How Culture Affects Risk Aversion
– A Cross-Country Analysis of the Mutual Fund Industry

Pontus Granlund
Stockholm School of Economics
Stockholm, Sweden
22271@student.hhs.se

Jakob Nilsson
Stockholm School of Economics
Stockholm, Sweden
22636@student.hhs.se

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Abstract

In this paper we examine how cultural aspects affect individuals' investment preferences on a national level. We employ Geert Hofstede's masculinity index to measure these cultural differences and use mutual fund data from 29 countries to determine risk-taking. The funds are examined in a cross country analysis with average values on loadings from the Carhart four-factor model in order to pinpoint different investment strategies relating to risk. We obtain both statistically and economic significant results and conclude that masculine countries are more prone to risky investments in the sense that they index less and use active management to a greater extent.

Tutor – Bige Kahraman

Keywords – Mutual funds, Risk, Carhart four-factor, Culture, Cross-country

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1. Introduction

In the wake of the recent crisis, the financial sector has been subjected to more intense scrutiny, and perhaps justifiably so. Both legislative bodies and the general public have increased the pressure on financial institutions to become more transparent and responsible in a way that corresponds to the public opinion, both globally and locally. However, we ask ourselves whether the general view on financial risk is the same across national borders? Or are there differences in how risk is perceived and in what way the capital under management is allocated differently across different countries? It is commonly perceived that individuals have different risk-preferences, but could these differences be observed on a national level as well? In today's global economy where financial markets are arguably more intertwined than ever before, it should be of increasingly great importance to understand the possible implications of culture in financial decision-making. *In this paper we propose to investigate how cultural differences between countries are observable in the amount of risk the private investor is willing to incur in investing their hard earned savings.*

The way we propose to approach our research question is to use a measure capturing cultural differences between countries and relate that measure to the level of financial risk incurred by a given country. We have chosen to use the cultural index developed by Geert Hofstede known as the Masculinity index (MAS) as a measure of cultural differences between countries and to use mutual fund data as an indication of how much risk the average individual is willing to incur within the same country.[1] Our initial hypothesis is that there is a positive correlation between MAS and the degree of risk-taking observed. We find this topic particularly intriguing because the possible implications this could have on the asset management industry and on the perception of investor rationality.

1.1 Cultural differences – Masculinity index

The masculinity index measures values often associated with the masculine or the feminine gender, such as assertiveness versus modesty and tough versus tender. Tenderness and modesty are associated with the feminine while assertiveness and

[1] Hofstede, G. (1991). *Software of the Mind.* New York: McGraq-Hill International.

toughness are associated with the masculine countries. However, the index does not contrast differences between men and women but rather which values are the most important to the society as a whole. The index is built upon a qualitative survey conducted in 53 countries and regions where each country receives a masculinity score between zero and one hundred, where the most feminine country (Sweden) received a score of 5 and the most masculine country in the survey (Japan) received 95.[2] We believe MAS is a fitting measure to use since values associated with masculinity often are related to higher risk-taking. We base this initial view on, amongst other examples, the common view that men take greater risks when driving, usually causing more accidents than women, translating into higher risk premiums for car insurances.

1.2 Measure of risk – Mutual fund data

In order to observe risk behavior and preferences we look at mutual fund data for the countries included in the masculinity index. We propose that funds will, in the long run, be removed or adapted to reflect the demand of investors. In a sense, the individual investors in a country vote with their capital according to their risk preference, investment style preference etc. By using the daily return for mutual funds from our countries of interest, as well as data for the Carhart four-factor model, we are able to estimate the loadings for all four factors as well as the alpha. We estimate these on a country level, for each quarter for the period of 2008 to 2013, both using the average and the value-weighted average net asset value for the funds in the dataset. The reason for estimating both the average and the weighted average is to be able to determine if the differences between countries originate from a few large funds or from many smaller ones. With the estimated betas we are able to analyze a number of interesting characteristics related to risk-taking, ranging from the degree of indexing to different investment styles, such as investing more in smaller stocks and in growth stocks, as well as how active the funds are, using the tracking error observed, in each country on an aggregated level.

1.3 Relating to previous works

Much research has been conducted both with regards to risk-taking and culture. In "How does culture affect corporate risk taking" by Ki li et al. a similar approach to ours is used. However, in their measurement of culture they use other indexes developed by Hofstede,

[2] Hofstede, G. (1991). *Software of the Mind.* New York: McGraq-Hill International.

such as individualism and harmony. This cultural measurement is then tested for correlation against, amongst other things, the standard deviation of R&D expenses in corporations.[3] Our approach is different in both the cultural aspect, because we use a different cultural index, and in the measurement of risk, focusing on the country level instead of the corporate level.

Another related paper, "Gender differences in risk behavior in financial decision-making: An experimental analysis" by M. Powell and D. Ansic, looks closer at the individual differences between genders in risk taking. This paper supports the notion that there is a difference in financial risk taking between men and women. They propose the cause comes from differences in motivation. In our paper, this motivation can be explained by the MAS measure. Thus as opposed to their paper, our analysis examines the country level aggregate of this motivation using MAS, we look at risk taking differences between countries with feminine or masculine values and thus hope to capture the differences in this motivation proposed by the authors.[4]

Furthermore, our analysis of how culture, on a national level, affects mutual funds risk taking would add some deeper explanation about funds and their characteristics and how these differ across countries. We are specifically thinking about the paper "Mutual fund corporate culture and performance" by A. Gottesman and M. Morey which looks at how fund performance is affected by corporate culture on a fund level. Our approach is rather how national culture affects the mutual funds and though mutual funds are but a proxy for individual investment decision the analysis is interesting because it broadens the understanding of how certain cultural aspects affect fund characteristics.[5]

1.4 Key results

We find that our results support our initial hypothesis that there is a positive correlation between a country's level of masculinity and the level of risk taken on by the average mutual fund in that country. This correlation remains after testing for robustness by adding relevant control variables.

[3] Li, K., Griffin, D., Yue, H., & Zhao, L. (2013). How does culture affect corporate risk taking? *Journal of Corporate Finance 23*, 1-23.
[4] Powell, M., & Ansic, D. (1997). Gender differences in risk behavior in financial decision-making: An experimental analysis. *Journal of economic psychology 18*, 605-628.
[5] Gottesman, A., & Morey, M. (May 2011). Mutual Fund Corporate Culture and Performance. New York: Pace University.

As we regress our estimated country level fund beta on MAS we find that there is negative correlation between beta and MAS. This is in line with our hypothesis, since a lower beta, by definition, implies a lower degree of indexing and consequently a higher degree of stock picking which is associated with greater risk. Although we obtain statistically significant results, at the one percent level, both for our unweighted and weighted models, the impact is much larger for our weighted models. An increase in two standard deviations in MAS will result in a decrease in beta of 0.125 (for our full weighted model), but only a decrease of 0.034 for the equivalent unweighted model. This would imply that larger funds index to a lesser extent than smaller funds.

Furthermore, when regressing the tracking error, obtained using the Carhart four-factor model, on the same variables as we did with beta, we observe a positive correlation between the tracking error and MAS. Since a high tracking error implies a higher level of activeness, not explained by stock picking and investment style, this gives additional credence to our hypothesis. However, we observe both lower significance levels and economic impact for our weighted models. Our proposed explanation for this is that larger funds have more formalized structures and procedures leading to smaller variation in tracking error compared to smaller less institutionalized funds.

Lastly, when looking at differences in investment style we obtain additional results supporting our thesis, namely that countries with a higher measure of MAS tend to invest more in smaller stocks. The positive correlation between SMB and MAS is significant at a one percent level for both our unweighted models and our weighted models. Once again, the effect is larger for our weighted models, implying that larger funds tend to invest more in smaller stocks than do the smaller funds.

1.4.1 Implications

The results we present could have important implications both for investors and fund managers. Consider the fund manager who plans to launch a fund with a high degree of stock picking and with an investment focus on small cap stocks. According to our research such a fund manager would normally benefit from marketing the fund in a country with a higher level of masculinity. Likewise, investors could use these results as an initial screening process to find potential funds to invest in matching their personal risk preferences.

