

National Culture and Household Finance

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In a series of cross-country comparisons, we show that national culture has a considerable impact on the characteristics of household finance. Using the Schwartz cultural value model and data on household finance, we analyze the impact of national culture on the use of deposits, equities, debt securities, life insurance, and pension funds in household portfolios. National culture is a strong indicator for the portfolio structure. The findings suggest several implications for the field of household financial engineering, as for household investments additional features of welfare seem to matter beyond expected return and return variance.

Research Field: Household finance

1. Introduction

Household finance is a field of research that has attracted much recent interest, given the increased complexity of household portfolios and the increased importance of retirement provisions due to population aging (Christelis, Georgarakos and Haliassos 2012). Nevertheless, research in the field of household finance is rather limited so far, as teaching and research primarily focus on the traditional fields of corporate finance and asset pricing. Analogously to corporate finance, household finance examines how households use financial instruments to attain their objectives. One can distinguish between positive household finance and normative household finance. Positive household finance asks how households actually invest; normative household finance asks how households should invest (Campbell 2006). This paper deals with positive household finance in a cross-country perspective.

Despite a number of studies observing cross-country differences in household finance worldwide, only very few studies explain the reasons for these differences. Several studies have looked at stock ownership solely and determined some meaningful determinants. When taking a broader view, the use of financial instruments by households in different countries is still an open issue. Our study analyzes the impact of culture on household finance. In a thorough theoretical elaboration on the characteristics of financial assets – deposits, equities, debt securities, life insurance, and pension funds – we formulate hypotheses on their relationships to national culture. To test these hypotheses, we operationalize cultural aspects with established data from psychology. In a cross-country empirical analysis we show that culture meaningfully predicts perceived differences in the portfolio structure of households.

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Breuer & Salzmann

The economics literature has hesitated to address cultural influences on financial questions for a long time. Values have been taken as given and culture has often been treated as a “black box” (Williamson 2000). Methodological challenges of operationalizing culture as well as a lack of sufficient theoretical foundation have contributed to the scarcity of research on this issue. However, recently, culture has emerged as a powerful determinant in economic studies (Guiso, Haliassos and Japelli 2000), and research papers on different areas of business administration (for example in accounting and organizational theory) have documented that culture can explain country-specific differences. In this vein, national culture has evidently been an important and effective factor for life insurance consumption according to a cross-disciplinary study conducted by Chui and Kwok (2008).

For this research paper, the goal is to examine the relationship between the portfolio structure of households and their developments in relation to the Schwartz cultural dimensions of Autonomy versus Embeddedness, Egalitarianism versus Hierarchy, and Harmony versus Mastery. As the main contribution of this paper, we find that national culture has a considerable impact on the characteristics of household finance. A regression analysis shows that Egalitarianism versus Hierarchy is negatively related to the use of deposits, Autonomy versus Embeddedness is negatively related to the use of debt securities and positively related to the use of life insurance and pension funds. Our findings hold after controlling for economical, demographical and institutional factors.

The remainder of the paper is structured as follows. Section 2 introduces the theoretical background. Section 3 presents the dataset and the research methodology. Section 4 reports the results. Section 5 discusses the implications. Section 6 concludes.

2. Literature Review

2.1 The Concept of National Culture

Culture is a very vague concept with manifold definitions (Kroeber and Kluckhohn 1952). A very common definition was introduced by the Dutch researcher Geert Hofstede (1984, p. 82) who defines culture as “the collective programming of the mind”. So-called values are to be understood as the most fundamental element of culture. Values shape attitudes which again form the behavior of people (Breuer and Quinten 2009).

Our study uses the Schwartz (1994) cultural theory to describe cultural paradigms. Although Hofstede’s framework has been commonly accepted as standard for the description of cultural differences, Schwartz’s model overcomes some difficulties of Hofstede’s approach: it is theoretically derived, it offers a more comprehensive set of value dimensions, it uses more recent data, it was obtained from more diverse regions including socialist countries, and it has been tested with two matched samples (Ng, Lee and Soutar 2007). Schwartz (1994, 1999) conducted his studies in the years of 1988 to 1992 and took samples from 38 countries in 30 different languages. Since then, the surveys have been continued and today data on cultural dimensions is available for 73 countries.

Breuer & Salzmann

The Schwartz (2004) cultural model specifies three bipolar dimensions that represent alternative solutions to basic problems confronting all societies: Autonomy versus Embeddedness, Egalitarianism versus Hierarchy, and Harmony versus Mastery. An emphasis on the cultural type at one pole of a dimension typically accompanies a de-emphasis on the polar type.

- *Autonomy* relates to the desirability of individuals independently pursuing their own ideas and draws on the values CURIOSITY, CREATIVITY, FREEDOM, and PLEASURE.
- *Embeddedness* emphasizes the maintenance of the status quo and relies on the values SOCIAL ORDER, RESPECT FOR TRADITION, MODERATION, and WISDOM.
- *Egalitarianism* relates to sharing basic interests and showing concern for everyone’s welfare and bears on the values EQUALITY, SOCIAL JUSTICE, LOYALTY, and HONESTY.
- *Hierarchy* corresponds to the legitimacy of an unequal distribution of power and applies to the values SOCIAL POWER, AUTHORITY, WEALTH, and HUMBLENESS.
- *Harmony* points to accepting the world as it is and rests on the values UNITY WITH NATURE, PROTECTING THE ENVIRONMENT, WORLD IN PEACE, and WORLD OF BEAUTY.
- *Mastery* supports the idea of getting ahead through active self-assertion and refers to the values INFLUENCE, COMPETENCE, DARING, and AMBITION.

