



## *National Culture, Economic Institutions, and International Equity Diversification*

**Abstract:** This paper examines the benefits of an international equity diversification strategy that is based on cross-national cultural differences as proxied by the Kogut and Singh (1988) measure of cultural distance, and while accounting for cross-national institutional quality as proxied by the Kaufman et al. (2010) measures for institutional governance. The study takes a Dutch investors' perspective and focuses on the period after the recent global financial crisis, from January 2010 until December 2017. Several risk-adjusted economic measures of diversification are derived from portfolios that are constructed and reformed throughout a series of robustness tests, and that are based on rankings to cultural and institutional differences across a sample of developed and developing countries. Results indicate more portfolio diversification benefits across developed and developing countries when investing in culturally close rather than in culturally distant countries, if an investor considers the unsystematic risk of the portfolio as is represented by portfolio variance. However, results indicate the opposite effect if an investor considers the systematic risk of the portfolio as is represented by portfolio beta; results show more portfolio diversification benefits when investing in culturally distant rather than in culturally close countries across developed and developing countries. Finally, an alternative measure of risk that is based on the lower partial standard deviation is also displayed; however, results for the diversification effects across the sample are inconsistent if this measure is to be used at examining the economic diversification effects.

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## 1. Introduction

Ever since the introduction of the Markowitz (1952) portfolio theory, a lot of research by financial economists was set to examine the benefits of diversification across financial assets, more notably across international financial assets following the openness of capital markets due to globalisation. Early works (e.g., Witt, 1978) on the benefits of international equity diversification across developed and developing countries in terms of portfolio risk and return employ mean-variance analysis. They find that investing in foreign markets provides more diversification benefits to domestic investors than what could otherwise be obtained by investing in only domestic assets (Li et al, 2003; Chiou et al., 2008). A distinction in the literature on equity investment is thus made between studies that focus on international equity flows (determinants to international portfolio allocation) and studies that focus on international diversification effects (determinants to international portfolio diversification). This study is oriented towards the effects of portfolio diversification; however, the two concepts are interrelated and will be jointly discussed.

While the theory holds true empirically, in that adding more international securities instead of domestic securities to the formed portfolio will have greater diversification effects; in practice, investors wish to determine the optimal complementary asset allocation determinants, to which the acquisition of additional securities would provide the most contribution to diversification in terms of risk and return to their existing portfolios. For example, investors might not want to invest in too many countries, due to informational and transactional considerations. This has created room for research on the determinants of beneficial portfolio diversification (Chiou et al., 2008). Relevant research focuses on investor-specific, home country-specific, foreign country-specific, and security-specific factors that affect international equity investment between countries (Anderson et al., 2010).

The international diversification effect is a consequence of non-perfect correlations of asset price movements across different economies and their financial markets, which in turn would enhance average portfolio returns while also minimising portfolio risk, with the inclusion of additional international rather than domestic assets. Such benefits are in general empirically shown to be stronger when investing in developing economies rather than in developed economies, because of the lesser integration of their markets to the global economy, which lowers their exhibited asset price correlations which thus enhances their portfolio diversification effects.

The development of financial markets concerns the removal of government controls over monetary flows, to develop the infrastructure of the financial systems, and to integrate them into the global market. (Li et al, 2003; Chiou et al., 2008; Laeven, 2014). Given such global developments in financial markets, investors are now more exposed to international equity securities and thus have more options in constructing their portfolios. Relevant research on various portfolio diversification strategies includes strategies that account for emerging markets (Kearney and Lucey, 2004), frontier markets (Berger et al., 2013), fundamental indexation (Estrada, 2008), and market development and capitalisation (Switzer and Tahaoglu, 2014).

This paper would thus follow this line of empirical research. However, it will account for the effects of national culture and economic institutions, on international equity diversification. The next section will start with reviewing the literature on the relevance of national culture in economics (2.1.1), followed by the relevance of economic institutions, which is discussed from a new institutional perspective (2.1.2). Section (2.2) would then discuss the relationships between national culture, economic institutions, and international equity diversification and conclude with the research question.

## **2. Literature Review**

### ***2.1 Culture and institutions in economics***

#### ***2.1.1 National culture in economics***

National culture is defined as “customary beliefs, values, and social constraints that ethnic, religious, and social groups transmit fairly unchanged from generation to generation” (Guiso et al, 2005). This implies that culture has channels of influence on an individual’s economic behaviour, through forming one’s preferences and constraints in economic transactions (de Jong, 2009). The relevance of culture has been introduced into economics by international business scholars. Geert Hofstede (1980) analysed a questionnaire based on the international differences in work-related values among global employees of IBM (a US multinational company), where he then originally derived four cultural dimensions from; which has thus made it possible to analyse cross-country differences in national culture (the four dimensions have been increased to six dimensions following more recent research of Hofstede and others) (de Jong, 2009). Those dimensions of culture have not been only used for analysing questions related to international business such as entry mode choices of multinational companies, but they have also been used for answering economic questions such as analysing cross-country differences in financial systems; among others. (de Jong, 2009). The six cultural dimensions identified by Hofstede (and others) are summarised below (Hofstede, 1980; 2003; Geert Hofstede’s website; [www.geerthofstede.com](http://www.geerthofstede.com)).

1. First, individualism is defined as the extent to which members in a society feel independent in their decisions and choices. This is opposed to collectivism which is being interdependent members of a larger whole societal member, which socially determines one’s place in the society. Examples of individualistic cultures are western European countries such as Germany, the United Kingdom, and the Netherlands. In contrast, Russia, China, and Japan represent highly collectivistic cultures.
2. Second, power distance is defined as the extent to which the less powerful members in the society accept the unequal distributions of power and wealth by the more powerful members. In other words, this index shows the affinity of the society towards inequality and authoritarianism. Relationships between members of societies that score low on power distance are less formal, such as in the Netherlands and Finland. In contrast, Saudi Arabia and China score high on the power distance; and the relationships between members in those societies are more formal.

3. Third, masculinity refers to the extent to which a society stresses the extent to which using force and competition is acceptable; masculine societies emphasise the male gender and are characterised by competition and fights for conflicts. In contrast, feminine societies do not openly endorse competition but instead value cooperation and teamwork. Highly masculine countries include the United States and Japan, while the Netherlands and Thailand are regarded as highly feminine countries.
4. Fourth, uncertainty avoidance deals with a society's tolerance for ambiguity and uncertainty; it is the extent of distrust and anxiety towards the unknown that is commonly shared among members in a society. A crucial difference between countries which score high on uncertainty avoidance (such as France and Italy) and countries which score low on uncertainty avoidance (such as the United Kingdom and China).
5. Fifth, long term-orientation concerns reactions to change. Long term-oriented societies are more dynamic and are preparing rigorously for the future, while short-term-oriented societies are more adhering to past practices and continue with them as they are. China and Taiwan are considered to be long-term oriented societies while Canada is considered to be a short-term oriented society.
6. Sixth, indulgence concerns the degree to which cultures are more open and freely driven, which is opposed to restraint cultures which are more intrinsically driven by duty and not by freedom. Indulgent cultures include Germany while restraint cultures include India.

Kogut and Singh (1988) have developed a national cultural distance measure, that is based on Hofstede's cultural dimensions. This measure refers to the deviations of each of the cultural dimensions of a foreign country to a home country (de Jong, 2009); and will be operationalised in this research to account for cross-national culture (see chapter 3).