2. Previous literature

2.1 Theoretical framework

In this paper, much of the analysis regarding style and its implication on risk is based on the Carhart four factor model. The traditional CAPM model explains about 70% of the diversified portfolio returns while the extended four factor model explains about 90%. The Carhart four-factor model is a corner stone in our analysis as it helps us to pinpoint styles which we in our analysis relate to risk. The model is constructed as:

$$Return = \alpha + \beta_1 * Mkt\ premium + \beta_2 * SMB + \beta_3 * HML + \beta_4 * MOM + \varepsilon$$

Where return is the return which is the observed daily return for the different funds. The market premium is the premium which is expected from the investment which is calculated as the historical market return minus risk-free rate. Small-minus-big (SMB) is the spread in returns between small and large firms, while high-minus-low (HML) is the spread in returns between growth and value stocks. Momentum (MOM) is the return from executing a strategy that involves being long past winners and shorting past losers. Epsilon is the error, which is the amount of return that cannot be explained by the regression, we are observing this measure as a level of activeness exerted by funds. Regarding the tracking error it is important that the model we use explains as much of portfolio diversification as possible in order to pinpoint the level of activeness.[6]

Our main independent variable that covers the cultural factor, the degree of masculinity, is taken from the works of Geert Hofstede.[7] Based on a study of IBM employees around the world where the participants were asked to answer a questionnaire and rate their agreement to different statements Hofstede developed the masculinity index. It was named the masculinity index because it was the only dimension of culture where men and women answered consistently different. Based on this survey Hofstede examined the cultural differences between the countries. Countries that held tender values were labeled feminine while countries that held tough values were labeled masculine. Hofstede examined how people in these countries value certain ideals and what is considered to be the norm. Table 1 below shows some of the differences in values found by Hofstede for feminine and masculine societies regarding politics, ideas, general norm, family school and workplace.

[6] Carhart, M.M. (1997). On Persistencee in Mutual Fund Performance. *The Journal of Finance 52*, 57-82.

[7] Geert Hofstede (1928-) is a Dutch social psychologist and professor emeritus at the University of Maastricht.

Table 1 Value differences between feminine and masculine countries

Feminine	Masculine
Everybody is supposed to be modest	Men are supposed to be assertive, ambitious and tough
The needy should be helped	The strong should be supported
Permissive society	Corrective society
Small and slow are beautiful	Big and fast are beautiful
People and warm relationships are important	Money and things are important
Average student is the norm	Best student is the norm
Stress on equality, solidarity and quality of work life	Stress on equity competition among colleagues, and performance
Failing in school is a minor disaster	Failing in school is a disaster
Work in order to live	Live in order to work
Government spends relatively large proportion of budget on development assistance to poor countries	Government spends relatively small proportion of budget on development assistance to poor countries
Government spends relatively small proportion of budget on armaments	Government spends relatively large proportion of budget on armaments

In this paper, we use the masculinity index in order to have an observable measure of cultural differences on aspects we believe to have an effect on personal investment by individuals on a country level. This aspect of culture is mainly the tenderness versus toughness that the masculinity index highlight as a main difference between feminine and masculine countries. It is important to note that this analysis does not look at the gender equality between different countries, even though, gender equality may be correlated to our measurement of culture. In feminine countries the gender differences, in regards to values held by men and women, are smaller than in masculine countries. In the context of Hofstede's work on the masculinity dimension, that means that men and women both exert an equal amount of toughness to a greater extent in feminine countries. In masculine

countries, both men and women show a tendency towards tougher values but men do so in a greater extent than women.

2.2 Our theoretical approach

Countries differ in many ways, both on an institutional and on an individual level. We want to examine if culture can affect investment behavior and risk preference on a national level. Thus we are also answering the questing if it is possible for culture to affect an industry often depicted as utterly rational and fact based. Our main assumptions are:

1. Individuals are shaped by their cultural environment and that this exposure does affect their decision making in relation to risk.
2. The general population in one country can affect their domestic financial market in regards to mutual funds in the long run.

Mutual funds are a common way to invest for people who do not want to put a lot of effort into managing their personal investments themselves. As any other product, successful funds will live on while unsuccessful ones will be removed. Why should our measure of culture affect the fund industry? Well, since our measure of culture mainly covers attitudes to tough values and that increases in MAS mean that the professional environment is more performance and career focused, we believe that these values will be correlated with what can be observed as risky behavior by mutual funds. According to the strong form of the efficient market hypothesis, no matter how successful ones study of the markets are, or how intelligent one is, it is not possible to predict market movements better than the market as a whole. It could thus be deducted from this that funds that follow strategies or use active management in their portfolios are showing proof of overconfidence in their abilities, an attribute that is clearly increasing with MAS or that the investors that invest their money in a fund believe that the fund is able to show proof of above average ability when it comes to investing. Our hypothesis is the following:

H_0: A high observed MAS is positively correlated with an increase in observed risk taking behavior or risky strategies exerted by mutual funds

We will be able to observe risk-taking behavior in countries' fund market based on the average values of its fund industry in different ways. One is the level of indexing; more indexing would indicate that the fund is exerting a low risk strategy, we will be measuring this by the degree to which an average fund in a country correlate with overall market

returns. Another measure is the degree of active management, an increased degree of active management indicates that the fund is prone to risk taking behavior; this can be observed in the tracking error.

2.3 Related works

The approach we have taken is quite unique. And so, related papers include analyses on gender differences regarding risk-taking and the cultural impact on performance and risk. In the paper "How does culture affect corporate risk taking" Li et al. look at the impact of three other dimensions also covered by Hofstede in his book and their impact on their risk taking measures. Their paper examines the cultural dimensions of individualism, uncertainty avoidance and harmony and how they impact risk-taking on a firm and country level. The risk-taking measures used in the paper are standard deviations of operating income and R&D expenses. They conclude that: "*… even in a highly globalized world with sophisticated managers, culture matters.*" We hope to extend that analysis to mutual funds and by way of inference to personal investments. Even though the culture measures and risk measures differ in our paper compared to theirs we hope to be able to show whether or not culture has a significant impact on our dependent variables and to add to the scientific research on the subject of how culture impacts rational investment decisions.

The paper "Gender differences in risk behavior in financial decision-making: An experimental analysis" by M. Powell and D. Ansic looks at gender differences in risk-taking. What makes this paper interesting in relation to ours is that they invite further research based on motivational theory and that the masculinity measure covers this on a national level because it broadly explains that in feminine countries values are to a great extent shared between men and women while in masculine countries they are less so. This difference in values shared between men and women in feminine versus masculine countries also covers motivation as values should affect motivation based on the findings of Hofstede. Our research thus partly shows how this motivational difference affects people's investment decisions and its economic significance.

Previous literature on culture in mutual funds include "Mutual fund corporate culture and performance" by A. Gottesman and M. Morey. Instead of just looking at culture on a country level, they look at how the corporate culture affects mutual fund performance. Although, we take a more holistic view we still hope to shed some light on how culture impacts mutual funds and their behavior.

3. Data methodology

Our analysis is based on joining two datasets, Thomson Reuters Mutual Funds Holdings – s12 Master File and CRSP Mutual Funds – Daily Returns and Net Asset Values, in order to label the funds with country of origin in order to distinguish the funds from each other when we do our cross country analysis. The Thomson Reuters dataset contains mutual fund information such as a funds' country of origin on 20,901 funds. The CRSP dataset contains daily returns and monthly net asset values on mutual funds. The joint dataset has daily observations on 7,567 mutual funds.

3.1 Method of operation

In order to gather mutual fund data we download the data set Thomson Reuters Mutual Funds Holdings in which we restrict our time frame to 2008-12-31 to 2013-12-31. In our analysis we want to look at daily returns for mutual funds globally for the past six years, but we choose to exclude funds that were not active by the end of 2008. This data set gives us quarterly data on mutual funds by country and fund number. The coverage of funds included here are all domestic mutual funds by country and an additional 3,000 global funds. [8]

We drop all funds from countries not included in Hofstede's masculinity index since they will not be relevant for our study. We then extract all unique fund numbers from this data set. With the help of these fund numbers we extract the data on these funds from CRSP mutual funds – daily returns and net asset values which contains the daily returns in the form on return per share and net asset value per share. We then join these two data sets so that we have country of origin and daily returns for each fund from 2008-01-02 to 2013-12-31. [9]

We then drop funds for which the data on return per share is incomplete or funds that have less than 50 observations for one quarter. These observations are data on daily returns for each fund. At this point we add the daily Carhart four factors for each date.[10] Then we run a rolling regression to estimate the Carhart four factor loadings for each fund

[8] Thomson Reuters, dataset. Mutual Funds Holding – s12 Master File. Accessed from Wharton research data services (05/04/2014)
[9] CRSP mutual funds – daily returns and net asset values. Accessed from Wharton research data services (05/04/2014)
[10] French, K. http://mba.tuck.darthmouth.edu/. Accessed from http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html (05/04/2014)

on a quarterly basis and then calculate the quarterly residuals for each quarter for each fund. The regression is run on the daily returns:

$$Return = \alpha + \beta_1 * market\ premium + \beta_2 * SMB + \beta_3 * HML + \beta_4 * MOM$$

In order to get total net asset value for each fund at the end of each quarter we use CRSP mutual funds dataset where net asset values are reported in millions of dollars.
At this point we create a variable which is unique for each fund and quarter upon which we collapse the set around mean values of our variables. Since we are only interested in the net asset value by the end of the quarter we drop all observations for the net asset value except for the last trading day of the quarter. After the collapse we add in the MAS measure for each observation. We end up with quarterly return and net asset value per fund. [11]

The next step is calculating the average return on a quarter and country basis and after that, a weighted average is calculated in the same way but where weight is put on the individual fund's quarterly net asset value. For example: A Swedish fund's weighted average return is its return over the quarter divided by the total net asset value for all Swedish funds during that quarter and then multiplied by that fund's net asset value at the end of the quarter. We calculate average and weighted averages in this way for all our estimated Carhart four-factor loadings as these are to be used in the analysis. This allows us to see how large and small funds differently contribute to their countries' exposure to certain investment styles. We are labeling the model of the average measure as the unweighted model while the weighted average model is labeled weighted model.