The cross-country surveys revealed the existence of distinct cultural regions, which assign similar weights to the different value types and corresponding cultural dimensions. Table 1 shows a brief summary of these results.

Table 1: The distribution of cultural dimensions according to Schwartz

	Embedded- ness	Aff. Autonomy	Intell. Autonomy	Hierarchy	Egalitaria- nism	Mastery	Harmony
West Europe		+	+		+		+
English-Speaking		+	+		+	+	
Confucian	+			+		+	
South Asia	+			+			
Africa	+						
Middle East	+					+	
Baltic States + Central Europe			+				+
Balkan States + East Europe							
Latin America							

2.2 National culture and household portfolios

Campbell (2006) suggests that households may have peculiar preferences resulting in fixed costs as one-time entry costs or permanent participation costs for certain financial instruments. These fixed costs constitute an economic description of psychological factors that make the ownership of certain assets uncomfortable for some households. Several studies dealing with the determinants of household finance so far find that psychological factors play a crucial role indeed.

Breuer & Salzmann

Renneboog and Spaenjers (2012) explore the role of religion on household finance, and identify thrift, risk preferences, responsibility, social capital, and planning horizon as main channels through which religion affects household financial decision-making. Hong, Kubik and Stein (2004) provide evidence that sociability fosters stock market participation. Guiso, Sapienza and Zingales (2008) show that trust has a significant influence on the level of stock holdings. Puri and Robinson (2007) observe that optimism is related to stock investment and saving behavior. Brown et al. (2008) establish a causal relation between community effects and stock market participation. Biliias, Georgarakos and Haliassos (2008) identify the willingness to take more than average risk, long investment horizon, and financial alertness as essential for determining stock holding levels. Haliassos and Bertaut (1995) find that inertia arising from cultural influences discourages stockholding. Georgarakos and Pasini (2011) show that trust and sociability matter for stock market participation.

This overview confirms that psychological factors play an important role in household finance. However, the studies all have in common that they capture only very vague yet narrow aspects of psychology. This drawback can be overcome by using the concept of culture we have introduced above. On the one hand, the concept of national culture offers a more comprehensive approach, as it describes the mindset of people exhaustively. All of the psychological factors referred to by previous studies can be found as basic values in the cultural value concept. On the other hand, the concept of national culture presents a more systematic approach, as miscellaneous basic values can be arranged in cultural dimensions. Values with similar characteristics can be pooled in one dimension.

Households have an overwhelming number of different investment choices available nowadays, which are bewildering both in range and complexity. Each investment opportunity features certain characteristics by which it appears more or less suitable for different kinds of investors. We focus on deposits, equities, debt securities, life insurance, and pension funds as basic investment alternatives for households. For national culture, we only focus on those basic values that should be important for financial characteristics of households. Generally, the basic values relate to all different facets of people's lives, so only a few of them should matter for portfolio choice. In the following, we examine the relationships between culture and household finance and summarize them in hypotheses.

Deposits are savings alternatives usually kept at accounts at a bank or other financial services institutions. The interest rate paid is relatively low, but money is readily accessible (Etzel 2003). Financial counselors usually advise investors to keep a certain amount of money in risk-free financial assets. There is no other capital gains opportunity than interest compounding. As most deposits are insured by government institutions, they are very safe. Safety and growth of investment through interest compounding are the main objectives with deposit assets (Downes and Goodman 2007).

In countries with a higher emphasis on Hierarchy we expect to have a higher share of deposit assets in household portfolios. Hierarchy rests on the values WEALTH and HUMBLENESS which reflect the characteristics of deposit assets. Referring to its high financial security, the use of deposits corresponds to WEALTH, as deposit assets are very

Breuer & Salzmann

safe assets with rather low returns – at least when compared to other investment alternatives. The use of deposits corresponds to HUMBLINESS, as deposits are investments that offer moderate but steady increase in wealth. According to the bipolar structure inherent in the Schwartz (2004) model, countries with a higher emphasis on the polar dimension of Egalitarianism should exhibit reverse characteristics and have a lower share of deposit assets in household portfolios. Following this reasoning, the anticipated positive relationship to Hierarchy and corresponding negative relationship to Egalitarianism yields the following research hypothesis:

Hypothesis 1: The use of deposit assets in a country is positively related to its level of Hierarchy, and hence negatively related to the bipolar cultural dimension of Egalitarianism versus Hierarchy.

Equities comprise ownership interest in a company possessed by shareholders. The basic equity ownership in a corporation is represented by a share of common stock. The owners of a company's common stock share directly in the success or failure of that company. Historical data suggest that no publicly traded investment alternative offers more potential for total return in the long run. The wide range of listed stock investment choices gives the investor maximum flexibility in adjusting holdings to meet personal objectives and risk comfort levels. However, there is no concrete assurance for the investment because there is always the risk that market capital will decline (Blume and Friedman 1982). A very common way to invest in several equities at the same time is mutual fund holdings. *Mutual funds* are operated by investment companies and raise money from shareholders for investments in all kinds of assets like stocks, bonds, options, futures, forwards, currencies, commodities, or money market securities. Mutual funds that invest, for example, in stocks offer investors with limited means the advantages of common stock ownership together with the benefits of professional management and portfolio diversification. Mutual funds come in an extraordinary variety and with a wide diversity of investment objectives and policies. Some invest aggressively for capital appreciation, while others are conservative and designed to generate steady income for their shareholders. Investors need to assess their tolerance for risk before deciding on an appropriate fund. Moreover, according to Downes and Goodman (2007), mutual funds have provided returns generally superior to other investments except stocks. Besides the fact that mutual funds offer particular diversification opportunities, the same risk considerations apply as with individual investments.

