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Risk Attitudes and the Equity Premium Puzzle: empirical tests in a cross-country setting

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Abstract: This study utilises panel data, Equity Home Bias measurements and a two-stage estimation process incorporating one version of the international CAPM to extract comparable input data and test country-scores for risk preferences, risk aversion and time discounting as well as country scores on broader cultural dimensions, on country-estimates of the Equity Risk Premia. The risk attitude scores, which just recently have been made available, are such that they may proxy for irrational behaviours which have been theorized to explain the Equity Premium Puzzle, and enable a rigorous way to empirically test such an effect. Rieger and Wang (2012) and Rieger and Ngo (2013) study the same parameters through cross-sectional regressions with macroeconomic variables as controls and find widespread evidence that they have an effect on the size of the Equity Risk Premia. Through highly differentiated methods and assumptions this study only finds this relationship in a limited number of subsamples for four out of the five parameters studied, of which only one has an augmenting effect on Equity Risk Premia levels. Additionally, regressions with interaction-terms are used to test the stationary assumption of cross-country risk preferences and cultural dimensions, rejecting the hypothesis of them always being constant over time.

Keywords: Equity Premium Puzzle; Myopic Loss Aversion; Ambiguity Aversion; Cultural dimensions; Cultural stationarity

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1. Introduction and theoretical basis

An extensive field of research has emerged on the equity risk premium ever since Mehra and Prescott's paper (1985) on the historically unexplainable large excess return of equities over the risk-free alternative, coining the concept of the Equity Premium Puzzle. One suggested explanation has referred to the fact that the sample examined by Mehra and Prescott, the U.S. stock market return 1889-1978, was extraordinary successful and that any available data on it is skewed with survivorship bias (Mehra, 2008). Indeed, examinations such as Dimson et al.'s (2006a-b) of a weighted world index of the historic Equity Risk Premium (ERP) arrive at a slightly lower premium. Nevertheless, they also show that the U.S. is not unique. The measured premium has been shown to be as high in many other countries in the world.

This study will empirically investigate theories stemming from behavioural finance that "irrational" behavioural traits, disjoint from the standard risk aversion coefficient of the individual investor, as well as cultural variables, potentially may explain the size of the ERP. This will be carried out through the use of cross-country scores on such parameters and a variant of the international Capital Asset Pricing Model (international CAPM). Indeed, one of the main conclusions of Mehra and Prescott's paper was that any reasonable relative risk aversion coefficient, such as derived from a standard consumption-based expected utility framework, is unable to explain the size of the historic ERP[1], leaving a puzzling wedge. The suggestion that there are "irrational" risk behaviours in the domain of investing, or other types of risk attitudes, that could account for this wedge has been thoroughly theorized (e.g. Gai and Vause, 2006; Cochrane, 2011; Damodaran, 2014). A theory that has gained widespread recognition is that of Benartzi and Thaler (1995) which, building on prospect theory, proposes the concept of Myopic Loss Aversion (MLA). A more recent explanation stemming from publications such as Chen and Epstein's (2002), Barillas et al.'s (2009), and Gollier's (2011), among other, is the Knightian concept of Ambiguity Aversion. Aside to these theories cultural variables, such as a selected number of those defined by Hofstede (1980; 2001) have moved from previous main academic use in management and economics, to also be studied in finance and in relation to investing behaviours (Forbes, 2009).

The ability to empirically test many of the theories on behavioural traits, or "irrationality", has previously been limited by a lack of data on the most relevant variables. Through the International Study of Risk Attitudes (INTRA) this gap is filled. Conducted by Rieger, Wang and Hens, with the first results published in 2011 (Rieger et al.) its currently published results

[1] Calibrating through a modified version of Lucas's (1978) model they found that relative risk aversion coefficients (ɣ) as high as 48 were warranted to explain the average historic ERP in their sample. At the same time 2 is a most plausible ɣ, and other empirical studies have estimated 10 to be its absolute ceiling (Mehra and Prescott, 1985; Mehra, 1998; Kandel and Stambaugh, 1991).

incorporates 6,912 respondents from 53 countries. Through a set of experimental questions the surveyors are able to assign country scores on parameters for e.g. risk preferences, risk aversion and time discounting, consequently also providing evidence of their cross-country variation. Their findings, complemented with empirical evidence on cross-country variation in historic ERP rates (e.g. Dimson et al., 2006a-b), provide a data intersection that may be used to empirically test causality of risk attitudes on the ERP. Rieger and Wang (2012) find a significant effect of the INTRA proxy for Ambiguity Aversion on the ERP through cross-sectional regressions of country scores on their mean ERPs (calculated on data retrieved from previous studies) for the countries surveyed in INTRA. Rieger and Ngo (2013) use extensive firm-level data from the last decade and find a significant influence of INTRA MLA proxies, along with effects of three out of Hofstede's cultural dimensions also tested in the same setting, on the ERP through cross-sectional regressions on countries' estimated average ERPs. Rieger et al. (2013) test for effect of time discounting parameters for a selection of countries in INTRA on their ERPs.

This paper has however four main contributions. Firstly, it collects panel input data on the ERP which is perfectly comparable between the countries. Secondly, it applies one variant of the international CAPM to control for other sources of cross-country variation in ERPs. Thirdly, it limits the study sample to observations where any causality can be reasonably testable, in a first stage defined as those time periods in each country where a degree of Equity Home Bias (EHB, Equity Home Bias; defined in Section 4.2.) above 0.5 is consistently observable. Fourthly, it aims, when possible, to test the assumption of cultural stationarity over time, stemming from Hofstede's theories on culture (1980; 2001). Cultural variation could be suggested as one main source also for cross-country variation in risk attitudes, therefore, likewise testing variation over time in the latter as well as culture itself could be argued as tests of Hofstede's assumption on stationarity of culture.

The paper is organised into 7 sections. Section 2 constitute a review of previous related research and studies and a specification of theoretical background and bases to this study. In Section 3 the two behavioural, Ambiguity Aversion and MLA, and three cultural, Individualism, Masculinity and Uncertainty Avoidance, variables that will be tested for effect on the ERPs are described along with expectations on the nature of their effects. In Section 4 the input data is described and a version of the international CAPM that will be used is defined. The methods applied for the main tests of the study is then outlined. In short, these are carried out through extracting the Jensen's alphas (significant or not) for each country in the sample from international CAPM-regressions and then cross-sectionally regress the country sets of behavioural and cultural scores separately on these. Regressions are carried out using both the full sample and sub country groups and time samples. Additionally, regressions with interaction-terms are run to test, when

possible, the stationary assumption of culture. In Section 5 the results of these regressions are presented. Section 6 discusses the results. In summary, the regressions show that the INTRA-proxies for Ambiguity Aversion have a significant effect on the size of the ERP, and to varying degrees and limited to certain sub samples, so do also all of the studied cultural dimensions. The effect of Ambiguity Aversion on the size of the ERP is augmenting, while the cultural dimension on the other hand decrease it. Contrary to findings in previous studies, no effect of Myopic Loss Aversion on the ERP is found in any group or time sample, although one of the two variables used to proxy for MLA is significant in certain subsamples. The results of the regressions using interaction-terms are equivocal, with evidence the hypothesis of cultural stationarity sometimes can be rejected w.r.t. to at least some variables. Section 7 concludes and offers some suggestions for further studies in the area.

2. Related research

As shown in Dimson et al. (2006a-b) there is large dispersion in the ERP between countries. This may be confirmed not only by historic and current estimates, applying a variety of calculative techniques, but also by cross-country surveys of the required rate of return among investors and practitioners (e.g. Fernandez, 2014). The variation in ERP between countries has several implications. It may be used as an additional basis to study and explain the size of the ERP. It also holds significant importance in relation to any benefits of international portfolio diversification, such as the CAPM would suggest (Leavy and Sarnat 1970; Solnik and McLeavey, 2009). From a corporate finance perspective, it matters in terms of determining the appropriate rate to discount Free Cash Flows, where standard textbook literature suggests an added country risk premium for projects undertaken in emerging markets or certain geographical areas (Goedhart et al., 2010). In a survey of European valuation experts (Bancel and Mittoo, 2014), approximately 40% reported that they adjust discounts rates in Free Cash Flow models to account for country-specific risk. A last notion relates to the matter of stationarity tests of cross-country scores and cultural dimensions. If cross-country differences in attitudes or culture affect ERPs, knowledge on stationarity of such parameters or their effect are of great importance in determining any limits to global convergence of risk premiums.

A vast number of studies have examined the ERP through a multi-component approach, to study its size and variation, but also with the aim to find variables which may be used to predict future returns. A widely used approach is to break down the ERP in terms of dividend yield, earnings growth and multiple expansions. Campbell and Shiller (1988a-b) and Cochrane (1997) develop models in which current dividend yields and lagged extrapolated averages, or forecasts, for earnings growth jointly may predict future returns. While widely applied, its out-of-sample

usefulness has been criticised (e.g. Goyal and Welch, 2008). Another part of the literature on the ERP use the one-factor model of CAPM as basis, and then extends it to a multi-factor one including the effect of firm characteristics (Fama and French, 1992) and momentum (Carhart, 1997). Additionally, and gaining in popularity, a field of research explain the ERP in terms of macroeconomic variables (Damodaran, 2014), also occasionally from this perspective with the aim to infer predictability. As elaborated by e.g. Gai and Vause (2006) and Damodaran (2014) many of the most commonly studied macroeconomic variables are often used as instruments to infer development of risk aversion of the investors in the population. For example, Bakshi and Chen (1994) and Liu and Siegel (2011) hypothesize that average age, through life-cycle risk aversion and life-cycle investment hypotheses, impact the size of the ERP, and find a significant relationship studying historic ERP rates and demography in the U.S.. Ang and Maddaloni (2003) confirm these results in a cross-country setting. The standard deviation of GDP, political risk, income distribution, information quality and reliability and predictability of the governmental and legal systems are other factors which have been evidenced to influence the size of the ERP. Furthermore, the circle may be closed with the fact that a body of the literature has focused on behavioural traits of the individual investor, innate to human, or contingent on or partially affected by cultural environment (Illmanen, 2011; Damodaran, 2014; La Porta et al. 1998, 2000; Hens and Bachmann, 2011). Connected to research theoretically deriving the ERP in terms of a utility function, such as applied by Mehra and Prescott (1985), these behavioural "irrational" traits, of which two suggested are Ambiguity Aversion and MLA, are suggested complements to the standard, universal, relative risk aversion coefficient, theorised to *add* an additional layer of risk attitudes augmenting the size of historic ERP levels and thereby offer least a partial explanation to the Equity Premium Puzzle. The notion that cultural variables per se may affect investing behaviours, and thereby more or less indirectly the size of the ERP, has been brought up in literature but the topic is less widespread and researched, with minimal published theorization whether any effect on the size of the ERP for each cultural dimension would be positive or negative.

Empirical tests of the theories on behavioural traits have however previously been limited due to lack of any extensive dataset of proxies for the relevant variables. A subset of studies, working with prospect theory as basis and drawing on findings of cultural clusters across the world (Gupta et al. 2002; Hofstede 2001) has focused on mapping variations in risk-aversion, loss aversion and patience between cultural regions. A prime finding has been observed differences in risk attitudes between Asian and non-Asian countries. Bontempo et al. (1997), using a monetary lottery setting, show that Asians are less loss averse than Europeans and Americans. Fan and Xiao

(2005) confirm their result by showing that Chinese inhabitants are more risk-tolerant and less loss-averse than European and American when facing financial risk. Weber and Hsee (1998) propose an explanation for this in the form of a "cushion hypothesis", in which they argue that in a collectivist society like China, more support from family and friends can be expected in case of financial troubles, which results in lower risk and loss aversion. Bachmann and Hens (2011) map patience between Asia and non-Asia, with evidence that the former is less patient.

The aforementioned mapping has however not been sufficient for comprehensive empirical studies in terms of number of countries examined and lacked data on some very relevant proxies for studies on the irrational behaviours theorized to affect the ERP. This has now changed at least w.r.t. Ambiguity Aversion and MLA with the publication of the INTRA survey data. The survey updates data availability compared to previous among other due to the large survey sample from over 50 countries, but also and crucial for any empirical tests of MLA by providing comprehensive scores on time discounting behaviours previously unavailable.

Rieger and Wang (2012) perform regressions of the INTRA proxy for Ambiguity Aversion on the mean ERP rates of the 53 countries in the survey sample, simultaneously using up to eight selected macroeconomic variables, as well as cultural variables, as controls, and show that Ambiguity Aversion has a positive significant impact on the cross-country variation of ERPs.

Rieger and Ngo (2013) use firm-level data from the 43 countries for which there are, at the time of publication of their paper, reviewed parameters for neutral loss aversion and time discounting available from the INTRA survey. Applying cross-sectional regressions on the mean ERPs derived for each country using an IRR approach on firm-level data for each country, and including several control variables both on firm-level and macroeconomic levels, they show that the two variables jointly proxying for MLA are significant at the 5% level, augmenting the size of the ERP.

A second cohort of studies has studied Hofstede's traditional cultural dimensions in relation to financial decision making or country equity market movements and characteristics as far as any connection can be made. In particular, Individualism, in the context often elaborated as a proxy for self-attribution bias and overconfidence, has been proposed to have major implications on risk attitudes, and consequently on investor behaviour. Chui et al. (2010) show that country scores on Individualism serve to predict trading volumes as well as momentum profits and long-term reversal patterns. Following up, Chui et al. (2012) show that Individualism and Uncertainty Avoidance scores partly can explain the value premium on equity markets. In their study of Ambiguity Aversion on the ERP, Rieger and Wang (2012) also regress Uncertainty Avoidance and find that it alone has a significant effect on the ERP, but when adding Ambiguity Aversion to the

regression only the latter has significance, which the authors attribute to a mediator effect between the two variables. In the same study as they also examine MLA, Rieger and Ngo (2013) regress scores for Individualism, Masculinity and Uncertainty Avoidance from Hofstede's 1988 version of the Values Survey Module (VSM) and find that they all have a significant explanatory effect, positive in the case of Individualism and negative in the cases of the other two dimensions, on the size of the ERP.

2.1. Calculating historic Equity Risk Premia

One usually refers to three main ways to estimate the historic ERP. The historic data difference of the relevant risk-free (commonly, a sovereign bill or bond rate depending on time horizon) from that of equity returns. An implied rate from the same components that commonly have been used to predict future ERP, such as the ERP implied by historic predictive parameters of which the most commonly used are a combination of dividend yields and dividend growth rates such as developed by Campbell and Shiller (1988a-b) and Cochrane (1997). Thirdly, various institutions, companies and academics regularly survey investors, practitioners and academics on their required rate of return or estimates of future rates (Damodaran, 2014).

This study applies the first of the mentioned methods, inferring the historic risk premia by simple subtraction of historic comparable country indexes to the risk-free alternative.

Mehra and Prescott (1985), and other (e.g. Siegel, 1992; 2005), report an approximate 6% arithmetic average in the USA for the past century. Arguments that questions the generalization of these estimates are that the historic equity market data from the U.S. suffers from survivorship bias, indexation of only those firms that remain on public indexes, and the simple fact that the U.S. has been remarkable successful over the period. Studies on post-1970 data arrive at lower rates and many academics theorize that future rates will stabilize around as low levels as 2% (Cochrane, 2011). Likewise Dimson et al.'s (2006a-b) estimate of long-term historic world-weighted rates show that the global ERP is lower than those measured for the U.S.

There are however limitations to measurements of historical equity risk premium in many non-U.S. markets. In many other developed countries which have time-series data, returns have been distorted by domination of a few major companies in terms of market cap and liquidity. In emerging markets, additional and major problems relate to the length and reliability of time-series. As Damodaran (2014) shows, standard errors of annual ERPs are often of such magnitude that, at the very least, 25 years of historic data often is a must to rigorously infer anything of value on most equity markets. Since volatility is comparably higher in many emerging markets, the combination with short time-series data availability makes many of these countries close to impossible to study in the field.

3. Behavioural and Cultural Variables

In this study five variables, two behavioural with a trackable presence in finance academia, and three out of Hofstede's five classical cultural dimensions, will be tested for empirical effect on the ERP. As previously indicated, the point of departure w.r.t. the behavioural traits is that they increase the ERP. For the cultural dimensions feasible signs of any significant coefficients will be hypothesised.

3.1. Ambiguity Aversion

Ambiguity Aversion is the concept of Knightean risk-taking (Knight, 1921), exemplified by the Ellsberg Paradox (Ellsberg, 1961), where individuals have been shown to prefer known to unknown risk. In a classic setting, a ball lot with a known number of Red balls and one with a known number, twice as many as the Red, of Yellow and Blue balls, but undisclosed information of the latter two's relative proportion is used to exemplify the behaviour. If a price is paid for picking one color, which then is drawn, most would choose Red. If you turn the price incentive around, such that you pick a color and win if that is not drawn, most would still choose Red. In terms of equity risk, it was firstly brought to attention theoretically by Chen and Epstein (2002), later developed by Barillas et al. (2009) and Gollier (2011), as a potential disjoint risk parameter to the standard risk aversion coefficient. Ambiguity Aversion makes investors unproportionally prefer known to unknown risk, which implies that investors' in countries with a higher score on the variable would require a higher ERP in return for bearing a certain standard deviation, implying a higher observable aggregated historic ERP. The point of departure is so that Ambiguity Aversion, if significant in effect, enlarges the ERP, and we expect it to carry a positive (+) sign.