### ***2.1.2 Neo-institutional economic framework***

New institutional economics is a research perspective within economics, that extends the focus of (old) institutional economics to a broader framework, which incorporates and analyses the social factors that shape the formation of national institutions. The new institutional economics framework considers four levels of social analysis. The first level of such analysis is culture; which has been defined in the previous section (2.2.1). The second level is the level of institutions. Institutions are regarded as the formal or informal laws that shape the interactions of economic agents in a society, which would thus reduce the uncertainty of economic events (institutions result directly from culture unless they are externally imposed or otherwise borrowed). High-quality economic institutions that progressively adapt over time enhance economic outcome and reduce transaction costs; high-quality economic institutions are represented in areas such as investor protection, among others. The third level of social analysis is the level of institutional governance. Governance is a level of social analysis, that follows the levels of culture and institutions, which affects the resulting quality of institutions. Governance concerns the informal rules that are used to settle disputes by

economic agents; well-functioning governance reduces transaction costs by creating order and mitigating conflict, which eventually would enhance economic transactions. Resource allocation is the final level of social analysis and is defined as the optimality of economic output in a society; which is a resultant of the preceding levels of analysis. (Williamson, 2000; de Jong, 2008; de Jong, 2009).

Neo-institutional economics is principally concerned with the levels of institutions and institutional governance of social analysis. Cross-country comparative research in new institutional economics takes the form of analysing the effect of the differences in institutions and their governance qualities, on economic phenomena; which is equity diversification in this paper's research context. The third level of institutional governance is of crucial importance. Although perfectly functioning legal systems, as frameworks of economic transactions, are essential in the definition of contractual relationships between economic agents; the enforcement of the contractual relationships, as represented by the level of governance quality, is needed to come to terms with the those defined contract laws (Williamson, 2000). For this reason, the quality of institutions in this paper will be proxied by the level of institutional governance in a country (see chapter 3); Kaufmann et al. (2010) identified six dimensions of governance qualities across countries:

1. The first dimension is voice and accountability, which reflects the extent to which citizens of a country can express their freedom which includes the freedom of selecting their governments.
2. The second dimension is political stability which is concerned with the likelihood that political unrest or terrorism will overthrow the current government.
3. Government effectiveness concerns the public perception of the quality of the offered public and civil services, and also concerns the government's ability to implement policies.
4. Regulatory quality concerns the public perception about government policies and regulations.
5. Rule of law concerns the degree of confidence of citizens in the laws under operation and their compliance with them.
6. Finally, control of corruption is concerned with the public perception about the degree with which public power is used for private gains.

Kaufmann et al. (2010) analysed those variables from different data sources reported in surveys, which made them able to derive such six indicators that could be used for cross-country comparisons on the governance level. This study will thus base the measures of institutional governance on the six dimensions identified above (see chapter 3).

## ***2.2 Culture, institutions, and equity investment***

Cultural and institutional heterogeneities are key factors in determining equity portfolio allocation between countries. Cultural and institutional heterogeneities are also key factors in determining correlations of asset

prices among markets, as they play a role in determining the degree of capital market development and global integration; which would affect equity portfolio diversification (Chiou et al, 2008). The following section discusses the relevant research concerning the effects of culture, institutions, and governance on international equity investment.

### ***2.2.1 Culture and equity investment***

Culture has been a topic of recent interest in the field of financial economics. International equity allocation is influenced by investor familiarity with various foreign markets, as suggested by a common language, bilateral trade flows, immigration links and geographical proximity between home and foreign countries (Anderson, 2010). In the literature relating to portfolio allocation, Anderson et al (2010) investigate cultural differences and international equity flows. They investigate how cross-cultural differences in behaviour affect international portfolio allocation. They find that home country cultural differences explain the cross-sectional variation in the degree of foreign equity allocation. They find that countries characterised by high levels of uncertainty avoidance exhibit larger home bias and are less diversified in their foreign stock holdings. Furthermore, they find that portfolios from countries characterised by higher masculinity and long-term orientation levels display a lower level of home bias and are more diversified in their foreign stock holdings.

Beugelsdijk and Frijns (2010) also provide a cultural explanation of a country's preference for foreign equity allocation. They show that a home country's cultural characteristics explain investors preferences for foreign stocks; more specifically, they find that investors from uncertainty avoiding countries are more risk-averse, and perceive foreign investments as being riskier, thus would exhibit a lower preference for foreign stocks. Furthermore, they find that individualistic societies which are characterised by individual decision making which is associated to overconfidence and over-optimism, would, in turn, lead to a lower perceived risk of foreign investment on the individual level; and thus exhibit a preference for foreign stocks. They also find that culturally distant countries generally have fewer preferences for investing in each other's stocks. Cultural distance has also been shown to negatively affect stock price return correlations across countries. Lucey and Zhang (2010) investigate this relationship for a sample of developing economies after operationalising for the Kogut and Singh index measure of cultural distance; and conclude that the smaller the cultural distance between a pair of countries, the higher the equity price correlations between the two as is represented in the observed bilateral correlations.

### ***2.2.2 Institutions and equity investment***

Differences in institutions across countries, including differences in country and firm-level governance qualities, have been documented to affect international equity allocation, through their effects on capital controls and the limits to foreign equity holdings. Chan et al. (2005) find that the country level determinants of capital controls and taxation influence international equity flows between countries; they find that countries with fewer restrictions on capital flows and taxation exhibit more incoming foreign equity investment. Vlachos (2004) finds that investors are more prone to hold portfolios of assets in countries with similar

frameworks of securities regulations as their home countries; and thus, concludes that the institutional harmonisation of securities regulation would promote large increases in bilateral equity flows. Differences in institutions across countries have also been shown to affect stock market comovements. Better institutions would have a positive impact on stock market comovements, through decreasing transaction costs and other barriers between stock markets; which would, in turn, induce better conditions for international investment. Better institutional quality also increases the efficiency of stock markets due to lower informational asymmetry, which would induce faster and more efficient transmission of news between stock markets as represented by more comovements of stock prices. This would in turn negatively affect equity diversification effects (Canh et al., 2018).

Country-level and firm-level governance are also shown to affect equity investment. La Porta et al. (1999) demonstrate the differences in global corporate ownership structures based on significant share ownership and control patterns on a country level. Dahlquist et al. (2003) and Kho et al. (2008) follow from this view and link it to portfolio allocation in the sense that countries with large economically important controlling corporate shareholders would offer fewer shares available for trade to international investors; which in turn limits these countries incoming equity investment. Furthermore, better governance on a firm level is associated with more efficient stock markets (IMF, 2016); which would, in turn, lead to more comovements of these capital markets to their international counterparts. This would in turn positively affect equity diversification effects.

### ***2.2.3 Research question***

These previous findings with regards to national culture and economic institutions form the basis for the research question of this research. This paper aims at empirically testing the dominance of a portfolio diversification strategy that is based upon cultural distance while controlling for the effect of institutional quality, to distinguish between both counteracting effects within the same grouping. The research question thus aims to explore the economic benefits of portfolio diversification strategy that is based on investing in culturally distant versus culturally close countries; whether individually or when grouped together, and while controlling for institutional effects.

The hypotheses are thus:

Hypothesis 1: cultural distance should marginally positively affect the observed portfolio diversification effects through its effect on the observed bilateral correlation;

Hypothesis 2: institutional quality should marginally negatively affect the observed portfolio diversification effect through this same channel.

Given the two hypotheses are connected, it is, therefore, necessary to control and distinguish between the more prevalent effect of both variables on portfolio diversification (this is an interacting part of the research question that needs to be controlled for). Therefore, the effect of the direction of a portfolio diversification

strategy that is based on cultural distance is left as an empirical question to examine (this is an empirical part of the research question).

After reviewing the relevant literature, and after formulating the research question and corresponding hypotheses; the following chapter shows the methodology that has been followed in order to reach a resulting conclusion to them.