In countries with a higher emphasis on Mastery, we expect to have a higher share of equities in household portfolios. Mastery relies on the values DARINGNESS and AMBITION which comply with investments in equities. The use of equities is consistent with DARINGNESS, as investments in equities are associated with high return and high levels of risk. The use of equities is consistent with AMBITION, as one needs to be self-assured in picking the successful equities with high return. With reference to the bipolar structure of the Schwartz (2004) model again, countries with a high emphasis on the polar dimension of Harmony should demonstrate opposite characteristics and have a lower share of equities in household portfolios. Therefore, we derive the research hypothesis as follows:

Breuer & Salzmann

Hypothesis 2: The use of equities in a country is positively related to its level of Mastery, and hence negatively related to the bipolar cultural dimension of Harmony versus Mastery.

Debt securities are also known as fixed-income securities and entitle the holder of it to the payment of principal and interest upon the sale of the security. Debt securities are generally issued for a fixed period and redeemable by the issuer at the maturity date. Examples of debt securities include government and corporate bonds, certificates of deposit and commercial papers. The interest rate of a debt security is essentially determined by the perceived repayment ability of the borrower. By having a fixed amount that is returned to the lender at the end of the term, debt securities are generally safer investments than equities (Blume and Friedman 1982).

In countries with a higher emphasis on Embeddedness we expect to have a higher share of debt securities in household portfolios. Embeddedness is based on the values WISDOM and MODERATION, which are in line with the opportunities offered by debt securities. The use of debt securities correlates with WISDOM, as debt securities are reasonably safe investments combined with moderate interest payments consistently higher than interests on deposits. The use of debt securities correlates with MODERATION, as the returns of debt securities are in the mid-range of all asset classes, usually providing higher returns than deposits but lower returns than equities. Countries with a high emphasis on the polar dimension of Autonomy should have a lower share of debt securities in household portfolios. These considerations can be summarized in the following hypotheses:

Hypothesis 3: The use of debt securities in a country is positively related to its level of Embeddedness, and hence negatively related to the bipolar cultural dimension of Autonomy versus Embeddedness.

A *life insurance* is a contract that pays the insured's beneficiaries a specified amount of money upon the insured's death. In return for this protection, the insured pays the life insurance company monthly or yearly premiums (Etzel 2003). For young families without sufficient financial security to provide for expenses in the event of the premature death of the breadwinner or homemaker, life insurance provides essential protection. There are many types of life insurance policies, and often life insurance is used in order to save money for retirement. This type is usually called whole life insurance. In addition to providing pure life insurance, whole life insurance builds up a cash value inside the policy. As insurance companies are highly regulated, there is little risk that they will not meet investment commitments. Thus, life insurance provides a very desirable measure of stability and predictability on the operation of the investment with little income obtained by the interest payments on premiums (Downes and Goodman 2007).

In countries with a higher emphasis on Autonomy we expect to have a higher use of life insurance in household portfolios. Autonomy is founded on the values PLEASURE and FREEDOM, which coincides with the principal objectives of life insurance. The use of life insurance is compliant with PLEASURE, as the main aim of a life insurance investment is saving money, in order to provide a reasonable maintenance even if the main jobholder retires. The use of life insurance is also consistent with FREEDOM, as one does not want

Breuer & Salzmann

to depend on others regarding financial matters. Countries with a higher emphasis on the polar dimension of Embeddedness should show a lower use of life insurance in household portfolios. This leads us to the research hypothesis below:

Hypothesis 4: The use of life insurance in a country is positively related to its level of Autonomy, and hence positively related to the bipolar cultural dimension of Autonomy versus Embeddedness.

Pension funds are funds set up by a corporation, government, or labor union to pay benefits to retired workers. While workers are employed, payments may be made through payroll contributions and through employers' benefactions (Etzel 2003). Pension funds have the same general objectives as other investors do, but the relative priorities given to liquidity, security of principal, investment income, and market value appreciation tend to be different. Pension funds take an extremely long-term view of safety considerations, as they expect a positive cash flow from contributions for many future years (Blume and Friedman 1982).

Again, we suppose that countries with a higher emphasis on Autonomy have a higher use of pension funds in household portfolios. As before, Autonomy rests on the values PLEASURE and FREEDOM, which match the ideas of pension funds. Pension funds exhibit similar characteristics as life insurance before. The use of pension funds matches PLEASURE, as it again has the basic aim of securing a living when the main income drops out. The use of pension funds matches FREEDOM, as one does not want to be constrained in financial circumstances. Countries with a higher emphasis on the polar dimension of Embeddedness should have a lower use of pension funds in household portfolios. These considerations make up for the following hypothesis:

Hypothesis 5: The use of pension funds in a country is positively related to its level of Autonomy, and hence positively related to the bipolar cultural dimension of Autonomy versus Embeddedness.