A final collapse is made upon the mean of all our variables by country and quarter. This gives us final data which can be used in an analysis of how the different countries are affected by our average and weighted average style measures. We end up with a dataset with one observation per country and quarter, amounting to a total of 24 observations per country. Table 2 provides some descriptive statistics on our constructed data set.

[11] CRSP, dataset. Mutual funds - monthly returns and net asset values. Accessed from Wharton research data services (05/04/2014)

Table 2 Fund sample overview

Country	MAS	No of Funds	Average Total NAV	Average quaterly return	Weighted average quaterly return
SWEDEN	5	52	20,118	1.34%	1.62%
NORWAY	8	53	88,894	1.74%	1.85%
NETHERLANDS	14	34	11,965	1.70%	1.63%
DENMARK	16	40	7,262	1.32%	1.64%
FINLAND	26	25	6,201	1.47%	1.79%
CHILE	28	25	1,689	1.40%	1.84%
PORTUGAL	31	27	5,598	1.52%	1.74%
FRANCE	43	130	26,685	1.47%	1.74%
SINGAPORE	48	33	12,730	1.28%	2.23%
BRAZIL	49	76	34,662	1.63%	1.90%
MALAYSIA	50	16	4,950	1.27%	0.29%
CANADA	52	287	82,360	1.53%	1.40%
BELGIUM	54	66	6,673	1.41%	1.73%
ARGENTINA	56	32	2,982	1.65%	2.09%
INDIA	56	28	6,002	1.82%	2.15%
GREECE	57	6	295	0.57%	0.64%
HONG KONG	57	48	58,274	1.32%	1.77%
AUSTRALIA	61	20	1,582	1.41%	1.25%
UNITED STATES	62	1676	684,043	1.42%	1.65%
SOUTH AFRICA	63	45	14,510	1.78%	2.21%
GERMANY	66	342	179,962	1.50%	1.90%
UNITED KINGDOM	66	309	82,984	1.51%	1.71%
IRELAND	68	25	7,044	1.20%	1.84%
MEXICO	69	54	53,780	1.50%	1.65%
ITALY	70	56	27,109	1.32%	1.15%
SWITZERLAND	70	106	32,255	1.10%	1.46%
SPAIN	72	580	514,664	1.31%	1.69%
AUSTRIA	79	25	45,428	1.62%	1.74%
JAPAN	95	118	19,179	1.35%	1.70%

3.2 Control variables

Our control variables include many general macroeconomic variables on a country level. All our control variables and their values for each country can be found in Table 3 in the appendix. The gini coefficients have been gathered from "The World Fact Book". [12] The purchasing power parity GDP has been taken from the International Monetary Fund and their World Economic Outlook Database and consists of the latest estimates of the gross domestic product, adjusted for purchasing power parity, for each country. [13] Remaining control variables are taken from the World DataBank's Global Financial Development set and these variables have been constructed as the mean over all observations available over the years 2000-2011. [14] Lastly, we add time dummies to control for time varying effects, these are added on a fund and quarter basis. The control variables we have used

[12] CIA. www.cia.gov. Accessed from https://www.cia.gov/library/publications/download (05/04/2014)
[13] International Monetary Fund. www.imf.org. Accessed from http://www.imf.org/external/pubs/ft/weo/2014/01/weodata/index.aspx (05/04/2014)

[14] World Bank. Data.worldbank.org. Accessed from http://data.worldbank.org/data- catalog/global-finance-development (05/04/2014)

are mainly describing how developed the financial markets are in each country and are supposed to cover the effect of this development on mutual fund returns in each country.

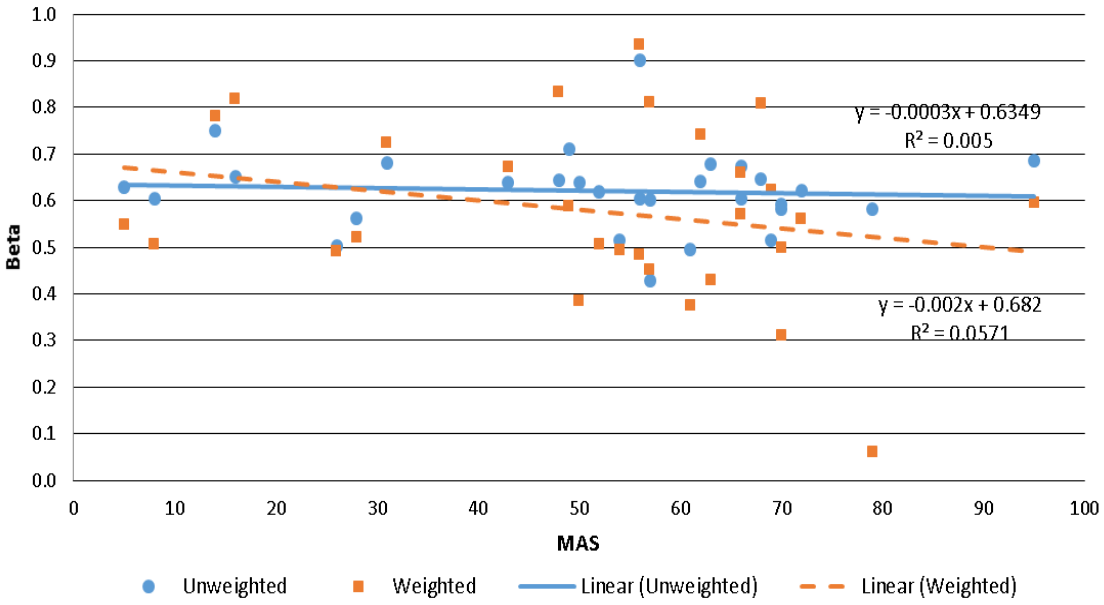
4. Results

When analyzing the data, we obtain several interesting results. In this section we present these results, focusing on the three most significant sets of results. First, we look at how the quarterly beta for the average fund in each country is influenced by MAS and the predetermined set of control variables. Second, we look at the influence of MAS on the tracking error. Third, we do the same thing for the factor loading for the SMB investment style factor. Lastly, we briefly touch upon the remaining results, which can be studied in greater detail in the appendix. An interpretation of the results will be attempted in the concluding remarks of the thesis.

4.1 Analysis of the mutual fund beta

First, when looking at the average beta for the covered period, it is quite hard to uncover a clear correlation between the level of masculinity in a country, given by MAS, and its level of indexation by mutual funds, given by beta. A detailed view, displaying mean, median, and standard deviation and number of observations, for both the unweighted and weighted average of beta for each country in the study, is found in Table A2 in the appendix. Since we are unable to identify any significant deviations between the mean and the median for our beta measures, we include a graphical illustration of only the mean beta, shown in Figure 1 below. When looking at the results in Figure 1 we observe a flat trendline for the average unweighted beta. We observe that, both Sweden and Japan, the two countries with lowest and highest MAS, 5 and 95 respectively, have an unweighted beta above 0.62, namely 0.63 and 0.69, which is the average for entire sample of countries. Argentina and Greece, on the other hand, only differ by one unit of MAS, 56 compared to 57, and yet the average unweighted beta is 0.90 for Argentina and 0.43 for Greece. This is a large difference in the level of indexing employed on average by these two countries, given a standard deviation of 0.09 for all countries in the sample. This difference cannot be explained by the small deviation in MAS, which incidentally has a standard deviation of 22.06. Hence, in the case of Argentina and Greece, a change in $\frac{1}{22}$ standard deviation in MAS leads to a decrease in more than five standard deviations in the average unweighted beta.