### **3. Methodology**

Relevant research focuses on investor-specific, home country-specific, foreign country-specific, and security-specific factors that affect international equity investment across countries (Anderson et al, 2010). Previous studies have identified the diversification effects to a home country, with regards to geographical distance to foreign countries and with regards to investing regions (Portes and Rey, 2005; Chiou et al, 2008). Moreover, previous studies have documented home country cultural values, and their effects on international equity flow towards foreign countries (Anderson et al, 2010); previous studies have also documented cultural distance between home and foreign countries, and its effect on the resulting bilateral equity flows (Beugelsdijk and Frijns, 2010). However, to the extent of my knowledge, no previous study focused on identifying the effects of marginal portfolio diversification to a home country portfolio, by the addition of international equity, after considering the cultural distance between the two. This research will thus focus on differences between a home and a foreign country, at the cultural level of social analysis, and their effect on the benefits of portfolio diversification towards a home country; which will be its main novelty. The institutional level of social analysis, which includes country and firm-level governance (de Jong, 2009), will also be considered as a determinant of portfolio diversification effects.

Most of the literature on the benefits of international portfolio diversification take a US investor's perspective; Driessen and Laeven (2007) expect that the effects of international portfolio diversification, for investors in smaller developed countries, may be much more when compared to the results obtained to US investors. Following from this view, and due to the lack of such relevant studies to the Netherlands, this paper would take a Dutch investor's perspective in this context. This study aims to use the mean-variance analysis approach, to compare the economic diversification effects to Dutch investors when marginally investing in international portfolios as opposed to originally holding a domestic-only portfolio; while accounting for national culture and economic institutions.

The analysis will consider the differences in diversification effects, across developed and developing countries, with respect to cultural distance and institutional qualities. The identification of such insights is important for financial professionals involved in portfolio management, as well as for the average Dutch investor, who would like to extend her/his equity portfolio from domestic only, to international assets. The dataset would cover the period post the recent global financial crisis, from 2010-2017, with monthly historical price data on a sample of national and international equity indices (Table 1). The Kogut and Singh (1988) measure of cultural distance which is based on Hofstede's (1980) cultural dimensions will be used as a proxy

for cultural differences between the Netherlands and the sample of countries (de Jong, 2009). The Worldwide Governance Indicators of Kaufmann (2010) will be used as a proxy for institutional governance differences across countries. The ranking of countries separately according to such differences according to cultural and institutional differentials, and the formation of comparable portfolios accordingly, will enable in answering the formulated research question.

### 3.1 Methods

The formation and analysis of comparable portfolios are represented by the efficient frontier of Markowitz (1952) as applied through using the mean-variance analysis. The expected return of a portfolio is calculated as the sum of the individual asset weights multiplied by their expected returns respectively (Cuthbertson and Nitzsche, 2004; Bodie, Kane, and Marcus; 2014):

$$\mu_p = \sum_{i=1}^n \omega_i \mu_i$$

Where,

$\mu_p$  = Expected return on portfolio (p)

$\sum \omega_i$  = Sum of the weights of individual assets in portfolio (p) = 1

$\omega_i$  = Weight proportion of asset (i) in portfolio (p)

$\mu_i$  = Expected return on asset (i)

n = Number of assets in portfolio (p)

Portfolio variance is calculated as the weighted average covariance of the individual asset returns (Cuthbertson and Nitzsche, 2004; Bodie, Kane, and Marcus; 2014):

$$\sigma_p^2 = \sum_{i=1}^n \omega_i^2 \sigma_i^2 + \sum_{i=1}^n \sum_{\substack{j=1 \\ i \neq j}}^n \omega_i \omega_j \rho_{ij} \sigma_i \sigma_j$$

Where,

$\sigma_p^2$  = Variance of the portfolio

$\rho_{ij}$  = Correlation coefficient between the returns of assets (i) and (j)

$\sigma_i, \sigma_j$  = Standard deviations of assets (i) and (j) respectively;

And where,

Portfolio standard deviation is the square root of the portfolio variance:

$$\sigma_p = \sqrt{\sigma_p^2}$$

The expected return and measures of the portfolio risks were performed using Microsoft Excel's data analysis, which made the processes of the mean-variance framework and portfolio optimisation feasible. Initially, the monthly returns of the sample of stock market indices (Table 1) were gathered from the database Thomson Reuters EIKON throughout the sample time period from 2010 until 2017. Exchange rate risk was considered during the process where all international currencies were translated to be denominated in Euros. The returns and the standard deviations of individual indices were computed as the arithmetic average of the monthly returns, which were then annualised for consistency of comparisons. The correlations and covariances were then calculated for securities per portfolio. Furthermore, the process included mathematically constraining individual asset weights within a portfolio, at different points on the risk-return space, in order to derive and graph an efficient frontier per portfolio. The graphical representation of the efficient frontiers of the comparable portfolios, according to cultural distance, or according to the average quality of institutional governance, would allow for a visual evaluation of the superiority of the portfolios (Efficient frontiers based on the maximum Sharpe ratios are displayed in the appendix.). Furthermore, quantitative measures to compare between the portfolio diversification effects based on different risk-adjusted portfolio performance measures were employed (Cuthbertson and Nitzsche, 2004; Bodie, Kane, and Marcus; 2014).

The Sharpe ratio gives a standard diversification measure of portfolio return per unit of portfolio risk, after the introduction of a risk-free asset. For this purpose, the average yield of the 10-year Dutch government bond for 2017 was used which would best proxy for an average expected risk-free rate for investing in the period post-2017; given the current financial policy implications. The introduction of a risk-free asset also forms the Capital Market Line (CML) which is the tangent line that connects the risk-free rate of return to the feasible region of assets on the frontier. In theory, investors seek to maximise the Sharpe ratio; the maximisation of the Sharpe ratio would result in the identification of the optimal portfolio on the efficient frontier, and the comparison of optimal portfolios across portfolios (Cuthbertson and Nitzsche, 2004; Bodie, Kane, and Marcus; 2014). The Sharpe ratio is then calculated as follows:

$$\text{Sharpe Ratio} = \frac{E(R_p) - r_f}{\sigma_p}$$

Where,

$E(R_p)$  = Expected return of the portfolio

$r_f$  = Risk free rate of return

$\sigma_p$  = Risk of the portfolio (p) as measured by the standard deviation of returns

Initially, a home (portfolio 1) which represents a fully diversified investment opportunity in the Netherlands is constructed. This portfolio (Table 2) includes indices representing Amsterdam's large, medium, and small market capitalisation stocks (AEX, AMX, and ASCX).

After obtaining data on the cultural dimensions per each country, which are available on Geert Hofstede's website ([www.geerthofstede.com](http://www.geerthofstede.com)), the Kogut and Singh (1988) cultural distance measure is operationalised to rank the sample of countries (Table 3) in order to form comparable portfolios (Table 2). Cultural distance is calculated based on the original four cultural dimensions by Hofstede (1980), for the sample of developed and developing economies separately. The higher the calculated measure of cultural distance, the higher the cultural distance observed to the Netherlands from the observed country. Following this step, the top twentieth percentile, which corresponds to the three most culturally close developed (portfolio 2) or developing (portfolio 4) countries to the Netherlands, will be added on top of the portfolio of domestic securities, to form the new comparable portfolios. This process is repeated for the lower twentieth percentile which corresponds to the three most culturally distant developed (portfolio 3) or developing (portfolio 5) countries. The formula to the Kogut and Singh index is as follows:

$$CD_j = \frac{\sum_{i=1}^4 \left\{ \frac{(I_{ij} - I_{in})^2}{V_i} \right\}}{4}$$

Where,

$CD_j$  = Cultural distance of the (jth) country to the Netherlands

$I_{ij}$  = Index for the cultural dimension (i) of the country (j)

$I_{in}$  = Index for the cultural dimension (i) of the Netherlands (n)

$V_i$  = Variance of the index for the cultural dimension (i)

#### 4. Results and Additional Tests

At this point, the original portfolios which were formed according to a grouping based on cultural distance, suggest more diversification of culturally close rather than culturally distant countries (as is hypothesised) to the Netherlands; this is represented by higher Sharpe ratios for portfolio 2 and 4, as opposed to portfolio 3 and 5 (Table 4).

