appropriate price, and thereby return, for an asset. More specifically, it predicts that within a competitive market, the expected risk premium varies according to a security's sensitivity to market changes. The following formula represents the model:

$$E(R_i) = R_f + \beta_i(E(R_m) - R_f)$$

Figure 1.2 Capital Asset Pricing Model

The security's sensitivity to market changes is measured through β_i. This is multiplied by a market-level ERP represented by $\left(E(R_m) - R_f\right)$, which is the expected return on the equity market minus the risk free rate. Finally, adding this resulting value to the risk free rate results in $E(R_i)$, the expected total return on a single risky asset (Brealey et al., 2014).

Why is the ERP Important?

The CAPM is the most common and most straightforward use for the ERP in modern finance. As mentioned in the Introduction, the ERP is integral in determining the costs of equity and capital. It is the CAPM which makes this possible. As such evaluation is vital for individuals, firms and financial institutions in making decisions, having a reliable estimation of the ERP and understanding what can effect it in the future is important. This is the case because the ERP's magnitude will affect how we allocate wealth across asset classes as well as in which assets we invest. Generally, when the ERP increases, investors charge a higher price for risk and vice versa (Damodaran, 2013). Nevertheless, the appropriate arguments and methods for magnitude, calculation and implications of the equity risk premium have been anything but consistent.

But what does this all practically mean for individuals, firms and the market? What can different magnitudes of ERPs subsequently mean for a company, a government, or even an individual? First of all, for the average company, through the CAPM, it affects whether an investment will generate greater or fewer returns than the initial cost and thereby whether it is worth financing or not. Furthermore, the ERP's magnitude can influence the decisions which large entities, such as corporations or governments, make in terms of funding for pension and health care funds. If the ERP is too high, there will be insufficient funds set aside for such investments each year. Additionally, regulated monopolies, such as utility companies, are required to charge a price determined as "fair" according to the proper return for equity investors. If the ERP is set too high then this will lead to higher prices for the customers (Damodaran, 2013). Just in these few examples, it is obvious that estimating the proper magnitude of the ERP can have broad effects. This is why an in-depth understanding of its determinants is a necessity.

Understanding the determinants of the ERP on an international scale is vital in the global environment in which firms make strategic decisions dependent on reliable pricing data. Acting and investing in different markets requires an understanding of variables which may significantly affect risk and financing considering this risk. In other words, there are varying levels of risk present in different markets. As we can calculate the ERP for markets for which we possess reliable data, this measure of country risk through the ERP can help companies make strategic decisions.

Investigating international ERPs is particularly worthwhile because it is possible to combine components of finance, macroeconomics and political/cultural factors into one

subject. Each of these fields are particularly strong interests of mine both personally and for future professional work. The research which I present here as well as my data and analyses demonstrate the necessity for a deeper understanding of the components of ERPs.

What Risk Should Be Rewarded?

As research indicates, there is reason to believe that there are varying risk premiums across countries (Dimson et al., 2002). But before going further, it is worth asking, should this actually be the case? A risk premium is a reward for taking on market or non-diversifiable risk. But in a world which is increasingly globalized, can a marginal investor not diversify the risk from a foreign equity with another? In fact, evidence suggests that investors tend to have a home market bias, meaning that they concentrate their portfolios on equities from their home market. Still, if they possess a globally-diversified portfolio then risk can indeed be compensated for (Stulz, 1999).

Nevertheless, there is still another issue. As we are addressing country specific risk, there should be an inherently low correlation on returns across markets. When this is the case, diversification works. But if returns across markets are positively correlated this is not the case. In fact, apparent low correlation among returns which analysts identified during the 1970s and 80s served to spur the popularity of global investment strategies and thereby increased correlations. Moreover, there is evidence that the correlation across equity markets increases during times of stress and volatility. Despite the effects of globalization and increasingly positive correlation of equity markets, the

fact that most investors still possess a strong home bias as well as that the strength of global diversification of risk has decreased, country-specific risk premiums are therefore indeed still appropriate (Damodaran, 2013).

All ERPs are not Created Equal

At this point I would like to briefly introduce the three methods for computing the ERP before explaining them in a more in-depth manner in the Literature Review section.. As I explained above, using Historical Returns is the most popular method by which to compute the ERP. However, the argument against this method is that if markets are efficient, then historical returns should have no impact on future returns. Therefore, using such data is inappropriate for pricing future projects. In response to this, the implied approach is a more forward-looking measurement using either current equity prices or risk premiums in non-equity markets. If one possesses pricing information on an asset then it is possible to imply the return on equity which investors expect; hence the name of this method. Possessing this required return on equity, one can then subtract a risk free rate from this to compute the equity risk premium. Finally, the third primary method is the survey approach, whereby a researcher asks financial managers, academics and investors about their opinion as to the proper ERP. Choosing the right method of computation often depends on the research goal or in what manner the measure is to be used (Damodaran, 2013).

With this *Theoretical Background* I have begun the initial explanation of the main research objective of this thesis: to explore the macroeconomic as well as

political/cultural determinants of the ERP. In doing so, I have addressed my personal motivation for undertaking this research. Furthermore, I provided a fundamental understanding of the ERP. This includes its most basic computing method; subtracting a risk free rate from an expected return on equity. Moreover, I have elaborated on its primary applications, such as within the CAPM, as well as what implications the magnitude of the ERP can have. Additionally, I have briefly addressed the three most popular methods for computing the ERP: historical returns, the implied method as well as the survey method. As the goal of this thesis is to shed light on the macroeconomic as well as political/cultural determinants of the ERP, I will now address the current state of research regarding these variables in relation to the ERP. In doing so, I will validate the use of specific variables within my model and provide the theoretical basis for my research hypotheses.

Chapter 2. Literature Review

This section will present the current literature in the field of ERPs. I will begin with a thorough explanation of the three methods by which to compute the ERP; the historical, implied and survey methods. Then I will address the evidence for and rationale of country-differences in ERPs. After that I will present the debate on the proper magnitude of the ERP which began with the so-called "Equity Risk Premium Puzzle" (Mehra & Prescott, 1985). Finally, I will address the literature which points to significant factors affecting the ERP, including the volatility of GDP, volatility of inflation, as well as property rights, trust and ethnic fractionalization. This section will provide the theoretical and empirical foundation for the model and results I will present in the Chapter 5. Model and Results.

Calculating Equity Risk Premiums

In my model the ERP will be the dependent variable. Since I will test each of the three primary methods for calculating the ERP, it is worth explaining in greater detail the means by which researchers and analysts calculate it. I begin first with the historical method, the most popular approach. It uses historical returns and a historical risk-free rate to calculate premiums. Next I consider the more forward-looking approach called implied premiums, whereby one uses current prices and cash flows to value a market index and, in conjunction with a risk-free rate, compute a premium. Finally, I explain the third popular method: surveying professionals in the industry and academia. The

preferred method depends on a number of factors and the different methods can result in contrasting premiums for the same country. Considering all three is worthwhile because it identifies those factors which affect the particular methods most strongly.

In his working paper, Aswath Damodaran tackles the resulting plethora of investigations into the ERP and presents a comprehensive survey of the current literature (Damodaran, 2013). This work has been particularly helpful in gaining a broad understanding of the current state of research. Moreover, his explanations of methods for computing the ERP and data sources have been valuable because he addresses the advantages and potential pitfalls of using each of the different premiums. Additionally, Damodaran's explanation of the logic and methodology of implied ERPs has been integral in choosing my dependent variables and appropriate independent variables for the models.

Historical Premiums

The standard approach to computing ERPs is the historical premium method. It entails estimating actual returns earned by stocks over an extended time period and comparing this to the actual returns earned by a default-free security. The difference between these two is the premium. Most researchers and companies in fact use the same data on equity performance from Ibbotson Associates when calculating the ERP themselves. The company possesses reliable market data for the US dating back to 1926. While this appears relatively straightforward, there is still significant variation in the resulting premiums which companies in the financial industry employ, ranging between

4 and 12 percent for the USA. There are three primary reasons for these differences: the time period over which they calculate average returns, the choice of the appropriate risk-free rate and averaging by arithmetic or geometric means. In the coming sections I will explain these choices more precisely.

The Time Period

Considering time period, one option is to compare the differences between equity returns and those from a risk-free security using the data going back all the way to 1926. Theoretically, this should provide a more unbiased and representative result. Another technique judges measuring current investor behavior with nearly ninety year old returns as inappropriate. Therefore, it uses shorter periods, such as fifty, twenty or even ten years, to account for the structural changes which the market has undergone over time. Between these two extremes, the last option gives greater weight to more recent returns while using the entire data set. Needless to say, using different time periods can result in drastically varying estimates (Damodaran, 2013).

The Risk Free Rate and Arithmetic vs Geometric Returns

Regarding the appropriate risk-free rate, treasury bills or bonds are most often considered. Either way, the duration of the default-free security must match the duration of the performance of equities. While it is possible to consider treasury bills as more 'default-free' than bonds because of their particularly short maturity interval, usually the yield on treasury bonds is employed. The final question demanding attention relates to the problem of arithmetic versus geometric averages. The arithmetic method uses the

simple mean of the series of annual returns while the geometric average employs compounded returns. Generally, if annual returns are not serially correlated then the arithmetic average is the best unbiased estimate. However, there is much research suggesting that the geometric calculation is more appropriate. Either way, most often the choices which researchers make in calculating historical premiums has to do with personal preferences, the characteristics of their data and their client (Damodaran, 2013).

Potential Problems

While the historical premium method is most often used, it is not without flaws. First of all, a historical premium inherently assumes that the risk premium deemed appropriate by investors has not changed over time. Portfolio theory, globalization and the evolving structures of even the most mature equity markets have altered investment strategies over the last 100 years. It is hard to believe that investors' ideas of risk have not changed as well. Using a smaller time period does correct for this problem but in doing so, creates another one. Standard errors are very high when using only a short time period.

An additional serious concern with historical premiums which has gained attention in the literature is the problem of "survivor bias". This bias occurs because when one uses data on today's largest markets, they may give a misinformed view of the global trend of equity performances. For example, if one were to have invested in the ten largest equity markets in 1926, no other markets would have earned as significant of a premium as the US investments. Meanwhile, other investments, such as those from Austria, would

have actually resulted in no or even negative returns over the same period. Therefore, the survivor bias, as a result of the above-average performances of today's dominating equity markets, can give historical returns an unrealistic perspective on the actual premium for risk in markets.