3. Methodology

3.1 Data

Data describing *national culture* using the Schwartz framework has been collected continuously and is currently available for 73 countries from the Israel Social Science Data Center at the Hebrew University of Jerusalem. Using the Schwartz Value Survey, people in each country are asked to judge 45 basic values according to their importance. The response options range from 7 (of supreme importance) to -1 (opposed to my values). The questionnaire was distributed among respondents on every continent anonymously in their native language. For each country, the values of the different cultural dimensions are then calculated out of these results.

Empirical analysis must very often cope with considerable weakness in the available data. This is especially an issue on the field of *household finance* because in many cultures people hesitate to disclose and discuss information about their income and wealth. This paper uses data from the Economist Intelligence Unit (EIU) World Data

Breuer & Salzmann

panel. We average each data over 2003 to 2007 which yields more reliable statistics for our focal variables. We exclude data after 2008 to circumvent the impact of the Global Financial Crisis. For the portfolio structure we consider *deposits, equities, debt securities, life insurance, and pension funds*, and calculate the percentage of each asset class to total assets.

Table 2 shows some descriptive statistics.

Table 2: Summary statistics

<i>Variable</i>	<i>Mean</i>	<i>Median</i>	<i>Stand. Dev.</i>	<i>Min</i>	<i>Max</i>	<i>N</i>
<i>data on national culture</i>						
Embeddedness	3.61	3.61	0.30	2.94	4.50	73
Aff. Autonomy	3.34	3.34	0.72	1.66	4.76	73
Intell. Autonomy	4.12	4.08	0.57	2.73	5.56	73
Hierarchy	2.19	2.15	0.45	1.15	3.74	73
Egalitarianism	4.48	4.44	0.46	3.61	5.42	73
Mastery	3.79	3.81	0.33	3.08	3.81	73
Harmony	3.83	3.82	0.51	2.61	4.92	73
<i>data on household portfolios</i>						
Deposits	0.34	0.32	0.13	0.10	0.69	45
Equities	0.30	0.29	0.14	0.04	0.60	46
Debt securities	0.12	0.07	0.14	0.00	0.65	46
Life insurance	0.07	0.04	0.01	0.00	0.53	44
Pension funds	0.11	0.05	0.13	0.00	0.50	43
<i>control variables</i>						
GDP per head	16303.47	12087.66	13525.85	1079.02	58139.84	51
Inflation rate (%)	4.48	2.89	4.04	-0.05	20.23	57
Bank sector development (%)	1.64	0.65	2.60	0.00	13.75	46
Stock market development (%)	8707.24	1686.34	17378.02	11.89	83767.98	49
State	0.32	0.00	0.47	0.00	1.00	72
Shareholder rights	3.12	3.00	1.43	0.00	5.00	34
Contract enforcement	4.61	4.65	0.99	2.70	6.40	42
Dependency ratio (%)	0.50	0.50	0.08	0.32	0.82	57
Religion	61.24	73.65	34.28	0.00	96.60	72
Tertiary enrollment (%)	51.42	56.20	21.13	10.20	93.20	43

3.2 Empirical analysis

For the main part of the empirical analysis, we follow Chui and Kwok (2008) and estimate country-level multivariate regression models of each characteristic of household finance on the dimensions of national culture. In consideration of the bipolarity of the cultural dimensions and to avoid multicollinearity, we collapse each bipolar cultural dimension to a single one by calculating its difference, as suggested in Schwartz (2004). This approach is justified by the notion that a higher value for a certain cultural dimension (like, e.g., Embeddedness) typically coincides with a lower value of its bipolar counterpart (here, e.g., Autonomy). Our basic model is of the form

$$\text{HousFin}_i = \alpha + \beta_1(\text{Aut-Emb}) + \beta_2(\text{Harm-Mast}) + \beta_3(\text{Egal-Hier}) - \sum_j C_j + \varepsilon_i$$

in which HousFin_i is the variable representing the characteristics of household finance studied, $i = 1, \dots, 5$, Aut-Emb , Harm-Mast , and Egal-Hier are the bipolar cultural dimensions to investigate. C_j is a set of country-specific control variables representing the economic, demographic, and institutional development which are suggested in the literature as potential factors influencing household finance (Chui and Kwok 2008).

Though estimating a full model including all independent variables would be desirable, we refrain from this procedure and add the controls in the aforementioned groups. This

Breuer & Salzmann

approach serves two purposes: First, we need to maintain a reasonable sample size. As for some variables data availability is very limited, including all of the controls simultaneously would reduce the sample size considerably and yield less conclusive results. Second, the correlation matrix of our explanatory variables presented in Table 3 reveals that some of the variables are severely related. To avoid problems of multicollinearity in the regressions we do not include all of the control variables in one model but in appropriate groups.