3.2. Myopic Loss Aversion

Benartzi and Thaler (1995), building on the prospect theories of relative risk preferences in losses to gains, such as developed by Kahneman and Tversky (1977), and the concept of mental accounting in terms of the effect of frequency of monitoring, developed the concept of MLA. According to Kahneman and Tversky an individual, in a utility framework and in reference to the neutral option, derives more disutility in giving something up than utility in acquiring it. Following up, Kahneman and Tversky empirically measure the ratio of disutility in losses to utility in gains to approximately 2 (Kahneman et al. 1990; Kahneman and Tversky, 1991).

A simple illustration from Benartzi and Thaler (1995), which may serve to illustrate both loss aversion and time discounting behavior, represents the utility function as

$$U(x) = \begin{matrix} x & if & x \geq 0 \\ 2x & if & x \leq 0 \end{matrix} \qquad [1.1]$$

According to the equation the individual derives twice as much disutility from losing as utility of gaining the same amount, which is attributable to loss aversion. If an individual is offered to participate in a lottery in which there is a 50% chance to win 150, or otherwise lose 100, the offer would be turned down by someone who exhibit the outlined utility function. Samuelsson, who laid theoretical ground for later theories in the field (1963), furthermore hypothesized that under multiple repetition, for example an offer to do the lottery once a week, for a year, most would accept the bet. This is evidence of time framing behavior. In a setting of stock investing it may be translated to the fact that most investments are done for the very long term, such as for pension, where stocks over time should outperform the risk-free alternative. However, since stocks have larger standard deviations than the risk-free, the potential of loss in the short term is larger. When an investor is confronted with the choice of a stock to the risk-free i) there is a tendency to evaluate each opportunity once and separately ii) his utility function tells him to go for the risk-free option. If a stock is monitored too often, even though the return horizon is long, he will consequently opt out of equities. This combined effect of time framing and loss aversion Benartzi and Thaler named Myopic Loss Aversion.

Equity is more risky than the risk-free. Therefore investors with a higher loss aversion will require a higher compensation to invest in equity, augmenting ERP. A significant coefficient for loss aversion is so expected to carry a positive (+) sign. The time framing "myopic behavior" is routinely estimated by a hyperbolic time discounting parameter (for calibration, see Section 4.4.1.), constructed in a way that the higher the score, the more frequent monitoring. Since more frequent monitoring leads to a lower ERP, any significant coefficients for the variable is expected it to be preceded by a negative (-) sign.

As previously substantiated, MLA is suggested as a risk treat that has a net effect of loss aversion and time framing that, just as theorised for Ambiguity Aversions, augments the size of the ERP separately from the standard relative risk aversion coefficient, and therefore could offer some solution to the Equity Premium Puzzle.

3.3. Hofstede's cultural dimensions

Hofstede's cultural dimensions, with initial basis in surveys of IBM personnel in over 70 countries in the 1960s and 1970s, and later further developed (Hofstede, 1980; 2001; Hofstede et al., 2010), have become the norm of cultural classification and clustering, with widespread adaptation in management and economics academia. In the most cited version, Hofstede distinguishes five cultural dimensions: Uncertainty Avoidance, Individualism, Masculinity, Power Distance and Long-term Orientation. Later a sixth dimension, Indulgence, has been suggested. For example,

Hofstede map Uncertainty Avoidance scores by country and show that European countries exhibit a larger amount of uncertainty in decision making compared to most other regions. Another example is that Nordic countries are very feminine, with low scores on Masculinity, compared to most other regions in the world (Hofstede, 2015).

While the use of Hofstede's cultural framework, so far, mainly has flourished within the field of management and economics, its applicability has, accordingly with development in behavioural finance, spread to the finance discipline (Forbes, 2009; Bachmann and Hens, 2011). Most prominently, Individualism has been tested in relation to investor behaviours and market sentiments (e.g. Chui et. al, 2010; 2012), but also Uncertainty Avoidance and Masculinity have been mentioned in the context. Rieger and Wang (2012) regress Uncertainty Avoidance from Hofstede's VSM94, and find that it has a significant explanatory effect on the size of the ERP. Rieger and Ngo (2013) regress scores for Individualism, Masculinity, Uncertainty Avoidance and Power Distance from VSM08 in separate regressions from each other, but jointly together with the two INTRA parameters they use to proxy MLA, and find that they all have significant explanatory effect on the size of the ERP.

This study largely follows previous in terms of dimensions to be studied as Individualism, Masculinity and Uncertainty Avoidance will be regressed for any effect on the ERP.

It should be noted that Hofstede's dimensions have bipolar characteristics. The higher the score for Individualism, the more individualistic sentiment in the country. On the contrary, a country with a low score on Individualism, represents one with a collectivistic culture. For Masculinity (high score), the counterpole is feminine (low score). In dealing with the indexes in relation to effect on the ERP, one must therefore remain a cautiousness that the sign of any effect could shift along the scores on the index. Individualism has as mentioned in relation to finance been used as a proxy for self-attribution bias and overconfidence (Chui et al. 2010; 2012). An overconfident investor can reasonably be presumed less risk averse, and consequently less prone to require a high ERP. For high scores, or w.r.t to groups of countries, high average scores, of Individualism we therefore expect a negative (-) sign on a significant coefficient for the dimension when regressed on the ERP. Collectivistic societies tend to be tightly knitted and cohesive, with protected individuals. This rhymes with Weber and Hsee's (1988) "cushion hypothesis" according to which citizens are less risk averse since they are protected by social constructions. We therefore expect also countries with low scores to carry a negative (-) sign for significant Individualism coefficients.

For Masculinity, there is no clear-cut generally accepted framework in relation to investing. A thesis could however be that masculine behaviour may proxy for competitive behaviour and

excessive/aggressive trading, which should drive down the ERP through forces of demand and supply and less cautiousness. Feminine behaviour, on the contrary more modest and tender, should intuitively entail relatively high risk and loss aversion. We therefore hypothesise an expected negative (-) effect on ERPs for significant coefficients based on high (high average) scores in the Masculinity index and a positive (+) effect for coefficients based on low (low average) scores in the index. The reasoning is slightly sweeping, with no clear exact cut-off point where the shift in sign could occur. The average score in the VSM08 Masculinity index is however 50 (Hofstede, 2015), which would be the most reasonable rule of thumb.

A high score in the Uncertainty Avoidance dimension is concisely defined as an aversion for ambiguity and uncertainty. As such, countries with high scores tend to have societies threatened by unknown or unstructured situations, opt for stiff codes of behavior, guidelines and laws, as well as be intolerant of unorthodox behavior and ideas. On the contrary, low scores represent an acceptance and high tolerance of ambiguity and uncertainty. Such societies impose fewer regulations, nurtures a more free-flowing environment of pragmatism/pragmatic society and acceptance of differing thoughts and ideas. The bipolar trait is not as clear-cut for Uncertainty Avoidance as for the other of Hofstede's dimensions. One can easily imagine that high scores for Uncertainty Avoidance have an analogous effect on the ERP to that of Ambiguity Aversion, augmenting ERP. It is more unclear if low scores in the index should be interpreted as an embracement of ambiguity or rather are limited to an acceptance/high tolerance. In the end we resort to an expected positive (+) sign for coefficients based on high scores of Uncertainty Avoidance, and note that there is potential for a shift in the sign due to representation of increased comfort with ambiguity in the underlying data. It should be noted that the mean score for Uncertainty Avoidance in VSM08, and thereby the potential rule of thumb for a shift in sign, is considerably higher, 67, than for Masculinity (Hofstede, 2015).

Long-term Orientation as derived through the VSM08 (Hofstede et al., 2010) does not carry close enough resemblance to what would be an appropriate parameter in relation to investing behaviours, such as the concept of long-sightedness, and will therefore not be examined in this study. Instead the hyperbolic time discounting parameter from INTRA, proxying for time framing and further described below, is a more appropriate parameter in the domain. Power Distance relates to social relationships and is as such not intuitive to study in relation to investing, and is also left out. Indulgence relates to degree of ability to fulfil desires and feelings which often are associated with happiness and fulfilment, such as maintaining friendships and spending meaningful leisure time. Any connection to risk-taking or behaviours in investing feels very far-fetched.

3.4. Linkage: culture and cross-country variation in risk attitudes

Culture could be suggested, together with macroeconomic, societal and geographical variables, to be the prime constituent that account for the wedge between countries' scores on risk attitudes. For example, Gai and Vause (2006) model the ERP of a country in terms beta to the market, and risk aversion which depends on the standard risk aversion coefficient as well as a combination of other risk attitudes and preferences dependent on cultural and macroeconomic environment.

The authors of the INTRA survey also control for the income level in each country by adjusting the amounts in the lotteries accordingly (Rieger et al., 2015). Additionally, countries with very close geographical proximity, and with economies circling around the same industries, show differences in scores.

As a confirming fact there are also vast differences between cross-country scores on cultural variables.

With developments in behavioural finance and use of Hofstede's cultural framework in the context some patterns have emerged which may be linked to findings on risk attitudes. The "cushion hypothesis" proposed by Weber and Hsee (1988) to explain the low loss aversion in Asia fit with the identified low scores on Individualism in China likewise in Asian countries on average in VSM08 (Hofstede, 2015). Rieger and Ngo (2013) identify a strong relationship, or mediator effect, between Uncertainty Avoidance and Ambiguity Aversion. Ambiguity Aversion and Uncertainty Avoidance each alone affect ERP in regressions. However when adding both in the same regression the effect seems to diminish for the latter. The fact that Uncertainty Avoidance scores for Asian countries is slightly below those of non-Asian in VSM08 (Hofstede, 2015) does not match the mediating effect between Ambiguity Aversion and Uncertainty Avoidance, since Asian countries have slightly higher scores on the latter, although the differences are marginal. However, Ambiguity Aversion in INTRA was surveyed in the context of lotteries with monetary awards, and Bachmann and Hens (2011) outline that the low loss aversion in Asia is in the domain of investing, whereas in many other areas, such as disease avoidance, Asians instead tend to be more uncertainty avoiding, loss averse and ambiguity averse. Since the VSM08 does not incorporate monetary incentives per se, the results are not necessarily contradictory to a mediating effect. The complexity of the relationship between the two variables, elaborated in Section 3.3., must furthermore be taken into consideration.

While no comparable time discounting variable has been available previously, earlier investigations exhibit that Asian countries are less patient than non-Asian (Bachmann and Hens, 2011). This is not distinctly consistent with the results from INTRA that, on average, indicate a very small difference in hyperBeta between Asian and non-Asian countries (Rieger et al., 2013).

3.5. The cultural stability assumption

One paramount assumption on culture in academia is that of stability over time. Building on the theoretical basis of Hofstede, culture is assumed as a stationary, constant parameter which does not vary over time, which implies that scores derived from Hofstede's initial surveys in the 1960s and 1970s should be as valid today as then. Likewise, the same scores are most often used for all observations in a time sample for a country. For example, Rieger and Wang (2012) and Rieger and Ngo (2013) treat the same (only available) INTRA risk attitude scores retrieved from respondents after 2011 as applicable to hold for their full historic ERP time samples dating back as far as a century.

The validity to make such an assumption has been confirmed by studies such as that of Hoorn et al. (2015), who study two generational cohorts and find that while the absolute cultural scores from similar surveys indeed vary over time for countries, their relative scores compared to other countries' barely. Contrary to these findings, studies have showed tendencies for certain cultural scores to shift along with income levels. Koveos and Tang (2008) show that Individualism, Long-term Orientation, and Power Distance scores shift with GDP per capita and Bachmann and Hens (2011) exhibit that time preferences correlate with inflation and GDP per capita respectively. While the INTRA survey does control for varying income levels between the countries through adjusting monetary returns in the lottery questions accordingly, the VSM08 does not, and neither of the surveys control for inflation levels. In particular, when the scores then are treated as stationary over time, using scores measured today as valid for periods up to 50 years, not taking income and inflation shifts into account becomes a potentially even more distinguished problem.

As a part of this study, we consequently try to test the hypothesis of cultural stationarity. The results of such tests are interesting not only from a point of view that it would provide strong ground for scrutiny of the assumptions and conclusions of papers such as Rieger and Wang's (2012) and Rieger and Ngo's (2013). It would also question the assumption of cultural stability in general, and the results of numerous papers both within and outside finance that apply this assumption. Furthermore, if indeed culture or cross-country differences in risk attitudes do account for differences in ERP between countries' equity markets, the difference between stability and non-stability would have major consequences on any potential limits to convergence of ERP between countries.

4. Methodology and Data

This section describes the theoretical underpinnings of the tests that will be performed. Furthermore, the data collected for the empirical tests is described and the actual regressions that will be carried out outlined.

4.1. International CAPM

To avoid any omitted variable bias, this paper will run regressions of a two or three-factor version of the international CAPM to extract Jensen's alphas. One of the first international versions of the Sharptner, Lintner, Mossin and Treyor CAPM (1964; 1965a-b; 1966; 1962) was derived by Solnik in 1974. Notable developments in reference to country degrees of world financial market integration have been made by Stehle (1977) and Bekaert and Harvey (1995a). It should be noted that an early mainstream literature on the international CAPM most commonly was a multi-factor. In addition to covariating with the world market portfolio instead of the domestic, additional risk sources, among other, foreign currency and inflation exposures and hedging opportunities for these were modelled in a variety of settings and under different assumptions. However, as Solnik (1977) notes alongside both contributing to and examining the development of the model, while an international CAPM by nature will be more complex than the domestic CAPM, in almost any setting, its potential complexity lends better for use in the setting of a theoretical examination than for empirical work.

This paper will apply the international CAPM as used by e.g. Harvey (1991) and Chan et al. (1992), denominating all indexes in U.S. dollars (USD) and ignoring both foreign currency risk, assuming perfect Purchasing Power Parity (PPP), as well as other potential factors. Its further implications are those that it works under the assumption of homogenous investor outlooks with no preferred currency habitats. A perfect and constant market integration is assumed. While the former assumptions are both favourable in terms that we approach the question from a single perspective and a simplifying tool since it allows us to collect longer time-series in the cases where the MSCI indexes otherwise would be cut off by the availability of data on the countries' risk-free, the latter of a perfect and constant market integration poses a potential threat to the validity of the results. This study's sample includes several emerging markets, which, as suggested through empirical tests by Harvey (1995; 2001), at least in early parts of the MSCI Standard indexes' time spans exhibit considerable market segmentation. The world market portfolio may therefore not sufficiently capture undiversifiable risk for those, leaving room for omitted variable bias. The MSCI Standard sample also comprise several developing countries for which considerable financial market integration has indeed been suggested. However, it is empirically not full nor constant. For example, Bekaert et al. show that financial integration, as measured by valuation differentials, has increased over time both globally (2011) and, in particular, within the Euro monetary zone (2013). The theoretical underpinning to the non-frictionless fit of the international CAPM under assumption of integration is that of impediments to capital mobility which work to separate national markets. These include, but are not limited to, psychological barriers, legal restrictions,

transaction costs, discriminatory taxation, political risks and foreign currency risks (Stehle, 1977; Solnik and McLeavy, 2009). Stehle's (1977) model incorporates varying degrees of financial market integration for countries, and a time-varying equivalent which allows for joint covariance to the domestic and world portfolio in a regime-switching pattern was developed by Bekaert and Harvey (1995a), with a simplified version outlined in Bekaert and Harvey (1995b), for which a wide range of suggestions outlined w.r.t. weighting of respective covariance have emerged (Harvey, 2001). Intuitively, one parameter which could have partial explanatory power on appropriate weighting is the degree of Equity Home Bias (defined and elaborated in Section 4.2., below). Since the main empirical investigations of this study will be performed through the use of datasets were degree of EHB below 0.5 and 0.7, respectively, is cut off, the remaining data would be even more segmented, further justifying a partially integrated model.

In the end we however turn to the above paraphrase from Solnik (1977) that empirical tests by necessity should resort to a simple version of the international CAPM model, and use a fully financially integrated working under the previously mentioned assumptions.

The CAPM [1.2] and a simple international CAPM [1.3] respectively are derived as

$$E(R_i) = R_f + \beta_i(E(R_{mkt}) - R_f) \quad [1.2]$$

$$E(R_i) = R_f + \beta_i(E(R_{Wmkt}) - R_f) \quad [1.3]$$

where R_{mkt} and R_{Wmkt} represent the domestic and world market portfolio respectively.

It should once more be noted that while the one-factor derivation indeed is a paramount part of the CAPM, several multi-factor versions, apart from those elaborated on e.g. exchange and interest rate risks in its international version, have gained wide acceptance (e.g. Fama-French, 1992; Carhart, 1997). Likewise there are those that have circumvented the Sharpe-Lintner-Merton framework, criticising the use of the market portfolio to alone explain returns through models of equity returns in terms of *n* undefined factors (most notably Ross, 1976). The international CAPM has furthermore, among many other, been tested and modelled in terms of liquidity-factors (e.g. Donadelli and Prosperi, 2012) and through the use of country bond spreads (Erb et al., 1995; Damodaran, 2014). One model simply states

$$E(R_i) = R_f + \beta_i E(R_{Wmkt}) + Country\ Risk_i \quad [1.4]$$

(Pratt and Grabowski, 2014) where suggested measures for country risk include but are not limited to, country bond or default spreads, credit ratings, political, economic or financial scores as

provided by rating institutions, and their relation to the world mean (Erb, et al., 1995; Damodaran, 2014; J.P. Morgan, 2012).