Finally, while historical premiums are a precarious value to conclude even from the US market, with nearly 100 years of reliable data, markets with limited or volatile equity histories are even more problematic. While emerging markets represent a clear example of this, markets such as Europe, which are traditionally considered mature, also present difficulties. Post World War I hyperinflation in Germany as well as World War II make historical estimates problematic for the entire continent. Additionally, comparing the equity markets in Germany, Italy and France is not entirely appropriate as their basic characteristics vary from each other and from the US's. For example, they are often dominated by only a few large companies. Additionally, in these countries many businesses prefer to remain private and do not issue publicly traded shares. Therefore, it can be challenging to compare even mature markets as they have differed significantly in their basic characteristics over the years (Damodaran, 2013).

As I have explained in this section, while the historical method is most popular for calculating the ERP, the means by which to estimate the premium are anything but codified. Whether it be the sources of the data, the most appropriate risk free rate or the best method by which to average returns, changes in each component can result in very different conclusions. For these reasons, I have chosen not to calculate individual historical premiums for different countries but instead to use a meta-analysis of the

literature on the subject to provide me with a consensus on the accepted historical risk premium. Rieger, Wang and Hens completed this survey of the literature within the scope of their paper on cross-cultural time discounting, which I will address later. First I will explain the method which many deem an appropriate response to some of the pitfalls of the historical method; the implied method (Rieger, Wang, & Hens, 2012).

Implied Premiums

While historical returns do offer insightful information into how investors have valued risk in the past, equity risk premiums are components integral in valuing future projects. And if one believes that markets are efficient, then prior returns should not help predict future returns. This is one of the primary complaints of the historical method, therefore leaving open the possibility of a more appropriate, more forward-looking calculation. This approach is the implied equity premium. The word implied in this sense refers to the return that an investor expects from an equity implied through the pricing an asset, given the characteristics of the expected cash flows. In this way, current market prices for equity, along with the expected cash flows minus a risk-free rate should in fact result in an ERP.

The *Gordon Constant Growth Model* is an example which demonstrates this fact. Here, one computes the present value of an asset given a constant growth in dividends, whereby:

$$Present\ Value\ of\ Asset = \frac{Dividends\ in\ Next\ Period}{(Required\ Return\ on\ Equity - Expected\ Growth\ Rate)}$$

Figure 2.1 *Gordon Constant Growth Model* (Brealey et al., 2014)

In computing the implied premium, we would already have the present value, the expected dividends in the next period and the expected growth rate in earnings and dividends in the long run. Solving for the required return on equity results in the implied expected return on a stock. With this, all that remains is to subtract the risk-free rate from the *implied* expected return. In this simple way, one finds an implied ERP. Data exists for the S&P 500 which is representative of the values for an individual security which I presented in this example, such as overall dividends to be paid next period, the expected growth rate as well as the present level of the market in general. In this way, this method can be applied to result in an entire market's implied ERP and not only be restricted to an individual security.

Damodaran used a variant of this method to calculate the implied ERP for the S&P 500. As it possesses a long history and represents a very broad index of equity, the S&P is an appropriate source of returns for computing the US market risk premium. Unlike the historical risk premium, we can compute the implied premium for extremely small time periods as the data on dividends and prices are constantly updated. While this is a potential useful aspect in practice, I am concerned more with long term measures in this

thesis. But to give an idea of how the ERP can fluctuate when calculated for a relatively short period of time, Damodaran computed the implied premium on an annual basis from 1960 until 2012, as demonstrated in the figure below.

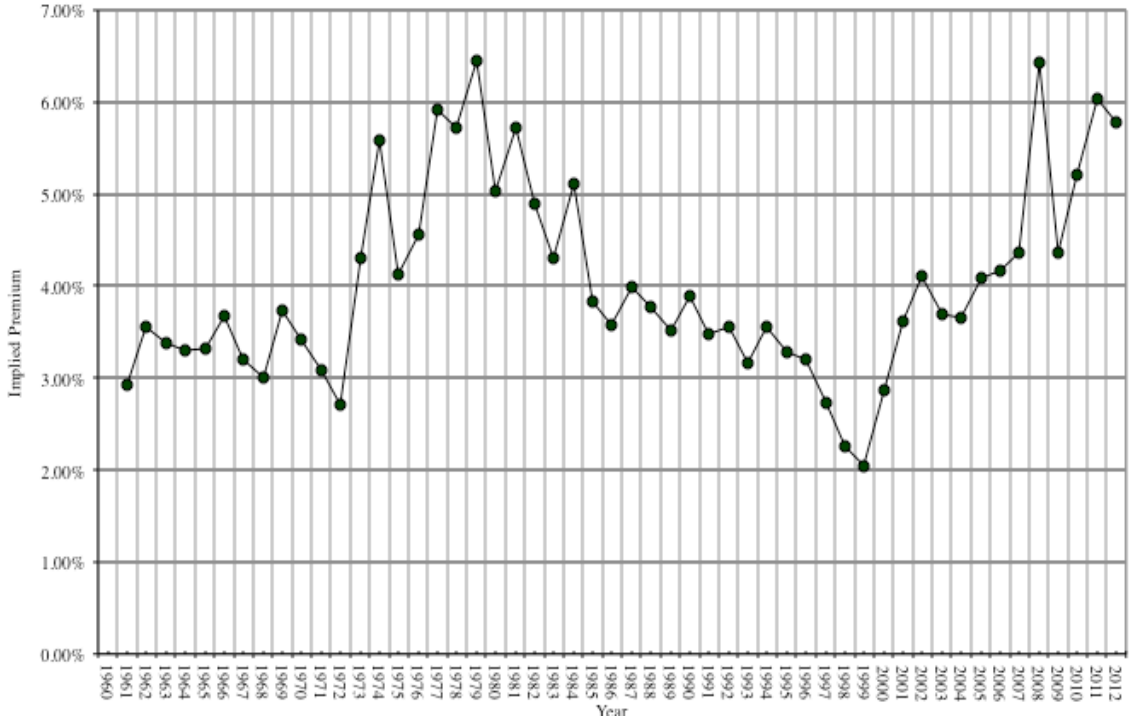

Figure 2.2 Implied Equity Risk Premium from 1960 to 2012 (Damodaran, 2013)

The graph indicates a few general tendencies of the implied ERP. First, if one takes a moment to remember the historic business cycle over the last 50 years or so, it is apparent that the higher the index values the lower the implied risk premium and vice versa. This fact is easily viewed, for example, at the low point in the premium in the year 1999, just before the dot-com bubble burst. Then the subsequent market correction resulted in higher premiums, with the highest ERP resulting in 2008 during the Financial Crisis. This implies that when markets are performing well, investors on the aggregate do not require as large of a return than they do when markets are down.

Damodaran also compares the resulting ERP for the US when employing three calculation methods which I have mentioned so far, namely the historical premium calculated with an arithmetic or geometric average as well as the implied ERP, evidenced in Figure 2.3 below. Over the same time period as in the previous illustration (Figure 2.2), it is apparent that the historical average, particularly that using the arithmetic average, results in a generally higher ERP than the implied method. This is consistent with the implication of the "Equity Risk Premium Puzzle," a significant paper from Mehra and Prescott which I will address later in this section (Mehra & Prescott, 2003). Additionally, the historical averages do demonstrate a tendency of decreasing over the last fifty years, evidence for the structural change in the market which many propose, while the implied ERP appears to hover around an average. Also worth noting is the shocking impact of the 2008 Financial Crisis on the implied ERP, whereby it increases even above the arithmetically averaged historical premium for the first time.

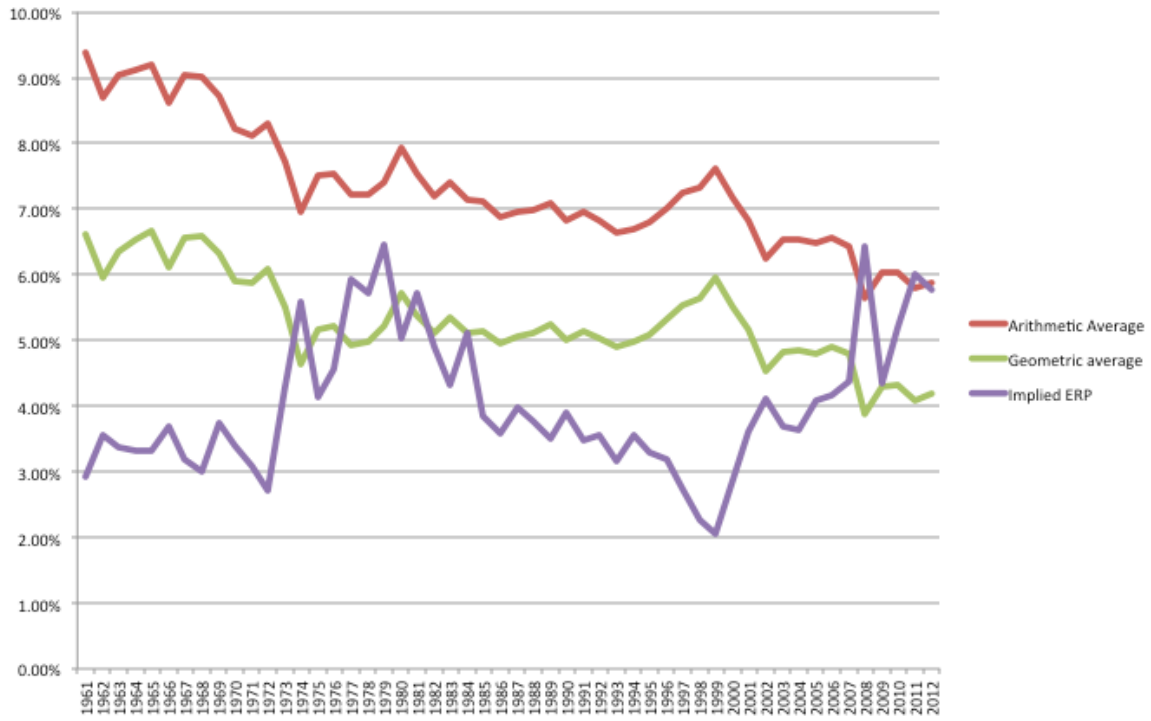

Figure 2:3 Comparison of Arithmetic Averaging, Geometric Averaging and the Implied ERP (Damodaran, 2013)