Figure 1



However, if we contrast the unweighted beta with the weighted beta, we actually observe quite a significant change. The weighted beta displays a clear negative trend. Granted, this is largely driven by very low weighted beta of 0.06 for Austria, but even if we exclude Austria we would observe a negative relationship between beta and MAS. The difference between our unweighted and weighted betas is driven by how much large and small funds within a country deviate from each other in terms of stock picking. As we can see in Figure 1 and in Table A2 these differences are small for many of the countries in our study. However, some countries display large differences between unweighted and weighted betas. As we alluded to earlier, Austria displays the largest difference between its unweighted and weighted beta, with a weighted beta that is 0.52 points lower than its unweighted beta. Other countries with significantly lower weighted beta than unweighted include Italy, 0.28 points lower, South Africa and Malaysia, both with 0.25 points lower weighted beta. These results would indicate that large funds in these countries index less or engage in stock picking to a much larger extent than the smaller funds. On the other hand, we have few countries where the opposite holds true, where the large funds seem to index more than smaller funds. The countries where this trend is the most prominent are Hong Kong, Singapore, and Denmark, all with a weighted beta that is between 0.17 to 0.21 points higher than the unweighted beta.

The weighted beta should to a larger extent be representative of risk propensity of investors in a country since larger funds have a larger weight. This however does not take into account the fact that different investors do not have an equal distribution of capital and therefore even the weighted beta suffers from an extensive omitted variable bias.

In order to address this bias and to obtain more accurate results we run regressions on beta, both the unweighted and the weighted. The results we obtain are summarized in Table 3 below. The simple regressions in the table indicate how the unweighted and the weighted beta is affected by a unit change in MAS while controlling for time fixed effects and the natural logarithm of both the purchasing power parity adjusted gross domestic product per capita as well as the natural logarithm of the total net asset value in a country. For both our simple regressions we obtain statistically significant results at the one percent level. For the simple regression of the unweighted beta a unit increase in MAS leads to a drop in beta corresponding to 6.18E-04. The effect on the weighted beta is larger, coherent with our initial analysis. For every unit increase in MAS we will see a 2.07E-03 drop in beta. When adding the rest of our control variables we see an even larger negative effect. In order to put this into perspective, consider the effect of an increase in MAS of two standard deviations. This would correspond to going from Finland, with a MAS of 26, to Switzerland, with a MAS of 70. In our full regression model of the weighted beta, such a move would dictate that Switzerland should have a 0.127 lower weighted beta than Finland. This equals approximately $\frac{7}{10}$ of the standard deviation in the observed weighted beta for the countries in our sample. This result can thus be argued to have an important economic significance, and not just a statistical one.

Table 3 Beta Regression	Unweighted		Weighted	
	(1)	(2)	(3)	(4)
VARIABLES	Simple	Full	Simple	Full
MAS	-0.000618***	-0.000774***	-0.00207***	-0.00288***
	(0.000156)	(0.000146)	(0.000374)	(0.000339)
Ln of PPP-adjusted GDP per capita	-0.0330***	0.0275***	0.0314***	0.0918***
	(0.00643)	(0.00686)	(0.0115)	(0.0132)
Ln of total net asset value	0.0136***	0.0144***	0.00765*	-0.0155**
	(0.00238)	(0.00350)	(0.00432)	(0.00607)
Gini coefficient		0.00428***		0.00764***
		(0.000338)		(0.000931)
Stock market turnover ratio (%)		6.71e-05		0.000241
		(0.000145)		(0.000249)
Number of listed companies per 1,000,000 people		-0.000650***		-0.000379*
		(9.45e-05)		(0.000198)
Stock price volatility		0.00435***		0.0117***
		(0.00135)		(0.00197)
Mutual fund assets to GDP (%)		-3.12e-05		0.000667***
		(5.04e-05)		(9.46e-05)
Number of funds		-3.91e-05**		0.000127***
		(1.57e-05)		(2.79e-05)
Constant	0.829***	-0.0278	0.310**	-0.644***
	(0.0653)	(0.0829)	(0.125)	(0.172)
Time dummies	Yes	Yes	Yes	Yes
Observations	696	696	696	696
R-squared	0.167	0.318	0.102	0.364

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

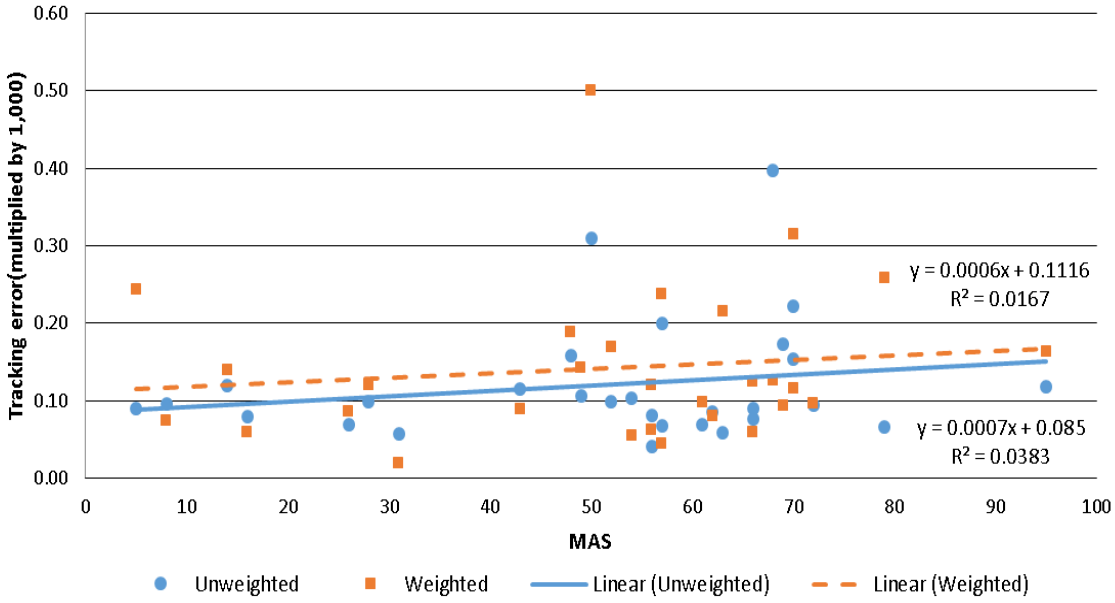
4.2 Analysis of the tracking error

Second, we look at the results we obtain when analyzing the tracking errors. We find a positive correlation between MAS and the tracking error. The tracking error basically gives us a measure of how the actual return differs from the one predicted by the Carhart four-factor model. Therefore, it gives us a measure of the activeness of a fund not explained by any of the four factors in the model. It is therefore easier to say what it does not measure than what the tracking error actually measures. However, the important thing is that it gives us an indication of how much funds deviate from the norm when controlling for the most common investment strategies.

A detailed view, displaying mean, median, and standard deviation and number of observations, for the average tracking error for each country, is found in Table A3 in the appendix. Again we have based these results both on the unweighted and the weighted factors from the Carhart four-factor model to be able to distinguish any potential differences between large and small funds within a given country.

In the scatterplot provided below, Figure 2, we see a somewhat positive correlation between the tracking error and MAS. There seem to be a small systematic difference between the unweighted and the weighted tracking error, with the trendline for the weighted tracking error being consistently above the unweighted. By this we understand that larger funds in general deviate more from the norm than the smaller funds. This tendency is the most prominent in Austria and Malaysia where the weighted tracking error is 1.9E-04 larger than for the unweighted. However, there are a handful countries where the opposite holds true, with Ireland being the most visible example where the unweighted tracking error is 2.7E-04 larger than the weighted tracking error.

Figure 2



To mitigate the omitted variable bias inherent in the initial analysis we regress the tracking error on MAS and the same set of control variables as we did with beta. The results we obtain, shown in Table 4, support the initial analysis of a positive correlation between MAS and the tracking error. However, we lose statistical significance when moving from the unweighted tracking error to the weighted. Both our simple and full regression models for the unweighted tracking error show statistical significant results for MAS at the one percent level, whereas the weighted tracking error only is significant on the five percent level for the simple regression model and the full model only at the ten percent level.