Here the results suggest more diversification benefits of culturally close countries, in both, developed and developing economies. However, at this point, this statement could be falsified (Karl Popper, 1963), through four statements:

1. Analysing the results at this stage could be biased because of the possible effect of the financial crisis on the return distributions of the added countries. A drawback of the mean-variance

framework is its measurement error; a major drawback as has been noted by (Jorion, 1992) is the measurement of inputs to the mean-variance optimisation procedure. Historical return data is thus assumed and used as being a perfect representative of past performance, which could, however, exhibit errors. This suggests a robustness check to control for the effect of the period right after the financial crisis. For this purpose, we will subdivide the sample period into two subsamples - 2010-2014, and 2014-2017 – and reperform portfolios that will take into account only the second half of the sample time period.

2. Cross-correlations between the similar countries that were added together to form a portfolio could be responsible for the overall observed aggregate portfolio diversification effect. This suggests controls to distinguish between the aggregate, and the individual effects of countries, on the observed aggregate portfolio diversification effect. For this purpose, we will reperform individual portfolios that will take into account the marginal diversification effect per individual country, instead of a diversification strategy that is based on the top or lower 20<sup>th</sup> percentile of a group of countries. Therefore, each individual portfolio will be subdivided into three portfolios to account for such differences.
3. After controlling for the above: we could not still reach a definite conclusion to the main cause of the observed diversification effect, i.e. we could not distinguish between whether the observed diversification effect is in fact caused mainly due to cultural distance or due to institutional quality. This suggests controls to distinguish between the effects of both cultural distance and institutional quality within a sample. For this purpose, we will perform two series of tests, one based on correlation and regression analyses, and one based on some implications to constructed portfolios. These tests would help in distinguishing whether the diversification effect that is observed is mainly due to culture or due to institutions.
4. The measure of perceived risk would also affect the diversification calculation, and thus the investment decision per comparable portfolios. For this purpose, we will reperform the measure of diversification per each portfolio which will take into account other portfolio risk measures; we will, therefore, calculate the Treynor and the Sortino ratios per originally formed portfolio.

To rule out the first statement, we will reperform the portfolios but only based on data from the second half of the sample. i.e. on data from 2014-2017. This should represent a more stable period of investment post the financial crisis to check for the robustness of the results. For this purpose, we have constructed robust (r) portfolios 2.r, 3.r, 4.r, and 5.r respectively (Table 2).

It seems that the direction of the effect does not statistically change due to the effect of the financial crisis on the distribution of asset returns; that is because the reward to volatility (Sharpe ratio) is still on average moving in the same direction or did not change the direction of its result (Table 2). Results indicate that both

pairs of portfolios seem to be performing better on average; in the period of 2014-2017 as compared to 2010-2017, possibly because of the recovery of global capital markets after the crisis.

After the above analysis, we have ruled out the effect of the financial crisis which revealed no effect on the formed portfolios. This takes us back to the original portfolios that were formed for the whole period. Now their results which are valid after the previous robustness check still suggest the superiority in diversification benefits of the culturally close countries over the culturally distant countries. This is true for a portfolio of similar countries grouped together according to their observed cultural distance to the Netherlands.

However, this statement could still be falsified by the statement (2) above. To separate this aggregate diversification effect from the individual effect of marginally adding one culturally close, or one culturally distant country, to a portfolio of domestic assets, we will form individual portfolios that only incorporate one culturally distant or one culturally close country at a time. And so, each original portfolio will be subdivided into 3 portfolios that incorporate each asset individually over the original Dutch portfolio. As an example, portfolio 2 will be subdivided into portfolios 2.1, 2.2, and 2.3 etc... (Table 2).

At this point, results (Table 2) are still in line with the originally formed portfolios. Individual assets that make up the portfolios are on average moving in the same direction of a strategy that aggregates them. It is therefore evident that this grouping of countries according to cultural distance has shown fewer diversification benefits when added together in a portfolio, this is due to the observed diversification effect from the aggregate portfolio that groups them together. Also, the assets that make up this group of countries, are on average, less diversifying in themselves, than the assets that make up the other culturally close group of countries.

However, at this point this statement could still be falsified by the statement (3) above; at this point the effect of culture and the effect of institutions are simultaneously affecting the bilateral correlation, that is now the main driver for the observed portfolio diversification effect, and that is individually observed between each country in the sample to the Netherlands. As has been described above, we will be doing two series of tests:

### **Correlation and regression analyses**

We will analyse the following three variables: the reported cultural distance measure, the reported bilateral correlation, and a calculation to the average difference to the Netherlands in terms of institutional governance.

To proxy for institutional differences, an average of the six governance dimensions by Kaufmann (2010) will be operationalised. After obtaining data on the Worldwide Governance Indicators from the World Bank Group's website ([www.worldbank.org](http://www.worldbank.org)), for the period from 2010-2016 (the dataset starts in 1996 and ends in 2016), an average calculation per country (Table 3), to rank the sample of countries (Table 4), over the sample period, based on the six governance dimensions is performed on developing and developed countries separately. The range of the WGI indices spans from -2.5 which corresponds to low governance, to +2.5 which corresponds to high governance. The average WGI score is performed as follows:

$$WGI_j = \sum_{i=1}^6 \frac{\{\sum_{t=2010}^{2016} I_{ijt}/7\}}{6}$$

Where,

$WGI_j$  = Average WGI score of the country (j)

$I_{ijt}$  = Index of the governance indicator (i) for the country (j) at the time (t)

Due to the small sample size which violates the assumption of normality of the population, we will perform a calculation of the Spearman correlation coefficient (Table 6). The Spearman correlation gives a negative however insignificant reading to the cultural distance, which maintains some statistical positivity about the hypothesized direction of the results. However, the Spearman coefficient of institutional quality, which is statistically highly significant suggests the opposite relationship than what has been hypothesised. At this point, it could be concluded that individually analysing the effects of cultural distance, or institutional quality, on the observed measure of bilateral correlation, would tend to be more statistically robust towards the directionality of institutions, rather than towards culture – between each variable and the observed bilateral coefficient of correlation. However, this analysis still does not consider the effects of both variables on the observed bilateral coefficient of correlation simultaneously.

Which is why, furthermore, a pooled OLS regression (Table 7), that combines both effects of culture and institutions, on the bilateral coefficient of correlation is performed. This combination would make more statistical sense, given that studying the effects of the independent variables in isolation for the purposes of understanding their directionality, would not be inferring much information on their combined effects, for the purposes of understanding their mutual causality on an independent variable.

The results of the regression confirm to the statistically representative directionalities which are observed from the Spearman correlations with respects to cultural distance but not to institutional quality. Cultural distance is exhibiting a negative coefficient with a highly significant p-value at the 0.5% confidence interval. Institutional quality is statistically insignificant from zero which suggests little to no linear effect. Although the specification is missing on a lot of omitted variables still, it is evident that cultural distance has more explanatory power than institutional quality, on the observed bilateral correlation. The model has a satisfactory coefficient of determination and overall p-value.

Following from these additional tests, we can now generalise the findings of this regression to the whole population; which is that the observed bilateral correlations are mainly driven by cultural distance, rather than by institutional quality, in the same grouping of countries. This would thus partially give an answer to the first part of the research question; which called for a differentiation between the more dominant effect between both variables on portfolio diversification. At this point, it is important to note that, the results of the regression do not imply a positive or a negative relationship between each variable to the portfolio

diversification effect itself; however, those results imply the direction and importance of the effect between each variable on the observed bilateral correlation, which would itself help in distinguishing between the dominance of the two variables on the observed net effect of diversification as a residual control, and after controlling for all possible previously mentioned biases. The net diversification effect is thus the effect that is observed empirically after accounting for all previously mentioned statements, which is that cultural distance is the main driver for changes in the diversification effect when compared to institutional quality within the same grouping of countries. At this point, it should also be noted that this result does not necessarily have to mean that cultural distance is the main driver to the observed effect of the reported bilateral correlation. This is due to the omitted variable bias which is due to possibly leaving out important independent variables in the regression specification that was performed. However, for the purpose of this test, the results are conclusive to the superiority of cultural distance over institutional quality over the effects on the observed bilateral correlation; and thus, on the observed diversification effect through this channel. A major drawback to this regression analysis is the low number of observations as is represented by the sample size of countries; which is why, furthermore, a test that is based on the implications to the mean-variance framework is also performed.