Country Equity Risk Premiums

So far, I have explained the implied risk premium specific to the United States. Damodaran, however, expands a method by which to compute the implied ERP for other countries by considering risk inherent in other markets through default spreads based on two methods: the local currency sovereign rating according to Moody's and the Credit Default Swaps (CDS) spread, as provided by Bloomberg. To do so, he first estimates the mature market ERP with the method described above using the S&P 500; the USA is often considered the representative market because of its ample data and relatively long consistent performance. He then adds the additional risk specific to each country by using the rating and CDS spread data. To compute a default spread using the ratings, he

estimates the usual spreads for each ratings class by averaging the CDS spreads and sovereign US bond spreads according to ratings class at the start of every year. He then proposes that this default spread can now be considered an estimate of the *additional* country risk. Still, he scales this up (for the purposes here, I used 1.5) to reflect the higher risk inherent in an equity market, relative to the default spread of sovereign currencies. Finally, he adds this country-specific risk premium to the mature market premium to achieve a country-specific ERP. In this way, the ratings system can be used to create a country-specific implied ERP. On the other hand, using the CDS spread, he subtracted the country's CDS spread from the US's, whereby if the spread was less than the US's than this resulted in an ERP lower than the US's. This was the case for Norway, for example. With this value, again to reflect the higher volatility of equity markets, he scaled this by 1.5 again. Finally, he added this value to the mature market ERP, resulting in an implied ERP from CDS data (Damodaran, 2013).

Survey Premiums

Having considered the methods by which to compute historical premiums as well as implied premiums, the final appropriate method worth addressing is the survey premium. As the name implies, experts within the financial industry and academia are surveyed regarding their opinion on the additional risk inherent in any equity market. Fernandez, Aguirreamalloa and Corres (2012) sent a short email to finance and economics professors as well as to analysts and managers across the world. Using the results from this survey, they were able to compute an average ERP which the respondents utilized in 2012 for 82 countries. Worth mentioning is that the variance of the premiums across

countries is much lower in this data set than in those which were computed from historical premiums or implied premiums (Fernandez, Aguirreamalloa, & Corres, 2012).

This section has summarized the most widely accepted ways in which one can calculate the ERP. It is necessary to understand the calculation methods because different variables could have different effects on the resulting ERP because of the data or method of calculation. This is of course integral in performing a proper analysis and interpreting the results. It is also worth having a deeper understanding of the calculation methods if only to realize how the field still lacks a codified perspective. Moreover, there remains much debate as to the most appropriate methods. Having addressed the dependent variables which I will include in my model, I will now move on to discussing the literature which points to the determinants of ERPs and therefore the appropriate independent variables for my model.

Literature on the Determinants of the ERP

Research on the determinants of the ERP is surprisingly scarce, often responding to the so-called "Equity Risk Premium Puzzle," the seemingly paradoxical conclusion that the data demonstrates that the ERP is higher than can be rationalized according to historical returns. Moving from there, research does demonstrate that there is indeed evidence for international risk premiums. "The Triumph of the Optimists" demonstrates the largest array of data regarding this point (Dimson et al., 2002). Specifically addressing the determinants of the ERP, many studies approach the topic theoretically and confirm their conclusions empirically. While these studies are quite useful for pointing me in the

right direction, I will instead approach the subject directly from an empirical perspective. Research points to appropriate reasons for cross-country differences in the ERP from, among others, macroeconomic factors such as the economic volatility and uncertainty about inflation, as well as property rights, trust and ethnic fractionalization.

Empirical or Theoretical Exploration

While many of the studies which I cover in this section go about investigating the ERP within a theoretical framework, empirical investigations in the style which I undertake within this thesis, be it on a single or multi-country level, exist as well. Empirical investigations in the literature include, for example, Sanvicente and Carvalho's 2012 working paper "Determinants of the Implied Equity Risk Premium in Brazil" in which they investigated Brazil's determinants of its implied ERP. The authors found significant and expected results from changes in the CDI rate, the country debt risk spread, equity market volatility and the US market liquidity premium (Rocha & Carvalho, 2012). "The Triumph of the Optimists", which I will address shortly, is also proof of the value of empirical investigation in this field (Dimson et al., 2002).

The Equity Risk Premium Puzzle and its Repercussions

Debate surrounding the ERP is not a recent development. Robert Lucas' publication of his paper "Asset Prices in an Exchange Economy," instigated discussion surrounding the CAPM (Lucas, 1978). The paper provided a framework for further investigation into the equity premium within the CAPM. From this starting point, Mehra and Prescott added fuel to the fire of debate with their publication of 'The Equity

Premium: A Puzzle' in 1985 (Mehra & Prescott, 2003; Mehra & Prescott, 1985). The researchers concluded that the premium demanded for taking on risk was of a magnitude greater than could be rationalized. In other words, considering the high level of equity prices, the ERP should have been lower than it was in reality. They employed arithmetic averages while using data on historical returns. This study and its paradox stimulated a frenzy of research. Much of the research either responded to "The Puzzle" or built upon research addressing it.

The Evidence for International Premiums

Nearly as significant for this research as Damodaran's survey of the literature which I mentioned earlier is Dimson, Marsh and Staunton's work "The Triumph of the Optimists" (2002). This study is not only vital for understanding the international nature of the research question but also for sparking my interest in pursuing this research in the first place. In their original work which was subsequently updated with more recent data and more countries, the authors used historical returns between the years 1900 and 2000 on sixteen countries. They chose these countries specifically because they represent 88 percent of the world's market capitalization today and were also dominant at the beginning of the twentieth century. They used arithmetic averages in order to give a long-term perspective of the equity premium characteristics. Moreover, they dropped periods in which countries experienced extreme macroeconomic conditions, such as war or hyperinflation in the case of Germany. On the one hand, they conclude that Denmark, at just above 4%, demonstrates the lowest ERP. On the other hand, Italy displays the highest at around 10%. The USA was near the average at around 7%.

In agreement with the "Puzzle", the title "Triumph of the Optimists" refers to the fact that in reality the ERP should be a smaller magnitude than historical returns would imply is appropriate. To address this title further, let us say that an investor has the choice of investing in equity or bonds. If they demand a *higher return* from equity for taking on their added risk then they are only willing to pay a *lower price* for them. But an investor who is *optimistic*, meaning in this sense that they do not perceive it as such a risky investment after all, would not require such a premium and would instead purchase the equity for a higher price, resulting in a lower return. Their optimism flies in the face of historical data, which would have led them to believe that the risk would demand a greater return, and therefore a lower price (Dimson et al., 2002). While this work excellently describes the characteristics of international ERPs when considering historical returns, and thereby lays a strong foundation for pursuing further investigation, further exploration in the literature is required when considering the determinants of these premiums.

Determinants

Having considered the fundamental aspects of international ERPs, it is now appropriate to address a facet of them which is particularly important to this thesis: their determinants. The current literature points to several macroeconomic factors which may affect the magnitude of a country's ERP. Such factors include economic risk, risk aversion and political/cultural characteristics. In the following, I provide the theoretical explanation for including such variables in the models which I employ within this thesis.

Economic Risk

Risk on a country level stems not only from the general concerns about the health and predictability of the economy and its real macroeconomic factors. For example, Lettau, Ludwigson and Wachter (2008) concluded that there is a relationship between different levels of ERPs in the United States and changes in the real economy, in particular GDP growth. They cite a fall in macroeconomic risk, or a decrease in the volatility of the aggregate economy, as a significant factor in increasing the differences between stock prices and indicators of fundamental value. The authors describe this phenomenon theoretically by estimating a two-state regime switching model for the volatility and mean of consumption growth. Thereby they find evidence of a shift to lower consumption volatility at the beginning of the 1990s. Then they use their results, combined with data from after the Second World War onwards, to calibrate a rational asset pricing model considering regime changes in both the mean and standard deviation of consumption growth. The authors conclude that when a shift toward decreased consumption risk is perceived to be sufficiently persistent, a standard pricing model can explain a significant portion of the increase in equity prices from US data in the 1990s. Their model points to the fact that stock prices increase because a decrease in macroeconomic risk leads to a fall in expected future stock returns, thereby reflecting on the ERP. Furthermore, they show a strong correlation between low-frequency movements in macroeconomic volatility not only for the US but for international markets as well. In this way, the potential exists that macroeconomic volatility plays a significant role in affecting international ERPs (Lettau, Ludvigson, & Wachter, 2007).

Volatility in gross domestic product is not the only macroeconomic factor which the literature indicates is an appropriate determinant of the ERP magnitude. Additionally, inflation has also often been considered. On the one hand, it has proven to lack substance in explaining ERPs as it is already considered in financial modeling. Markets are assumed to be efficient, meaning they should account for all relevant available information. On the other hand, Brandt and Wang (2003) demonstrated that uncertainty about inflation does in fact play a role in determining risk premiums. The authors created a consumption-based asset pricing model in which aggregate risk aversion is time-varying regarding news on consumption growth, similar to the pricing models from the previous section, as well as news about inflation. Their results support the hypothesis that aggregate risk aversion varies according to news on inflation. Both these studies point to the fact that ERPs are lower in economies with predictable inflation, interest rates and economic growth than when these factors are volatile (Brandt & Wang, 2003).

In relating the implied ERP to macroeconomic variables, Damodaran reaches several relevant conclusions using time series data on the S&P 500. First, he finds that GDP growth and inflation are positively correlated with the implied ERP. However, regressing the implied ERP on these two variables provided mixed results. On the one hand, real GDP growth was only marginally significant. On the other hand, inflation was significant. He also considered the standard deviation of GDP and found only marginally significant results in the regression model. Reason for this is that, when considering risk, not the level of GDP growth but the uncertainty about the level matters. Moreover, the US equity market is mature. Therefore, there is a very low variance in real growth. Taken

together, for the US it makes sense that both of these variables were not significant. Nevertheless, when investigating less mature markets cross-sectionally, these factors could be more appropriate (Damodaran, 2013).