4.2. Equity Home Bias: a necessity and source of error

For a study which uses the intersection between culturally conditioned risk attitude scores and the ERP in the same country, Equity Home Bias is a necessity. If each investor holds a proportionate share of the world market portfolio, such as asset pricing theory, under assumptions of constant PPP and no impediments to capital mobility, would assume is optimal (Leavy and Sarnat 1970; Solnik and McLeavey, 2009), the domestic culture's influence on the domestic stock market would be diluted by that of a mix of the major foreign investors'. It would then be no theoretical or practical bases to try to test if country-scores on risk attitudes are able to explain a country's ERP.

In 1991 French and Poterba presented documentation of a disproportionate large ownership of domestic stock compared to foreign in a study of three of the world's largest economies. Coined degree of Equity Home Bias (Equity Home Bias, EHB), it may be quantified as

$$EHB_i = 1 - \frac{Share\ of\ Foreign\ Equities\ in\ Country\ i's\ Equity\ Holdings}{Share\ of\ Foreign\ Equities\ in\ the\ World\ Market\ Portfolio} \qquad [1.5]$$

In French and Poterba (1991), this defined degree of Equity Home Bias was measured in the range 82%-98% in a sample of the three major economies studied, USA, U.K. and Japan. Such behavioural observation that investors seem to prefer domestic equities to those of foreign represents a major impediment to the international CAPM, especially in a setting were homogenous investors are assumed. Along with evidence on general increased market integration around the world (e.g. Bekaert et al., 2011) there has, however, not the least through the use of improved data availability made available by CPIS, IMF's Coordinated Portfolio Investment Survey (conducted for the first time in 1997; then annually from 2001) been evidenced a falling trend. Using data from the IFS's survey and the World Federation Exchanges, Coeuracier and Rey (2013) show that degree of Equity Home Bias has fallen consistently in all regions of the world since the end of the 1980s, and in particular in Continental Europe. Arab et al. (2014), studying a selected number of countries, show that this trend has continued.

4.3. Equity Risk Premia data

Monthly and annual MSCI Standard (Large + Mid Cap) price indexes denominated in USD are retrieved from MSCI's webpage (MSCI, 2015) for the country inception between MSCI index availability, where only countries whose indexes start before 1988 is considered, available INTRA

survey data, and thresholds of degree of Equity Home Bias as measured and calculated using the underlying model to Rey and Coeurdacier (2013), with the underlying data provided by the authors. The sole inclusion of MSCI indexes incepted before 1988 is due to the fact that too short data series would create too much noise to imply reasonable estimates (Damodaran, 2014). The denomination of all price indexes in USD is made to fit our methodology of an international CAPM which works under assumptions of a homogenous investor perspective where preference currency habitat is considered non-existent. In terms of Equity Home Bias, all countries left for consideration after exclusions based on years of index availability and the INTRA dataset, exhibit a fitted downward sloping trend. For countries that have two consecutive years of EHB<0.5 the two years and the remaining in its series, which in all cases also exhibit an EHB coefficient<0.5, are removed. In preparation for a second set of tests, observations with EHB coefficients<0.7 are removed according to the same criteria.

The use of MSCI indexes is favourable due to its cross-country comparability and indexation scope and methods. The Standard indexes, which are used in this study, include all publicly listed large and mid-cap companies and comprise between 80 and 90% of if the investible equity set. An alternative index would be the Investible Market index, which captures more than 99% of investible equities, but its use is limited by time-series inceptions, at the earliest, in 1999. Additionally, MSCI basically constitutes time-series of the Morgan Stanley Capital International Perspectives. Therefore, historical data for companies that disappear remain in the index, while only data from the date of introduction is included for newly listed companies, and as a result much of survivor bias is removed (MSCI methodology, 2007; 2015; Fama and French, 1998).

To cut off indexes based on degree of Equity Home Bias, the underlying dataset and methods used as basis for the presentation of regional trends on Equity Home Bias, 1988-2008, in Coeurdacier and Rey (2013) is retrieved from the authors. Using the same sources, IMF's annual CPIS and the World Federation Exchanges, and methods as they, the data is extended to 2012 for the countries and purpose of this study. Additionally, through the use of the updated and extended version of the External Wealth of Nations mark II dataset (EWN II, 2011; for further elaboration, see Lane and Milesi-Ferretti, 2007), the degree of Equity Home Bias is estimated, as far as possible, pre-1988 for the countries studied with a MSCI index incepted before 1988.

For calculation of excess returns, data for the 30-day U.S. Treasury bills from Ibbotson Associates, is retrieved from the Fama-French website (Fama and French, 2015). With the purpose to estimate the world market portfolio, the MSCI World Standard index is downloaded in addition to our sample country equivalents.

Table 1 – Descriptive statistics: ERP for intersection of countries with MSCI Standard index starting in 1988 at the latest and INTRA survey data

All indexes retrieved in USD. Descriptive statistics w.r.t. the ERP for the intersection of MSCI Standard Indexes starting in 1988 at the latest and countries with available INTRA survey data (MSCI, 2015; Fama and French, 2015; Rieger et al., 2015)

MSCI	*Period*	*Observations*	*ERP: arithmetic mean*		*Std. Dev.*	
			Monthly	*Annual*	*Monthly*	*Annual*
World	01/70 - 03/15	543	0.210	3.453	4.290	18.371
Developed						
Australia	01/70 - 03/15	543	0.233	3.087	6.994	25.333
Austria	01/70 - 03/15	543	0.233	5.437	6.809	36.913
Belgium	01/70 - 03/15	543	0.289	4.920	5.906	25.820
Canada	01/70 - 03/15	543	0.269	3.816	5.685	20.361
Denmark	01/70 - 03/15	543	0.578	8.784	5.676	27.588
Finland	01/82 - 03/15	399	0.916	15.64	8.539	44.396
France	01/70 - 03/15	543	0.317	5.038	6.528	28.336
Germany	01/70 - 03/15	543	0.357	5.652	6.345	29.592
Hong Kong	01/70 - 03/15	543	0.931	13.914	9.954	43.021
Ireland	01/88 - 03/15	327	0.116	3.511	6.482	26.775
Italy	01/70 - 03/15	543	0.056	1.986	7.426	33.544
Japan	01/70 - 03/15	543	0.392	6.920	6.102	32.013
Netherlands	01/70 - 03/15	543	0.345	4.688	5.548	20.188
New Zealand	01/82 - 03/15	399	0.277	6.545	7.255	37.224
Norway	01/70 - 03/15	543	0.490	9.382	7.869	41.980
Portugal	01/88 - 03/15	327	-0.18	-1.159	6.765	27.059
Spain	01/70 - 03/15	543	0.115	2.787	6.834	30.560
Sweden	01/70 - 03/15	543	0.633	14.12	6.920	38.639
Switzerland	01/70 - 03/15	543	0.459	6.520	5.252	23.194
UK	01/70 - 03/15	543	0.245	4.322	6.314	26.234
USA	01/70 - 03/15	543	0.240	3.703	4.431	18.458
Emerging or Frontier						
Argentina	01/88 - 03/15	327	1.816	28.294	15.177	86.861
Chile	01/70 - 03/15	327	0.816	12.784	6.983	34.301
Greece	01/70 - 03/15	327	0.100	5.453	10.954	42.460
Malaysia	01/88 - 03/15	327	0.486	8.335	7.980	33.225
Mexico	01/70 - 03/15	327	1.385	20.232	8.738	37.355
South Korea	01/88 - 03/15	327	0.679	11.780	10.536	46.171
Taiwan	01/88 - 03/15	327	0.593	8.787	10.062	41.429
Thailand	01/70 - 03/15	327	0.718	13.887	10.608	49.657
Turkey	01/70 - 03/15	327	1.399	31.282	15.933	108.54

As Table 1 indicates we observe an annual arithmetic mean around 3.7% for the U.S. Standard MSCI index. This is lower than the approximate 6% observed by Mehra and Prescott (1985) for the 1889-1978 period, but consistent with predictions and observation of lower ERP levels over more recent periods (Cochrane, 2011). Consistent with the results of Dimson et al. (2006a-b) we observe a slightly lower ERP for the world, around 3.5%, than for the USA. The

lowest ERPs can be found in the countries affected by the Euro crisis the worst, PIIGS (Portugal, Italy, Ireland, Greece, Spain), and the highest in Emerging and Frontier (Em. & Fr.) markets, the Nordic countries and Hong Kong. As suggested by asset pricing theory, the countries in the latter two groups and Hong Kong are also the countries that exhibit relatively high standard deviations.

4.4. Behavioural and Cultural variables: two data sources

4.4.1. The INTRA survey

The INTRA survey was conducted in 2007-2009 throughout 53 countries from all of the 5 continents. It does not constitute the first cross-country survey on risk attitudes, but with most certainty one of the most comprehensive, and is unique in that it provides scores on several variables that previously have been unavailable.

The surveyors used 14 experimental decision-making questions, of which 10 were of lottery type with monetary losses or gains as probability-weighted outcomes. To complement, additional questions from Hofstede's VSM94 and a questionnaire regarding the participants' personal situation and sentiment was included. To serve for cross-country comparability, and to calibrate culture as a potential source to any differences in scores, the monetary amounts in the lottery were adjusted in relation to the income level of each country in the survey. For a homogenous sample, only university students participated. For a comprehensive elaboration on the INTRA survey, see Rieger et al. (2011) and Rieger et al. (2015). The complete questionnaire set is also available for download (INTRA, 2015).

For Ambiguity Aversion, the survey applies a version of the lottery questions with ball lots used to derive the previously outlined Ellsberg-paradox (Ellsberg, 1961). The INTRA survey arrives at estimates of relative preferences for risk with known odds compared to those with ambiguous which are in line with earlier theoretical derivations and empirical work. The estimates for Ambiguity Aversion used in this study are retrieved from the latest published paper on its results, reporting parameters for Ambiguity Aversion on all studied countries, and are displayed in Table 2.

The INTRA survey derives the Relative Risk Premium (RRP) in gains and losses, as elaborated in prospect theory, using monetary lotteries. Briefly, the RRP in losses and gains are the flip sides of the same coin. The RRP in losses is measured by the average relative amount a participant is willing to pay to avoid participation in lotteries with no chance of gains, known probabilities of losses, and varying monetary amounts of losses. The RRP in gains is derived as the average relative amount an individual is willing to pay to participate in lotteries with no risk of losses, known probabilities of gains, and varying monetary amounts of gains. This paper, however, follows the approach of Tversky and Kahneman (1992) and Rieger and Ngo (2013) and proxy loss

aversion by a third coefficient in prospect theory available from INTRA, neutral loss aversion. It incorporates RRP in losses and gains as input, and is calibrated as the ratio of loss x and gain z such that the monetary amounts make the individual neutral in a setting with equal probabilities of outcome x and z.

To estimate time discounting behavior, the INTRA survey includes a question in which the surveyed is asked for the amount, in one year and in ten years, which would make them forego the immediate payment of a specified, country-adjusted, sum. The aggregated answers enables calibration of a function for Quasi-hyperbolic discounting

$$u(x_0, x_1 \dots \dots x_T) = u(x_0) + \beta\delta^t u(x_t) \quad [1.6]$$

where *t* is the length of time, δ the long-term discount factor, and β (hyperBeta) is the hyperbolic discount factor which discounts the future values against the present. Because of the homogeneity of delta, hyperBeta is retrieved since it better captures the intertemporal effect of narrow framing of individuals in each country.

To finally proxy for Myopic Loss Aversion, we jointly use the two proxies for loss aversion (neutral loss aversion, logTheta) and time discounting (hyperbolic time discounting, hyperBeta).

This study applies the INTRA parameters for time discounting and neutral loss aversion as presented in Rieger and Ngo (2013), which is the latest set available at the time of data collection for this study. In that paper parameters for 43 countries are reported, including 24 of the 30 included in this paper, for which the parameters are presented in Table 2. Correspondence with the authors of the survey in May 2015 reveals that an updated set of parameters for time discounting and neutral loss aversion, which incorporates estimates for more countries, have been collected but the results are still under review and not publicly available.

4.4.2. VSM08

From the first surveys of IBM personnel in the 1960s and 1970s, Hofstede and his colleagues have systematised, formalized and developed the questionnaires, with significant events being the introduction of the first version of the Values Survey Module in 1980, and its main follow-ups VSM82, VSM94 and VSM08. The adjustments between each version have gone hand-in-hand with Hofstede's and others' research over the years. The VSM08 is primarily developed on the basis of Hofstede and Hofstede (2005) and Minkov (2007). Compared to its predecessors both cultural dimensions investigated and questions asked have been revised, replaced and added. The currently published results from VSM08 incorporate answers from 78 countries, 56 of which the surveyors

have been able to collect sufficient number of answers from to assign a score on each of the main 6 dimensions investigated. The complete Questionnaire, an informative Manual to it, as well as the resulting score indexes based on data collection to date can all be retrieved on Hofstede's website (Hofstede et al., 2008a-b; Hofstede, 2015).

Scores of the countries in this study for the three relevant cultural dimensions are presented in Table 2.

Table 2 – Behavioural and Cultural variables

Parameters for Ambiguity Aversion (INTRA) are derived from Rieger et al. (2015), and parameters for MLA (INTRA) from Rieger et al. (2013) in which parameters for all studied countries not are available. Parameters for Individualism, Masculinity and Uncertainty Avoidance based on VSM08 are derived from Hofstede (2015)

	Ambiguity Aversion	*Hyperbolic Time Discounting, hyperBeta*	*Neutral Loss Aversion, logTheta*	*Individualism*	*Masculinity*	*Uncertainty Avoidance*
Expected sign	+	-	+	-	**- (high scores) / + (low scores)**	**+ (high scores) / - (low scores)**
Country						
Developed						
Australia	0.48	0.87	1.06	90	61	51
Belgium	0.72			75	54	94
Canada	0.63	0.65	1.28	80	52	48
Denmark	0.59	0.78	1.09	74	16	23
Sweden	0.5	0.81	2.4	71	5	29
New Zealand	0.53	0.67	0.89	79	58	49
Austria	0.39			55	79	70
Finland	0.46			63	26	59
France	0.54			71	43	86
Germany	0.47	0.56	1.3	67	66	65
Italy	0.53	0.58	1.48	76	70	75
Netherlands	0.57			80	14	53
Norway	0.46	0.7	0.98	69	8	50
Portugal	0.6	0.57	0.82	27	31	104
Spain	0.6	0.66	1.31	51	42	86
UK	0.61	0.68	0.73	89	66	35
USA	0.42	0.69	1.18	36	38	46
Ireland	0.48	0.73	1.09	70	68	35
Switzerland	0.57	0.59	1.19	68	70	58
Japan	0.62	0.64	1.31	46	95	92
Hong Kong	0.64	0.62	1.6	25	57	29
Emerging and Frontier						
Argentina	0.59	0.59	2.23	46	56	86
Mexico	0.62	0.5	0.79	30	69	82
Turkey	0.62			37	45	85
Chile	0.68	0.44	1.46	23	28	86
Greece	0.59	0.41	1.15	35	57	112
Thailand	0.8	0.85	2.22	20	34	64
Malaysia	0.59	0.44	2.42	26	50	36
Taiwan	0.67	0.6	1.49	17	45	69
South Korea	0.58	0.73	1.41	65	83	49
Average	**0.57**	**0.64**	**1.37**	**55**	**50**	**64**
Average Asian	0.65	0.65	**1.74**	**34**	58	61
Average Non-Asian	0.55	0.64	**1.25**	62	47	64
Average Developed	0.54	0.68	1.23	65	49	59
Average Emerging or Frontier	0.64	0.57	1.65	33	52	74
Average all countries in INTRA/VSM08	***0,58***	***1,02***	***1,46***	***48***	***50***	***67***
No. of published country scores in INTRA/VSM08	*53*	*40*	*40*	*62*	*62*	*62*

4.5. Linkage: culture and cross-country variation in risk attitudes revisited

The linkages between culture and risk attitudes provided, exemplified and tested against VSM08 and INTRA full datasets in Section 3.4. seem to apply also for this study's data sample. Asian countries score relatively low on neutral loss aversion and Individualism (Table 2), supporting that Asian's are relatively less loss averse in the domain of investing (Fan and Xiao (2005), Bontempo et al., 1997) and Weber and Hsee's (1988) cushion hypothesis. Rieger and Wang's (2012) proposed mediator effect between Ambiguty Aversion and Uncertainty Avoidance is not supported, but the same caveats w.r.t. monetary vs. non-monetary domain of survey as previously brought up remains. Bachmann and Hens (2011) mapped patience differences, here proxied by hyperbolic time discounting, between Asia and non-Asia, is not distinctly consistent with the results from INTRA that, on average, indicate a very small difference in hyperBeta between Asian and non-Asian countries (Table 2).