Table 3: Correlation matrix

	1	2	3	4	5	6	7	8	9	10
1 GDP per head	1.00									
2 Inflation rate (%)	0.00	1.00								
3 Bank sector development (%)	-0.21	-0.10	1.00							
4 Stock market development (%)	-0.06	-0.12	0.45***	1.00						
5 State	-0.16	0.07	0.10	0.17	1.00					
6 Shareholder rights	0.00	-0.25	-0.19	-0.17	0.03	1.00				
7 Contract enforcement	0.02	-0.62***	0.29*	0.08	-0.16	0.31*	1.00			
8 Dependency ratio (%)	0.11	0.27*	-0.07	-0.04	-0.38***	-0.14	-0.39**	1.00		
9 Religion	-0.03	0.13	0.28*	-0.01	-0.22*	-0.39**	-0.10	0.33**	1.00	
10 Tertiary enrollment (%)	0.06	-0.24	0.13	-0.21	-0.02	0.05	0.41	-0.43***	0.02	1.00

Correlation coefficients and corresponding significance among the main explanatory variables. *** $p \leq 1\%$, ** $p \leq 5\%$, * $p \leq 10\%$

To ensure that our results are robust against the presence of outliers we remove observations with variables that depart more than three times the standard deviation from the mean. Exact specifications of the control variables we use can be found in Table 4.

Table 4: Control variables and sources

GDP per head	Nominal GDP divided by population. <i>EIU WorldData (2009)</i>
Inflation rate (%)	Average inflation rate. Inflation rate is calculated as percentage change in consumer price index. <i>EIU WorldData (2009)</i>
Bank sector development (%)	The ratio of private sector credit to GDP. Private sector credit measures total loans to the corporate and household sectors. <i>EIU WorldData (2009)</i>
Stock market development (%)	The ratio of stock market capitalization to GDP. Stock market capitalization measures the local stock market capitalization excluding investment funds. <i>EIU WorldData (2009)</i>
State	State takes the value 1 if the country is (or previously was) a socialist country, and 0 otherwise.
Shareholder rights	Aggregation of numerous measures of shareholder rights. Higher values indicate stronger shareholder protection. <i>Financial Development Report (2008)</i>
Contract enforcement	Aggregation of measures for the effectiveness of law-making bodies, judicial independence, irregular payments in judicial decisions, number of procedures to enforce a contract, time to enforce a contract, cost of enforcing contracts, strength of investor protection, and time to close a business. Higher values indicate stronger contract enforcement. <i>Financial Development Report (2008)</i>
Dependency ratio (%)	The dependency ratio is the sum of the ratio of the population under age 15 to the population ages 15 to 64 and the ratio of the population over age 64 to the population ages 15 to 64. <i>EIU WorldData (2009)</i>
Religion	The percentage of the population with Protestant, Catholic, or Muslim beliefs. <i>LaPorta et al. (1999)</i>
Tertiary enrollment (%)	Gross tertiary enrollment rate. This variable is the ratio of total enrollment to the population of the age group that officially corresponds to the level of education shown. Tertiary instruction is provided at a university, teachers' college, or higher-level professional school. <i>Financial Development Report (2008)</i>

4. Results

The first hypothesis is supported by the regression results. Egalitarianism versus Hierarchy has a negative impact on the use of deposit assets in a country, which is highly significant throughout all the regressions. The coefficient of Egalitarianism versus Hierarchy in our basic regression is -0.11 , which implies that, all else equal, a one-standard-deviation increase in Egalitarianism versus Hierarchy would induce a 0.11 ·

Breuer & Salzmann

0.64 = 0.0704 decrease in deposits. In percentage terms, relative to the mean of deposits, this corresponds to a 21% increase which is also economically significant.

Our results show no support for the second hypothesis. Harmony versus Mastery has no significant impact on the use of equities in a country. Indeed, none of the cultural dimensions has a significant influence on the use of equities; the only variable that has a significant impact is State. The influence of State is positive, confirming that (former) socialist countries have fewer investments in equities.

The third hypothesis is supported. Autonomy versus Embeddedness has a negative impact on the use of debt securities in a country, which is highly significant in almost all the regressions and high significance is only marginally missed in one model. Contract enforcement has a significant negative impact, suggesting that people tend to substitute equities by debt securities when controlling and voting rights are lower. The Dependency ratio has a positive impact, proposing that middle-aged people tend to rely on debt securities. Compared to the mean of debt securities, a one-standard-deviation increase in Autonomy versus Embeddedness would induce a $0.15 \cdot 0.76 = 0.114$ decrease in debt securities, which corresponds to an economically significant 95% decrease.