Political/Cultural Factors

The literature directly related to the ERP does address the importance of cultural factors in determining its magnitude across countries. However, this is primarily constrained to culture-specific risk aversion and consumption preferences. I will address these factors but I will not include them in my models. Nevertheless, this literature is worth addressing because it demonstrates the presence of culture-specific literature within the financial literature. On this basis, my models will extend the use of political and cultural variables with cues from the development literature. These factors include political and cultural variables such as property rights, trust and ethnic fractionalization.

Risk Aversion and Culture

Behavioral economics and culture are linked through work on cross-country studies on risk aversion (Harrison, Lau, & Rutström, 2007; Holt & Laury, 2002). Financial models of the ERP directly or indirectly assume that risk aversion influences the size of the risk premium. Risk aversion is positively correlated with the ERP, meaning the more risk averse a market is, the higher the ERP will be, as investors will require a greater compensation for taking on risk. Conversely, as risk aversion falls, so will the ERP.

Risk aversion may be influenced by demographics, religious preferences or cultural characteristics. There is evidence that older societies are prone to be more risk

averse (Halek & Eisenhauer, 2001; Riley Jr & Chow, 1992; Wang & Hanna, 1997) Additionally, Weber showed that different levels of risk aversion exist within a culture depending on factors such as religion and home culture. In his study of risk tendencies within German culture, Protestants and atheists, for example, were more willing to take on risk than other social groups. Additionally, immigrants within Germany from countries such as Italy were less willing to take on risk (Weber, 2013). While this study is specific to Germany and its application to an international study would require significant modification, it points to the potential for cultural and societal differences in determining risk tolerance and therefore risk premiums.

The literature does address the importance of cultural factors in determining the ERP. However, it is primarily constrained to culture-specific risk aversion and consumption preferences (Rieger et al., 2012; Weber, 2013). In this study, I consider three factors which may influence the degree of risk aversion in a country: property rights, trust, and ethnic fractionalization.

I have taken cues from the development literature here in incorporating these three factors. Breuer and McDermott (2013) has been particularly influential. In their work they identify economic, political, financial and cultural variables which are associated with economic depressions. The cultural factors work indirectly through influencing the degree and extent to which transactions are efficiently and successfully concluded. Indeed, there is a new and growing body of literature that finds that the deepest causes of economic development in fact reside in culture (Breuer & McDermott, 2013; Gorodnichenko & Roland, 2011; Guiso, Sapienza, & Zingales, 2006; Knack & Keefer,

1997; Tabellini, 2008). It seems plausible, given this literature, that certain cultural traits would reduce risk aversion and thus help a country mitigate or avoid shocks that might otherwise cause depression. As I have already addressed the potential for economic instability to affect the ERP, it is logical to explore how cultural factors could hinder growth and thereby increase the risk inherent in an economy and subsequently its ERP.

Property rights protect ownership of private property and make secure the contracts which establish ownership. Property rights should reduce the risk of economic and financial transactions and thus reduce the ERP. Trust has long been considered a component of social capital (Breuer & McDermott, 2013). Research shows that lower trust is associated with slower growth (Knack & Keefer, 1997; La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1997; Zak & Knack, 2001). Because trust is a form of social capital that extends the size and scope of transactions in society, more trust implies a lower degree of risk aversion.

Finally, research establishes a negative link between fractionalization and economic growth (Alesina, Devleeschauwer, Easterly, Kurlat, & Wacziarg, 2003; Alesina & Ferrara, 2005; Fearon, 2003; Mauro, 1995). For this study, it is asserted that more fractious societies may be those that are inherently riskier since such societies are prone to civil unrest, political unrest, and civil war – all of which may raise the ERP.

In sum, property rights, trust and ethnic fractionalization are influential factors in the literature on economic development and have implications for the ERP. Therefore,

including quantified measures for these variables is a worthwhile exploration in their relationship with the ERP.

Chapter 3. Operationalization of Research Concepts

Having considered the state of current research thus far, it is worth restating that the aim of this thesis is to empirically explore the theoretical conclusions of the literature regarding the nature of ERPs. I have taken my dependent and independent variables from the aforementioned studies. Additionally, I composed the indicators for GDP volatility and inflation volatility myself. The ERPs come from multiple sources and were calculated according to the three methods addressed in the Theoretical Background, will be the dependent variables in my models. As the implied premium can be calculated using the rating system or credit default swaps, I employ two implied premiums. Therefore, I have four dependent variables in all. Concerning appropriate independent variables, the literature pointed me towards macroeconomic factors such as the volatility of GDP and the volatility of inflation as well as political/cultural variables such as property rights, trust and ethnic fractionalization. By performing regression analyses with these variables, I aim to gain a further understanding into which factors affect the ERP across countries. I use the four different measures of the ERP in my analyses in order to find if the factors affecting them are comparable or if different independent variables affect the four forms of the ERP in different ways. The following section will explain the methods by which I found and calculated these variables as well as their defining characteristics.

Dependent Variables

As stated at the beginning of this section, I use country specific ERPs as the dependent variables in my regression analyses. They have been calculated by other researchers using either historical returns, the two implied methods or survey results. In the following I will describe each of the four dependent variables.

First, the data on international historical ERPs has been computed by Rieger, Wang and Hens, who based this variable on their meta-analysis of the literature. They employed this indicator for thirty-nine countries in their investigation of the effect of hyperbolic discount factors on country-specific ERPs (Rieger et al., 2012). Their rationale for using this method is the lack of codification in calculating historical returns. By giving equal weight to all the studies and finding an averaging for each country, their results are an appropriate way to achieve a consensus for Historic ERPs across countries.

The second and third ERPs were calculated through the implied method by Damodaran. As explained in my summary above, he computed the ERPs for international markets by adding country-specific risk through local currency sovereign ratings and Credit Default Swap spreads (Damodaran, 2013). To create this data set, he compiled information from financial websites such as Bloomberg, Morningstar and others. I have already given a more complete summary of his methods in the Theoretical Background section. I will use both his Rating ERP as well as his CDS ERP values as dependent variables in my regression models.

The fourth dependent variable I use is the ERP derived from survey results by Fernandez et al. (2012). Their aggregate survey results represent a consensus from academia and the financial industry on the appropriate 2012 ERP for 82 countries. Their results come from different professionals in different branches utilizing varying techniques to compute the ERP. These results are particularly interesting as, in contrast to the theoretical basis of the Historic ERP variable, these ERPs represent the values employed today in the praxis.

No single dependent variable is a more appropriate measure than another; the four are simply different sides of the same coin. By considering each of them in my regression models, I aim to find which factors affect each ERP specifically.

Independent Variables

Based on the research presented in the previous section, this thesis employs several independent variables. I have chosen to focus on two broad categories of variables in my regressions: factors representing macroeconomic risk as well as political/cultural variables.

Macroeconomic Variables - Standard Deviation of GDP

The literature addressed in the Literature Review points to macroeconomic volatility as a key determinant of ERPs. I propose that the standard deviation of real GDP growth is an appropriate measure of this volatility. To calculate this value, I used the World Bank's database. Hereby, I obtained annualized GDP growth from between the

years 1981 and 2012. Then for each country I computed the standard deviation of GDP growth over this time period.

I chose to compute the standard deviation over this time period for three reasons. First, in using cross-sectional analysis, the goal is to investigate long term factors affecting the ERP. This thirty-year period allows me to do this. Second, there is evidence that markets have undergone structural changes over the last thirty years. Whether GDP volatility from fifty years ago contributes to the ERP today or not is therefore questionable. Finally, many of the countries in the data set did not possess reliable data on GDP growth past this period. For these three reasons, I have chosen to compute the standard deviation of GDP using this period.

Damodaran (2013) demonstrated that when considering risk, it is not the level of GDP growth that matters but instead the uncertainty about that level. Despite this conclusion, in his analysis of the US market, he included the standard deviation of GDP growth as an independent variable but it lacked statistical significance. One explanation for this is that the US is a mature equity environment with a low variance in real growth. However, using this variable for my analysis is promising because my data set includes international economies with significantly more variation. Their standard deviations range from a minimum of 1.26 (Bangladesh) to 12.39 (Rwanda). Therefore, the standard deviation of GDP could function as a more significant control variable in my model.

Standard Deviation of Inflation

Inflation is another macroeconomic factor which research has identified as playing a significant role for ERP magnitudes. In my literature review, I emphasized that financial planning accounts for inflation as far as it can be predicted. Accordingly, the level of inflation itself should not play a role for ERPs. Instead, the uncertainty about inflation is of greater importance. Empirically, including inflation uncertainty in my model is challenging as it is difficult to measure. I argue that the standard deviation of inflation is an appropriate proxy for inflation uncertainty. This study's cross-sectional analysis across countries, instead of a longitudinal investigation of a single economy, could demonstrate a significant, long term effect on ERP magnitudes which theoretical papers analyzing single economies lack.

I used the World Bank's database once more and compiled data from the years 1981 to 2012. My arguments for using this time period are the same as for the GDP volatility variable. Also, I chose to use the GDP deflator in current US dollars as a representative value for the inflation environment because many countries lacked data on the CPI during this time period. Using this annualized inflation growth based on the GDP deflator, I then computed its standard deviation over the time period in the same manner as for GDP volatility. Germany possessed the lowest standard deviation (1.4) and Israel (85.23) the highest.

Political and Cultural Variables

In addition to the macroeconomic risk indicators of GDP and inflation volatility, I will also include political/cultural variables such as property rights, trust and ethnic fractionalization in my regression models. I aim to investigate the role which such factors play in country-specific risk.

Property Rights

Property rights are a measure of the regulatory environment which protects individual property within the country. I group this political variable within the scope of cultural variables here because I take its use from the development literature in the same manner as trust and ethnic fractionalization. Additionally, it is not necessarily a "traditional" macroeconomic variable in the sense of GDP or inflation.

The variable is derived from the Index of Economic Freedom, an annual publication of *The Wall Street Journal* and *The Heritage Foundation*. The property rights variable is a sub-index within the larger guide. The entire index covers ten types of freedoms in 186 countries. The data spans from the year 1995 until 2014. The scale for measuring property rights runs from 0 to 100, primarily in intervals of 10. In order to achieve a long term view of the property rights in a country, and therefore its long term effect on the ERP in my cross-sectional analysis, I took the average score over the span of the index's existence for each country.