Furthermore a correlation matrix of the behavioural and cultural scores used in this study is conducted, useful not only for examination of linkages, but also to provide guidance for a number of multi-factor regressions described in Section 4.7.. It reveals four significant correlations based on the study's sample (Table 3, Appendix). Noticeable, three of them are in intersections of cultural (Hofstede) and risk attitude (INTRA) variables. Individualism exhibits modest negative correlations with Ambiguity Aversion and Uncertainty Avoidance and a modest positive correlation with hyberbolic time discounting. Uncertainty Avoidance moreover exhibits a relatively strong negative correlation with hyperbolic time discounting. Noteworthy is the fact that Uncertainty Avoidance and Ambiguity Aversion which were suggested to share a mediating effect in Rieger and Wang (2012), and share some similarities in their definition (Uncertainty Avoidance relates to attitudes towards Ambiguity Aversion, see Section 3.3. for a discussion), does not exhibit a significant correlation in our sample, providing additional evidence to previous against a suggested mediating effect between the variables. The lack of relationship between the two could might be explained by the potential dual polars of Uncertainty Avoidance and the complexity of their relationship.

4.6. Testing international CAPM

Hypothesising that there are no significant Jensen's alphas, tests of the one-factor international CAPM are performed, firstly on the full time sample of MSCI Standard indexes, and secondly on the same time series intersected by Equity Home Bias measurements below 0.5 and 0.7, respectively, of which the latter two will be the datasets that will be used going forward in this study. We rearrange the international CAPM from [1.3] in terms of the ERP, resort to

denomination in form of the single-index model, and regress for each country in a separate regression

$$ERP_{i,t} = \alpha_i + \beta_i ERP_{W_{mkt},t} + \varepsilon_{i,t} \quad [2.1]$$

where $ERP_{i,t}$ is the MSCI Standard index in each country less the 30-day U.S. treasury bill rate at time *t* representing the country's excess return for that point in time, and $ERP_{W_{mkt},t}$ the MSCI Standard World index less the 30-day U.S. treasury rate bill rate, representing the excess return of the world market portfolio at time *t*. α_i in the international CAPM model is Jensen's alpha for a country. For the international CAPM to perfectly hold, this should be equal to zero, or equivalently insignificant. To test the latter fact not only on an individual country basis but for all countries in this studies sample an accompanying Wald-test of joint equality to zero for the alpha coefficients is performed.

4.7. Testing culture and cross-country risk attitudes for empirical effect on the ERP

Hypothesising that firstly, Ambiguity Aversion, may not explain cross-country variance in the historic MSCI indexes to the alternative that it may, Jensen's alpha for each country (significant or not) derived from [2.1] and as presented in tables 5 and 6 for this study's full time sample, are estimated by Ambiguity Aversion from the INTRA survey as

$$\hat{\alpha}_i = bBeh_i + u_i \quad [2.2]$$

Since behavioural scores are time-invariant, such that $Beh_{i,t} = Beh_i$, running a two-factor (or in the case of MLA, three-factor) international CAPM including behavioural parameters directly, where each country can retain its own alpha and beta through application of fixed effects, is not feasible since any time-invariant parameters automatically will be omitted from a fixed effects model. Instead we resort to the outlined method and firstly run a one-factor international CAPM for each country [2.1], from which we extract their Jensen's alphas and then cross-sectionally regress the behavioural scores for the countries on these through equation [2.2].

A weakness of such a two-stage method must however be noted in the fact that the dependent variable in [2.2], Jensen's alpha for the countries in the study, itself will be an estimate retrieved from [2.1]. The sample errors in estimating the Jensen's alphas will not be identical across observations, with the result that the regressions applying the alphas as dependent will suffer from heteroscedasticity. To ameliorate the problem all [2.2] regressions are estimated applying two versions of Heteroscedasticity-Consistent standard errors (HC) separately. Due to its commonality as a first-hand resort the regressions are in an initial step estimated with HC1 (MacKinnon and White (1985)), which is commonly referred to as robust standard errors and a follow-up to White's

(1980) HC0, from which standard errors, significances and coefficients of determination will be reported. However, as noted in e.g. Long and Ervin (2000) and Lewis and Linzer (2005), a jackknifing HC-version presented in MacKinnon and White (1985), building on the work of Efron (1982), and later refined by Davidson and MacKinnon (1993), HC3, have been shown to heavily outperform HC1 (and other HC-versions) in small samples where HC1 tend to over-reject the null (e.g. MacKinnon, 2012). The regressions are therefore rerun applying HC3, and significance levels based on regressions with it are reported jointly with the initial estimates.

The same regressions are also run for scores on each of the three studied cultural dimensions. Due to potential multicollinearity between risk attitude measures or cultural dimensions, we regress each behavioural or cultural variable in separate regressions for our main tests. An exception are the tests of MLA, in which the neutral loss aversion and time discounting parameters are run jointly on Jensen's alphas. Moreover and nonetheless, but purely as a side-track, a number of regressions is run with two or more of the variables jointly, for which the selection of exact combinations largely is based on the correlation matrix of the variables (Table 3, Appendix) and previous research. The results from these regressions will briefly be discussed with the aim to potentially find some insightful patterns, but corresponding coefficients will not be presented.

The models are tested, firstly, on to the full sample set cleared of observations with degree of Equity Home Bias<0.5. Secondly, Developed and Emerging/Frontier markets, as distinguished by the MSCI categorization (MSCI, 2015) are regressed separately. Thirdly, and justified by previous results on differences in certain risk attitudes between Asian and other countries, a group with the Asian and a group with the non-Asian countries are regressed separately. For all of the three groups, to account for varying degrees and environments of world market financial integration, and to later be able to test for non-stationarity of behavioural and cultural scores over time, regressions are performed firstly on the full time sample, secondly on the time sample before 1992/09 (pre-1992) and thirdly on the time sample after 1992/08 (post-1992) using Jensen's alpha scores for each country calculated on data solely from respective time period.

In a second stage, the same tests are performed but using the full sample set cleared of observations with degree of Equity Home Bias<0.7 as basis.

A sanity check on the reasoning regarding cut-offs for degree of Equity Home Bias is furthermore conducted by regressing each studied coefficient for All countries over the full time sample on Jensen's alphas using the counterfactual to our EHB>0.5 and EHB>0.7 datasets. For these regressions we hypothesize that none of the studied variables have a significant effect on Jensen's alphas in the EHB<0.5 and EHB<0.7 datasets.

4.8. Testing cultural stability

To test for any potential change over time within a sample group, Jensen's alpha scores based on data from two time periods - from inception of the MSCI Standard indexes for each country, at the earliest January 1970, to August 1992, and from September 1992 to the most recent observation at the date of data collection, March 2015, are used. Only those groups in which either or both time samples show significant coefficients for the risk attitude or cultural score are tested for stationarity. Hypothesising that there are no deviating explanatory effect of the observations on excess returns, within the same group, but for different time samples, regressions based on alphas from the two time periods are nested, and interaction-terms multiplying a time dummy for pre or post 1992 and scores for each behavioural or cultural variable are created. The tests are performed w.r.t Ambiguity Aversion, Individualism, Masculinity and Uncertainty Avoidance through regression [2.3], and w.r.t. MLA through a six-factor version of it.

$$\hat{\alpha}_{i,t} = \alpha_0 + \beta_1 Beh1_i + \beta_2 TimeDummy_t * Beh1_i + \alpha_1 TimeDummy_t + z_{i,t} \qquad [2.3]$$

5. Results

Initial tests of the international CAPM (Table 4) confirm that Beta significantly correlates to the world market portfolio for most countries in our sample. However, one country, Finland exhibits a deviating, non-significant, Beta-coefficient and consequent R^2 close to zero.[2] In the process of eliminating years where countries exhibit an Equity Home Bias in excess of 0.5, it is furthermore noted that Ireland exhibits a very divergent degree of EHB, in the range of 2-4 for observable years.[3] As a consequence of these remarks all observations for both Finland and Ireland are dropped for the remainder of this study. Of the remaining countries, seven exhibit significant alphas: one at the 1% rate, one at the 5%, and five at the 10% rate when regressing on the full time sample. It may be noted that the international CAPM used does not seem to work worse in reference to Developed countries compared to the set of Emerging/Frontier. Four Developed countries exhibit significant alphas and three Emerging/Frontier, while the sample of Emerging/Frontier are fewer. Eliminating years where countries exhibit an Equity Home Bias below 0.5 (Table 5, Appendix) does not change the results, however, in the sample with only EHB>0.7 (Table 6, Appendix) fewer countries, five compared to seven, exhibit significant Jensen's

[2] This is most likely due to Nokia's historically unproportional weight in its index. In the 1990s and early 2000s Nokia accounted for over 70% of the market cap on the Helsinki stock exchange (Nyberg and Vaihekoski, 2014). Nokia's valuation has declined since then, and a cap limiting each company's weight in the Helsinki 25 to a maximum of 10% has been introduced (Bloomberg, 2015).

[3] Ireland has a very specific economy since the beginning of the 1990s were the implementation of a specific tax structure has led to considerable off-shoring to the country, in particular in Computing and IT, as well as foreign mutual fund investments (Bosch and Schoenmaker, 2008).

alpha. As more thoroughly discussed further on, this result could depend on our assumption of full financial market integration and the fact that that a higher degree of Equity Home Bias could be an indication of segmentation. Generalised, it must be noted that the study's version of the international CAPM seems to work imperfectly for our sample, as exhibited by the low p-values from Wald tests on the joint significance and difference from zero of Jensen's alphas (bottom row Table 4; Tables 5 and 6, Appendix).

Table 4 – One-factor international CAPM by country: all available years

All regressions are estimated using ordinary least squares. The dependent variable is the MSCI Standard Index for each country less the 30-day U.S. Treasury bill rate, and the independent the MSCI Standard world market portfolio less the 30-day U.S. Treasury bill rate (MSCI, 2015; Fama and French, 2015). All indexes are denominated in USD. The standard error for each coefficient is shown in parentheses to the left of coefficient values. The p-value from a Wald test of joint significance of the alpha coefficients for all countries in the sample is reported at the bottom of the third column

MSCI	*Period*	*a*	*β*	*Observations*	R^2
World	01/70 - 03/15			543	
Developed					
Australia	01/70 - 03/15	0.010 [0.228]	1.062*** [0.053]	543	0.4254
Austria	01/70 - 03/15	0.062 [0.251]	0.816*** [0.056]	543	0.2647
Belgium	01/70 - 03/15	0.088 [0.183]	0.956***[0.043]	543	0.4812
Canada	01/70 - 03/15	0.056 [0.157]	1.019***[0.037]	543	0.5904
Denmark	01/70 - 03/15	0.406** [0.192]	0.820***[0.045]	543	0.3838
Finland	01/82 - 03/15	0.876** [0.429]	0.111 [0.099]	399	0.0033
France	01/70 - 03/15	0.084 [0.192]	1.111*** [0.045]	543	0.5332
Germany	01/70 - 03/15	0.137 [0.192]	1.050*** [0.045]	543	0.5047
Hong Kong	01/70 - 03/15	0.696* [0.375]	1.120*** [0.087]	543	0.2323
Ireland	01/88 - 03/15	-0.172 [0.247]	1.093*** [0.057]	327	0.5299
Italy	01/70 - 03/15	-0.151 [0.263]	0.985*** [0.061]	543	0.3234
Japan	01/70 - 03/15	0.193 [0.195]	0.951*** [0.046]	543	0.4471
Netherlands	01/70 - 03/15	0.127 [0.141]	1.042*** [0.033]	543	0.6490
New Zealand	01/82 - 03/15	-0.050 [0.873]	0.872*** [0.072]	399	0.2727
Norway	01/70 - 03/15	0.250 [0.265]	1.146***[0.062]	543	0.3902
Portugal	01/88 - 03/15	-0.435 [0.297]	0.962*** [0.069]	327	0.3761
Spain	01/70 - 03/15	-0.095 [0.229]	1.000*** [0.053]	543	0.3933
Sweden	01/70 - 03/15	0.399* [0.215]	1.113*** [0.050]	543	0.4765
Switzerland	01/70 - 03/15	0.274* [0.157]	0.884*** [0.036]	543	0.5200
UK	01/70 - 03/15	0.019 [0.185]	1.080*** [0.043]	543	0.5378
USA	01/70 - 03/15	0.048 [0.090]	0.912*** [0.021]	543	0.7797
Emerging or Frontier					
Argentina	01/88 - 03/15	1.576* [0.815]	0.906*** [0.189]	327	0.0661
Chile	01/70 - 03/15	0.625* [0.347]	0.725*** [0.080]	327	0.2008
Greece	01/70 - 03/15	-0.219 [0.536]	1.205*** [0.124]	327	0.2251
Malaysia	01/88 - 03/15	0.268 [0.397]	0.823***[0.081]	327	0.1986
Mexico	01/70 - 03/15	1.086*** [0.402]	1.134*** [0.093]	327	0.3143
South Korea	01/88 - 03/15	0.338 [0.497]	1.291*** [0 .115]	327	0.2793
Taiwan	01/88 - 03/15	0.329 [0.511]	0.955***[0.118]	327	0.1676
Thailand	01/70 - 03/15	0.398 [0.513]	1.210*** [0.119]	327	0.2420
Turkey	01/70 - 03/15	1.050 [0.827]	1.318***[0.191]	327	0.1277
Prob > F		*0.000*			

*** significant at 1 % level in a two-sided test
** significant at 5 % level in a two-sided test
* significant at 10% level in a two-sided test

Testing the country scores proxying for Ambiguity Aversion on Jensen's alphas we find a highly significant explanatory effect of Ambiguity Aversion in the groups of All countries for the full time and pre 1992 samples. The result holds true for both the EHB>0.5 (Table 7) and

EHB>0.7 (Table 9, Appendix) datasets. Furthermore Ambiguity Aversion has a significant effect on the ERP of Asian and non-Asian countries in the pre-1992 time sample based both EHB-datasets. As expected significant coefficients carry a positive sign.

Table 7 – Ambiguity Aversion on Jensen's alphas (EHB>0.5)

All regressions are estimated using ordinary least squares and robust standard errors (HC1; as well as significance for coefficients applying HC3 as complementary information (MacKinnon and White, 1985; Davidson and MacKinnon, 1993)). The dependent variable is the Jensen's alpha for each county retreived from a one-factor international CAPM regression (all indexes in USD) on the -03/15 time sample (displayed in Table 5) and -08/92 and 09/92- time samples, respectively, and the independent are country scores for Ambiguity Aversion from Rieger et al. (2015). EHB>0.5 implies that only observations within the indicated time span before two consecutive years of Equity Home Bias below a coefficient of 0.5 for a country, as measured by underlying dataset to Coeuracier and Rey (2012) and EWN II (2011), have been included in the regressions. The coefficients for the constant are suppressed in the presentation. The standard error for each coefficient is shown in parentheses to the left of coefficient values

MSCI	*Period*	*Ambiguity Aversion*	*Observations*	R^2
All	- 03/15	1.089•• [0.462]	28	0.0528
	- 08/92	4.668••* [1.588]	28	0.0723
	09/92 -	0.440 [0.856]	28	0.0087
Developed Countries	- 03/15	0.149 [0.568]	19	0.0026
	- 08/92	0.443 [1.100]	19	0.0077
	09/92 -	0.808 [1.076]	19	0.0356
Emerging and Frontier Countries	- 03/15	-1.028 [1.942]	9	0.0184
	- 08/92	-3.259 [7.665]	9	0.0118
	09/92 -	-1.405 [1.365]	9	0.0712
Asia	- 03/15	0.240 [0.475]	6	0.0124
	- 08/92	5.622•• [1.667]	6	0.5365
	09/92 -	-1.464 [0.870]	6	0.2402
Non-Asia	- 03/15	1.260 [0.806]	22	0.0490
	- 08/92	5.792* [3.213]	22	0.0761
	09/92 -	1.244 [1.031]	22	0.0614

*** significant at 1 % level in a two-sided test, hc1 robust std. errors; ••• , hc1 & hc3 robust std. errors
** significant at 5 % level in a two-sided test, hc1 robust std. errors; •• , hc1 & hc3 robust std. errors
* significant at 10 % level in a two-sided test, hc1 robust std. errors; • , hc1 & hc3 robust std. errors

Tests of any significant change between the two time periods for the relevant groups provides indicative but mixed evidence. Regressions [2.3] based on both EHB>0.5 and EHB>0.7 datasets reject, for All and Asian countries, the hypothesis of cultural stationarity evidenced by significant interaction-terms (Table 8; Table 10, Appendix). The result is also supported by shifting significances of the coefficients between time periods within the two groups in our initial regressions on Jensen's alphas (Table 7; Table 9, Appendix).

For non-Asian countries, cultural stationarity cannot be rejected (Table 8; Table 10, Appendix) w.r.t. Ambiguity Aversion. However, evidence that Ambiguity Aversion has any effect on the ERP at all is weak for this group (10% level applying HC1 in both EHB>0.5 and EHB>0.7 datasets).