Table 4 Tracking error regression	Unweigthed		Weighted	
	(1)	(2)	(3)	(4)
VARIABLES	Simple	Full	Simple	Full
MAS	1.078***	0.730***	0.910**	0.909*
	(0.382)	(0.278)	(0.449)	(0.486)
Ln of PPP-adjusted GDP per capita	29.84*	25.35	-6.559	-6.710
	(15.87)	(16.62)	(17.71)	(29.81)
Ln of total net asset value	-16.60***	-12.44*	-18.62**	-18.38*
	(6.032)	(6.800)	(8.675)	(10.46)
Gini coefficient		-0.415		0.648
		(0.994)		(1.311)
Stock market turnover ratio (%)		-0.193		0.254
		(0.202)		(0.335)
Number of listed companies per 1,000,000 people		-0.798*		0.105
		(0.434)		(0.310)
Stock price volatility		-2.871*		-3.762
		(1.618)		(3.556)
Mutual fund assets to GDP (%)		0.460		-0.194**
		(0.339)		(0.0969)
Number of funds		0.00248		-0.0248
		(0.0254)		(0.0487)
Constant	-161.1	-38.78	230.1	277.8
	(141.8)	(215.0)	(213.4)	(440.6)
Time dummies	Yes	Yes	Yes	Yes
Observations	696	696	696	696
R-squared	0.440	0.456	0.287	0.291

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Regression was run on the squared residuals which have been multiplied by 1,000,000

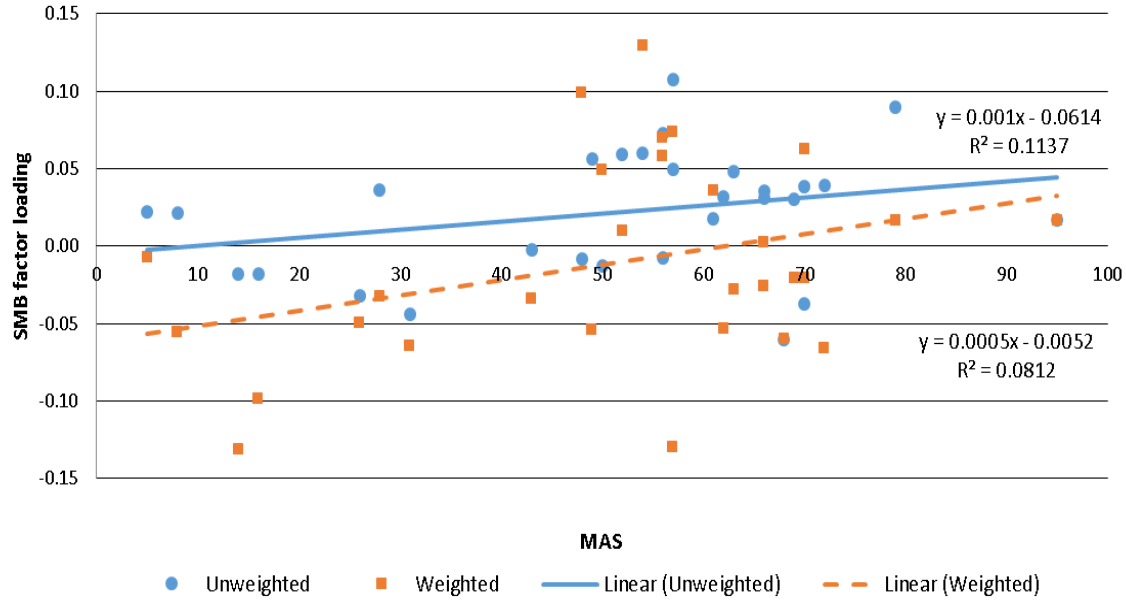
In order to obtain coefficients of a magnitude easier to handle we multiplied the tracking errors by 1,000,000 before we run the regressions. This would imply that a unit increase in MAS would correspond to an increase of 7.3E-07 in the tracking error, for the full unweighted model, or 9.09E-07, for the full weighted model. If we instead consider an increase in two standard deviations in MAS that should imply an increase in the tracking error of 2.33E-05 and 4.01E-05 for the two models respectively. This should be put in relation to the average tracking error for the countries in our sample which is 1.41E-04.

4.3 Analysis of the SMB factor loading

The third set of results we obtain is that of the relationship between the investment strategy of being long small stocks and being short big stocks, referring of course to the market capitalization of the stocks. We find a clear positive correlation between the level of MAS and the SMB factor loading, which will have a positive value if funds invest more in small stocks than in big stocks and a negative value if the opposite holds true.

As with the previous results presented, Table A4, displaying mean, median, and standard deviation and number of observations, for both the unweighted and the weighted average SMB factor loading for each country, is found in the appendix. As shown in Figure 3 below, there is a positive correlation between MAS and the SMB factor loading both for the unweighted and the weighted factor loading. However, the unweighted SMB is consistently higher than the weighted SMB. This would lead us to believe that smaller funds are more prone to invest in small stocks across the globe but that the difference between the smaller and larger funds is much less pronounced in the countries with higher MAS. The average, for the countries in our sample, unweighted SMB factor loading is in fact 0.02 and -0.01 for the weighted SMB. Furthermore, we see a larger spread between the countries for the weighted SMB with a standard deviation of 0.06, compared to 0.04 for the unweighted SMB. The country with the largest discrepancy between the unweighted and the weighted SMB is Hong Kong, where the unweighted value is at 0.05 and for the weighted it drops to -0.13. In this case the large funds must be heavily invested in big stocks in contrast to the smaller funds.

Figure 3



When we add other dimensions to our analysis and run regressions on the SMB factor loadings we are able to control for other variables that might be correlated to the investment style. This way we can better judge the proper impact of MAS on this particular investment strategy.

We find that we obtain statistically significant results on one percent level for MAS in all four regressions. We also find support for our crude analysis that there is a positive correlation between MAS and the SMB factor loading and that this effect is greater for the weighted SMB. In Table 5 below we see that according to our full weighted model, a unit increase in MAS should correspond to an increase of 1.55E-03 units in the SMB factor loading. If MAS were to increase by two standard deviations (approximately 44 units) then this would imply an increase of 0.068 units of the SMB. Besides the statistical significance of these results, it is hard not to see that they will have a large economic impact given the averages of the countries' SMB factor loadings are 0.02 for the unweighted SMB and -0.01 for the weighted SMB with standard deviations of 0.04 and 0.06 respectively.

Table 5 SMB Regression

	Unweighted		Weighted	
	(1)	(2)	(3)	(4)
VARIABLES	Simple	Full	Simple	Full
MAS	0.000443***	0.000522***	0.00132***	0.00155***
	(8.82e-05)	(8.67e-05)	(0.000135)	(0.000132)
Ln of PPP-adjusted GDP per capita	-0.0144***	-0.0293***	0.00209	-0.0119*
	(0.00331)	(0.00429)	(0.00513)	(0.00693)
Ln of total net asset value	0.00215	0.00178	-0.0176***	-0.0151***
	(0.00159)	(0.00210)	(0.00210)	(0.00298)
Gini coefficient		-0.00124***		-0.00227***
		(0.000231)		(0.000369)
Stock market turnover ratio (%)		-0.000320***		-0.000562***
		(6.21e-05)		(7.51e-05)
Number of listed companies per 1,000,000 people		0.000564***		0.000636***
		(6.53e-05)		(8.66e-05)
Stock price volatility		0.00135**		0.000867
		(0.000580)		(0.000581)
Mutual fund assets to GDP (%)		-0.000143***		-0.000400***
		(3.77e-05)		(3.13e-05)
Number of funds		4.76e-05***		6.21e-05***
		(7.78e-06)		(1.10e-05)
Constant	0.158***	0.333***	0.0981**	0.306***
	(0.0322)	(0.0523)	(0.0496)	(0.0835)
Time dummies	Yes	Yes	Yes	Yes
Observations	696	696	696	696
R-squared	0.374	0.455	0.338	0.488

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

4.4 Additional results

We also obtain results from regressions run on the rest of the factor loadings in the Carhart four-factor model, namely for the high minus low book-to-market value and the momentum investment strategy. However, these regressions do not render any significant results, either supporting or opposing our initial hypothesis. We are unable to identify any clear tendencies with regards to these investment styles that would somehow be related to the level of masculinity of a given country in our study. We include regression tables and scatter plots for these two variables in the appendix for reference. The lack of results for these two factors might in and of itself be a reason for closer study in hope of uncovering a relationship unidentifiable to us at this point given our data.

4.5 Summary of results

To summarize, we find that countries with higher MAS in general have a lower beta, i.e. they index less, and that this effect is more prominent for the larger funds. Furthermore, we find that there is a positive correlation between MAS and tracking error. We also find that the larger funds systematically exhibit larger tracking errors than the smaller funds. Lastly, we find that more masculine countries tend to invest in stocks with a smaller market capitalization than more feminine countries. Again, the effect is larger when accounting for the size of the funds than when just looking at the simple arithmetic mean.