According to the *Heritage Foundation*'s website, the variable is an evaluation of the "ability for individuals to accumulate private property, secured by clear laws that are

fully enforced by the state." Generally, "the more certain the legal protection of property, the higher a country's score." Conversely, "the greater the chances of government expropriation of property, the lower a country's score." A score of 0 indicates that "Private Property is outlawed, and all property belongs to the state. People do not have the rights to sue others and do not have access to the courts. Corruption is endemic." On the other side of the spectrum, a score of 100 indicates that "Private property is guaranteed by the government. The court system enforces contracts efficiently and quickly. The justice system punishes those who unlawfully confiscate private property. There is no corruption or expropriation," (Heritage Foundation, 2014).

Trust

In the broadest sense, the trust variable should represent the aggregate level of trust in a culture. I used Question A165 from the World Values Survey for this variable (*World Values Survey*, 2014). Specifically, it represents the proportion of individuals selecting ''most people can be trusted'' to the question ''Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?'' The proportion is a value from 0 to 1; the closer to one, the greater the level of trust. In order to achieve a long term perspective of trust in each culture, the responses were averaged over individuals in each country over all available survey waves.

Ethnic Fractionalization

The ethnic fractionalization variable is a measure of the concentration of different ethno-linguistic groups within a country. It was developed by Alesina, Devleeschauwer,

Easterly, Kurlat and Wacziarg (2003). In their work the authors compiled a measure of ethnic fractionalization based on a broader classification of groups, considering not only linguistic but also racial differences. They found that ethnic fractionalization is correlated with GDP per capita and geographic variables such as latitude. More fragmentation is expected in poorer countries closer to the equator. As with trust, the measure ranges between 0 and 1, with the most fractionalized cultures closer to 1 and less diverse cultures closer to 0 (Alesina et al., 2003). Unlike the other variables, this measure does not represent a long term value averaged over a specific time period. Instead I took the values directly from the study.

Latitude

I use latitude as a control variable in each regression model. Development literature cites latitude as an appropriate control. The values for latitude come from the *CIA World Factbook*. The value corresponds to the distance (in degrees) from the equator to the "centroid or center point of a country" (CIA, 2014). In order to convert the variable into a proportion between 0 and 1, its absolute value was taken and then divided by 90. This variable should represent a country's relative distance from the equator. Therefore, 0 represents a country with its center directly on the equator and 1 is a country (theoretically) directly on the North or South Pole.

This concludes the section in which I introduce the variables to be included in my regression models. I will employ four measures of the ERP as my four dependent variables. I will utilize macroeconomic as well as political/cultural factors as my

independent variables. And I will control for latitude in all models. I will now continue by presenting the basic characteristics of the data.

Chapter 4. Characteristics of the Data

The following section will present the characteristics of the data as well as numerous correlation matrices to provide the necessary knowledge for interpreting the regression models. Table 4.1 contains the descriptive statistics.

Table 4.1 Summary Statistics

	N	Mean	Std. Dev.	Min	Max
Dependent Variables					
Rating ERP	60	8.35	3.69	5	20
CDS ERP	39	6.89	2.65	4.75	20.51
Historic ERP	32	10.77	6.32	4.84	26.17
Survey ERP	52	7.09	1.61	5.40	12.20
Independent Variables					
Stand. Dev. of GDP Growth	60	3.42	1.99	1.26	12.38
Stand. Dev. of Inflation	60	10.90	14.82	1.41	85.23
Property Rights	60	64.76	21.94	25	91.58
Trust	60	0.30	0.16	0.04	0.68
Ethnic Fractionalization	60	0.37	0.28	0.01	0.93
Control Variable					
Latitude	60	0.36	0.20	0.01	0.72

There are four measurements of the ERP, five independent variables and one control variable. When examining the dependent variables, one first notices that each has a different sample size. The reason for this is that I worked with different data sets for each ERP method. While almost all countries possess a sovereign currency rating, not all of them have a reliable long-term equity market by which to gage historical returns. These numbers further reduced themselves as I only included countries with full data for all

independent variables. Furthermore, I excluded those countries from the data set which exhibited extreme values within a variable. Brazil and Peru could not be considered, for example, because of their extremely volatile inflation rate during the analysis period. While the Rating ERP contains the greatest number of countries, (N=60) the Historic ERP the fewest (N=32).

The ERP measure with the highest average, at 10.77, is based on historical returns. This average corresponds well to the *ERP Puzzle*, which states that historical returns can lead to a resulting ERP higher than can be rationalized. Conversely, the CDS method resulted in the lowest average at 6.89. The survey method exhibits the most consistent ERP, with a standard deviation of 1.61 and values ranging only between 5.4 and 12.2. In stark contrast to this, the Historic ERP not only possesses the highest average but it also has the highest standard deviation at 6.32 as well as the most extreme values, with a minimum of 4.84 and maximum of 26.17. The implied methods result in standard deviations and ranges which are, in contrast to the other two methods, relatively comparable. The Rating ERP's standard deviation is 3.69 and the CDS method's is 2.65. They both range basically from 5 to 20.

Moving onto the independent variables, I listed the summary statistics here calculated from the Rating ERP data set, the method with the largest sample size. It is worth noting that, although the sizes of the data sets are differing, they are comparable. This is the case for two reasons. First, the three larger data sets include all countries assessed in the Historic ERP data set. Second, each smaller data set contains only countries from the next largest one.

The two macroeconomic risk variables, standard deviation of GDP growth and inflation, contrast regarding their means as well as volatilities. While the GDP variable has a relatively low average of 3.42, inflation exhibits a much higher mean at 10.9. The property rights variable ranges from 1 to 100, with an average of 64.76. The trust, ethnic fractionalization and latitude variables range from 0 to 1. Additionally, they also possess similar averages between 0.3 and 0.4. Having considered these basic statistics, the following tables present the correlations among the variables.

Table 4.2 Correlation Matrix Containing all Dependent Variables and Independent Variables from ERP Rating Data Set

	Rating ERP	CDS ERP	Historic ERP	Survey ERP	Stand. Dev. of GDP Growth	Stand. Dev. of Inflation	Pro-perty Rights	Trust	Ethnic Fraction alization	Latitude
Dependent Variables										
Rating ERP	1.00									
CDS ERP	0.92	1.00								
Historic ERP	0.33	0.39	1.00							
Survey ERP	0.61	0.65	0.45	1.00						
Independent Variables										
Stand. Dev. Of GDP Growth	0.31	0.55	0.72	0.55	1.00					
Stand. Dev. Of Inflation	0.19	0.24	0.24	0.28	0.25	1.00				
Property Rights	-0.58	-0.60	-0.23	-0.75	-0.41	-0.32	1.00			
Trust	-0.50	-0.45	-0.42	-0.47	-0.36	-0.34	0.49	1.00		
Ethnic Fractionalization	0.19	0.26	-0.12	0.38	0.20	0.27	-0.46	-0.35	1.00	
Control Variable										
Latitude	-0.35	-0.43	-0.22	-0.56	-0.37	-0.28	0.65	0.62	-0.53	1.00

Table 4.3 Correlation Matrix for Historic ERP Data Set

	Historic ERP	Stand. Dev. of GDP Growth	Stand. Dev. of Inflation	Property Rights	Trust	Ethnic Fractionali-zation	Latitude
Historic ERP	1.00						
Stand. Dev. of GDP Growth	0.72	1.00					
Stand. Dev. of Inflation	0.24	0.16	1.00				
Property Rights	-0.23	-0.29	-0.26	1.00			
Trust	-0.42	-0.39	-0.36	0.46	1.00		
Ethnic Fractionalization	-0.12	-0.12	0.02	-0.40	-0.22	1.00	
Latitude	-0.22	-0.37	-0.20	0.60	0.60	-0.42	1.00

Table 4.4 Correlation Matrix for CDS ERP Data Set

	CDS ERP	Stand. Dev. of GDP Growth	Stand. Dev. of Inflation	Property Rights	Trust	Ethnic Fractionali-zation	Latitude
CDS ERP	1.00						
Stand. Dev. of GDP Growth	0.55	1.00					
Stand. Dev. of Inflation	0.24	0.21	1.00				
Property Rights	-0.60	-0.47	-0.23	1.00			
Trust	-0.45	-0.29	-0.31	0.46	1.00		
Ethnic Fractionalization	0.26	0.07	0.04	-0.57	-0.34	1.00	
Latitude	-0.43	-0.45	-0.17	0.69	0.51	-0.64	1.00

Table 4.5 Correlation Matrix for Survey ERP Variables

	Survey ERP	Stand. Dev. of GDP Growth	Stand. Dev. of Inflation	Property Rights	Trust	Ethnic Fractionali-zation	Latitude
Survey ERP	1.00						
Stand. Dev. of GDP Growth	0.55	1.00					
Stand. Dev. of Inflation	0.28	0.32	1.00				
Property Rights	-0.75	-0.38	-0.32	1.00			
Trust	-0.47	-0.35	-0.33	0.44	1.00		
Ethnic Fractionalization	0.38	0.23	0.17	-0.52	-0.36	1.00	
Latitude	-0.56	-0.51	-0.27	0.63	0.58	-0.59	1.00

The correlation matrices (Tables 4.2 to 4.5) provide insight into the relationships between individual variables and foreshadow potentially important characteristics for the regression analyses. Table 4.2 displays the relationships between all dependent variables, between all dependent and independent variables as well as the independent variables present only in the Rating ERP data set. I have provided tables 4.3 – 4.5 because each data set has a different sample size. Therefore, correlations among the independent variables were different for each data set. Table 4.3 displays the correlations for the Historic ERP data set, Table 4.4 the CDS ERP data set and Table 4.5 the Survey ERP data set. It is worth noting that nearly all correlations between the dependent and independent variables correspond to the positive and negative relationships proposed by the literature which informed my hypotheses.