Table 5: Regression results for H1, H2, and H3

Independent variables	Dependent variable: Deposits (H1)				Dependent variable: Equities (H2)				Dependent variable: Debt securities (H3)			
Autonomy – Embeddedness	0.01	0.01	0.02	0.01	-0.05	-0.04	-0.11	-0.06	-0.15***	-0.13***	-0.09	-0.11**
	<i>0.80</i>	<i>0.78</i>	<i>0.68</i>	<i>0.84</i>	<i>0.31</i>	<i>0.48</i>	<i>0.07</i>	<i>0.29</i>	<i>0.00</i>	<i>0.01</i>	<i>0.11</i>	<i>0.05</i>
Harmony – Mastery	0.06	0.02	0.06	0.08	-0.03	0.00	-0.03	-0.04	-0.07	-0.09	-0.07	-0.06
	<i>0.23</i>	<i>0.75</i>	<i>0.38</i>	<i>0.17</i>	<i>0.57</i>	<i>0.96</i>	<i>0.70</i>	<i>0.57</i>	<i>0.21</i>	<i>0.15</i>	<i>0.30</i>	<i>0.31</i>
Egalitarianism – Hierarchy	-0.11**	-0.08*	-0.16**	-0.14*	0.04	0.02	0.09	0.03	0.11**	0.11*	0.04	0.07
	<i>0.03</i>	<i>0.10</i>	<i>0.02</i>	<i>0.09</i>	<i>0.50</i>	<i>0.69</i>	<i>0.18</i>	<i>0.77</i>	<i>0.04</i>	<i>0.06</i>	<i>0.50</i>	<i>0.43</i>
GDP per head		0.00				0.00				0.00		
		<i>0.90</i>				<i>0.30</i>				<i>0.99</i>		
Inflation rate		0.01				0.01				0.01		
		<i>0.48</i>				<i>0.55</i>				<i>0.44</i>		
Bank sector development		0.00				0.01				0.00		
		<i>0.89</i>				<i>0.36</i>				<i>0.46</i>		
Stock market development		0.00				0.00				0.00		
		<i>0.78</i>				<i>0.22</i>				<i>0.35</i>		
State			-0.05				0.14*				0.04	
			<i>0.56</i>				<i>0.08</i>				<i>0.58</i>	
Shareholder rights			-0.03				0.01				-0.03	
			<i>0.14</i>				<i>0.65</i>				<i>0.18</i>	
Contract enforcement			0.00				0.05				-0.07**	
			<i>0.95</i>				<i>0.14</i>				<i>0.03</i>	
Dependency ratio				-0.26				-0.34				0.59*
				<i>0.43</i>				<i>0.39</i>				<i>0.09</i>
Religion				0.00				0.00				0.00
				<i>0.94</i>				<i>0.56</i>				<i>0.69</i>
Tertiary enrollment				0.00				0.00				-0.01
				<i>0.90</i>				<i>0.70</i>				<i>0.38</i>
Constant	0.59***	0.53	0.79***	0.78***	0.23*	0.21	-0.14	0.35	-0.07	-0.11	0.49**	-0.24
	<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>0.06</i>	<i>0.15</i>	<i>0.48</i>	<i>0.13</i>	<i>0.53</i>	<i>0.42</i>	<i>0.02</i>	<i>0.23</i>
N	50	47	36	43	51	47	36	43	50	47	36	43
R ²	0.18	0.19	0.33	0.27	0.03	0.10	0.28	0.07	0.23	0.23	0.49	0.37
F	2.93**	1.18	1.99*	1.94	0.40	0.57	1.62	0.43	4.11***	1.57	3.96***	3.17***
p	<i>0.04</i>	<i>0.34</i>	<i>0.10</i>	<i>0.19</i>	<i>0.75</i>	<i>0.77</i>	<i>0.18</i>	<i>0.85</i>	<i>0.01</i>	<i>0.18</i>	<i>0.01</i>	<i>0.01</i>
Standard error	0.10	0.13	0.12	0.12	0.12	0.14	0.21	0.14	0.04	0.08	0.07	0.07
Adjusted R ²	0.12	0.03	0.17	0.13	-0.04	-0.08	0.11	-0.10	0.17	0.08	0.36	0.26
Variance inflation factor	1.70	1.91	2.03	2.84	1.70	1.10	0.28	0.07	0.23	0.23	0.49	0.37

Least squares regressions of the cross-section of countries. *** p ≤ 1 %, ** p ≤ 5 %, * p ≤ 10 %. p-values in *italics*.

The fourth hypothesis is again supported. According to Table 6, Autonomy versus Embeddedness has a positive impact on the use of life insurance in a country, that is highly significant in almost every regression. The influence is not affected by the model where the impact is insignificant, as the insignificance is not due to the control variables. Religion has a significantly positive influence, indicating that religious individuals tend to purchase life insurance in particular. All else equal, a one-standard-deviation increase in Autonomy versus Embeddedness would induce a $0.07 \cdot 0.76 = 0.0836$ increase in life

Breuer & Salzmann

insurance. In percentage terms, relative to the mean of life insurance, this corresponds to about a 119% increase, and is economically significant.

Our results support the fifth hypothesis. Autonomy versus Embeddedness has a positive impact on the use of pension funds in a country, which is highly significant all over the regressions. Bank sector development has a significantly negative and Stock market development has a significantly positive influence, maintaining that pension funds investments take particularly place in more liquid financial markets. Besides, the impact of Shareholder rights is significantly positive, indicating that investments in pension funds also require a certain level of shareholder protection. Compared to the mean, a one-standard-deviation increase in Autonomy versus Embeddedness would induce a $0.11 \cdot 0.76 = 0.0836$ increase in pension funds. In percentage terms, this corresponds to about a 76% increase in pension funds which is economically significant.