### **Mean-variance implications**

Additionally, a test that is observed directly through the mean-variance analysis of portfolios is performed. Here we want to control for the effect of institutional quality in the sample that was originally ranked based on cultural distance. Within the mean-variance framework, we are thus interested to see the superiority of a strategy that is based on rankings to institutional quality, as compared to a strategy that is based on rankings to cultural distance, while maintaining a matched sample.

In order to control for this effect, within the mean-variance framework, we will now need to group the countries based on rankings to institutional qualities. Unfortunately, comparing to find such effects within the mean-variance framework is not perfectly feasible, due to difficulties in matching two sets of non-comparable portfolios; which are originally formed to be comparable per each set's grouping criteria. However, due to preliminary data screening, it has come to our attention that the same portfolio that represents the developed countries that are most culturally close to the Netherlands, is the same portfolio that represents the developed countries with the highest reported governance qualities.

From this fact itself, we can rule out the possibility of lower governance contributing to the effects that are observed in culturally close developed countries. However, this still leaves the possibility that the observed effects in the sample are still due to lower governance in culturally distant countries, or higher governance in the whole sample of developed countries. Alternatively, in order to generalise this finding to account for the average effect of institutional quality, across the whole sample of developed countries, that are ranked according to cultural distance, we will perform this following test:

*P3: Culturally distant*

*P2: Culturally close/ P6: More governed*

*P7: Less governed*

*Since P3 is comparable to P2 and P6,*

*and P2 and P6 are comparable to P7;*

*Therefore, it could be said that P3 is comparable to P7*

*(Derived from Table 4)*

Now, we have two controlled portfolios (Table 4) that would distinguish the effect between the observed bilateral correlation on the one hand, and the more prevalent effect of either culture versus institutions on the other hand. Since a rational investor would choose to invest in P3 when compared to P7. Therefore, it could now be said that cultural distance would bring more net diversification effects on average, through the bilateral correlation coefficient, as opposed to the counteracting effects of institutional governance; that could be observed through this same channel. This result, in this context, is not exactly inferring more over fewer diversification effects per each portfolio as opposed to the approach we conducted earlier. This is because the rankings of the groups of countries were performed to compare portfolios from within, and not from across these groups. However, by this matching to the sample, that enabled for such a comparability across the groups, the reward to volatility is now inferring the average importance of the contribution to diversification through the observed bilateral coefficient of correlation, that is observed based on each individual grouping of the countries, after accounting for the other previously mentioned effects.

Alternatively, this result could also be thought of as an investment strategy that is based on more cultural distance (while controlling for institutional quality within the grouping) would bring more diversification effects than an investment strategy that is based on closer institutional governance (while controlling for cultural distance within the grouping). This would thus mean that, the marginal diversification benefit of investing in a more culturally distant country is greater than that of investing in a more governed country; which is also now inferring the average importance of the contribution to diversification through the observed bilateral coefficient of correlation. However, this result only holds true for developed countries and not for developing countries. Unfortunately, this one-off test that is performed within the mean-variance analysis could not be reperformed to account for such changes in developing countries, due to the inability to match the sample again for inferring such controlled comparisons. Therefore, at this point, it is safe to generalise the mean-variance tests and the statistical analyses, which are conforming to one another, to hold true the whole population.

Therefore, at this point we can safely conclude that cultural distance - although individually still statistically significantly contributing to better overall portfolio diversification effects, through negatively affecting the observed bilateral coefficient of correlation - did not empirically contribute to overall better portfolio

diversification benefits, in the portfolios that were formed and ranked according to it; whether individually, or when grouped.

This would give an answer to the first part to research question of, which effect out of culture and institutions is more prevalent in the sample that is grouped based on culture, after controlling for the effect of institutions within this same group. Thus, leaving a corollary result that, even though being more prevalent in affecting the observed bilateral correlations than institutions, cultural distance does not seem to influence the net bilateral correlation coefficient, in a way that would imply it as being a proper beneficial strategy for marginal international equity diversification.

Furthermore, results indicate that a strategy of combining more than one culturally distant countries together, offers less beneficial portfolio diversification effects, than a strategy that would combine more than one culturally close countries together. This would give an answer to the second part to the research question, of an empirical observation to the aggregate portfolio diversification effect, of such a grouping of countries into one portfolio. This would also add to the previously attained result, which is that, in addition to not being diversifiers on their own, culturally distant countries are also not offering aggregate diversification effects when grouped together into one portfolio; further implying the invalidity of such a diversification strategy that is based on cultural distance. This effect could also be confidently said to hold true for developed and for developing countries, after doing a robustness check for the possible bias in the results due to the financial crisis, and after controlling for the effects of institutional quality within the observed sample that is grouped based on national culture.

However, at this point, the falsification sequence (the statement 4 identified earlier) could still apply to the measure of risk that could be used by an investor in reaching a measure for the diversification effect. This is why I will also display measures to the Treynor and the Sortino ratios;

The Treynor ratio is an alternative modification to the Sharpe ratio, however, it measures the portfolio return per unit of portfolio beta instead of portfolio variance (portfolio systematic risk instead of portfolio unsystematic risk). Portfolio beta is the weighted average of the individual security betas that form the portfolio. The betas of the individual securities measure their systematic risk which is defined as their sensitivity of returns to the returns of a benchmark (Cuthbertson and Nitzsche, 2004; Bodie, Kane, and Marcus; 2014). For this purpose, the betas are calculated against the benchmark index of MSCI All Country World Equity (MSCI ACWE) which incorporates an aggregate representation of developed and developing equity markets. The Treynor ratio is then calculated as follows:

$$\text{Treynor Ratio} = \frac{E(R_p) - r_f}{\beta_p}$$

Where,

$E(R_p)$  = Expected return of the portfolio

$r_f$  = Risk free rate of return;

And where,

$$\beta_p = \sum_{i=1}^n \omega_i \beta_i$$

Portfolio beta is the weighted average of the individual asset betas in the portfolio.

The Sortino ratio is another alternative modification to the Sharpe ratio which uses the lower partial standard deviation (or downside deviation) instead of the standard deviation of returns. The use of the standard deviation as a measure of risk when the return distribution is non-normal poses two issues: first, the asymmetry of the information suggests the separation of analysis between negative and positive outcomes separately. Second, the introduction of the risk-free asset as an alternative investment suggests the observation of deviations of returns from the risk-free rate of return, rather than from the sample mean; in other words, the returns below the risk-free rate of return are considered to be deviated and taken into account (Estrada, 2006; Bodie, Kane, and Marcus; 2014). The downside deviation is calculated as follows:

$$\sigma_d = \sqrt{\frac{1}{t} \sum_{t=1}^t \{\text{MIN}(R_p - r_f, 0)\}^2}$$

Where,

$\sigma_d$  = Lower partial standard deviation (downside deviation of returns from the risk-free rate benchmark)

$R_p$  = Return of portfolio (p)

$r_f$  = Risk-free rate of return

After computing the downside risk of each portfolio, the Sortino ratio is calculated as follows:

$$\text{Sortino Ratio} = \frac{E(R_p) - r_f}{\sigma_d}$$

Where,

$E(R_p)$  = Expected return of the portfolio

$r_f$  = Risk free rate of return

$\sigma_d$  = Risk of the portfolio as measured by the downside deviation of returns from the risk-free rate.