Focusing first on correlations of the dependent variables among each other in Table 4.2 allows us to observe whether the different measures of ERP are consistent among themselves or not. The historical ERP is only moderately correlated to the other measures of ERP, ranging from .33 to .45. Its strongest correlation is with survey premiums. In contrast, the ERP Rating strongly correlates to the CDS ERP (.92) and the Survey ERP (.61). The CDS method is strongly correlated to the Survey ERP with a comparable coefficient of .65. The weak correlation between the Historic ERP and the other measures is logical because it is based on historical performances. In contrast, the other three are arguably more forward-looking measures. Their strong correlations demonstrates this similar characteristic.

I will now explain the Rating ERP's correlations to the independent variables as well as the correlations among the independent variables in its data set. This ERP measure most strongly correlates to the index for the strength of property rights. This negative relationship of .58 implies that the higher the property rights, the lower the ERP. This variable is moderately correlated to trust (-.5) as well. It is only weakly correlated to the inflation and ethnic fractionalization variables, with coefficients of .19. Considering the relationships between independent variables, the GDP volatility variable's strongest correlation is that to the property rights index (-.41). The property rights variable itself is most strongly correlated to latitude (.65) but it is also worth noting its correlation to trust (.49). Trust and ethnic fractionalization are both moderately correlated to latitude, with coefficients of .62 and -.53 respectively.

I will now move attention to Table 4.3 containing the correlations of variables within the Historical Premiums data set. This ERP measure possesses a strong correlation with the GDP volatility variable (.72). It is also moderately correlated to the trust variable (-.42). Interestingly, although the relationship is extremely week (.12), the Historical Premiums variable possesses a negative relationship with the ethnic fractionalization variable while all other ERP measures possess a positive relationship. Within this data set, most of the independent variables only correlate weakly to each other, with the exception of property rights with trust and latitude (both .6).

Next I will examine the correlations from the CDS ERP data set from Table 4.4. Worth noting are the strong relationships between this ERP measure and both property rights (-.6) and GDP volatility (.55). Trust is moderately correlated (-.45) and then inflation

(.24) and ethnic fractionalization (.26) display only weak relationships. Looking among the independent variables, the GDP volatility variable is moderately correlated to property rights (-.47) and latitude (-.45). Inflation's strongest relationship is that with trust (-.31). Property rights, however, has moderate to strong correlations with trust (.46), ethnic fractionalization (-57) and latitude (.69).

Finally, I will review the values in the Survey ERP data set displayed in Table 4.5. The dependent variable exhibits moderate to strong linear relationships with several of the independent variables, including GDP volatility (.55), property rights (-.75), trust (-.47) and latitude (-.56). The independent variables lack strong relationships among themselves. Similar to the other data sets, latitude is moderately to strongly correlated to the independent variables; for example, GDP volatility (-.51), property rights (.63), trust (.58) and ethnic fractionalization (-.59).

Chapter 5. Model and Results

This chapter describes the results of the four regression models in which the dependent variable is the ERP computed according to each of the four methods. The components of my model are summarized in the formula in Figure 5.1. The four ERP types are indexed by the subscript *j*. The independent variables include the standard deviation of GDP growth, the standard deviation of inflation, property rights, trust and ethnic fractionalization, indicated with the subscript *i* according to country. The formula reads as follows:

$$ERP_{i,j} = \alpha + \beta_1 \text{St Dev of GDP}_i + \beta_2 \text{ St Dev of Inflation}_i + \beta_3 \text{ Property Rights}_i + \beta_4 \text{ Trust}_i + \beta_5 \text{ Ethnic Fractionalization}_i + \varepsilon_i$$

j = Historic ERP, Rating ERP, CDS ERP, Survey ERP

Figure 5.1 Regression Model

Hypotheses

According to my theoretical and empirical investigation, I formulated the following hypotheses:

- Higher volatility in GDP and inflation as well as ethnic fractionalization will increase the magnitude of the ERP
- Higher levels of trust and property rights will decrease the level of the ERP

Results

All tables contain parameter estimates, the level of significance as well as the t-Test results in parentheses. Additionally, I also provide the adjusted R^2 for each model. The first group of tables (Tables 5.1 – 5.4) presents results from five versions of my regression model containing both macroeconomic and political/cultural variables. Additionally, in each model, latitude (not reported) is included as a control. Table 5.1 reports the results with the Historic ERP as the dependent variable. Table 5.2 shows the results of the model with the Rating ERP as the dependent variable. Table 5.3 reports the results from the model with the CDS ERP. And Table 5.4 shows the results from the model with the Survey ERP as the dependent variable. The second group of tables (Tables 5.5 – 5.8) displays the results of those regressions focusing more on the political/cultural variables of property rights, trust and ethnic fractionalization.

Table 5.1 Regression Analysis, Historic ERP as Dependent Variable

Model	1	2	3	4	5
Intercept	-0.14	-4.08	-3.07	-1.99	0.04
	(-0.02)	(-1.01)	(-0.58)	(-0.38)	(0.01)
Property Rights	-1.34		-1.79	-2.76	-1.55
	(-0.22)		(-0.30)	(-0.47)	(-0.27)
Trust	-9.58				-10.68
	(-1.34)				(-1.60)
Ethnic Fractionalization	-0.60				
	(-0.15)				
Stand. Dev. of GDP Growth	4.56***	4.91***	4.89***	4.96***	4.62***
	(4.30)	(5.18)	(5.05)	(5.14)	(4.81)
Stand. Dev. of Inflation	3.05	5.54	5.27		
	(0.54)	(1.06)	(0.97)		
Adjusted R^2	0.46	0.48	0.47	0.47	0.50

***Significant at the 1% level
**Significant at the 5% level
*Significant at the 10% level

Table 5.2 Regression Analysis, Rating ERP as Dependent Variable

Model	1	2	3	4	5
Intercept	15.90***	8.62***	13.67***	13.66***	14.73***
	(7.24)	(5.61)	(7.23)	(7.62)	(8.49)
Property Rights	-9.43***		-9.75***	-9.74***	-8.98***
	(-3.91)		(-3.89)	(-3.97)	(-3.85)
Trust	-8.87***				-8.57***
	(-2.83)				(-2.81)
Ethnic Fractionalization	-1.19				
	(-0.72)				
Stand. Dev. of GDP Growth	10.19	37.33	18.11	18.05	9.79
	(0.47)	(1.51)	(0.80)	(0.81)	(0.46)
Stand. Dev. of Inflation	-1.24	1.69	-0.06		
	(-0.44)	(0.53)	(-0.02)		
Adjusted R^2	0.37	0.12	0.30	0.31	0.39

***Significant at the 1% level
**Significant at the 5% level
*Significant at the 10% level

Table 5.3 Regression Analysis, CDS ERP as Dependent Variable

Model	1	2	3	4	5
Intercept	8.80***	5.02***	8.35***	8.51***	8.94***
	(2.86)	(3.02)	(4.11)	(4.28)	(4.53)
Property Rights	-5.49**		-5.98**	-6.13**	-5.56**
	(-2.15)		(-2.53)	(-2.65)	(-2.40)
Trust	-3.38				-3.48
	(-1.34)				(-1.47)
Ethnic Fractionalization	0.07				
	(0.04)				
Stand. Dev. of GDP Growth	81.46**	100.83***	81.23**	83.12**	81.53**
	(2.18)	(2.82)	(2.38)	(2.47)	(2.46)
Stand. Dev. of Inflation	0.40	1.93	1.16		
	(0.17)	(0.78)	(0.50)		
Adjusted R^2	0.39	0.31	0.40	0.41	0.43

***Significant at the 1% level

**Significant at the 5% level

*Significant at the 10% level

Table 5.4 Regression Analysis, Survey ERP as Dependent Variable

Model	1	2	3	4	5
Intercept	9.71***	6.88***	9.31***	9.28***	9.42***
	(9.77)	(8.71)	(12.23)	(12.52)	(12.57)
Property Rights	-4.93***		-4.92***	-4.88***	-4.78***
	(-5.33)		(-5.53)	(-5.63)	(-5.50)
Trust	-1.29				-1.19
	(-1.20)				(-1.14)
Ethnic Fractionalization	-0.23				
	(-0.34)				
Stand. Dev. of GDP Growth	37.05***	41.19**	37.94***	37.25***	36.35***
	(2.94)	(2.60)	(3.05)	(3.09)	(3.02)
Stand. Dev. of Inflation	-0.52	0.83	-0.28		
	(-0.49)	(0.63)	(-0.26)		
Adjusted R^2	0.61	0.38	0.62	0.63	0.63

***Significant at the 1% level

**Significant at the 5% level

*Significant at the 10% level

I chose to display the results in the current format because the standard deviation of GDP variable consistently demonstrated its statistical significance in its effect on ERPs regardless of the method of computation. Therefore, I have formulated the tables to emphasize that its effect is significant when paired with other independent variables as well as within a large multivariate model. In each table, moving left to right from model one to five, the first model includes all independent variables. The second utilizes only the two macroeconomic variables, namely the volatilities of GDP and inflation. Model three adds property rights to this model while model four drops inflation from the independent variables. Finally, model five adds trust to property rights and GDP volatility. As previously stated, each model also controls for latitude as well.

For three of the measurements of the ERP, the standard deviation of GDP has a positive and statistically significant effect, despite which other variables I include in the model. The Rating ERP models lacked significance however, although the coefficient's direction of effect was consistent. Despite this insignificance, all other models point to the fact that greater volatility in GDP, as measured in the standard deviation of GDP growth, leads to a higher equity risk premium across countries. The conclusion is consistent with the literature which considers individual markets. My results indicate that this also functions internationally through cross-sectional analysis. Moving on from the GDP volatility variable, property rights is also a significant variable for three of the four ERP methods, lacking significance only with the Historic Premiums. It effect, along with that of trust, was consistently negative, implying that better enforcement of property rights as well as higher levels of trust within a culture result in a lower ERP.

Furthermore, it is worthwhile considering each model individually, starting with the regression in which the Historical ERP is the dependent variable. Here, as stated before, the standard deviation of GDP variable is consistently statistically significant to the 1% level. The parameter estimate ranges from 4.56 to 4.96, depending on which other variables I include. Consistent with the other models, the effect is always positive, implying that a 1 unit increase in GDP volatility leads to between a 4.56% and 4.96% increase in the historical ERP, holding other variables constant. Noteworthy is that for this ERP measure, GDP volatility is the only significant variable, although using the other forms of ERP resulted in models in which variables such as property rights and trust were also significant.