Table 6: Regression results for H4 and H5

<i>Independent variables</i>	<i>Dependent variable: Life insurance (H4)</i>				<i>Dependent variable: Pension funds (H5)</i>			
Autonomy – Embeddedness	0.07** <i>0.03</i>	0.06* <i>0.10</i>	0.05 <i>0.19</i>	0.07* <i>0.07</i>	0.11*** <i>0.01</i>	0.10*** <i>0.02</i>	0.12** <i>0.05</i>	0.10** <i>0.04</i>
Harmony – Mastery	0.03 <i>0.45</i>	0.03 <i>0.58</i>	0.07 <i>0.22</i>	0.04 <i>0.37</i>	-0.04 <i>0.37</i>	-0.04 <i>0.45</i>	-0.03 <i>0.61</i>	-0.06 <i>0.32</i>
Egalitarianism – Hierarchy	-0.02 <i>0.52</i>	-0.02 <i>0.58</i>	-0.01 <i>0.77</i>	0.02 <i>0.79</i>	0.02 <i>0.74</i>	0.03 <i>0.52</i>	0.02 <i>0.71</i>	0.06 <i>0.47</i>
GDP per head		0.00 <i>0.70</i>				0.00 <i>0.12</i>		
Inflation rate		-0.01 <i>0.11</i>				0.01 <i>0.26</i>		
Bank sector development		0.00 <i>0.64</i>				-0.03** <i>0.01</i>		
Stock market development		0.00 <i>0.52</i>				0.00* <i>0.06</i>		
State			-0.08 <i>0.18</i>				-0.06 <i>0.46</i>	
Shareholder rights			0.02 <i>0.26</i>				0.04* <i>0.06</i>	
Contract enforcement			0.03 <i>0.28</i>				0.01 <i>0.70</i>	
Dependency ratio				0.24 <i>0.31</i>				0.10 <i>0.76</i>
Religion				0.00* <i>0.05</i>				0.00 <i>0.46</i>
Tertiary enrollment				0.00 <i>0.43</i>				0.00 <i>0.96</i>
Constant	0.10 <i>0.24</i>	0.14 <i>0.14</i>	-0.09 <i>0.59</i>	-0.06 <i>0.65</i>	0.03 <i>0.73</i>	0.09 <i>0.39</i>	-0.13 <i>0.50</i>	-0.05 <i>0.78</i>
N	49	47	36	43	48	46	35	42
R ²	0.17	0.24	0.35	0.34	0.31	0.45	0.44	0.33
F	2.76**	1.50	2.14*	2.65**	5.70***	3.91***	3.04**	2.47**
p	0.05	0.21	0.09	0.03	0.00	0.00	0.02	0.05
Standard error	0.08	0.09	0.12	0.09	0.10	0.10	0.16	0.11
Adjusted R ²	0.11	0.08	0.19	0.21	0.25	0.34	0.30	0.20
Variance inflation factor	0.18	0.24	0.35	0.33	0.32	0.46	0.56	0.33

Least squares regressions of the cross-section of countries. *** p ≤ 1 %, ** p ≤ 5 %, * p ≤ 10 %. p-values in italics.

5. Discussion

Looking at the supported hypotheses, one notices that the influence of the cultural dimension of Autonomy versus Embeddedness is prevailing. It has a firm impact on several characteristics of household finance, namely the use of debt securities, life insurance, and pension funds. However, this dominance of Autonomy versus Embeddedness is not truly surprising; it originates from the foundation of the Schwartz model where each of the three bipolar dimensions represents one basic problem confronting all societies. The dimension of Autonomy versus Embeddedness characterizes the relation between the person and the group, which is not only the most critical cultural dimension in general (Schwartz 1999), but also most relevant in the context of household finance, as it deals with the desirable degree of independence of

Breuer & Salzmann

the person from groups. The other dimensions are only subordinated here: Egalitarianism versus Hierarchy, which deals with the desirability of equal allocation of roles, and Harmony versus Mastery, that addresses the desirability of harmony with the social and natural environment, are rather ineffectual. This is also demonstrated in the empirical results.

Our study shows that national culture must be seen as an essential determinant for household finance. After the derivation of five hypotheses which summarize the proposed relationships between culture and household finance, we estimate multivariate regression models to examine the hypotheses empirically. We control for the economic, demographic and institutional environment and find significant support for four of our five hypotheses. None of the control variables substantially reduces the power of national culture to predict the structure of household portfolios. The share of variation explained by national culture is considerably larger than the R^2 s typically obtained in standard empirical models of portfolio allocation, which rarely explain more than 5% of the variation in portfolio structure despite using a rich set of covariates (Curcuro et al. 2009).

6. Conclusion

Speaking in terms of positive household finance, our study introduces national culture as a key determinant for fundamental characteristics of household finance. Established theoretical models aiming at explaining household behavior should be extended by a component capturing cultural influences. The non-consideration of national culture would only lead to incomplete approaches.

Considering the complexity of the financial planning problem and the often confusing financial instruments, the scope for error is considerable. If households make investment mistakes, it may be possible to create solutions that reduce occurrence and costs of these mistakes by the explicit consideration of cultural determinants. Government can help make investors aware of their cultural biases, so that they can carefully outweigh them. For instance, one can require appropriate advice and warnings, induce disclosure in setups that minimize or counteract known biases, designate core elements of financial literacy that are essential for households' financial planning, encourage public provision or tax subsidy of appropriate investment options, or advance financial products incorporating the cultural background. This field of *household financial engineering* offers a strong motivation for the study of household finance (Campbell 2006).