5. Conclusion and implications

We conclude that the results we obtain are consistent with our initial hypothesis that countries with a higher level of masculinity would likely exhibit signs of a higher level of risk-taking. A lower beta indicates a lower degree of indexing, or in other words, a higher degree of stock picking. A higher degree of stock picking is related to a higher degree of risk. Larger and more established funds likely have greater leniency from investors to engage in activities entailing higher risk. Smaller funds are often young, not yet established, and will often be punished more harshly by capital out-flows when displaying poor performance.[15] The cost of deviating from consensus is a high price to pay if being wrong.

[15] Chevalier, Judith, and Glenn Ellison. ”Career concerns of mutual fund managers.” The Quarterly Journal of Economics 114.2 (1999): 389-432.

This might also be a plausible explanation for why larger funds exhibit larger tracking errors than smaller funds, regardless of the level of masculinity of the country of domicile out the funds. Younger mutual funds will to a larger extent have to be able to defend their course of action and not engage in unorthodox trading styles. However, it could be argued that smaller funds should have greater flexibility than larger, more institutionalized funds, and thus be able to engage in trading activities not explained by the Carhart four-factor model. However, the higher tracking error observed for more masculine countries provides additional support for our thesis that there is a positive correlation between the level of masculinity in a country and risk-propensity of the average investor, shown by the decision to invest in funds with higher tracking errors.

Lastly, the positive correlation between the SMB investment strategy and MAS further strengthens our thesis. We expected more masculine countries to engage in these two investment strategies to a greater extent since investing in smaller stocks or growth stocks, with low book-to-market value, often is associated with a higher degree of risk. The only thing that weakens our hypothesis somewhat is the ostensible lack of correlation between HML and MAS that we expected.

We recognize some apparent weaknesses in our paper. The fact that, even though we introduced several control variables to mitigate an omitted variable bias, it is far from unthinkable that we have not included variables in our models that would explain some of the correlation between our independent and dependent variables. As an example we tried to control for the fact that in most countries a fairly small portion of the population holds a larger portion of the capital by controlling for the income distribution by introducing the gini coefficient. However, this might not be enough to draw pertinent conclusions about the common investor. Another potential weakness is our reliance on Hofstede's masculinity index in our analysis. We recognize the criticism this index has endured by other scholars.[16] Regardless of these weaknesses, we still consider having obtained sufficient support for our initial hypothesis in order not to reject it. We encourage others to use this research as inspiration for future research in this field, which we think could greatly influence the global industry of asset management going forward.

[16] Moulettes, A. (2007). The absence of women's voices in Hofstede's Cultural Consequences. *Women in Management Review 22*, 443-455.

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Table A1 Control variables overview

Country	MAS	Gini	Stock market turnover ratio	Number of listed stocks per 100,000	Stock price volatility	Mutual fund assets to GDP %	GDP per Capita PPP adjusted	Ln of Average Total NAV
ARGENTINA	56	45.8	9.54	2.68	33.93	2.17	16495.61	7.98
AUSTRALIA	61	30.3	80.17	79.86	14.93	23.20	40250.01	7.25
AUSTRIA	79	26.3	43.58	11.52	21.57	30.48	40450.40	10.70
BELGIUM	54	28	41.69	16.98	18.42	27.57	36789.54	8.63
BRAZIL	49	51.9	49.06	2.14	31.49	35.58	11197.55	10.40
CANADA	52	32.1	73.95	102.89	18.47	43.63	40896.60	11.24
CHILE	28	52.1	18.40	14.72	16.61	11.55	16797.14	6.92
DENMARK	16	28.4	79.82	36.65	20.88	25.97	36751.80	8.84
FINLAND	26	26.8	113.46	25.69	30.73	21.38	34997.88	8.68
FRANCE	43	32.7	95.75	13.45	23.64	62.83	34375.20	10.07
GERMANY	66	27	133.78	8.38	23.85	41.92	36851.05	12.05
GREECE	57	34.3	49.85	28.20	26.04	11.95	26171.16	5.52
HONG KONG	57	53.7	83.40	158.63	24.97	357.42	48150.20	10.97
INDIA	56	36.8	128.17	4.60	26.75	5.46	3510.22	8.63
IRELAND	68	33.9	42.46	13.93	22.02	304.42	40147.84	8.77
ITALY	70	31.9	134.95	4.88	22.44	22.98	29738.75	10.12
JAPAN	95	45.5	105.90	25.43	22.50	11.14	34538.79	9.73
MALAYSIA	50	46.2	32.11	35.93	15.10	19.93	15622.99	8.14
MEXICO	69	48.3	28.33	1.31	23.38	6.24	14652.54	10.89
NETHERLANDS	14	30.9	135.45	11.03	23.67	15.23	40926.77	9.33
NORWAY	8	25	109.37	40.26	25.35	13.37	52984.40	11.37
PORTUGAL	31	38.5	63.45	5.64	16.46	11.63	22989.29	8.54
SINGAPORE	48	47.8	67.32	109.92	20.28	46.37	57273.44	9.42
SOUTH AFRICA	63	63.1	49.28	9.04	20.72	25.97	10754.00	9.40
SPAIN	72	32	163.79	67.58	23.29	24.25	29915.93	13.13
SWEDEN	5	23	117.45	32.57	25.64	33.55	38585.92	9.60
SWITZERLAND	70	29.6	94.64	34.62	19.52	33.23	43667.71	10.35
UNITED KINGDOM	66	40	132.72	38.69	18.72	26.50	36077.23	11.29
UNITED STATES	62	45	207.20	18.04	20.33	69.47	49641.49	13.41

Table A2 Beta per Country

			Mean		Median		Standard Deviation		Differences (unweighted minus weighted)		
Country	MAS	No. of observations	Unweighted	Weighted	Unweighted	Weighted	Unweighted	Weighted	Mean	Median	Std. Deviation
SWEDEN	5	1322	0.63	0.55	0.63	0.52	0.04	0.10	0.08	0.11	-0.06
NORWAY	8	1249	0.60	0.51	0.60	0.48	0.04	0.08	0.10	0.11	-0.04
NETHERLANDS	14	773	0.75	0.78	0.75	0.79	0.06	0.08	-0.03	-0.04	-0.02
DENMARK	16	996	0.65	0.82	0.65	0.82	0.05	0.07	-0.17	-0.17	-0.02
FINLAND	26	615	0.50	0.49	0.51	0.48	0.05	0.07	0.01	0.03	-0.02
CHILE	28	752	0.56	0.52	0.56	0.54	0.05	0.10	0.04	0.02	-0.05
PORTUGAL	31	639	0.68	0.72	0.67	0.71	0.04	0.05	-0.04	-0.04	-0.02
FRANCE	43	2967	0.64	0.67	0.64	0.68	0.04	0.07	-0.03	-0.04	-0.03
SINGAPORE	48	812	0.64	0.83	0.64	0.83	0.05	0.05	-0.19	-0.19	-0.01
BRAZIL	49	1785	0.71	0.59	0.71	0.60	0.05	0.10	0.12	0.11	-0.06
MALAYSIA	50	374	0.64	0.38	0.64	0.27	0.05	0.25	0.25	0.37	-0.20
CANADA	52	7035	0.62	0.51	0.62	0.51	0.03	0.08	0.11	0.11	-0.04
BELGIUM	54	1429	0.51	0.49	0.52	0.48	0.06	0.10	0.02	0.04	-0.04
ARGENTINA	56	758	0.90	0.93	0.89	0.93	0.04	0.07	-0.03	-0.03	-0.03
INDIA	56	875	0.61	0.48	0.60	0.45	0.07	0.12	0.12	0.15	-0.06
GREECE	57	208	0.43	0.45	0.42	0.43	0.08	0.19	-0.02	-0.01	-0.11
HONG KONG	57	1130	0.60	0.81	0.63	0.82	0.08	0.06	-0.21	-0.19	0.02
AUSTRALIA	61	489	0.49	0.37	0.49	0.29	0.04	0.21	0.12	0.19	-0.17
UNITED STATES	62	39263	0.64	0.74	0.64	0.74	0.03	0.05	-0.10	-0.10	-0.02
SOUTH AFRICA	63	1074	0.68	0.43	0.68	0.41	0.04	0.14	0.25	0.26	-0.11
GERMANY	66	8257	0.61	0.66	0.60	0.65	0.03	0.05	-0.05	-0.05	-0.02
UNITED KINGDOM	66	7579	0.67	0.57	0.68	0.57	0.03	0.05	0.10	0.11	-0.02
IRELAND	68	576	0.65	0.81	0.65	0.85	0.07	0.11	-0.16	-0.20	-0.04
MEXICO	69	1261	0.51	0.62	0.50	0.61	0.04	0.05	-0.11	-0.11	-0.01
ITALY	70	1448	0.59	0.31	0.59	0.31	0.05	0.06	0.28	0.28	-0.01
SWITZERLAND	70	2621	0.58	0.50	0.57	0.51	0.05	0.06	0.08	0.07	-0.01
SPAIN	72	14551	0.62	0.56	0.62	0.56	0.04	0.08	0.06	0.06	-0.04
AUSTRIA	79	710	0.58	0.06	0.58	0.06	0.05	0.07	0.52	0.52	-0.02
JAPAN	95	2907	0.69	0.60	0.69	0.57	0.06	0.09	0.09	0.12	-0.03
Average of total	51.41	3601.90	0.62	0.58	0.62	0.57	0.05	0.09	0.04	0.05	-0.04
Standard deviation of total	22.06	7552.59	0.09	0.19	0.09	0.20	0.01	0.05	0.16	0.17	0.05