Considering other variables, while none of them were statistically significant, observing the sizes and signs of their coefficients is still valuable. The inflation volatility variable has positive coefficients ranging from 3.05 to 5.54, implying that greater volatility in inflation results in a higher ERP. Property rights and trust each had negative coefficients, implying that stronger enforcement of property rights and greater trust present in a culture result in a lower ERP. The coefficients for property rights were between 1.34 and 2.76, while those for trust were around 10. The model with the greatest R^2 was the fifth, at .5, in which property rights, trust and GDP volatility were the independent variables.

Having considered the results from the model with the Historic ERP as the dependent variable, I will now move on to the model using the Rating ERP. The first fact worth noting is that the volatility of GDP is not significant with this variable. Nevertheless,

the coefficient is still positive. Also puzzling, the inflation volatility coefficient's direction of effect is not consistent; it is negative in models one and three but positive in the second one. Still, it lacks statistical significance. On the other hand, property rights and trust are both highly significant variables for the Rating ERP variable. Consistent with the Historic data, they are also both consistently negative. Moreover, the model with the highest R^2 was once again the fifth, at .39, in which I included property rights, trust and GDP volatility as independent variables. It is worth remembering that this data set is the largest (N=60) and that using the implied method should result in a more forward-looking premium. Therefore, these results support this fact, as GDP volatility in the past appears to not affect the ERP for the future significantly.

I will now address the results from the models in which the other implied method, the CDS ERP, was the dependent variable. In contrast to the Rating ERP, GDP volatility was once again a significant factor in all models. Its coefficient was again positive, implying that higher volatility results in a higher ERP. Consistent with the results of the other dependent variables, the inflation variable lacked significance but was this time consistent in its positive effect. Property rights was once again a significant variable despite the other independent variables I included, ranging from 5.49 to 6.13. Property rights and trust once again displayed negative coefficients, meaning that greater enforcement of property rights and higher trust in a culture work to reduce the ERP. Unlike with the Rating method, the trust variable was not significant. Once again the model explaining the most variation in the dependent variable was the fifth one, with an R^2 of .43.

Finally I will explain the results from modeling the Survey ERP as dependent variable. The volatility of GDP as well as property rights once again proved their significance. Furthermore, consistent with all other models, the inflation variable lacked significance. Surprisingly, this variable once again flipped its sign, just as within the models with the Rating ERP. Both models four and five had R^2 values of .63, the highest of all the results using all the ERP methods. Worth noting through this result is the amount of variation in the Survey ERP which only GDP volatility and property rights can explain. I would like to note that the Survey Premium is the resulting premium which experts believe should be appropriate; the methods or data which these experts employed is unknown. Considering this, it is thought-provoking that the R^2 is so high with these models.

The following tables show the results of models which isolate specifically the political/cultural factors of property rights, trust and ethnic fractionalization.

Table 5.5 Regression Analysis, Historic ERP Dep Var, Focus on Political/Cultural Variables

Models	1	2	3	4	5
Intercept	-0.14	17.06***	16.72***	18.01***	18.29***
	(-0.02)	(3.43)	(5.45)	(4.44)	(3.83)
Property Rights	-1.34	-5.67			-3.35
	(-0.22)	(-0.71)			(-0.43)
Trust	-9.58		-18.17**		-17.61*
	(-1.34)		(-2.14)		(-2.02)
Ethnic Fractionalization	-0.60			-6.47	
	(-0.15)			(-1.35)	
Stand. Dev. of GDP Growth	456.21***				
	(4.30)				
Stand. Dev. of Inflation	3.05				
	(0.54)				
Adjusted R^2	0.46	0.00	0.12	0.04	0.10

***Significant at the 1% level

**Significant at the 5% level

*Significant at the 10% level

Table 5.6 Regression Analysis, Rating ERP Dep Var, Focus on Political/Cultural Variables

Models	1	2	3	4	5
Intercept	15.90***	14.71***	11.92***	10.66***	15.31***
	(7.24)	(11.88)	(12.58)	(6.89)	(12.96)
Property Rights	-9.43***	-10.23***			-9.22***
	(-3.91)	(-4.30)			(-4.08)
Trust	-8.87***		-10.63***		-8.77***
	(-2.83)		(-3.18)		(-2.93)
Ethnic Fractionalization	-1.19			0.07	
	(-0.72)			(0.04)	
Stand. Dev. of GDP Growth	10.19				
	(0.47)				
Stand. Dev. of Inflation	-1.24				
	(-0.44)				
Adjusted R^2	0.37	0.32	0.23	0.09	0.40

***Significant at the 1% level

**Significant at the 5% level

*Significant at the 10% level

Table 5.7 Regression Analysis, CDS ERP Dep Var, Focus on Political/Cultural Variables

Models	1	2	3	4	5
Intercept	8.80***	12.42***	10.23***	9.56***	12.80***
	(2.86)	(9.69)	(10.06)	(5.84)	(9.92)
Property Rights	-5.49**	-7.53***			-6.89***
	(-2.15)	(-3.14)			(-2.87)
Trust	-3.38		-4.99		-3.67
	(-1.34)		(-1.83)*		(-1.45)
Ethnic Fractionalization	0.07			-0.29	
	(0.04)			(-0.15)	
Stand. Dev. of GDP Growth	81.46**				
	(2.18)				
Stand. Dev. of Inflation	0.40				
	(0.17)				
Adjusted R^2	0.39	0.33	0.22	0.14	0.35

***Significant at the 1% level

**Significant at the 5% level

*Significant at the 10% level

Table 5.8 Regression Analysis, Survey ERP Dep Var, Focus on Political/Cultural Variables

Model	1	2	3	4	5
Intercept	9.71***	11.04***	9.11***	8.55***	11.15***
	(9.77)	(21.48)	(20.70)	(11.94)	(21.46)
Property Rights	-4.93***	-5.12***			-4.99***
	(-5.33)	(-5.48)			(-5.34)
Trust	-1.29		-2.05		-1.40
	(-1.20)		(-1.47)		(-1.24)
Ethnic Fractionalization	-0.23			0.46	
	(-0.34)			(0.53)	
Stand. Dev. of GDP Growth	37.05***				
	(2.94)				
Stand. Dev. of Inflation	-0.52				
	(-0.49)				
Adjusted R^2	0.61	0.56	0.32	0.29	0.57

***Significant at the 1% level

**Significant at the 5% level

*Significant at the 10% level

In agreement with the presentation of the results so far, I first present the models with all of the variables for comparison. Then I display the regression results with only either property rights, trust or ethnic fractionalization while also controlling for latitude once again. In general, ethnic fractionalization was not a significant variable. Additionally, depending on the type of ERP, the coefficient was either positive or negative. On the other hand, property rights proved to be significant variable for all the ERP measurements except the Historic ERP. Trust was a significant variable in half of the models, namely those with the Historic ERP and the Rating ERP. The results for both property rights and trust were always negative, consistent with my hypotheses.

I will now analyze the tables more specifically, beginning with Table 5.5 displaying the models using Historic ERPs. Worth noting here is that the volatility of GDP appears to be the primary motivator of the ERP; without it, the R^2 is consistently small. Nevertheless, trust is a significant variable, implying that higher levels of trust lead to a lower ERP. Still, the model with trust alone has an R^2 of only 0.12. When adding property rights to trust, R^2 even decreases to 0.1. One issue to consider is that within this data set these variables do possess a moderate correlation of .46. This could have reduced the significance of trust in this model.

Moving on to the results with the Rating ERP as the dependent variable, both property rights and trust prove to be significant variables here. Both remain highly significant variables even when I include them both in the model. With an R^2 of .4, these two variables explain a satisfactory proportion of the variance in the Rating ERP. Property rights alone even has a fairly high R^2 of .32. Once again, these two variables have negative

coefficients, meaning that better enforced property rights and a greater level of trust contribute to lowering the ERP. As with the other measures of the ERP, ethnic fractionalization lacked significance. But here, just as with the other two remaining tables, the sign flipped when it was the only independent variable compared to when it was included in the largest model. As the Rating ERP data set is the largest (N=60) and it is a more forward-looking measure of the ERP, it is worth noting that property rights and trust were both highly significant.

Moving on to the results from the CDS ERP regression models, trust and property rights once again exhibit a negative relationship with the ERP. Trust and property rights once again possess negative coefficients. The property rights coefficient is also again highly statistically significant. Nevertheless, trust is no longer significant in these models. Also, the sign of ethnic fractionalization flipped again between model one, containing all the variables, and model four, focusing only on it. While model one possesses an R^2 of .39, model two, only containing property rights, has an R^2 of .33. Needless to say, property rights is a powerful variable for the CDS ERP method of computation.

Finally I will discuss the results from the Survey ERP regression models. It is useful to see that from these four tables, the Survey ERP models again possess the highest R^2 values overall. Model one for example has a value of .61. Even model two, in which property rights is the independent variable, has a value of .56. Considering the variables, the tendencies here are similar to those from the CDS ERP table. Property rights once again proves itself to be a statistically significant variable. Trust is not statistically significant but the sign of the coefficient is negative, just as for property rights. Ethnic

fractionalization again lacks significance and the sign changes between models one and four.

Having completed my presentation of the results, in the following Discussion Chapter I will address some of the major implications of my results as well as the contributions my thesis makes to the literature.

Chapter 6. Discussion

Having completed reviewing the results from the regression models, I will now address their primary implications. It is worth repeating that most of the models imply that greater volatility in GDP will serve to increase the ERP. Also, they imply that greater enforcement of property rights and greater levels of trust serve to decrease the ERP. These results are consistent with the findings in the literature. Nevertheless, ethnic fractionalization as well as inflation volatility are not significant. These results appear to be fairly straightforward with direct implications. This Discussion section will attempt to address some of the potential ramifications of these results.

The reasons for these variables' significance, and lack thereof, are diverse and thought provoking. Not only does their significance have to do with the factors themselves but also the different measurements of the ERP. Considering the implications of the GDP volatility variable, I would say that higher aggregate volatility makes planning for the future more difficult. Risk and hedging for it is of course a large component of this planning. Greater aggregate risk could cause investors to depend more on safer, less risky assets, in economies with greater volatility. In this case, this would imply a lower relative price for equities and therefore a higher premium for them.