Table 8 – Regressions with interaction-terms, multi-factor Jensen's alphas model (EHB>0.5), to test coefficients proxying for Ambiguity Aversion for significant change over time

All regressions are estimated using ordinary least squares and robust standard errors (HC1; as well as significance for coefficients applying HC3 as complementary information (MacKinnon and White, 1985; Davidson and MacKinnon, 1993)). The dependent variable is the Jensen's alpha for each country retrieved from one-factor international CAPM regressions (all indexes in USD) on our sample for years in the -08/92 and 09/92- time samples, respectively, and the independent variables country scores for Ambiguity Aversion from Rieger et al. (2015), an interaction term of the latter term with a time dummy dividing the data set in pre and post August 1992 and the time dummy alone. EHB>0.5 implies that only observations within the indicated time span before two consecutive years of Equity Home Bias below a coefficient of 0.5 for a country, as measured by underlying dataset to Coeuracier and Rey (2012) and EWN II (2011), have been included in the regressions. The coefficients for the constant and time dummy alone are suppressed in the presentation. The standard error for each coefficient is shown in parenthesis to the left of coefficient values

MSCI	*Period*	*Ambiguity Aversion*	*Ambiguity Aversion*TimeDummy*	*Observations*	R^2
All	- 03/15	4.668••• [1.588]	-4.267•• [1.804]	56	0.1465
Asia	- 03/15	5.623••* [1.667]	-7.086••* [1.881]	12	0.7074
Non-Asia	- 03/15	5.792* [3.214]	-4.548 [3.375]	44	0.1360

*** significant at 1 % level in a two-sided test, hc1 robust std. errors; ••• , hc1 & hc3 robust std. errors
** significant at 5 % level in a two-sided test, hc1 robust std. errors; •• , hc1 & hc3 robust std. errors
* significant at 10 % level in a two-sided test, hc1 robust std. errors; • , hc1 & hc3 robust std. errors

Testing the proxies for MLA in a two-factor Jensen's alphas model (Table 11; and for EHB>0.7, Table 13, Appendix), hyperBeta is significant at the 10% and 5% levels for All and non-Asian countries in the pre-1992 time samples. LogTheta, on the other hand, is insignificant in all group and time samples. These results hold true for both EHB>0.5 data and EHB>0.7 data. The insignificance of logTheta implies that the null hypothesis that MLA does not significantly affect ERP clearly not can be rejected.

As expected significant coefficients for hyperBeta carry negative signs.

Table 11 – Myopic Loss Aversion on Jensen's alphas (EHB>0.5)

All regressions are estimated using ordinary least squares and robust standard errors (HC1; as well as significance for coefficients applying HC3 as complementary information (MacKinnon and White, 1985; Davidson and MacKinnon, 1993)). The dependent variable is the Jensen's alpha for each county retreived from a one-factor international CAPM regression (all indexes in USD) on the -03/15 time sample (displayed in Table 5) and -08/92 and 09/92- time samples, respectively,and the independent are country scores for hyperbolic time discounting (hyperBeta), neutral loss aversion (logTheta) from Rieger et al. (2013). EHB>0.5 implies that only observations within the indicated time span before two consecutive years of Equity Home Bias below a coefficient of 0.5 for a country, as measured by underlying dataset to Coeuracier and Rey (2012) and EWN II (2011), have been included in the regressions. The coefficients for the constant are suppressed in the presentation. The standard error for each coefficient is shown in parentheses to the left of coefficient values

MSCI	*Period*	*hyperBeta*	*logTheta*	*Observations*	R^2
All	- 03/15	-0.388 [0.684]	0.337 [0.233]	23	0.1607
	- 08/92	-4.886* [2.465]	1.118 [1.008]	23	0.2274
	09/92 -	0.678 [0.702]	0.098 [0.138]	23	0.1175
Developed Countries	- 03/15	0.531 [0.770]	0.284 [0.162]	15	0.2290
	- 08/92	0.151 [1.161]	0.438 [0.313]	15	0.1426
	09/92 -	1.123 [0.738]	0.137 [0.108]	15	0.2325
Emerging and Frontier Countries	- 03/15	0.089 [1.101]	0.090 [0.487]	8	0.0113
	- 08/92	-3.279 [4.587]	0.359 [2.114]	8	0.0483
	09/92 -	0.448 [1.013]	0.051 [0.250]	8	0.0534
Asia	- 03/15	0.028 [0.276]	-0.043 [0.149]	6	0.0143
	- 08/92	1.464 [1.220]	0.799 [0.429]	6	0.3988
	09/92 -	-0.222 [0.615]	0.020 [0.266]	6	0.0190
Non-Asia	- 03/15	-0.683 [0.902]	0.493 [0.334]	17	0.2245
	- 08/92	-7.514•* [2.845]	1.784 [1.378]	17	0.3640
	09/92 -	1.011 [0.716]	0.177 [0.126]	17	0.2516

*** significant at 1 % level in a two-sided test, hc1 robust std. errors; ••• , hc1 & hc3 robust std. errors
** significant at 5 % level in a two-sided test, hc1 robust std. errors; •• , hc1 & hc3 robust std. errors
* significant at 10 % level in a two-sided test, hc1 robust std. errors; • , hc1 & hc3 robust std. errors

Tests of any significant difference in effect between the two time periods for the relevant groups reject, based on data for All and non-Asian countries, the hypothesis of cultural stability with reference to hyperBeta as indicated by significant interaction-terms (Table 12; and for EHB>0.7, Table 14, Appendix). The result is confirmed by the shifting significances of the coefficient between time periods within-groups in the main regressions (Table 11; Table 13, Appendix). For EHB>0.7 data a slight basis for cautiousness is that there is one less observation in the All countries likewise non-Asian group post-1992 compared to pre-1992, which could lead to relative loss in power in the former time sample.

Table 12 – Regressions with interaction-terms, multi-factor Jensen's alphas model (EHB>0.5), to test coefficients proxying for MLA for significant change over time

All regressions are estimated using ordinary least squares and robust standard errors (HC1; as well as significance for coefficients applying HC3 as complementary information (MacKinnon and White, 1985; Davidson and MacKinnon, 1993)). The dependent variable is the Jensen's alpha for each country retrieved from one-factor international CAPM regressions (all indexes in USD) on our sample for years in the -08/92 and 09/92- time samples, respectively, and the independent variables country scores for hyperbolic time discounting (hyperBeta), neutral loss aversion (logTheta) from Rieger et al. (2013), interaction-terms of the two latter terms with a time dummy dividing the data set in pre and post 08/92 and the time dummy alone. EHB>0.5 implies that only observations within the indicated time spans before two consecutive years of Equity Home Bias below a coefficient of 0.5 for a country, as measured by underlying dataset to Coeuracier and Rey (2012) and EWN II (2011), have been included in the regressions. The coefficients for the constant and time dummy alone are suppressed in the presentation. The standard error for each coefficient is shown in parentheses to the left of coefficient values

MSCI	*Period*	*hyperBeta*	*logTheta*	*hyperBeta*TimeDummy*	*logTheta*TimeDummy*	*Observations*	R^2
All	- 03/15	-4.886• [2.465]	1.117 [1.008]	5.564•• [2.534]	-1.020 [1.014]	46	0.3004
Non-Asia	- 03/15	-7.515•* [2.845]	1.784 [1.378]	8.526••* [2.933]	-1.607 [1.384]	34	0.4125

*** significant at 1 % level in a two-sided test, hc1 robust std. errors; ••• , hc1 & hc3 robust std. errors
** significant at 5 % level in a two-sided test, hc1 robust std. errors; •• , hc1 & hc3 robust std. errors
* significant at 10 % level in a two-sided test, hc1 robust std. errors; • , hc1 & hc3 robust std. errors

Testing scores for Individualism, Masculinity and Uncertainty Avoidance separately through regressions on Jensen's alphas (Tables 15, 19, 23; and for EHB>0.7 Tables 17, 21, 25, Appendix), we find that the pre-1992 time sample for All, Asian and non-Asian countries to some degree exhibit significant coefficients for Individualism. Significance for Individualism is also displayed in the full time samples for All countries, and post-1992 for Emerging and Frontier countries. The results hold true based both on EHB>0.5 and 0.7>EHB data. All significant coefficients for the dimension are negative.

Since no significant observation except those in Emerging and Frontier (only HC1) is significant in the later time sample we can argue for a diminishing effect of Individualism over the years, which is further supported by the fact that regressions with interaction-terms show significant difference in the coefficients for Individualism between the pre and post 1992 periods for all groups except Em. & Fr.

Regressions with interaction-terms furthermore find that there is a significant difference in the explanatory effect of Individualism between the two time groups in the All, Asian and non-Asian samples (Table 16; Table 18, Appendix), a result further confirmed by observable changes in significance between time periods within-groups in our initial regressions on Jensen's alphas.

For Masculinity significant coefficients appear in the post-1992 time samples for All and non-Asian (EHB>0.5 data) and All, Developed and non-Asian (EHB>0.7 data) as well as Asian for the pre-1992 time sample (EHB>0.7 data) have a significant negative effect on the ERP. The fact that the effect is negative is in line with expectations for the group of Asian countries that have an average score on Masculinity well above the average of 50. For all the other groups the average score is 50, or very close, which makes negative coefficients signs reasonable according to expectations, but cannot either refute or support the hypothesis that the sign might shift for groups with an average score well below 50 (Table 2).

Contrary to the case for Individualism, the great majority of significant coefficients for Masculinity appear in the more recent, post-1992, time samples. To rationalise, one could potentially argue that there is a link between more aggressive and/or excessive trading, a more competitive environment, and higher risk premiums. The environment has naturally become more competitive in recent times when equity markets have matured, opened up for increased international participation, likewise a larger proportion of inhabitants in Emerging markets trading in equities. In the end there is little theoretical likewise empirical work on any relationship of Masculinity on equity returns in general.

The results for regressions with interaction-terms are equivocal for Masculinity (Table 20; Table 24, Appendix). Cultural stationary can only be rejected for Developed countries in the EHB>0.7 dataset, compared to a failure to reject stationarity in the four other data intersections where it is testable.

For Uncertainty Avoidance, most notably, significant coefficients are exhibited in the Developed countries group in the full likewise post-1992 time samples using both EHB>0.5 and EHB>0.7 data. Furthermore, coefficients are significant in the post-1992 sample for All countries and Asian countries (EHB>0.5 and EHB>0.7 data) and non-Asian countries (EHB>0.5). All significant coefficients observed are negative. The significant coefficients are negative, which supports the theory of a bipolar index shifting away from plus as we reach low average scores (Developed countries have an average 59 compared to an average of 64 in our full sample or 67 in VSM08, Table 2).

Also Uncertainty Avoidance seems to diminish in effect over time.

Interaction terms on Uncertainty Avoidance (Table 22; Table 26, Appendix), cultural stationarity can only be rejected in All and non-Asian countries (EHB>0.5) and All countries (EHB>0.7) out of eight testable data intersections.

It should be noted that the absolute values of the coefficients for the cultural dimensions, especially Masculinity and Uncertainty Avoidance, are much smaller than those for Ambiguity Aversion and hyberBeta. This is partly due to scaling differences in the parameters (0-100) and (0-1), but even when adjusting for these the absolute values of the coefficients for the cultural variables are up to ~25 times smaller in magnitude than those for Ambiguity Aversion and hyperBeta.

Table 15 – Individualism on Jensen's alphas (EHB>0.5)

All regressions are estimated using ordinary least squares and robust standard errors (HC1; as well as significance for coefficients applying HC3 as complementary information (MacKinnon and White, 1985; Davidson and MacKinnon, 1993)). The dependent variable is the Jensen's alpha for each county retreived from a one-factor international CAPM regression (all indexes in USD) on the -03/15 time sample (displayed in Table 5) and -08/92 and 09/92- time samples, respectively, and the independent are country scores for Individualism from Hofstede (2015). EHB>0.5 implies that only observations within the indicated time span before two consecutive years of Equity Home Bias below a coefficient of 0.5 for a country, as measured by underlying dataset to Coeuracier and Rey (2012) and EWN II (2011), have been included in the regressions. The coefficients for the constant are suppressed in the presentation.The standard error for each coefficient is shown in parentheses to the left of coefficient values

MSCI	*Period*	*Individualism*	*Observations*	R^2
All	- 03/15	-0.006•* [0.003]	28	0.1001
	- 08/92	-0.026••* [0.009]	28	0.1632
	09/92 -	0.003 [0.003]	28	0.0322
Developed Countries	- 03/15	-0.001 [0.005]	19	0.0015
	- 08/92	-0.002 [0.009]	19	0.0098
	09/92 -	0.006 [0.004]	19	0.0939
Emerging and Frontier Countries	- 03/15	0.007 [0.013]	9	0.0326
	- 08/92	0.005 [0.064]	9	0.0014
	09/92 -	0.011** [0.003]	9	0.1302
Asia	- 03/15	-0.003 [0.003]	6	0.1147
	- 08/92	-0.023* [0.011]	6	0.4880
	09/92 -	0.005 [0.006]	6	0.1511
Non-Asia	- 03/15	-0.007 [0.005]	22	0.0963
	- 08/92	-0.037** [0.017]	22	0.2136
	09/92 -	0.002 [0.004]	22	0.0137

*** significant at 1 % level in a two-sided test, hc1 robust std. errors; ••• , hc1 & hc3 robust std. errors
** significant at 5 % level in a two-sided test, hc1 robust std. errors; •• , hc1 & hc3 robust std. errors
* significant at 10 % level in a two-sided test, hc1 robust std. errors; • , hc1 & hc3 robust std. errors

Table 16 – Regressions with interaction-terms, multi-factor Jensen's alphas model (EHB>0.5), to test coefficients proxying for Individualism for significant change over time

All regressions are estimated using ordinary least squares and robust standard errors (HC1; as well as significance for coefficients applying HC3 as complementary information (MacKinnon and White, 1985; Davidson and MacKinnon, 1993)). The dependent variable is the Jensen's alpha for each country retrieved from one-factor international CAPM regressions (all indexes in USD) on our sample for years in the -08/92 and 09/92- time samples, respectively, and the independent variables country scores for Individualism from Hofstede (2015), an interaction term of the latter term with a time dummy dividing the data set in pre and post August 1992 and the time dummy alone. EHB>0.5 implies that only observations within the indicated time span before two consecutive years of Equity Home Bias below a coefficient of 0.5 for a country, as measured by underlying dataset to Coeuracier and Rey (2012) and EWN II (2011), have been included in the regressions. The coefficients for the constant and time dummy alone are suppressed in the presentation. The standard error for each coefficient is shown in parenthesis to the left of coefficient values

MSCI	*Period*	*Individualism*	*Individualism*Timedummy*	*Observations*	R^2
All	- 03/15	-0.027••• [0.009]	0.030••• [0.010]	56	0.2262
Em. & Fr.	- 03/15	0.005 [0.064]	0.005 [0.065]	18	0.3216
Asia	- 03/15	-0.023* [0.011]	0.028* [0.012]	12	0.6760
Non-Asia	- 03/15	-0.037•* [0.017]	0.040•• [0.017]	44	0.2551

*** significant at 1 % level in a two-sided test, hc1 robust errors; ••• , hc1 & hc3 robust errors
** significant at 5 % level in a two-sided test, hc1 robust errors; •• , hc1 & hc3 robust errors
* significant at 10 % level in a two-sided test, hc1 robust errors; • , hc1 & hc3 robust errors

Table 19 – Masculinity on Jensen's alphas (EHB>0.5)

All regressions are estimated using ordinary least squares and robust standard errors (HC1; as well as significance for coefficients applying HC3 as complementary information (MacKinnon and White, 1985; Davidson and MacKinnon, 1993)). The dependent variable is the Jensen's alpha for each county retreived from a one-factor international CAPM regression (all indexes in USD) on the -03/15 time sample (displayed in Table 5) and -08/92 and 09/92- time samples, respectively, and the independent are country scores for Masculinity from Hofstede (2015). EHB>0.5 implies that only observations within the indicated time span before two consecutive years of Equity Home Bias below a coefficient of 0.5 for a country, as measured by underlying dataset to Coeuracier and Rey (2012) and EWN II (2011), have been included in the regressions. The coefficients for the constant are suppressed in the presentation.The standard error for each coefficient is shown in parentheses to the left of coefficient values

MSCI	*Period*	*Masculinity*	*Observations*	R^2
All	- 03/15	-0.001 [0.002]	28	0.0014
	- 08/92	0.005 [0.009]	28	0.0053
	09/92 -	-0.007•• [0.003]	28	0.1663
Developed Countries	- 03/15	-0.002 [0.002]	19	0.0409
	- 08/92	0.003 [0.003]	19	0.0249
	09/92 -	-0.009 [0.003]	19	0.0246
Emerging and Frontier Countries	- 03/15	0.001 [0.007]	9	0.0016
	- 08/92	-0.001 [0.042]	9	0.0001
	09/92 -	0.004 [0.004]	9	0.0290
Asia	- 03/15	-0.003 [0.002]	6	0.1122
	- 08/92	-0.015 [0.012]	6	0.3457
	09/92 -	0.000 [0.006]	6	0.0002
Non-Asia	- 03/15	-0.001 [0.003]	22	0.0021
	- 08/92	0.011 [0.012]	22	0.0205
	09/92 -	-0.008•• [0.004]	22	0.2185