Table A3 Tracking Error per Country (multiplied by 1,000)

			Mean		Median		Standard Deviation		Differences		
Country	MAS	No. of observations	Unweighted	Weighted	Unweighted	Weighted	Unweighted	Weighted	Mean	Median	Std. Deviation
SWEDEN	5	1322	0.09	0.24	0.04	0.06	0.15	0.48	-0.15	-0.02	-0.33
NORWAY	8	1249	0.10	0.07	0.02	0.04	0.14	0.10	0.02	-0.02	0.04
NETHERLANDS	14	773	0.12	0.14	0.04	0.07	0.19	0.19	-0.02	-0.02	0.00
DENMARK	16	996	0.08	0.06	0.03	0.03	0.12	0.09	0.02	0.00	0.03
FINLAND	26	615	0.07	0.09	0.04	0.03	0.11	0.12	-0.02	0.00	-0.01
CHILE	28	752	0.10	0.12	0.04	0.02	0.19	0.22	-0.02	0.02	-0.03
PORTUGAL	31	639	0.06	0.02	0.03	0.01	0.08	0.03	0.04	0.02	0.05
FRANCE	43	2967	0.12	0.09	0.03	0.03	0.18	0.13	0.03	0.00	0.05
SINGAPORE	48	812	0.16	0.19	0.08	0.05	0.24	0.33	-0.03	0.03	-0.09
BRAZIL	49	1785	0.11	0.14	0.03	0.07	0.18	0.17	-0.04	-0.04	0.00
MALAYSIA	50	374	0.31	0.50	0.11	0.07	0.51	1.31	-0.19	0.04	-0.80
CANADA	52	7035	0.10	0.17	0.04	0.06	0.15	0.22	-0.07	-0.02	-0.07
BELGIUM	54	1429	0.10	0.06	0.02	0.02	0.22	0.09	0.05	0.01	0.12
ARGENTINA	56	758	0.08	0.06	0.03	0.02	0.12	0.14	0.02	0.01	-0.02
INDIA	56	875	0.04	0.12	0.02	0.04	0.05	0.20	-0.08	-0.01	-0.15
GREECE	57	208	0.20	0.24	0.09	0.07	0.26	0.57	-0.04	0.02	-0.31
HONG KONG	57	1130	0.07	0.04	0.02	0.02	0.10	0.06	0.02	-0.01	0.04
AUSTRALIA	61	489	0.07	0.10	0.02	0.04	0.10	0.18	-0.03	-0.01	-0.08
UNITED STATES	62	39263	0.09	0.08	0.03	0.05	0.13	0.09	0.01	-0.02	0.04
SOUTH AFRICA	63	1074	0.06	0.22	0.02	0.07	0.12	0.41	-0.16	-0.05	-0.29
GERMANY	66	8257	0.08	0.06	0.02	0.03	0.11	0.07	0.02	-0.01	0.04
UNITED KINGDOM	66	7579	0.09	0.13	0.04	0.05	0.14	0.28	-0.04	-0.01	-0.15
IRELAND	68	576	0.40	0.13	0.07	0.02	0.96	0.28	0.27	0.05	0.68
MEXICO	69	1261	0.17	0.09	0.02	0.02	0.31	0.20	0.08	0.00	0.11
ITALY	70	1448	0.22	0.31	0.08	0.04	0.32	0.47	-0.09	0.05	-0.16
SWITZERLAND	70	2621	0.15	0.12	0.02	0.04	0.27	0.18	0.04	-0.02	0.09
SPAIN	72	14551	0.09	0.10	0.04	0.05	0.15	0.12	0.00	-0.01	0.03
AUSTRIA	79	710	0.07	0.26	0.02	0.14	0.09	0.35	-0.19	-0.12	-0.26
JAPAN	95	2907	0.12	0.16	0.03	0.04	0.20	0.28	-0.05	-0.01	-0.08
Average of total	51.41	3601.90	0.12	0.14	0.04	0.04	0.20	0.26	-0.02	-0.01	-0.05
Standard deviation of total	22.06	7552.59	0.08	0.10	0.02	0.03	0.17	0.24	0.09	0.03	0.23

Table A4 SMB per Country

			Mean		Median		Standard Deviation		Differences		
Country	MAS	No. of observations	Unweighted	Weighted	Unweighted	Weighted	Unweighted	Weighted	Mean	Median	Std. Deviation
SWEDEN	5	1322	0.02	-0.01	0.00	0.03	0.05	0.06	0.03	-0.03	-0.02
NORWAY	8	1249	0.02	-0.06	-0.05	0.02	0.04	0.05	0.08	-0.07	-0.02
NETHERLANDS	14	773	-0.02	-0.13	-0.14	-0.03	0.05	0.07	0.11	-0.11	-0.02
DENMARK	16	996	-0.02	-0.10	-0.09	-0.02	0.04	0.03	0.08	-0.07	0.01
FINLAND	26	615	-0.03	-0.05	-0.05	-0.04	0.04	0.05	0.02	-0.01	-0.01
CHILE	28	752	0.04	-0.03	-0.03	0.04	0.04	0.06	0.07	-0.07	-0.03
PORTUGAL	31	639	-0.04	-0.06	-0.07	-0.04	0.04	0.03	0.02	-0.02	0.01
FRANCE	43	2967	0.00	-0.03	-0.04	0.00	0.04	0.05	0.03	-0.04	0.00
SINGAPORE	48	812	-0.01	0.10	0.10	0.00	0.06	0.08	-0.11	0.10	-0.02
BRAZIL	49	1785	0.06	-0.05	-0.04	0.06	0.05	0.06	0.11	-0.10	-0.01
MALAYSIA	50	374	-0.01	0.05	0.05	-0.01	0.10	0.09	-0.06	0.05	0.01
CANADA	52	7035	0.06	0.01	0.02	0.05	0.04	0.06	0.05	-0.03	-0.02
BELGIUM	54	1429	0.06	0.13	0.12	0.06	0.05	0.06	-0.07	0.06	-0.02
ARGENTINA	56	758	-0.01	0.07	0.07	0.00	0.05	0.05	-0.08	0.07	0.00
INDIA	56	875	0.07	0.06	0.04	0.08	0.03	0.06	0.01	-0.04	-0.03
GREECE	57	208	0.11	0.07	0.05	0.12	0.08	0.14	0.03	-0.07	-0.06
HONG KONG	57	1130	0.05	-0.13	-0.13	0.04	0.07	0.05	0.18	-0.17	0.02
AUSTRALIA	61	489	0.02	0.04	0.03	0.03	0.04	0.05	-0.02	0.00	0.00
UNITED STATES	62	39263	0.03	-0.05	-0.05	0.03	0.04	0.04	0.08	-0.08	0.00
SOUTH AFRICA	63	1074	0.05	-0.03	-0.02	0.05	0.03	0.08	0.08	-0.07	-0.04
GERMANY	66	8257	0.03	-0.03	-0.03	0.04	0.04	0.04	0.06	-0.06	0.00
UNITED KINGDOM	66	7579	0.04	0.00	0.00	0.04	0.04	0.05	0.03	-0.03	-0.01
IRELAND	68	576	-0.06	-0.06	-0.06	-0.04	0.08	0.05	0.00	-0.02	0.03
MEXICO	69	1261	0.03	-0.02	-0.03	0.03	0.04	0.04	0.05	-0.06	0.00
ITALY	70	1448	-0.04	-0.02	-0.02	-0.03	0.05	0.05	-0.02	0.01	0.00
SWITZERLAND	70	2621	0.04	0.06	0.06	0.04	0.04	0.06	-0.02	0.02	-0.02
SPAIN	72	14551	0.04	-0.07	-0.07	0.04	0.04	0.04	0.10	-0.11	-0.01
AUSTRIA	79	710	0.09	0.02	0.01	0.08	0.05	0.07	0.07	-0.07	-0.02
JAPAN	95	2907	0.02	0.02	0.00	0.02	0.04	0.07	0.00	-0.02	-0.04
Average of total	51.41	3601.90	0.02	-0.01	-0.01	0.02	0.05	0.06	0.03	-0.04	-0.01
Standard deviation of total	22.06	7552.59	0.04	0.06	0.06	0.04	0.02	0.02	0.06	0.06	0.02