Speaking in terms of normative household finance, our study advances possibilities to improve welfare among households. As we mentioned before, households may have peculiar preferences resulting in fixed costs for certain financial instruments. In this sense, the extensive influence of culture on household finance may be interpreted as a specific kind of bias leading to investment mistakes. In the absence of transaction costs, mean-variance optimization implies participation in all asset and security markets. However, many investors entirely neglect major asset classes and omit many individual securities within each class (Daniel, Hirshleifer and Teoh 2002). Figure 1 gives some examples of countries that exhibit very strong preferences for certain asset classes,

Breuer & Salzmann

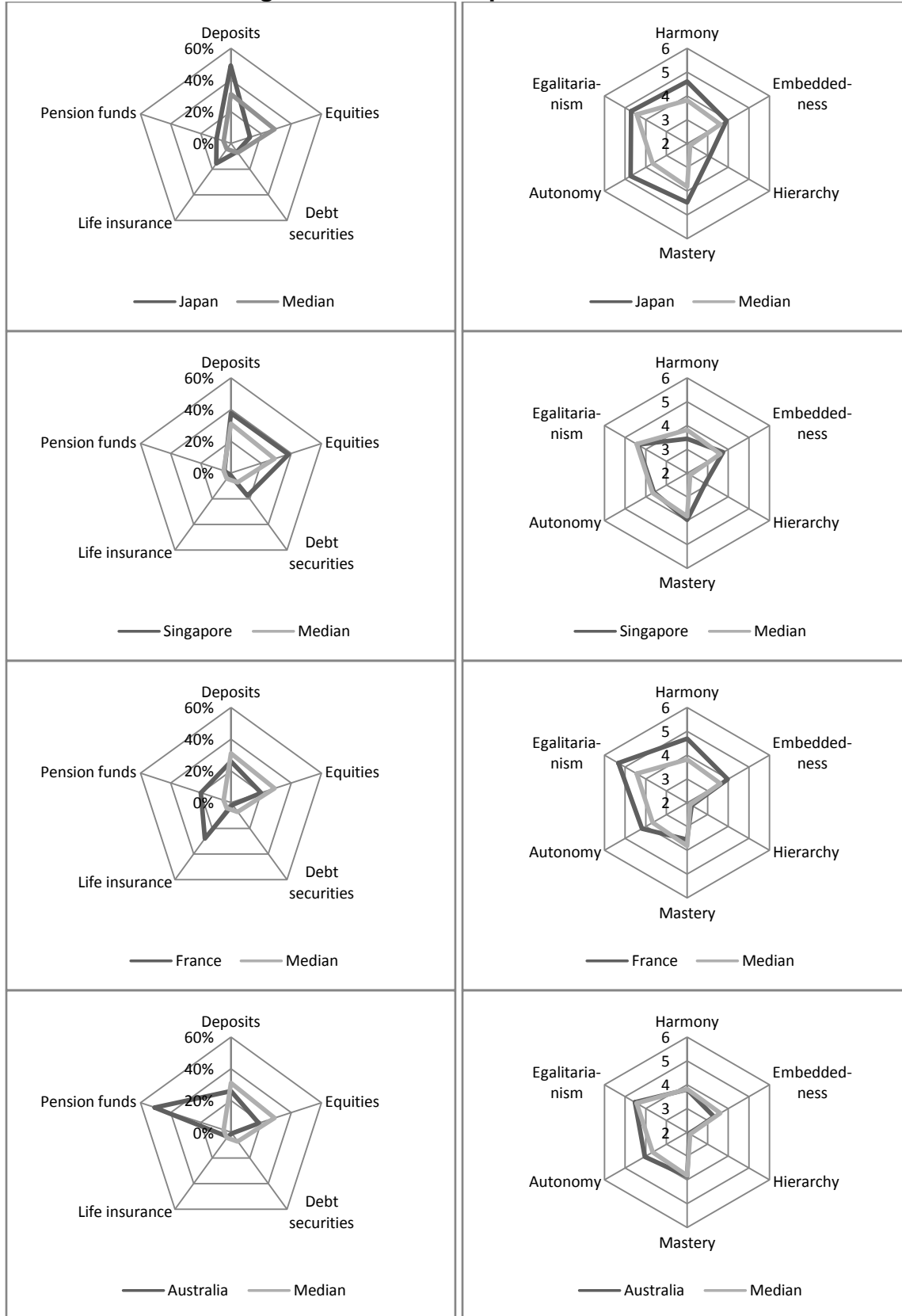
which might be rooted in cultural aspects. Japan scores very high in Hierarchy and shows a strong preference for deposits in household portfolios, but neglects equities. Singapore emphasizes the cultural dimension of Embeddedness and reaches very high shares of debt securities, but shows only very little use of life insurance. Autonomy is important in France, which maintains a high level of life insurance consumption, but disacknowledges the use of debt securities. Australia stresses Autonomy as well and underlines pension funds, but disregards all other asset classes substantially.

Our study is a major extension of existing research in cultural finance. In other areas of business studies, the remarkable impact of culture has already been documented. However, studies examining the effect of national culture on household finance have hardly existed at all. Our study fills this gap and offers a comprehensive analysis of the impact of culture on basic characteristics of household finance.

As is the same with other studies, this one has its limitations. Firstly, as we use socio-economic variables to map the main characteristics of household finance, the measurement is not precise. In order to alleviate this problem, the study should be repeated using alternative measures. Secondly, other studies suggest different approaches of testing the effect of cultural dimensions on dependent variables. The estimation of different models could serve as robustness checks for our results and might offer additional insights on the effect of different cultural regions. Thirdly, the analysis could be repeated on a micro-level of households. A survey of detailed data on the characteristics of single households would lead to more reliable results and should be the objective of further studies.

Breuer & Salzmann

Figure 1: Household portfolios of countries



The diagrams illustrate the structure of household portfolios and the dimensions of national culture in Japan, Singapore, France, and Australia in comparison to median values.

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Breuer & Salzmann

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