*** significant at 1 % level in a two-sided test, hc1 robust std. errors; ••• , hc1 & hc3 robust std. errors
** significant at 5 % level in a two-sided test, hc1 robust std. errors; •• , hc1 & hc3 robust std. errors
* significant at 10 % level in a two-sided test, hc1 robust std. errors; • , hc1 & hc3 robust std. errors

Table 20 – Regressions with interaction-terms, multi-factor Jensen's alphas model (EHB>0.5), to test coefficients proxying for Masculinity for significant change over time

All regressions are estimated using ordinary least squares and robust standard errors (HC1; as well as significance for coefficients applying HC3 as complementary information (MacKinnon and White, 1985; Davidson and MacKinnon, 1993)). The dependent variable is the Jensen's alpha for each country retrieved from one-factor international CAPM regressions (all indexes in USD) on our sample for years in the -08/92 and 09/92- time samples, respectively, and the independent variables country scores for Masculinity from Hofstede (2015), an interaction term of the latter term with a time dummy dividing the data set in pre and post August 1992 and the time dummy alone. EHB>0.5 implies that only observations within the indicated time span before two consecutive years of Equity Home Bias below a coefficient of 0.5 for a country, as measured by underlying dataset to Coeuracier and Rey (2012) and EWN II (2011), have been included in the regressions. The coefficients for the constant and time dummy alone are suppressed in the presentation. The standard error for each coefficient is shown in parenthesis to the left of coefficient values

MSCI	*Period*	*Masculinity*	*Masculinity*TimeDummy*	*Observations*	R^2
All	- 03/15	0.005 [0.009]	-0.012 [0.009]	56	0.0969
Non-Asia	- 03/15	0.011 [0.013]	-0.020 [0.013]	44	0.0949

*** significant at 1 % level in a two-sided test, hc1 robust std. errors; ••• , hc1 & hc3 robust std. errors
** significant at 5 % level in a two-sided test, hc1 robust std. errors; •• , hc1 & hc3 robust std. errors
* significant at 10 % level in a two-sided test, hc1 robust std. errors; • , hc1 & hc3 robust std. errors

Table 23 – Uncertainty Avoidance on Jensen's alphas (EHB>0.5)

All regressions are estimated using ordinary least squares and robust standard errors (HC1; as well as significance for coefficients applying HC3 as complementary information (MacKinnon and White, 1985; Davidson and MacKinnon, 1993)). The dependent variable is the Jensen's alpha for each county retreived from a one-factor international CAPM regression (all indexes in USD) on the -03/15 time sample (displayed in Table 5) and -08/92 and 09/92- time samples, respectively, and the independent are country scores for Uncertainy Avoidance from Hofstede (2015). EHB>0.5 implies that only observations within the indicated time span before two consecutive years of Equity Home Bias below a coefficient of 0.5 for a country, as measured by underlying dataset to Coeuracier and Rey (2012) and EWN II (2011), have been included in the regressions. The coefficients for the constant are suppressed in the presentation.The standard error for each coefficient is shown in parentheses to the left of coefficient values

MSCI	*Period*	*Uncertainty Avoidance*	*Observations*	R^2
All	- 03/15	-0.000 [0.003]	28	0.0006
	- 08/92	0.017 [0.011]	28	0.0768
	09/92 -	-0.006•* [0.003]	28	0.1325
Developed Countries	- 03/15	-0.006•• [0.002]	19	0.3597
	- 08/92	-0.007 [0.005]	19	0.1858
	09/92 -	-0.007••• [0.002]	19	0.1665
Emerging and Frontier Countries	- 03/15	0.003 [0.010]	9	0.0193
	- 08/92	0.045 [0.026]	9	0.2273
	09/92 -	-0.005 [0.007]	9	0.0719
Asia	- 03/15	-0.005 [0.003]	6	0.3943
	- 08/92	-0.003 [0.007]	6	0.0089
	09/92 -	-0.008•• [0.002]	6	0.6101
Non-Asia	- 03/15	0.001 [0.003]	22	0.0018
	- 08/92	0.021 [0.013]	22	0.1018
	09/92 -	-0.006* [0.003]	22	0.1172

*** significant at 1 % level in a two-sided test, hc1 robust std. errors; ••• , hc1 & hc3 robust std. errors
** significant at 5 % level in a two-sided test, hc1 robust std. errors; •• , hc1 & hc3 robust std. errors
* significant at 10 % level in a two-sided test, hc1 robust std. errors; • , hc1 & hc3 robust std. errors

Table 24 – Regressions with interaction-terms, multi-factor Jensen's alphas model (EHB>0.5), to test coefficients proxying for Uncertainty Avoidance for significant change over time

All regressions are estimated using ordinary least squares and robust standard errors (HC1; as well as significance for coefficients applying HC3 as complementary information (MacKinnon and White, 1985; Davidson and MacKinnon, 1993)). The dependent variable is the Jensen's alpha for each country retrieved from one-factor international CAPM regressions (all indexes in USD) on our sample for years in the -08/92 and 09/92- time samples, respectively, and the independent variables country scores for Uncertainty Avoidance from Hofstede (2015), an interaction term of the latter term with a time dummy dividing the data set in pre and post August 1992 and the time dummy alone. EHB>0.5 implies that only observations within the indicated time span before two consecutive years of Equity Home Bias below a coefficient of 0.5 for a country, as measured by underlying dataset to Coeuracier and Rey (2012) and EWN II (2011), have been included in the regressions. The coefficients for the constant and time dummy alone are suppressed in the presentation. The standard error for each coefficient is shown in parenthesis to the left of coefficient values

MSCI	*Period*	*UAv.*	*UAv.*TimeDummy*	*Observations*	R^2
All	- 03/15	0.017 [0.011]	-0.023• [0.012]	56	0.1569
Developed	- 03/15	-0.007 [0.005]	0.000 [0.005]	38	0.2121
Asia	- 03/15	-0.003 [0.007]	-0.006 [0.007]	12	0.4689
Non-Asia	- 03/15	0.022 [0.013]	-0.027•* [0.013]	44	0.1616

*** significant at 1 % level in a two-sided test, hc1 robust std. errors; ••• , hc1 & hc3 robust std. errors
** significant at 5 % level in a two-sided test, hc1 robust std. errors; •• , hc1 & hc3 robust std. errors
* significant at 10 % level in a two-sided test, hc1 robust std. errors; • , hc1 & hc3 robust std. errors

The findings are inconclusive but in a few cases clearly (hyperBeta, Individualism) when available to be tested, rejects the hypothesis of cultural stationary through the result that explanatory effect of INTRA or cultural scores varies over time. However, it should be noted that such result could be due to our model of the international CAPM assuming full and constant world market integration, while empirically, shifting degrees of world financial market integration indeed have occurred over the studied period. In particular, in the case of Emerging and Frontier Markets, far from full integration can be assumed, but also in Developed countries major changes in integration have been empirically concluded (Bekaert et al., 2010; 2013; Harvey, 1995; 2001). A second caveat relates to the fact that it could indeed be the effect of, and not the actual culture or risk attitude parameter, which varies over time. A third that shifts in degree of Equity Home Bias over time impact the results.

Running a sporadic number of regressions [2.2] including more than one behavioural or cultural variable in each render inconclusive results. All five studied variables in the same regression regressed on Jensen's alphas makes none of them significant in the group and time samples tested. In some instances, running one variable significant on its own in a sample of the data together with one that it correlates significantly with, which either also exhibit significance on its own in the data sample or not, ends up with both coefficients having an insignificant effect in explaining alphas (e.g. Individualism and hyberBeta; Uncertainty Avoidance and hyperBeta). In other instances where the same combinations of variables in terms of significance and correlation are regressed, the significance remains for one or two of the variables (e.g. Individualism and Ambiguity Aversion; Individualism and Uncertainty Avoidance). Adding a variable which does not correlate with another eliminates significance in some instances (e.g. Ambiguity Aversion and logTheta) and not in other (e.g. Masculinity and logTheta). No case is found where adding a variable makes a variable insignificant on its own significant. The mediating effect that Rieger and Ngo (2013) reported between Uncertainty Avoidance and Ambiguity Aversion is not confirmed by this paper's method and data sample. The regressions so render little of value.

At last the sanity check on the reasoning regarding EHB cut-offs (Table 27, Appendix) on EHB<0.5 and EHB<0.7 datasets for All countries and the full time sample shows that logTheta and Uncertainty Avoidance are significant based on the EHB<0.7 dataset and Individualism based on EHB<0.5. Two of the observed significances are at the 10% level and one at the 5% level (HC1). The hypothesis that none of the studied variables have an effect on the ERPs in the counterfactual EHB-datasets can so not be unanimously rejected.

6. Discussion

The findings of this paper is not consistent with previous by Rieger and Wang (2012) and Rieger and Ngo (2013) which find wide evidence that the same proxies for Ambiguity Aversion and MLA, as well as cultural dimensions, all significantly explain cross-country ERPs for the countries in INTRA over a full time sample. Their country sample is however not completely equal to this paper's. While Rieger and Wang study all 53 countries in INTRA and Rieger and Ngo 38, this study limits the initial sample to 30 countries through availability of MSCI indexes dating back to 1988 or further. Furthermore, their full time sample is neither equivalent to our, nor any of our sub time samples. More importantly, the methods to reach empirical conclusions in this paper differ from the ones in the previous two on several aspects. Contrary to those studies, this one applies comparable panel data to calculate ERP rates, only use observations which reach certain thresholds of Equity Home Bias, and controls for other risk factors which could create differences in ERP between countries through one version of the international CAPM. The results of the latter method should theoretically render more accurate results. Firstly, underlying ERP panel data, retrieved from a single and primary source and denominated in the same currency, is used to extract Jensen's alphas. This makes the observations very comparable. The panel structure of the data allows the observations to be divided into analogous time samples, facilitating testing of any differences between time periods. Secondly, with the caveat of the actual validity of the international CAPM, and the effects of the assumptions made to the one applied in this paper, we control for all undiversifiable risk when regressing the parameters on Jensen's alphas. While Rieger and Wang (2012) and Rieger and Ngo (2013) indeed do control for several variables, such as GDP per capita, Gini coefficients and legal coefficients, empirical evidence on the effect on ERPs of these control variables is sometimes ambiguous and not widely accepted. Furthermore, such control variables miss major factors as countries industry composition (and accompanying weighted industry Betas). International CAPM, if functional, should according to theory capture all undiversifiable effects.

Disregarding observations with too low degree of Equity Home Bias should improve accuracy of the results. One exception, would be if too many observations are removed, affecting statistical power and shortening time series substantially. A second problem could once more relate to this study's assumption of full integration in applying the international CAPM. If degree of Equity Home Bias is interpreted as one indicator of financial integration, removing observations with the highest coefficients should leave a less integrated sample. Such reasoning is confirmed by the fact that the international CAPM seems to work better, as measured by fewer significant Jensen's alphas, for the data when EHB>0.5 (Table 5) than when EHB>0.7 (Table 6, Appendix).

A third caveat in relation to the Equity Home Bias cut-offs becomes apparent by our tests on the counterfactual datasets where we find significance effects on the ERP for three variables.

Noticeable, logTheta which is insignificant in the EHB>0.5 and EHB>0.7 datasets, is significant in the counterfactual to EHB>0.7. Furthermore, Uncertainty Avoidance is significant in EHB<0.7. One speculative explanation emerges for these two variables specifically. For all countries, degree of EHB follows a downward sloping trend, which implies that the counterfactual to our EHB>0.5 and EHB>0.7 datasets includes more recent MSCI time samples. Since the risk attitude and cultural scores are time-invariant, assumed stationary over time, but this study has evidenced them to, at least according to tests in some settings, be non-stationary (e.g. Uncertainty Avoidance for All countries over the full time-sample (Table 24; Table 26, Appendix), which is the group and time sample the regressions based on the counterfactual data are run on). If the variables indeed are non-stationary, any actual effect of scores on the ERP should be more pronounced in more recent time samples since both the risk attitudes and cultural scores have been collected recently, in 2008 for Hofstede's VSM and 2007-2009 for INTRA, providing a better representation of recent rather than past attitudes. Such a reasoning, with underlying assumption of non-stationarity, would not be supported for e.g. the variables Ambiguity Aversion, hyperbolic time discounting, Individualism and Masculinity, as most significant coefficients we find for them are in pre-1992 time samples. However for Uncertainty Avoidance we find most significances in post-1992 samples and for neutral loss aversion we do not know where any significant effect, if found, would be on the time scale. It could so be that even though the counterfactual data is distorted with inflow of other countries' risk attitudes and cultures at the same time as each country see a substantial outflow of their own attitudes and culture, these flows are not sufficient to eliminate findings for Uncertainty Avoidance and neutral loss aversion for a country having an effect on its ERP in a more recent time sample, close to that time when the VSM and INTRA was conducted, and for which the behavioural and cultural scores, under assumption of non-stationarity, are relatively more representative compared to less recent, ranging up to 45 years past the surveys, time samples.

A single result for Individualism (EHB<0.5) is furthermore noted. In this discussion it is treated as a haphazard outlier. It should furthermore be noticed that two of the significances are at a 10% level, and one at 5% (HC1) and 10% (HC3), and all are based on very few observations. Furthermore, the times series for the counterfactuals are very short, averaging 9.6 (EHB<0.5) and 14.2 (EHB<0.7) years, implying high standard errors, which together with significance levels limited at 5-10%, further supports the case that the observations might just be haphazard.

The fact that one, due to noise in data, needs sufficiently long time-series of historical equity risk premiums to rigorously infer anything of value, or at all, is a general obstacle to studies based on historic ERP data. The time-series for the sample of countries applied in the tests in this study span, in their initial form, from a maximum of 45.2 years (more than half of the 28 countries

studied), to an average length of 37.2 years, and a minimum of 27.3 years (11 out of 28 countries studies) (Table 1). Damodaran (2014) exemplifying the steep increase in standard errors as shorter time spans of historical ERP levels are studied, and the fact that they quickly reach unreasonable levels compared to the actual ERP levels observed, insinuates 25 years as a potential rule of thumb for minimum number of years of data, especially if the sample includes highly volatile markets. Our initial time range could be deemed acceptable by that rule of thumb. Three issues do however emerge in the course of this study, two that shortens the initial time-series i) we cut the time-series at thresholds EHB>0.5 and EHB>0.7 ii) for the purpose of interim results we split the time-series in two intervals, pre-1992 and post-1992. Calculations show that these two measures increase standard errors, although i) does not imply an average length below 25 years. Thirdly, and intuitive examining their volatility as well as emphazised by Damodaran (2014), inclusion of Emerging markets in studies that use the historical equity risk premiums as basis could be problematic.

Apart from their volatility, there is also a tendency that available ERP time-series for Emerging countries usually are both shorter and less reliable. For our sample the latter two assertions does however not hold true. The fact that the time series for Emerging Markets not are shorter than those of Developing (and actually longer in the EHB>0.5 and EHB>0.7 datasets due to generally lower degrees of Equity Home Bias in Developing market) is partially affected by the study's inclusion criteria of only time-series spanning a certain time back. Moreover by that MSCI has selected to incept time-series on those Emerging or Frontier countries where there have been any reliable documentation of time-series for long, as well as the INTRA survey being conducted in those Emerging countries where there is relative stabilisation and development and therefore more mature equity markets.

7. Conclusion

Through control through one version of the international CAPM and methods of panel regressions to extract comparable input data on ERPs, this study test country-scores for risk preferences, risk aversion and time discounting made available by the INTRA-survey by Rieger, Wang and Hens, and proxying for Ambiguity Aversion and Myopic Loss Aversion, as well as a selected number of Hofstede's cultural dimensions, for any empirical effect on the size of the ERP. Results indicate that Ambiguity Aversion have an effect on the size of the ERP, augmenting its size, and therefore contribute to explain the Equity Premium Puzzle. No effect is found for the full sample nor any sub group or time sample w.r.t. both of the proxies for MLA. Neutral loss aversion, one of the two proxies for MLA, does however exhibit a positive significant effect in a few subsamples. Furthermore, the three cultural variables studied, Individualism, Masculinity and Uncertainty Avoidance; all affects the size of the ERP. Their effect on ERP levels is however negative, and thus

rather add to the puzzling size of the ERP. It should be noted that the effect of the cultural variables are much smaller in magnitude compared to those of Ambiguity Aversion and neutral loss aversion.

Both the methods in this study, motivated by a more robust anchoring in asset pricing academia, and the results differ from that of previous studies. Rieger and Wang (2012) and Rieger and Ngo (2013) find evidence that all five parameters contribute to explain the size of the ERP over the full time samples they study.

Furthermore, regressions with interaction-terms show that the variables studied not always are stable over time. Such results not only questions Hofstede's assumption of cultural stationarity, but also the ability to extrapolate risk attitude parameters or cultural scores measured at a point in time backwards or forwards, and thereby the results of both this, Rieger and Wang's (2012), Rieger and Ngo's (2013) and other studies. Non-stationarity indicates that culture and risk attitudes does not pose an impediment to increased global convergence of ERPs.