Figure A1

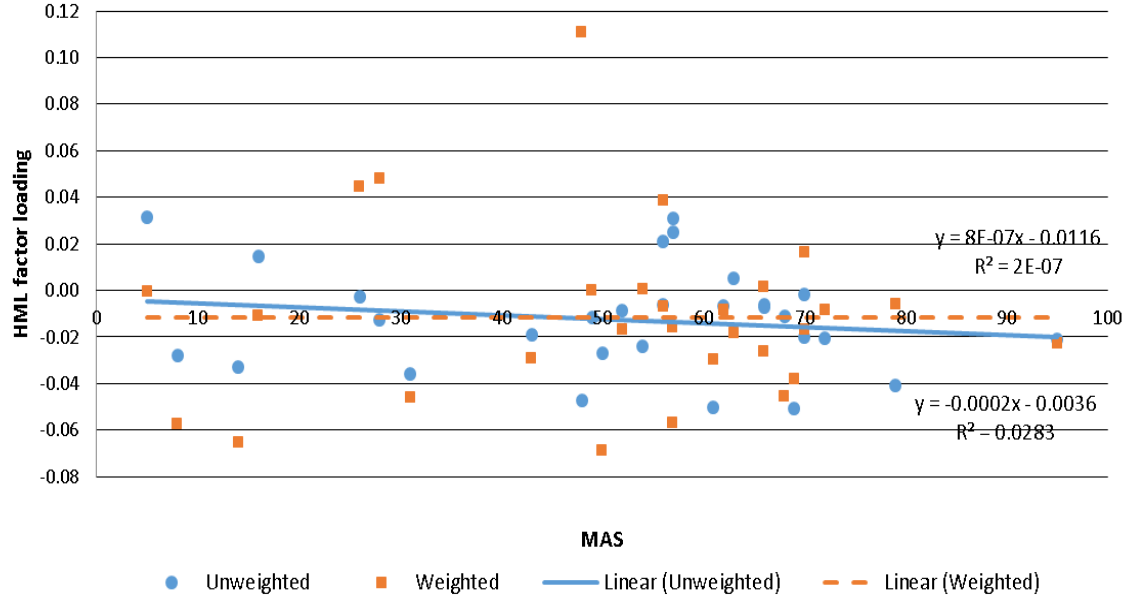

Figure A2

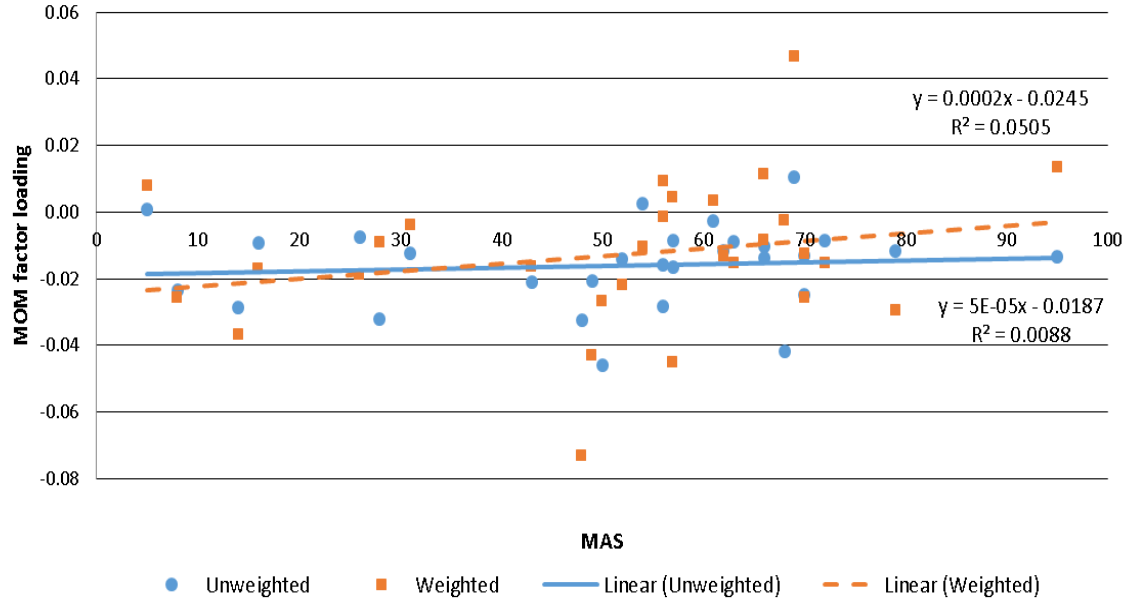

Table A5 HML Regression

	Unweighted		Weighted	
	(1)	(2)	(3)	(4)
VARIABLES	Simple	Full	Simple	Full
MAS	-0.000164**	-0.000126	8.42e-05	0.000193
	(8.12e-05)	(8.21e-05)	(0.000144)	(0.000153)
Ln of PPP-adjusted GDP per capita	-0.00412	-0.00606	0.00265	0.0162**
	(0.00351)	(0.00512)	(0.00562)	(0.00779)
Ln of total net asset value	-0.00107	-0.00577***	-0.00412**	-0.00744***
	(0.00137)	(0.00185)	(0.00183)	(0.00263)
Gini coefficient		-6.97e-05		0.000779
		(0.000232)		(0.000516)
Stock market turnover ratio (%)		7.84e-05		-6.16e-05
		(5.43e-05)		(0.000105)
Number of listed companies per 1,000,000 people		7.54e-05		0.000292***
		(6.12e-05)		(0.000106)
Stock price volatility		0.00232***		0.00315***
		(0.000446)		(0.000714)
Mutual fund assets to GDP (%)		8.63e-05***		-0.000234***
		(3.17e-05)		(4.27e-05)
Number of funds		2.26e-05***		2.75e-05**
		(7.01e-06)		(1.38e-05)
Constant	0.0309	0.0303	-0.0389	-0.249**
	(0.0352)	(0.0615)	(0.0559)	(0.0981)
Time dummies	Yes	Yes	Yes	Yes
Observations	696	696	696	696
R-squared	0.651	0.683	0.362	0.403

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A6 MOM Regression	Unweighted		Weighted	
	(1)	(2)	(3)	(4)
VARIABLES	Simple	Full	Simple	Full
MAS	2.75e-05	9.03e-05	0.000237*	0.000274**
	(6.98e-05)	(7.26e-05)	(0.000125)	(0.000134)
Ln of PPP-adjusted GDP per capita	-7.53e-05	-0.00163	-0.00707	-0.00540
	(0.00312)	(0.00463)	(0.00501)	(0.00708)
Ln of total net asset value	0.00140	0.00147	-0.00158	-0.00155
	(0.00115)	(0.00165)	(0.00153)	(0.00223)
Gini coefficient		-0.000352*		-0.000472
		(0.000201)		(0.000436)
Stock market turnover ratio (%)		-2.45e-05		-4.30e-05
		(5.06e-05)		(9.23e-05)
Number of listed companies per 1,000,000 people		6.01e-05		-0.000193**
		(5.38e-05)		(8.52e-05)
Stock price volatility		0.000230		-0.000218
		(0.000445)		(0.000602)
Mutual fund assets to GDP (%)		-5.12e-05*		-6.74e-06
		(3.03e-05)		(3.50e-05)
Number of funds		2.53e-06		8.46e-06
		(6.19e-06)		(1.17e-05)
Constant	-0.131***	-0.108*	-0.0334	-0.0213
	(0.0318)	(0.0565)	(0.0505)	(0.0867)
Time dummies	Yes	Yes	Yes	Yes
Observations	696	696	696	696
R-squared	0.813	0.816	0.566	0.574

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1