Results of the Treynor ratio suggest more portfolio diversification benefits when investing in culturally distant countries when compared to the alternative investment in culturally close countries. These results hold true in both developed and developing countries (Table 5). These results tend to move in line with the originally proposed hypothesis of more expected diversification benefits for culturally distant countries, as opposed to culturally close countries. The differences in results between the Sharpe and the Treynor ratios lie in the differences between portfolio variance and portfolio beta; portfolios of culturally distant countries in general exhibit more portfolio variance than their alternative counterpart portfolios of culturally close countries, which is therefore exhibited in lower economic diversification benefits as is represented by the Sharpe ratio. On the other hand, portfolios of culturally distant countries in general exhibit less portfolio beta than their alternative counterpart portfolios of culturally close countries, which is therefore exhibited in higher economic diversification benefits as is represented by the Treynor ratio. Portfolio variance (unsystematic or specific risk) is determined by the covariances of the individual asset returns in the portfolio with one another, while portfolio beta (systematic or market risk) is determined by the covariances of the individual asset returns with a benchmark market return (MSCI ACWE index returns in this case). These results would thus imply that a consideration of only unsystematic risk (portfolio variance) would give a consistent result for a better diversification strategy of investing in culturally distant rather than culturally close countries, as is exhibited in the Sharpe ratios to the portfolios; furthermore, these results would also imply that a consideration of only systematic risk (portfolio beta) would give a consistent result for a better diversification strategy of investing in culturally close rather than culturally distant countries, as is exhibited in the Treynor ratios of the portfolios. Finally, results of the Sortino ratio are not consistent throughout the pairs of portfolios; the results of the lower partial standard deviation are therefore not inferring consistent information on the portfolio diversification effects, however, results are presented in the appendix.

## ***5. Discussion and Conclusion***

This paper aims at empirically exploring the viability of an investment strategy that is based on cultural distance when forming portfolios of equity securities. The previous section has highlighted the robust results of the research, where the originally formed portfolios have been reperformed and analysed, throughout a series of tests; to account for a series of falsification statements to the initial observed result. Results have indicated that a strategy of combining culturally distant countries in aggregate, would offer less economic diversification benefits when compared to an alternative strategy of combining culturally close countries. This result also holds true for a strategy of marginally adding one culturally distant country, where it offers lesser economic diversification benefits than a strategy of marginally adding one culturally close country. These results only hold true for investors who perceive portfolio risk as being represented by portfolio standard deviation, as is calculated through the Sharpe ratio. These results are also robust after taking into account the effect of institutional quality, within the same sample that is based on cultural distance; which concluded that this observed effect is resulting from cultural distance rather than from institutional quality. Moreover, other

risk measures to the formed portfolios were calculated to derive alternative diversification measures which might influence the investment decision between the portfolios; which implies the fundamental importance of the measure of risk when reaching an investment decision.

Limitations of this research could be divided into two categories; limitations that are based on the mean-variance framework, and limitations that are based on the performed statistical measurements and tests. Limitations arising directly from the mean-variance tests have been controlled for by the first robustness test which has divided the sample into two subperiods. However, the mean-variance framework could still be said to be biased. This is due to the presence of measurement errors still within the subsamples; although the portfolio reperformance method that has been employed reduces the measurement error, a more conclusive method, and a research recommendation, therefore, would be to simulate and resample the portfolios, as has been proposed by (Jorion, 1992). Limitations based on the statistical measurements lie in the low sample size (30 countries) and thus in the low observations to the correlation and regression statistics; a recommendation, therefore, would thus be to increase the sample size to form more statistically conclusive results. Furthermore, implications of the regression result that was performed call for the search for omitted variables that might be more significant than cultural distance, and that could thus be more dominant in affecting the reported bilateral coefficient of correlation than cultural distance. If a point comes of identifying variables that are more dominant than cultural distance, then such variables could be then said to be offering more diversification benefits to a portfolio if an investment strategy exploits this opportunity. This would thus imply that a search for a proper portfolio diversification strategy begins with the search for independent variables that statistically significantly affect the reported measure of bilateral correlation. However, this statement would still need to be verified through applying the mean-variance analysis, in order to reach a solid conclusion to economic diversification effects.

Limitations based on measurement errors lie in errors to the two methods which were used to quantify national culture and institutional quality. The Kogut and Singh index for cultural distance is calculated based upon equal weighting of importance to the original four dimensions by Hofstede (1980), further recommendations and improvements to this measure include weighting the importance of each dimension on equity investment according to its importance; and also improvements to the measure could be achieved by including the six dimensions instead of the original four. Furthermore, the Kogut and Singh index has been criticised by the likes of (Shenkar, 2001) as being symmetrical from country A to country B, while this does not necessarily hold true in reality in reverse from country B to country A. Furthermore, the measure is based on Hofstede's cultural dimensions which are taken at one point in time and would thus suggest constant and non-dynamic cultural differences through time (de Jong, 2009). Recommendations for improving this measurement thus move in line with the propositions in the theoretical framework for a modified measure of cultural distance by (Shenkar, 2001). Limitations based on measurement errors in the calculation of the average WGI are also on the same note as the previous limitations to the Kogut and Singh index; the results

are based on the WGI that are obtained by Kaufmann, which are - although representing a more dynamic measure for the time period under investigation, through being reported as an average over this time period - also represented by an average weighting to the WGI, while alternatively it could also be weighted by importance of each dimension on equity investment, which could thus affect the obtained results.

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## 7. Appendix

<i>Sample of Indices</i>	
<b>Home 1</b>	Amsterdam large capitalisation (ASX)
<b>Home 2</b>	Amsterdam medium capitalisation (AMX)
<b>Home 3</b>	Amsterdam small capitalisation (ASCX)
<b>World</b>	MSCI All Country World Index
<i>Developed country sample</i>	<i>Stock Exchange (Market Index)</i>
<b>Australia</b>	Australian securities exchange (S&P/ASX 20 index)
<b>Canada</b>	Toronto stock exchange (S&P/TSX 60 index)
<b>Finland</b>	Helsinki stock exchange (OMX index)
<b>France</b>	Euronext Paris (CAC 40 index)
<b>Germany</b>	Frankfurt stock exchange (DAX index)
<b>Hong-Kong</b>	Hong Kong stock exchange (Hang Seng index)
<b>Ireland</b>	Irish stock exchange (ISEQ 20 index)
<b>Israel</b>	Tel Aviv stock exchange (TA-35 index)
<b>Italy</b>	Borsa Italiana (FTSE MIB index)

<b>Japan</b>	Tokyo stock exchange (Nikkei index)
<b>New Zealand</b>	New Zealand stock exchange (NZX 50 index)
<b>Spain</b>	Bolsa de Madrid (IBEX 35 index)
<b>Taiwan</b>	Taiwan stock exchange (TAIEX index)
<b>UK</b>	London stock exchange (FTSE 100)
<b>USA</b>	New York stock exchange, NASDAQ (S&P 500)
<i>Developing country sample</i>	<i>Stock Exchange (Market Index)</i>
<b>Argentina</b>	Buenos Aires stock exchange (MERVAL index)
<b>Brazil</b>	B3 stock exchange (IBOVESPA index)
<b>Bulgaria</b>	Bulgarian stock exchange (BG40 index)
<b>China</b>	Shanghai stock exchange (SHCOMP index)
<b>Hungary</b>	Budapest stock exchange (BUX index)
<b>India</b>	Bombay stock exchange (S&P BSE SENSEX index)
<b>Indonesia</b>	Indonesia stock exchange (LQ45 index)
<b>Morocco</b>	Casablanca stock exchange (MASI index)
<b>Malaysia</b>	Bursa Malaysia (FBM KLCI index)
<b>Mexico</b>	Mexican stock exchange (MEXBOL index)
<b>Romania</b>	Bucharest stock exchange (BET index)
<b>Russia</b>	Moscow stock exchange (RTS index)
<b>Saudi Arabia</b>	Saudi stock exchange (Tadawul index)
<b>South Africa</b>	Johannesburg stock exchange (FTSE JSE top 40 index)
<b>Thailand</b>	Stock exchange of Thailand (SET50 index)