There are prospects to complement or update this study. While more complex, an ATP-factor model (Ross, 1976; or in an international version e.g. Levine, 1989) is more flexible and adaptable to model an undefined number of country-specific macroeconomic factors. The CAPM has its weaknesses (see e.g. Roll, 1977), and in particular with the simplifying assumptions of an international version. As thoroughly discussed, a version of the CAPM that incorporates time-switching integration is more complex, but could render more accurate results. Additional tests when time discounting values for all countries in INTRA has been reviewed and could be useful. Other parameters derived from INTRA, likewise any other survey, could render useful results (e.g. on other "irrational" traits theorized to affect the size of the ERP). The stationarity assumption of cultural parameters and risk attitudes with reference to investing is an underinvestigated matter, and could yield very interesting results w.r.t., among other, potential cross-country convergence of the ERP.

As with almost all studies using historical ERP data, a follow-up when longer periods of reliable (and for the purpose of this study's tests also comparable) data is available could add value.

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Appendix

Table 3 – Correlation matrix for the Behavioural and Cultural variables

Calculations of the correlations are based on scores for the variables from the countries in this study (displayed in Table 2) retrieved from Rieger et al. (2013; 2015) and Hofstede (2015). The degrees of freedom for each correlation, n-2, applied w.r.t. the table of critical values of the Pearson Product-Moment Correlation Coefficient, used to test significance of the correlations, is shown in parentheses to the left of coefficient values

Variable	*Ambiguity Aversion*	*Hyperbolic Time Discounting, hyperBeta*	*Neutral Loss Aversion, logTheta*	*Individualism*	*Masculinity*
Hyperbolic Time Discounting, hyperBeta	-0.16 [22]				
Neutral Loss Aversion, logTheta	0.27 [22]	0.03 [22]			
Individualism	-0.44** [28]	0.48** [22]	-0.33 [22]		
Masculinity	-0.01 [28]	-0.21 [22]	-0.22 [22]	0.04 [28]	
Uncertainty Avoidance	0.28 [28]	-0.54*** [22]	-0.13 [22]	-0.36* [28]	0.20 [28]

*** significant at 1 % level in a two-sided test
** significant at 5 % level in a two-sided test
* significant at 10% level in a two-sided test

Table 5 – One-factor international CAPM by country (EHB>0.5)

All regressions are estimated using ordinary least squares. The dependent variable is the MSCI Standard Index for each country less the 30-day U.S. Treasury bill rate, and the independent the MSCI Standard world market portfolio less the 30-day U.S. Treasury bill rate (MSCI, 2015; Fama and French, 2015). All indexes are denominated in USD. EHB<0.5 represents the first of two consecutive years of Equity Home Bias below a coefficient of 0.5 for a country, as measured by underlying dataset to Coeuracier and Rey (2012) and EWN II (2011). Only observations within the indicated time span, representing MSCI less years after EHB<0.5, have been included in the regressions. The standard error for each coefficient is shown in parentheses to the left of coefficient values. The p-value from a Wald test of joint significance of the alpha coefficients for all countries in the sample is reported at the bottom of the fourth column

MSCI	*EHB<0.5*	*Period*	*a*	*β*	*Observations*	R^2
World		01/70 - 03/15			543	
Developed						
Australia		01/70 - 03/15	0.010 [0.228]	1.062*** [0.053]	543	0.4247
Austria	01.99	01/70 - 12/98	0.155 [0.311]	0.482*** [0.075]	348	0.1073
Belgium	01.07	01/70 - 12/06	0.190 [0.203]	0.838***[0.049]	443	0.3964
Canada		01/70 - 03/15	0.055 [0.156]	1.019***[0.037]	543	0.5901
Denmark		01/70 - 03/15	0.406** [0.192]	0.820***[0.045]	543	0.3831
Finland						
France		01/70 - 03/15	0.084 [0.192]	1.111*** [0.045]	543	0.5334
Germany		01/70 - 03/15	0.137 [0.192]	1.050*** [0.035]	543	0.5042
Hong Kong		01/70 - 03/15	0.696* [0.375]	1.120*** [0.088]	543	0.2320
Ireland						
Italy		01/70 - 03/15	-0.151 [0.263]	0.985*** [0.062]	543	0.3230
Japan		01/70 - 03/15	0.193 [0.195]	0.951*** [0.046]	543	0.4477
Netherlands	01.01	01/70 - 12/00	0.221 [0.181]	0 .914***[0.044]	372	0.5423
New Zealand		01/88 - 03/15	-0.050 [0.312]	0.872*** [0.072]	399	0.2728
Norway	01.07	01/70 - 12/06	0.393 [0.300]	1.002***[0.073]	443	0.3002
Portugal		01/88 - 03/15	-0.435 [0.299]	0.962*** [0.069]	327	0.3701
Spain		01/70 - 03/15	-0.095 [0.229]	1.000*** [0.042]	543	0.3934
Sweden		01/70 - 03/15	0.399* [0.216]	1.113*** [0.050]	543	0.4761
Switzerland	01.08	01/70 - 12/07	0.296* [0.179]	0.879*** [0.044]	457	0.4714
UK		01/70 - 03/15	0.019 [0.185]	1.080*** [0.043]	543	0.5378
USA		01/70 - 03/15	0.048 [0.090]	0.912*** [0.021]	543	0.7792
Emerging or Frontier						
Argentina		01/88 - 03/15	1.576* [0.815]	0.906*** [0.189]	327	0.0663
Chile		01/70 - 03/15	0.625* [0.347]	0.725*** [0.080]	327	0.2001
Greece		01/70 - 03/15	-0.219 [0.731]	1.201*** [0.124]	327	0.2232
Malaysia		01/88 - 03/15	0.268 [0.397]	0.823***[0.092]	327	0.1983
Mexico		01/70 - 03/15	1.086*** [0.456]	1.134*** [0.093]	327	0.3133
South Korea		01/88 - 03/15	0.338 [0.497]	1.291*** [0.115]	327	0.2799
Taiwan	01.08	01/88 - 12/07	0.403 [0.672]	0.892***[0.169]	241	0.1046
Thailand	01.08	01/70 - 12/07	0.348 [0.661]	1.270*** [0.167]	241	0.1951
Turkey		01/70 - 03/15	1.050 [0.827]	1.318***[0.191]	327	0.1279
Prob > F			*0.000*			

*** significant at 1 % level in a two-sided test

** significant at 5 % level in a two-sided test

* significant at 10% level in a two-sided test

Table 6 – One-factor international CAPM by country (EHB>0.7)

All regressions are estimated using ordinary least squares. The dependent variable is the MSCI Standard Index for each country less 30-day U.S. Treasury bill rates, and the independent the MSCI Standard world market portfolio less 30-day U.S. Treasury bill rates (MSCI, 2015; Fama and French, 2015). All indexes are denominated in USD. EHB<0.7 represents the first of two consecutive years of Equity Home Bias below a coefficient of 0.7 for a country, as measured by underlying dataset to Coeuracier and Rey (2012) and EWN II (2011). Only observations within the indicated time span, representing MSCI less years after EHB<0.7, have been included in the regression. The standard error for each coefficient is shown in parentheses to the left of coefficient values. The p-value from a Wald test of joint significance of the alpha coefficients for all countries in the sample is reported at the bottom of the fourth column

MSCI	*EHB<0.7*	*Period*	α	β	*Observations*	R^2
World					543	
Developed						
Australia		01/70 - 03/15	0.010 [0.228]	1.062*** [0.053]	543	0.4243
Austria	01/97	01/70 - 12/96	0.228 [0.322]	0.445*** [0.078]	324	0.0914
Belgium	01/07	01/70 - 12/06	0.190 [0.203]	0.838*** [0.049]	443	0.3962
Canada		01/70 - 03/15	0.056 [0.157]	1.018*** [0.036]	543	0.5901
Denmark	01/00	01/70 - 12/99	0.406** [0.192]	0.820*** [0.045]	360	0.3832
Finland						
France	01/03	01/70 - 12/02	0.160 [0.252]	1.029*** [0.059]	396	0.3143
Germany	01/98	01/70 - 12/97	0.184 [0.266]	0.802**** [0.065]	336	0.1002
Hong Kong		01/70 - 03/15	0.696 [0.375]	1.120*** [0.087]	543	0.2333
Ireland						
Italy	01/00	01/70 - 12/99	-0.062 [0.362]	0.813*** [0.087]	360	0.4604
Japan		01/70 - 03/15	0.364 [0.258]	1.084*** [0.062]	543	0.4532
Netherlands	01/90	01/70 - 12/89	-0.057 [0.278]	0.957 ***[0.036]	241	0.5491
New Zealand	01/97	01/82 - 12/96	0.205 [0.570]	0.740*** [0.139]	180	0.1374
Norway	01/07	01/70 - 12/06	0.387 [0.300]	1.001*** [0.073]	443	0.3002
Portugal	01/03	01/88 - 12/02	-0.121 [0.440]	0.805*** [0.103]	180	0.2543
Spain		01/70 - 03/15	-0.095 [0.230]	0.999*** [0.053]	543	0.3941
Sweden	01/01	01/70 - 12/00	0.487 [0.281]	0.895*** [0.068]	372	0.3221
Switzerland	01/88	01/70 - 12/87	0.152 [0.288]	0.921*** [0.068]	216	0.4644
UK	01/00	01/70 - 12/99	0.086 [0.269]	1.129*** [0.065]	360	0.4592
USA	01/06	01/70 - 12/05	-0.120 [0.110]	0.917*** [0.026]	431	0.7392
Emerging or Frontier						
Argentina		01/88 - 03/15	1.576* [0.815]	0.906*** [0.188]	327	0.0665
Chile		01/70 - 03/15	0.625* [0.347]	0.725*** [0.080]	327	0.2001
Greece		01/70 - 03/15	-0.184 [0.535]	1.201*** [0.124]	327	0.2245
Malaysia		01/88 - 03/15	0.268 [0.397]	0.823*** [0.0919]	327	0.1982
Mexico		01/70 - 03/15	1.086*** [0.402]	1.134*** [0.093]	327	0.3134
South Korea		01/88 - 03/15	0.338* [0.497]	1.292*** [0.115]	327	0.2801
Taiwan	01/08	01/88 - 12/07	0.422 [0.675]	0.884*** [0.171]	241	0.1956
Thailand	01/08	01/70 - 12/07	0.348 [0.661]	1.270*** [0.166]	241	0.1954
Turkey		01/70 - 03/15	1.054 [0.825]	1.317*** [0.191]	327	0.1273
Prob > F			*0.000*			

*** significant at 1 % level in a two-sided test

** significant at 5 % level in a two-sided test

* significant at 10% level in a two-sided test

Table 9 – Ambiguity Aversion on Jensen's alphas (EHB>0.7)

All regressions are estimated using ordinary least squares and robust standard errors (HC1; as well as significance for coefficients applying HC3 as complementary information (MacKinnon and White, 1985; Davidson and MacKinnon, 1993)). The dependent variable is the Jensen's alpha for each county retreived from a one-factor international CAPM regression (all indexes in USD) on the -03/15 time sample (displayed in Table 6) and -08/92 and 09/92- time samples, respectively, and the independent are country scores for Ambiguity Aversion from Rieger et al. (2015). EHB>0.7 implies that only observations within the indicated time span before two consecutive years of Equity Home Bias below a coefficient of 0.7 for a country, as measured by underlying dataset to Coeuracier and Rey (2012) and EWN II (2011), have been included in the regressions. The coefficients for the constant are suppressed in the presentation.The standard error for each coefficient is shown in parentheses to the left of coefficient values

MSCI	*Period*	*Ambiguity Aversion*	*Observations*	R^2
All	- 03/15	1.100•* [0.510]	28	0.0575
	- 08/92	5.176••• [1.622]	28	0.0880
	09/92 -	-0.274 [0.760]	26	0.0045
Developed Countries	- 03/15	0.274 [0.607]	19	0.0102
	- 08/92	0.416 [1.105]	19	0.0068
	09/92 -	-0.115 [1.087]	17	0.0008
Emerging and Frontier Countries	- 03/15	-1.012 [1.946]	9	0.0179
	- 08/92	-2.310 [7.644]	9	0.0064
	09/92 -	-1.396 [1.367]	9	0.0510
Asia	- 03/15	0.093 [0.545]	6	0.0025
	- 08/92	6.347* [2.530]	6	0.5739
	09/92 -	-0.972 [1.438]	6	0.0353
Non-Asia	- 03/15	1.264 [0.834]	22	0.0526
	- 08/92	5.773* [3.209]	22	0.0754
	09/92 -	0.598 [0.900]	20	0.0212

*** significant at 1 % level in a two-sided test, hc1 robust std. errors; ••• , hc1 & hc3 robust std. errors
** significant at 5 % level in a two-sided test, hc1 robust std. errors; •• , hc1 & hc3 robust std. errors
* significant at 10 % level in a two-sided test, hc1 robust std. errors; • , hc1 & hc3 robust std. errors

Table 10 – Regressions with interaction-terms, multi-factor Jensen's alphas model (EHB>0.7), to test coefficients proxying for Ambiguity Aversion for significant change over time

All regressions are estimated using ordinary least squares and robust standard errors (HC1; as well as significance for coefficients applying HC3 as complementary information (MacKinnon and White, 1985; Davidson and MacKinnon, 1993)). The dependent variable is the Jensen's alpha for each country retrieved from one-factor international CAPM regressions (all indexes in USD) on our sample for years in the -08/92 and 09/92- time samples, respectively, and the independent variables country scores for Ambiguity Aversion from Rieger et al. (2015), an interaction term of the latter term with a time dummy dividing the data set in pre and post August 1992 and the time dummy alone. EHB>0.7 implies that only observations within the indicated time span before two consecutive years of Equity Home Bias below a coefficient of 0.7 for a country, as measured by underlying dataset to Coeuracier and Rey (2012) and EWN II (2011), have been included in the regressions. The coefficients for the constant and time dummy alone are suppressed in the presentation. The standard error for each coefficient is shown in parenthesis to the left of coefficient values

MSCI	*Period*	*Ambiguity Aversion*	*Ambiguity Aversion*TimeDummy*	*Observations*	R^2
All	- 03/15	5.176••• 1.624	-5.449••• [1.793]	54	0.1572
Asia	- 03/15	6.348** [2.530]	-7.319** [2.910]	12	0.7074
Non-Asia	- 03/15	5.773* [3.217]	-5.175 [3.340]	42	0.1191

*** significant at 1 % level in a two-sided test, hc1 robust std. errors; ••• , hc1 & hc3 robust std. errors
** significant at 5 % level in a two-sided test, hc1 robust std. errors; •• , hc1 & hc3 robust std. errors
* significant at 10 % level in a two-sided test, hc1 robust std. errors; • , hc1 & hc3 robust std. errors

Table 13 – Myopic Loss Aversion on Jensen's alphas (EHB>0.7)

All regressions are estimated using ordinary least squares and robust standard errors (HC1; as well as significance for coefficients applying HC3 as complementary information (MacKinnon and White, 1985; Davidson and MacKinnon, 1993)). The dependent variable is the Jensen's alpha for each county retreived from a one-factor international CAPM regression (all indexes in USD) on the -03/15 time sample (displayed in Table 6) and -08/92 and 09/92- time samples, respectively,and the independent are country scores for hyperbolic time discounting (hyperBeta), neutral loss aversion (logTheta) from Rieger et al. (2013). EHB>0.7 implies that only observations within the indicated time span before two consecutive years of Equity Home Bias below a coefficient of 0.7 for a country, as measured by underlying dataset to Coeuracier and Rey (2012) and EWN II (2011), have been included in the regressions. The coefficients for the constant are suppressed in the presentation. The standard error for each coefficient is shown in parentheses to the left of coefficient values

MSCI	*Period*	*hyperBeta*	*logTheta*	*Observations*	R^2
All	- 03/15	-0.389 [0.672]	0.305 [0.223]	23	0.1471
	- 08/92	-5.004* [2.477]	1.145 [1.007]	23	0.2373
	09/92 -	0.746 [0.647]	0.046 [0.134]	22	0.0781
Developed Countries	- 03/15	0.329 [0.658]	0.255 [0.126]	15	0.2021
	- 08/92	0.199 [1.157]	0.438 [0.313]	15	0.1449
	09/92 -	0.906 [0.826]	0.106 [0.174]	14	0.0807
Emerging and Frontier Countries	- 03/15	0.095 [1.106]	0.088 [0.486]	8	0.0112
	- 08/92	-2.951 [4.806]	0.256 [2.066]	8	0.0425
	09/92 -	0.450 [1.015]	0.050 [0.249]	8	0.0537
Asia	- 03/15	-0.036 [0.253]	-0.119 [0.103]	6	0.1319
	- 08/92	0.709 [1.891]	0.485 [0.617]	6	0.1106
	09/92 -	-0.073 [0.865]	0.237 [0.469]	6	0.0716
Non-Asia	- 03/15	-0.674 [0.881]	0.463 [0.317]	17	0.2190
	- 08/92	-7.498•* [2.845]	1.786 [1.379]	17	0.3631
	09/92 -	1.131 [0.812]	0.149 [0.102]	16	0.2924