Also worth considering is that the volatility of GDP is not significant for the ERP rating models. Moreover, it is not as strongly correlated to this ERP as to the other ones. Worth noting is that the Rating ERP possesses the largest and thereby most diverse data set. One potential reason for GDP volatility's lack of significance could be that the implied methods are a more forward-looking measure; they compute the ERP for the very next period using only data on the current period. This is in contrast to the Historical Returns method which focuses on long term factors. In this way, it makes sense that GDP volatility in the past would not necessarily influence the ERP in the future. If the markets are efficient then such volatility factors should already be incorporated into pricing while the past volatility should not play a role for the next period. As past GDP volatility is not significant for the Rating ERP, my models support this fact. Instead, for this ERP, the political and cultural factors, which may not be considered in pricing, appear to play a greater role.

Taking this argument further, perhaps political and cultural variables have more staying power than macroeconomic variables. On the one hand, GDP volatility does indeed have an effect on the Historic ERP but political and cultural variables lack significance. On the other hand, political and cultural variables affect the more forward-looking, Implied ERPs. Enforcing property rights and increasing trust are complicated legal, political and social actions. Perhaps governments and markets are able to compensate for and stabilize macroeconomic volatility but the political and cultural variables are more entrenched.

I will now address the political and cultural variables of property rights and trust more specifically. Property rights proved to be a significant variable in most of the models. Therefore, countries with stronger legal protection of property and smaller chances of government expropriation have lower ERPs. Such an environment serves to insure stability and predictability in business transactions and therefore reduces the riskiness of investment. The significance of this variable is a logical result of a secure business environment.

The trust variable was significant in nearly half of the regression models, depending on the ERP and the other factors present. Higher levels of trust tended to reduce the level of the ERP. This result could be a consequence of a belief in the financial system or a trust in the credibility of business transactions within a country. Exploring these notions more deeply would be worth further investigation. Additionally, given the presence of risk behavior research and its effect on the ERP in the literature, how trust affects risk behavior could be a fruitful further research endeavor. Another logical step for future investigation would be to use another measure of trust, such as that employed by Breuer and McDermott (2013) where they operationalized trust as confidence in institutions. Perhaps this component of trust has a stronger effect of evaluating risk within an economy.

Despite support from the literature, ethnic fractionalization and inflation volatility each lacked significance in my regression models. One explanation for this could be that in some countries, ethnic fractionalization does not imply a highly fractious and conflict-prone society. Rather, it may represent an acceptance and tolerance of diversity. Given

the variation in ethnic fractionalization across countries, it may be hard to find a statistically significant relationship, whether positive or negative. Considering the lack of significance for this variable, I decided to test a further measure of cultural characteristics in my model, namely ethnic polarization. However, this indicator was even less significant than ethnic fractionalization in all models.

As ethnic fractionalization lacked significance, so did the volatility of the inflation variable. Inflation uncertainty is difficult to measure and it is questionable whether the volatility of inflation served as an appropriate proxy for this uncertainty. Moreover, when planning for risk, one can compensate for the level of inflation. It is possible that this variable lacked significance because volatility can be planned and adjusted for as well.

As a final note, it is worth addressing that the regression models with the consistently highest adjusted R^2 values were those with the Survey ERP as the dependent variable. R^2 ranged between .63 and .29, remarkably high values, underlying the explanatory power of my models. In other words, the independent variables of property rights and the standard deviation of GDP growth were the strongest predictors of variation in the Survey ERP variable. Nevertheless, this fact does not imply that the Survey ERP is a "more appropriate" measure of the ERP than the others. It does mean that the responses overall are significantly affected by the factors which I included in my models. Perhaps when planning for the future and choosing an appropriate ERP, the survey method as representative of an expert consensus, could serve as a good starting point for analysis. In this way, the effects from the factors which I explored in this thesis would be most significant.

The aim of this thesis was to further the understanding of risk and return in the globalized investment environment. More specifically, I wanted to shed light on the macroeconomic and political/cultural determinants of ERPs. I have completed both these objectives. I have substantiated the theoretical predictions through my empirical analysis and identified the importance of GDP volatility as well as property rights in determining the magnitude of the ERP across countries. Furthermore, comparing the different estimates of the ERP within a single study is an innovative approach which, for the first time, detected clearly definable differences and similarities among the measures and their determinants. I therefore perceive my contribution to the current debate in the field as significant and thought-provoking. Nevertheless, the research endeavor of this Master's Thesis represents only the beginning of necessary further investigations into risk in the globalized environment.

References

Alesina, A., Devleeschauwer, A., Easterly, W., Kurlat, S., & Wacziarg, R. (2003). Fractionalization. *Journal of Economic Growth*, *8*(2), 155–194. doi:10.1023/A

Alesina, A., & Ferrara, E. La. (2005). Ethnic diversity and economic performance. *Journal of Economic Literature*, *43*(3), 762–800.

Brandt, M. W., & Wang, K. Q. (2003). *Time-varying risk aversion and unexpected inflation*. *Journal of Monetary Economics* (Vol. 50, pp. 1457–1498). doi:10.1016/j.jmoneco.2003.08.001

Brealey, R. A., Myers, S. C., & Allen, F. (2014). *Principles of Corporate Finance: Eleventh Global Edition* (pp. 160–244). Maidenhead, England: McGraw-Hill Education.

Breuer, J. B., & Mcdermott, J. (2013). Economic depression in the world. *Journal of Macroeconomics*, *38*, 227–242.

Breuer, J. B., & McDermott, J. (2013). Respect, Responsibility, and Development. *Journal of Development Economics*, *Forthcomin*.

CIA. (2014). The CIA World Factbook. Retrieved November 21, 2014, from https://www.cia.gov/library/publications/the-world-factbook/fields/2011.html

Damodaran, A. (2013). *Equity Risk Premiums (ERP): Determinants, Estimation and Implications – The 2013 Edition* (pp. 1–114). Retrieved from http://ssrn.com/abstract=2238064

Dimson, E., Marsh, P., & Staunton, M. (2002). *Triumph of the optimists: 101 years of global investment returns*. Princeton, N.J: Princeton University Press.

Fearon, J. D. (2003). Ethnic and Cultural Diversity by Country. *Journal of Economic Growth*, *8*(2), 195–222.

Fernandez, P., Aguirreamalloa, J., & Corres, L. (2012). Market Risk Premium used in 82 countries in 2012 : a survey with 7 , 192 answers. *IESE Business School*, 1–17.

Gorodnichenko, Y., & Roland, G. (2011). Which dimensions of culture matter for long-run growth? *American Economic Review*, *101*(3), 492–498.

Guiso, L., Sapienza, P., & Zingales, L. (2006). Does culture affect economic outcomes? *Journal of Economic Perspectives*, *20*(2), 23–48.

Halek, M., & Eisenhauer, J. G. (2001). Demography of risk aversion. *Journal of Risk and Insurance*, 1–24.

Harrison, G. W., Lau, M. I., & Rutström, E. E. (2007). Estimating risk attitudes in denmark: A field experiment. *The Scandinavian Journal of Economics*, *109*(2), 341–368.

Heritage Foundation. (2014). Property Rights: Definition, Economic Growth, Index, Examples. Retrieved November 21, 2014, from http://www.heritage.org/index/property-rights

Holt, C. A., & Laury, S. K. (2002). Risk aversion and incentive effects. *American Economic Review*, *92*(5), 1644–1655.

Knack, S., & Keefer, P. (1997). Does social capital have an economic payoff? A cross-country investigation. *The Quarterly Journal of Economics*, *112*(4), 1251–1288.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. (1997). Trust in large organizations. *American Economic Review*, *87*(2), 333–338. doi:10.1016/S0304-405X(00)00065-9

Lettau, M., Ludvigson, S. C., & Wachter, J. a. (2007). The Declining Equity Premium: What Role Does Macroeconomic Risk Play? *Review of Financial Studies*, *21*(4), 1653–1687. doi:10.1093/rfs/hhm020

Lintner, J. (1965). The valuation of risk assets and the selection of risky investments in stock portfolios and capital budgets. *The Review of Economics and Statistics*, *47*(1), 13–37. Retrieved from http://www.jstor.org/stable/1924119

Lucas, R. E. (1978). Asset Prices in an Exchange Economy. *Econometrica*, *46*(6), 1429–1445.

Mauro, P. (1995). Corruption and Growth. *The Quarterly Journal of Economics*, *110*(3), 681–712.

Mehra, R., & Prescott, E. C. (1985). The Equity Premium: A Puzzle. *Journal of Monetary Economics*, *15*, 145–161.

Mehra, R., & Prescott, E. C. (2003). The equity premium in retrospect. *Handbook of the Economics of Finance*, 889–938.

Rieger, M. O., Wang, M., & Hens, T. (2012). International Evidence on the Equity Premium Puzzle and Time Discounting. *SSRN Working Paper Series*, 1–19. Retrieved from http://elib.tcd.ie/login?url=http://search.proquest.com/docview/1323891648?accountid=14404\nhttp://ssrn.com/abstract=2120442

Riley Jr, W. B., & Chow, K. V. (1992). Asset allocation and individual risk aversion. *Financial Analysts Journal*, 32–37.

Rocha, M., & Carvalho, A. De. (2012). Determinants of the Implied Equity Risk Premium in Brazil Antonio Zoratto Sanvicente Insper Working Paper.

Sharpe, W. F. (1964). Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk. *The Journal of Finance*, *19*(3), 425–442. Retrieved from http://onlinelibrary.wiley.com/doi/10.1111/j.1540-6261.1982.tb03586.x/abstract

Stulz, R. M. (1999). Globalization of Equity Markets and the Cost of Capital. In *SBF/NYSE Conference on Global Equity Markets*.

Tabellini, G. (2008). Culture and institutions: economic development in the regions of Europe. *Journal of the European Economic Association*, *(forthcomi*.

Wang, H., & Hanna, S. (1997). Does risk tolerance decrease with age. *Financial Counseling and Planning*, *8*(2), 27–31.

Weber, C. S. (2013). *Cultural Differences in Risk Tolerance **.

World Values Survey. (2014). Ann Arbor, Michigan.

Zak, P. J., & Knack, S. (2001). Trust and growth. *Economic Journal 111*, *470*, 295–321.