(Table 1: Country sample)

<b>Cultural Distance</b>	<b>Country (developed)</b>	<b>Country (developing)</b>
3.472	<b>Japan</b>	
3.002		<b>Saudi Arabia</b>
2.956		<b>China</b>
2.858		<b>Malaysia</b>
2.808		<b>Mexico</b>
2.430		<b>Hungary</b>
2.370		<b>Indonesia</b>
2.267		<b>Romania</b>
2.171	<b>Hong Kong</b>	
2.050		<b>Russia</b>
1.913	<b>Taiwan</b>	
1.653		<b>Bulgaria</b>

1.610		<b>Thailand</b>
1.548		<b>India</b>
1.497		<b>Brazil</b>
1.429	<b>Italy</b>	
1.388		<b>Argentina</b>
1.361		<b>Morocco</b>
1.320	<b>Ireland</b>	
1.201	<b>Great Britain</b>	
1.190	<b>Germany</b>	
1.090		<b>South Africa</b>
1.031	<b>Israel</b>	
0.989	<b>United States</b>	
0.954	<b>Spain</b>	
0.933	<b>Australia</b>	
0.877	<b>France</b>	
0.865	<b>New Zealand</b>	
0.592	<b>Canada</b>	
0.172	<b>Finland</b>	
<b>Culturally Close</b>		
<b>Culturally Distant</b>		

(Table 2: Kogut-Singh Cultural Distance measure)

<b>Average WGI</b>	<b>Country (developed)</b>	<b>Country (developing)</b>
1.7519	<b>Finland</b>	
1.7515	<b>New Zealand</b>	
1.5668	<b>Canada</b>	
1.5184	<b>Australia</b>	
1.4318	<b>Germany</b>	
1.4208	<b>Hong Kong</b>	
1.3912	<b>Ireland</b>	
1.3593	<b>United Kingdom</b>	
1.2583	<b>Japan</b>	
1.1949	<b>United States</b>	
1.1048	<b>France</b>	
0.9799	<b>Taiwan</b>	
0.7979	<b>Spain</b>	
0.6458	<b>Israel</b>	
0.5755		<b>Hungary</b>
0.4633	<b>Italy</b>	
0.3720		<b>Malaysia</b>
0.1976		<b>South Africa</b>
0.1517		<b>Bulgaria</b>
0.1467		<b>Romania</b>

-0.0282		<b>Brazil</b>
-0.2002		<b>Mexico</b>
-0.2395		<b>Saudi Arabia</b>
-0.2572		<b>Morocco</b>
-0.2829		<b>Thailand</b>
-0.2830		<b>Argentina</b>
-0.3007		<b>India</b>
-0.3341		<b>Indonesia</b>
-0.4370		<b>China</b>
-0.6903		<b>Russia</b>
<b>Less Governed</b>		
<b>More Governed</b>		

(Table 3: Average Worldwide Governance Indicators measure)

Portfolios	Time Period	Asset 1	Asset 2	Asset 3	Asset 4	Asset 5	Asset 6	Sharpe Ratio
<b>P1 Home</b>	<b>2010-2017</b>	AEX	AMX	ASCX	-	-	-	0.74
<b>P2 Developed, Culturally Close</b>	<b>2010-2017</b>	AEX	AMX	ASCX	Canada	New Zealand	Finland	0.92
<b>P3 Developed, Culturally Distant</b>	<b>2010-2017</b>	AEX	AMX	ASCX	Japan	Hong Kong	Taiwan	0.85
<b>P4 Developing, Culturally Close</b>	<b>2010-2017</b>	AEX	AMX	ASCX	South Africa	Morocco	Argentina	1.03
<b>P5 Developing, Culturally Distant</b>	<b>2010-2017</b>	AEX	AMX	ASCX	Malaysia	China	Saudi Arabia	0.75
<b>P2.r Developed, Culturally Close</b>	<b>2014-2017</b>	AEX	AMX	ASCX	Canada	New Zealand	Finland	1.32
<b>P3.r Developed, Culturally Distant</b>	<b>2014-2017</b>	AEX	AMX	ASCX	Japan	Hong Kong	Taiwan	1.20
<b>P4.r Developing, Culturally Close</b>	<b>2014-2017</b>	AEX	AMX	ASCX	South Africa	Morocco	Argentina	1.88
<b>P5.r Developing, Culturally Distant</b>	<b>2014-2017</b>	AEX	AMX	ASCX	Malaysia	China	Saudi Arabia	1.83
<b>P2.1 Developed, Culturally Close</b>	<b>2010-2017</b>	AEX	AMX	ASCX	Canada	-	-	0.82
<b>P2.2 Developed, Culturally Close</b>	<b>2010-2017</b>	AEX	AMX	ASCX	New Zealand	-	-	0.74

<b>P2.3</b> Developed, Culturally Close	2010-2017	AEX	AMX	ASCX	Finland	-	-	0.90
<b>P3.1</b> Developed, Culturally Distant	2010-2017	AEX	AMX	ASCX	Japan	-	-	0.78
<b>P3.2</b> Developed, Culturally Distant	2010-2017	AEX	AMX	ASCX	Hong Kong	-	-	0.74
<b>P3.3</b> Developed, Culturally Distant	2010-2017	AEX	AMX	ASCX	Taiwan	-	-	0.84
<b>P4.1</b> Developing, Culturally Close	2010-2017	AEX	AMX	ASCX	South Africa	-	-	1.00
<b>P4.2</b> Developing, Culturally Close	2010-2017	AEX	AMX	ASCX	Morocco	-	-	0.75
<b>P4.3</b> Developing, Culturally Close	2010-2017	AEX	AMX	ASCX	Argentina	-	-	0.89
<b>P5.1</b> Developing, Culturally Distant	2010-2017	AEX	AMX	ASCX	Malaysia	-	-	0.74
<b>P5.2</b> Developing, Culturally Distant	2010-2017	AEX	AMX	ASCX	China	-	-	0.74
<b>P5.3</b> Developing, Culturally Distant	2010-2017	AEX	AMX	ASCX	Saudi Arabia	-	-	0.75
<b>P6</b> Developed, Governed	2010-2017	AEX	AMX	ASCX	Canada	New Zealand	Finland	0.92
<b>P7</b> Developed, Less governed	2010-2017	AEX	AMX	ASCX	Spain	Italy	Israel	0.74

(Table 4: Portfolios formed)

Portfolios	Sharpe Ratio	Treynor Ratio	Sortino Ratio
<b>P1</b> Home	0.74	0.69	0.15
<b>P2</b> Developed, Culturally Close	0.92	0.37	0.19
<b>P3</b> Developed, Culturally Distant	0.85	0.49	0.12
<b>P4</b> Developing, Culturally Close	1.03	0.28	0.27
<b>P5</b> Developing, Culturally Distant	0.75	1.39	2.84

(Table 5: Alternative risk measures)

**Spearman correlation between the measure of cultural distance and the measure for the bilateral correlation:**

-0.2912

**P value:**

0.226

**Spearman correlation between the measure of institutional quality and the measure of bilateral correlation:**

-0.4456

**P value:**

0.002

(Table 6: Spearman Correlation)