*** significant at 1 % level in a two-sided test, hc1 robust std. errors; ••• , hc1 & hc3 robust std. errors
** significant at 5 % level in a two-sided test, hc1 robust std. errors; •• , hc1 & hc3 robust std. errors
* significant at 10 % level in a two-sided test, hc1 robust std. errors; • , hc1 & hc3 robust std. errors

Table 14 – Regression with interaction terms, multi-factor Jensen's alphas model (EHB>0.7), to test coefficients proxying for MLA for significant change over time

All regressions are estimated using ordinary least squares and robust standard errors (HC1; as well as significance for coefficients applying HC3 as complementary information (MacKinnon and White, 1985; Davidson and MacKinnon, 1993)). The dependent variable is the Jensen's alpha for each country retrieved from one-factor international CAPM regressions (all indexes in USD) on our sample for years in the -08/92 and 09/92- time samples, respectively, and the independent variables country scores for hyperbolic time discounting (hyperBeta), neutral loss aversion (logTheta) from Rieger et al. (2013), interaction-terms of the two latter terms with a time dummy dividing the data set in pre and post 08/92 and the time dummy alone. EHB>0.7 implies that only observations within the indicated time spans before two consecutive years of Equity Home Bias below a coefficient of 0.7 for a country, as measured by underlying dataset to Coeuracier and Rey (2012) and EWN II (2011), have been included in the regressions. The coefficients for the constant and time dummy alone are suppressed in the presentation. The standard error for each coefficient is shown in parentheses to the left of coefficient values

MSCI	*Period*	*hyperBeta*	*logTheta*	*hyperBeta*TimeDummy*	*logTheta*TimeDummy*	*Observations*	R^2
All	- 03/15	-5.004* [2.482]	1.145 [1.009]	5.749•* [2.564]	-1.099 [1.018]	45	0.3015
Non-Asia	- 03/15	-7.498•* [2.856]	1.786 [1.384]	8.629••* [2.968]	-1.637 [1.387]	33	0.3982

*** significant at 1 % level in a two-sided test, hc1 robust std. errors; ••• , hc1 & hc3 robust std. errors
** significant at 5 % level in a two-sided test, hc1 robust std. errors; •• , hc1 & hc3 robust std. errors
* significant at 10 % level in a two-sided test, hc1 robust std. errors; • , hc1 & hc3 robust std. errors

Table 17 – Individualism on Jensen's alphas (EHB>0.7)

All regressions are estimated using ordinary least squares and robust standard errors (HC1; as well as significance for coefficients applying HC3 as complementary information (MacKinnon and White, 1985; Davidson and MacKinnon, 1993)). The dependent variable is the Jensen's alpha for each county retreived from a one-factor international CAPM regression (all indexes in USD) on the -03/15 time sample (displayed in Table 6) and -08/92 and 09/92- time samples, respectively, and the independent are country scores for Individualism from Hofstede (2015). EHB>0.7 implies that only observations within the indicated time span before two consecutive years of Equity Home Bias below a coefficient of 0.7 for a country, as measured by underlying dataset to Coeuracier and Rey (2012) and EWN II (2011), have been included in the regressions. The coefficients for the constant are suppressed in the presentation.The standard error for each coefficient is shown in parentheses to the left of coefficient values

MSCI	*Period*	*Individualism*	*Observations*	R^2
All	- 03/15	-0.006•• [0.003]	28	0.1127
	- 08/92	-0.030••• [0.009]	28	0.2028
	09/92 -	0.004 [0.002]	26	0.0478
Developed Countries	- 03/15	-0.002 [0.004]	19	0.0173
	- 08/92	-0.002 [0.009]	19	0.0122
	09/92 -	0.005 [0.004]	17	0.0871
Emerging and Frontier Countries	- 03/15	0.006 [0.013]	9	0.0310
	- 08/92	-0.005 [0.059]	9	0.0015
	09/92 -	0.010** [0.003]	9	0.1276
Asia	- 03/15	-0.002 [0.002]	6	0.0654
	- 08/92	-0.034•••[0.004]	6	0.8868
	09/92 -	0.010 [0.012]	6	0.0020
Non-Asia	- 03/15	-0.007 [0.005]	22	0.1099
	- 08/92	-0.038** [0.017]	22	0.2156
	09/92 -	0.002 [0.003]	20	0.0114

*** significant at 1 % level in a two-sided test, hc1 robust std. errors; ••• , hc1 & hc3 robust std. errors
** significant at 5 % level in a two-sided test, hc1 robust std. errors; •• , hc1 & hc3 robust std. errors
* significant at 10 % level in a two-sided test, hc1 robust std. errors; • , hc1 & hc3 robust std. errors

Table 18 – Regressions with interaction-terms, multi-factor Jensen's alphas model (EHB>0.7), to test coefficients proxying for Individualism for significant change over time

All regressions are estimated using ordinary least squares and robust standard errors (HC1; as well as significance for coefficients applying HC3 as complementary information (MacKinnon and White, 1985; Davidson and MacKinnon, 1993)). The dependent variable is the Jensen's alpha for each country retrieved from one-factor international CAPM regressions (all indexes in USD) on our sample for years in the -08/92 and 09/92- time samples, respectively, and the independent variables country scores for Induvidualism from Hofstede (2015), an interaction term of the latter term with a time dummy dividing the data set in pre and post August 1992 and the time dummy alone. EHB>0.7 implies that only observations within the indicated time span before two consecutive years of Equity Home Bias below a coefficient of 0.7 for a country, as measured by underlying dataset to Coeuracier and Rey (2012) and EWN II (2011), have been included in the regressions. The coefficients for the constant and time dummy alone are suppressed in the presentation. The standard error for each coefficient is shown in parenthesis to the left of coefficient values

MSCI	*Period*	*Individualism*	*Individualism*Timedummy*	*Observations*	R^2
All	- 03/15	-0.030••• [0.009]	0.033••• [0.009]	54	0.2594
Em. & Fr.	- 03/15	-0.005 [0.059]	0.016 [0.059]	18	0.3671
Asia	- 03/15	-0.034••• [0.004]	0.035** [0.032]	12	0.8181
Non-Asia	- 03/15	-0.038•* [0.017]	0.039•• [0.017]	42	0.2471

*** significant at 1 % level in a two-sided test, hc1 robust std. errors; ••• , hc1 & hc3 robust std. errors
** significant at 5 % level in a two-sided test, hc1 robust std. errors; •• , hc1 & hc3 robust std. errors
* significant at 10 % level in a two-sided test, hc1 robust std. errors; • , hc1 & hc3 robust std. errors

Table 21 – Masculinity on Jensen's alphas (EHB>0.7)

All regressions are estimated using ordinary least squares and robust standard errors (HC1; as well as significance for coefficients applying HC3 as complementary information (MacKinnon and White, 1985; Davidson and MacKinnon, 1993)). The dependent variable is the Jensen's alpha for each county retreived from a one-factor international CAPM regression (all indexes in USD) on the -03/15 time sample (displayed in Table 6) and -08/92 and 09/92- time samples, respectively, and the independent are country scores for Masculinity from Hofstede (2015). EHB>0.7 implies that only observations within the indicated time span before two consecutive years of Equity Home Bias below a coefficient of 0.7 for a country, as measured by underlying dataset to Coeuracier and Rey (2012) and EWN II (2011), have been included in the regressions. The coefficients for the constant are suppressed in the presentation.The standard error for each coefficient is shown in parentheses to the left of coefficient values

MSCI	*Period*	*Masculinity*	*Observations*	R^2
All	- 03/15	0.000 [0.002]	28	0.0006
	- 08/92	0.005 [0.009]	28	0.0047
	09/92 -	-0.008•* [0.003]	26	0.1960
Developed Countries	- 03/15	0.001 [0.002]	19	0.0032
	- 08/92	-0.003 [0.003]	19	0.0277
	09/92 -	-0.011*** [0.003]	17	0.5342
Emerging and Frontier Countries	- 03/15	0.001 [0.007]	9	0.0015
	- 08/92	-0.005 [0.042]	9	0.0015
	09/92 -	0.004 [0.004]	9	0.0285
Asia	- 03/15	-0.001 [0.001]	6	0.0050
	- 08/92	-0.022* [0.010]	6	0.5931
	09/92 -	-0.007 [0.010]	6	0.1333
Non-Asia	- 03/15	-0.000 [0.003]	22	0.0000
	- 08/92	0.011 [0.012]	22	0.0209
	09/92 -	-0.007•• [0.003]	20	0.1651

*** significant at 1 % level in a two-sided test, hc1 robust std. errors; ••• , hc1 & hc3 robust std. errors
** significant at 5 % level in a two-sided test, hc1 robust std. errors; •• , hc1 & hc3 robust std. errors
* significant at 10 % level in a two-sided test, hc1 robust std. errors; • , hc1 & hc3 robust std. errors

Table 22 – Regressions with interaction-terms, multi-factor Jensen's alphas model (EHB>0.7), to test coefficients proxying for Masculinity for significant change over time

All regressions are estimated using ordinary least squares and robust standard errors (HC1; as well as significance for coefficients applying HC3 as complementary information (MacKinnon and White, 1985; Davidson and MacKinnon, 1993)). The dependent variable is the Jensen's alpha for each country retrieved from one-factor international CAPM regressions (all indexes in USD) on our sample for years in the -08/92 and 09/92- time samples, respectively, and the independent variables country scores for Masculinity from Hofstede (2015), an interaction term of the latter term with a time dummy dividing the data set in pre and post August 1992 and the time dummy alone. EHB>0.7 implies that only observations within the indicated time span before two consecutive years of Equity Home Bias below a coefficient of 0.7 for a country, as measured by underlying dataset to Coeuracier and Rey (2012) and EWN II (2011), have been included in the regressions. The coefficients for the constant and time dummy alone are suppressed in the presentation. The standard error for each coefficient is shown in parenthesis to the left of coefficient values

MSCI	*Period*	*Masculinity*	*Masculinity*TimeDummy*	*Observations*	R^2
All	- 03/15	0.005 [0.009]	-0.012 [0.009]	54	0.0938
Developed	- 03/15	0.003 [0.003]	-0.013••* [0.005]	36	0.2243
Asia	- 03/15	-0.022* [0.010]	0.015 [0.014]	12	0.7283
Non-Asia	- 03/15	0.011 [0.012]	-0.018 [0.013]	42	0.0741

*** significant at 1 % level in a two-sided test, hc1 robust std. errors; ••• , hc1 & hc3 robust std. errors
** significant at 5 % level in a two-sided test, hc1 robust std. errors; •• , hc1 & hc3 robust std. errors
* significant at 10 % level in a two-sided test, hc1 robust std. errors; • , hc1 & hc3 robust std. errors

Table 25 – Uncertainty Avoidance on Jensen's alphas (EHB>0.7)

All regressions are estimated using ordinary least squares and robust standard errors (HC1; as well as significance for coefficients applying HC3 as complementary information (MacKinnon and White, 1985; Davidson and MacKinnon, 1993)). The dependent variable is the Jensen's alpha for each county retreived from a one-factor international CAPM regression (all indexes in USD) on the -03/15 time sample (displayed in Table 6) and -08/92 and 09/92- time samples, respectively, and the independent are country scores for Uncertainy Avoidance from Hofstede (2015). EHB>0.7 implies that only observations within the indicated time span before two consecutive years of Equity Home Bias below a coefficient of 0.7 for a country, as measured by underlying dataset to Coeuracier and Rey (2012) and EWN II (2011), have been included in the regressions. The coefficients for the constant are suppressed in the presentation.The standard error for each coefficient is shown in parentheses to the left of coefficient values

MSCI	*Period*	*Uncertainty Avoidance*	*Observations*	R^2
All	- 03/15	0.001 [0.003]	28	0.0024
	- 08/92	0.018 [0.011]	28	0.0807
	09/92 -	-0.005* [0.003]	26	0.1305
Developed	- 03/15	-0.003* [0.002]	19	0.1784
	- 08/92	-0.007 [0.005]	19	0.1771
	09/92 -	-0.006* [0.003]	17	0.2075
Emerging and Frontier Countries	- 03/15	0.003 [0.011]	9	0.0198
	- 08/92	0.042 [0.026]	9	0.2146
	09/92 -	-0.005 [0.008]	9	0.0705
Asia	- 03/15	-0.002 [0.003]	6	0.1322
	- 08/92	0.003 [0.009]	6	0.0101
	09/92 -	-0.015** [0.005]	6	0.6933
Non-Asia	- 03/15	0.000 [0.004]	22	0.0111
	- 08/92	0.021 [0.013]	22	0.1036
	09/92 -	-0.005 [0.003]	20	0.1176

*** significant at 1 % level in a two-sided test, hc1 robust std. errors; ••• , hc1 & hc3 robust std. errors
** significant at 5 % level in a two-sided test, hc1 robust std. errors; •• , hc1 & hc3 robust std. errors
* significant at 10 % level in a two-sided test, hc1 robust std. errors; • , hc1 & hc3 robust std. errors

Table 26 – Regressions with interaction-terms, multi-factor Jensen's alphas model (EHB>0.7), to test coefficients proxying for Uncertainty Avoidance for significant change over time

All regressions are estimated using ordinary least squares and robust standard errors (HC1; as well as significance for coefficients applying HC3 as complementary information (MacKinnon and White, 1985; Davidson and MacKinnon, 1993)). The dependent variable is the Jensen's alpha for each country retrieved from one-factor international CAPM regressions (all indexes in USD) on our sample for years in the -08/92 and 09/92- time samples, respectively, and the independent variables country scores for Uncertainty Avoidance from Hofstede (2015), an interaction term of the latter term with a time dummy dividing the data set in pre and post August 1992 and the time dummy alone. EHB>0.7 implies that only observations within the indicated time span before two consecutive years of Equity Home Bias below a coefficient of 0.7 for a country, as measured by underlying dataset to Coeuracier and Rey (2012) and EWN II (2011), have been included in the regressions. The coefficients for the constant and time dummy alone are suppressed in the presentation. The standard error for each coefficient is shown in parenthesis to the left of coefficient values

MSCI	*Period*	*UAv.*	*UAv.*TimeDummy*	*Observations*	R^2
All	- 03/15	0.017 [0.011]	-0.023• [0.012]	54	0.1569
Developed	- 03/15	-0.007 [0.005]	0.001 [0.006]	36	0.1892
Asia	- 03/15	0.003 [0.010]	-0.018 [0.011]	12	0.5921

*** significant at 1 % level in a two-sided test, hc1 robust std. errors; ••• , hc1 & hc3 robust std. errors
** significant at 5 % level in a two-sided test, hc1 robust std. errors; •• , hc1 & hc3 robust std. errors
* significant at 10 % level in a two-sided test, hc1 robust std. errors; • , hc1 & hc3 robust std. errors

Table 27 – Variables studied on Jensen's alphas (EHB<0.5 and EHB<0.7)

All regressions are estimated using ordinary least squares and robust standard errors (HC1; as well as significance for coefficients applying HC3 as complementary information (MacKinnon and White, 1985; Davidson and MacKinnon, 1993)). The dependent variable is the Jensen's alpha for each county retreived from a one-factor international CAPM regression (all indexes in USD) on the -03/15 time sample from EHB<0.5 and EHB<0.7 datasets, and the independant are scores for the behavioural and cultural variables for the same countries from Rieger et al. (2013; 2015) and Hofstede (2015). EHB<0.5 (EHB<0.7) implies that only observations within the indicated time span after two consecutive years of Equity Home Bias below a coefficient of 0.5 (0.7) for a country, as measured by underlying dataset to Coeuracier and Rey (2012) and EWN II (2011), have been included in the regressions. The coefficients for the constant are suppressed in the presentation. The standard error for each coefficient is shown in parentheses to the left of coefficient values

MSCI	*Period*	*Dataset*	*Ambiguity Aversion*		*Observations*	R^2
All	- 03/15	EHB<0.5	1.034 [0.934]		7	0.2342
All	- 03/15	EHB<0.7	0.321 [0.938]		16	0.0103
MSCI	*Period*	*Dataset*	*hyperBeta*	*logTheta*	*Observations*	R^2
All	- 03/15	EHB<0.5	-1.393 [1.265]	0.828 [0.205]	4	0.9092
All	- 03/15	EHB<0.7	0.841 [1.052]	0.366* [0.164]	12	0.4173
MSCI	*Period*		*Individualism*		*Observations*	R^2
All	- 03/15	EHB<0.5	-0.009* [0.004]		7	0.4980
All	- 03/15	EHB<0.7	-0.001 [0.005]		16	0.0025
MSCI	*Period*		*Masculinity*		*Observations*	R^2
All	- 03/15	EHB<0.5	0.002 [0.004]		7	0.0283
All	- 03/15	EHB<0.7	-0.001 [0.003]		16	0.0072
MSCI	*Period*		*Uncertainty Avoidance*		*Observations*	R^2
All	- 03/15	EHB<0.5	-0.004 [0.005]		7	0.0625
All	- 03/15	EHB<0.7	-0.009•* [0.004]		16	0.3327

*** significant at 1 % level in a two-sided test, hc1 robust std. errors; ••• , hc1 & hc3 robust std. errors

** significant at 5 % level in a two-sided test, hc1 robust std. errors; •• , hc1 & hc3 robust std. errors

* significant at 10 % level in a two-sided test, hc1 robust std. errors; • , hc1 & hc3 robust std. errors