SUMMARY OUTPUT

*Regression Statistics*

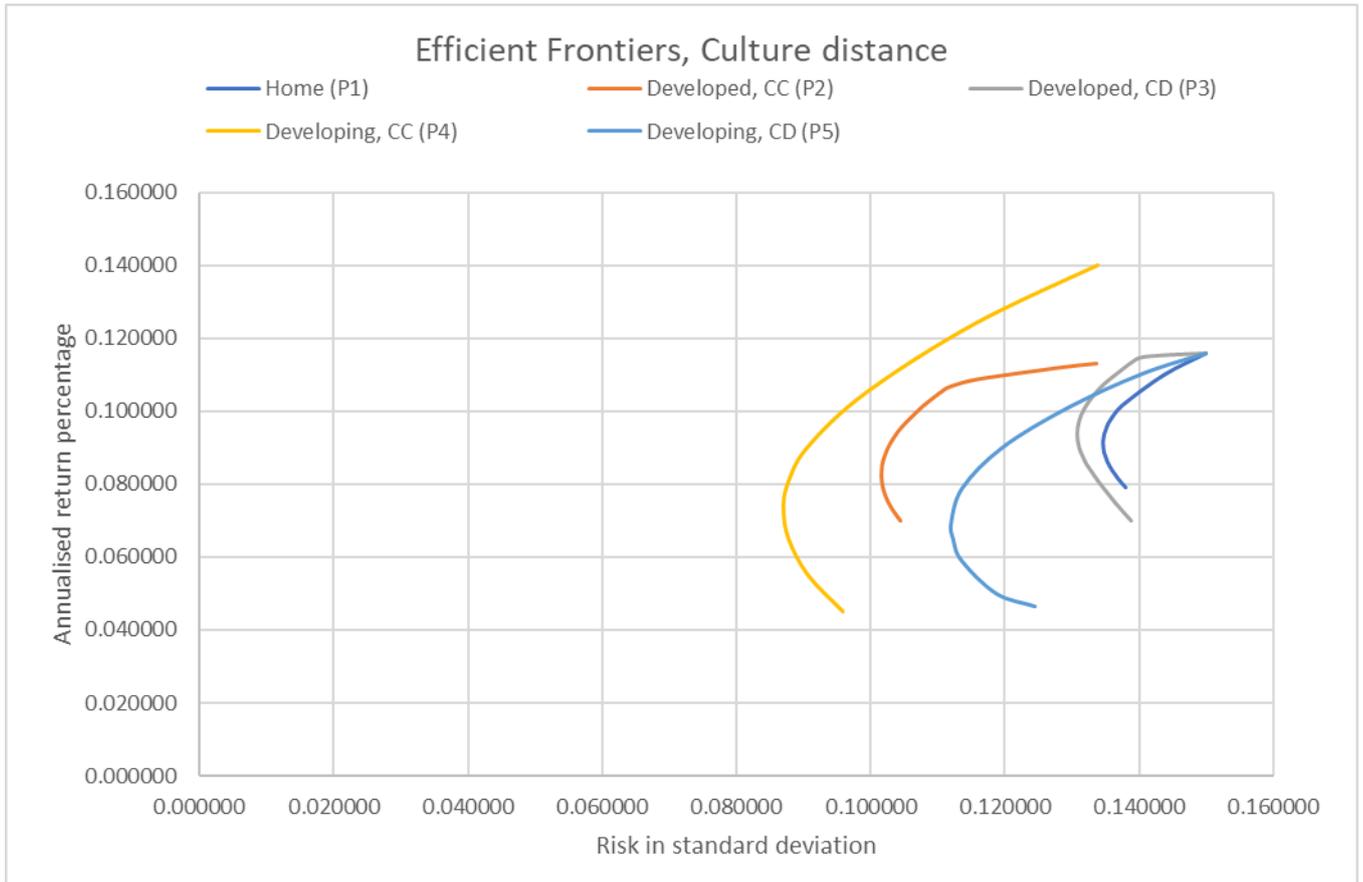
Multiple R	0.79628658
R Square	0.63407231
Adjusted R Square	0.55275505
Standard Error	0.0744423
Observations	12

ANOVA

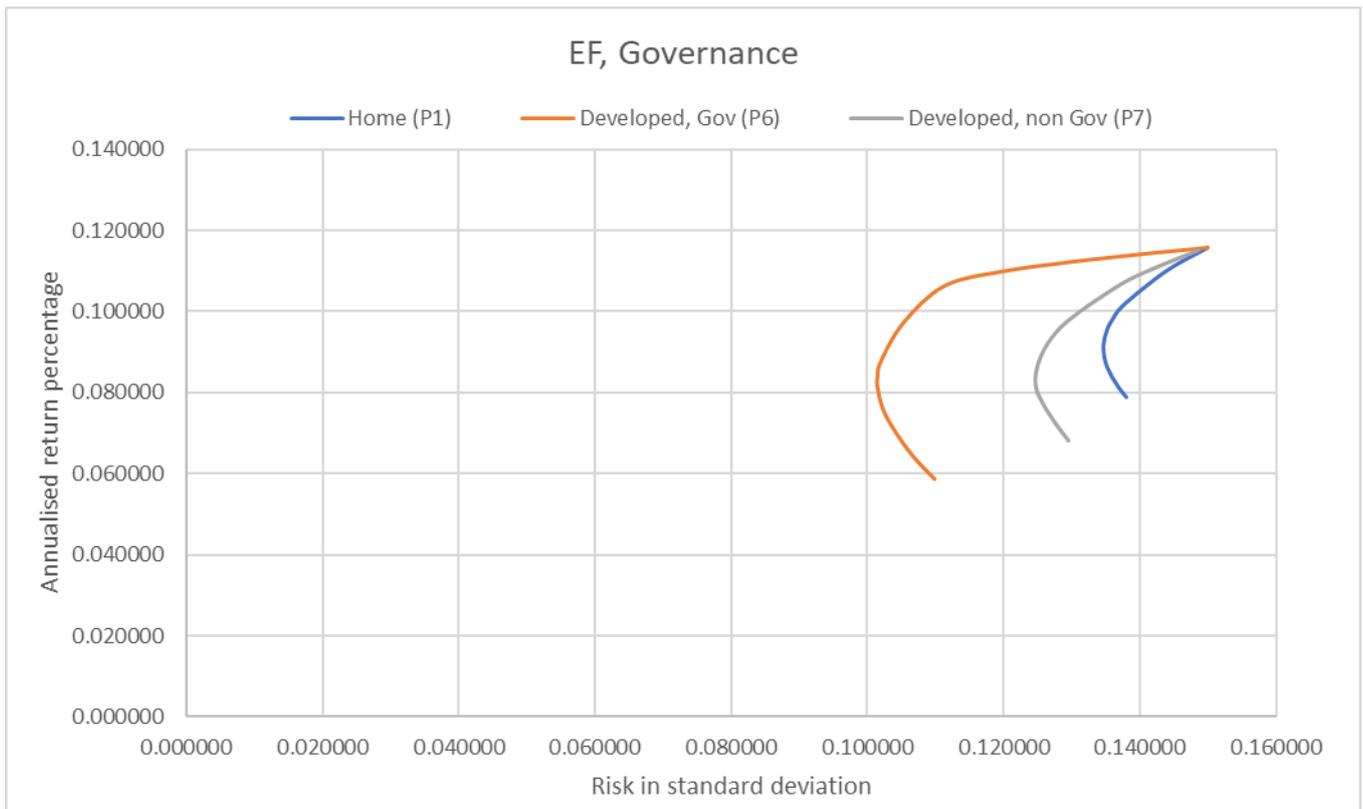
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	2	0.08642225	0.04321113	7.797511729	0.01084623
Residual	9	0.0498749	0.00554166		
Total	11	0.13629715			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	0.42438313	0.04883127	8.69080725	1.13543E-05	0.31391913	0.53484713	0.31391913	0.53484713
CD	0.10769967	0.02823816	3.81397671	0.004127866	-0.17157882	0.04382052	0.17157882	0.04382052
WGI	0.01350145	0.02280941	0.59192482	0.568470306	-0.03809701	0.06509992	0.03809701	0.06509992

(Table 7: Regression output)



(Figure 1: Efficient Frontiers according to rankings of cultural distance)



(Figure 2: Efficient Frontiers according to rankings of institutional governance)