Cultural Origins of Investment Behavior*

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Abstract

There are large cross-country differences in the portfolio composition of individual investors. In this paper, we study the role of cultural heritage in explaining these differences by combining data on the asset allocation of second-generation immigrants in Sweden with the cultural attributes of their parents' countries of origin. Descendants of more risk-loving and less patient cultures take more idiosyncratic risk by keeping a higher share of their financial wealth in directly held stocks. They are also less likely to delegate their equity investment, as they assign a lower share of their wealth to mutual funds. We show that these findings are not driven by the selection of migrating parents, other country of origin attributes, or individual socio-economic characteristics. Our findings also provide an alternative explanation for under-diversification and lack of delegation among many individual investors.

Keywords: culture, cultural transmission, delegation, diversification, investment behavior, risk preference, time preference.

JEL classification codes: G11, G50, Z10.

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1 Introduction

Substantial cross-country differences in financial portfolio composition of individual investors (Badarinza et al., 2016; Christelis et al., 2013) remain largely unexplained even after accounting for demographics, education, income, and wealth - there is considerable variation in asset allocation among very similarly developed and geographically close countries.[1]

Cultural heritage might be a prime factor.[2] It has been shown that culture shapes beliefs and preferences, and influences individual choices that are reflected in decisions such as labor force participation, education, fertility, corruption, and violence.[3] Given the importance of preferences in shaping financial behavior, cultural heritage, transmitted from parents to children, could explain some of the differences in portfolio compositions across countries. This paper examines this idea by assessing the effects of two distinct culturally transmissible attributes that are front and center in any finance text book - risk and time preferences - on the composition of financial portfolios.

Although previous research does not directly test this hypothesis, existing evidence points to the potential role of cultural traits in forming financial portfolios.[4] Guiso et al. (2008) find that trust, a cultural attribute with deep historical roots, affects households' willingness to use the formal financial system. Haliassos et al. (2017) use data on first-generation migrants in Sweden, divided into six-country clusters based on their genetic distance to native

[1] For example, Badarinza et al. (2016) document that, while the share of mutual funds in financial wealth is three times as large as that of directly held stocks in Germany and Netherlands, the former is smaller in France and the two are very similar in Finland.

[2] For our purposes, culture is defined as a set of inter-generationally transmitted preferences, beliefs and attitudes in a society (Bisin and Verdier, 2001; Fernández, 2011; Fernandez and Fogli, 2009).

[3] Alesina et al. (2013); Fernández (2011); Fernández et al. (2004); Fernandez and Fogli (2009); Figlio et al. (2019); Fisman and Miguel (2007); Guiso et al. (2003, 2006); Miguel et al. (2011); Voigtländer and Voth (2012).

[4] Gomes et al. (2021) provide an overview of the literature on the link between culture and financial decision making.

Swedes, and study the role of cultural differences in asset market participation. They find people who were exposed to their home country for more years in their working life tend to exhibit greater cultural differences from the native culture and that differences diminish with exposure to the host country institutions, even for large cultural distances.

Separating the effect of culturally transmitted preferences on investment behavior from other institutional and economic factors is challenging. A culture that might drive one type of investment behavior could also result in institutions and policies that accommodate or incentivize that behavior (Guiso et al., 2006). Under these circumstances, one would not be able to distinguish whether a certain investment behavior is due to institutional features or individuals' cultural attributes.

We overcome these concerns by relating the investment behavior of second-generation migrants in Sweden, a subsample of the Swedish population who were born in Sweden but have at least one parent born in a different country, with cultural measures associated to their parents' countries of origin. As attitudes are inter-generationally transmitted from parents to children (Dohmen et al., 2012), our identification strategy exploits the opportunity to observe this subsample with varying parental cultural background in a common environment, thus, distinguishing cultural factors from other institutional and aggregate economic factors. Since the spatial separation of migrants from country of origin rules out reverse-causality and any other omitted factor must be intergenerationally transmissible, none of the usual confounders –such as institutions, the economic environment, technology and geography– can plausibly explain away our estimates.[5]

[5]This identification strategy has been dubbed as the epidemiological approach in the literature and is based on the variation in outcomes across different immigrant groups residing in the same country (Carroll et al., 1994; Fernandez and Fogli, 2006, 2009; Fernández, 2011; Giuliano, 2007). The majority of this literature looks at first-generation immigrants who, unlike second-generation immigrants, have been exposed to institutional and economic factors in their countries of origin as well as to those of their host countries. Depending on the question, one or the other group could be the preferable sample to investigate. For

To investigate individuals' investment behavior, we look at the shares of financial wealth invested directly in stocks and in mutual funds, as well as stock-market and mutual-fund participation. It has been shown that individuals who invest in stocks, as opposed to mutual funds, are likely to treat trading as gambling and switch between the two activities as substitutes. Dorn et al. (2015) show that variation in lottery prizes in Germany affects trading in individual stocks and options, but mutual fund trading fails to produce the experience sought by gambling-motivated investors. Gao and Lin (2015) show increases in the prize of lottery jackpots in Taiwan decrease the trade volume among stocks preferred by individual investors and Kumar (2009) finds that individual investors prefer stocks with lottery-type features (low-priced with high idiosyncratic volatility and high idiosyncratic skewness). As a result, direct investments in stocks generally exhibit higher volatility, with potentially more extreme returns, compared to investments in mutual funds, characteristics more appealing for risk-loving investors.[6]

On the other hand, investment in mutual funds requires being content with trading less frequently, which results in foregoing potential utility gained from the act of trading (Dorn and Sengmueller, 2009). It also requires delegating investment decisions, something that could appeal more to patient investors. Using data on the universe of investors and assets held in Sweden between 1999-2007, we show that funds are indeed traded less often

example, as mentioned earlier, Haliassos et al. (2017) use data on first-generation migrants in Sweden to study the pace of migrants' financial-behavior assimilation. Similarly, Osili and Paulson (2008) investigate if the attitudes of the first-generation migrants towards institutions affect their financial decisions by asking if their likelihood of participation in the US stock market is influenced by the degree of protection of property rights in their home country and their length of exposure to the host country's institutions.

[6]Gambling, especially when the outcome is correlated with consumption, has been used to obtain measures of risk preference (e.g., Barsky et al. (1997) and Frey et al. (2017)) and numerous studies (e.g., Ali (1977), Asch et al. (1982), and Snyder (1978)) have suggested that those involved in gambling-type activities have higher risk tolerance.

and are held for a longer period by their owners compared to stocks. This is consistent with fund owners being more patient on average.

For our main analysis, we combine administrative data on the investment outcomes of the population of second-generation migrants in Sweden with risk and time preferences in the countries of origin of their parents derived from the Global Preference Survey (Falk et al., 2018). Global Preference Survey (GPS) is an experimentally validated survey data set of economic preferences (risk and time preferences) from 76 countries that represent approximately 90 percent of the world population.[7] We focus on risk and time preferences in the GPS to capture culturally transmitted economic preferences for two reasons. First, these are the two types of preferences that enter virtually any attempt at modeling financial decision-making; indeed, it is difficult to think of how one would go about modeling inter-temporal decisions under uncertainty without specifying some form of risk and time preferences (Cochrane, 2005). They have also been shown to be among the drivers of decisions beyond financial decision making.[8] Second, global coverage of GPS allows us to assign second-generation migrants in Sweden to the measures of economic preferences in the country of ancestry.

While we do not find any evidence that culturally transmitted risk and time preferences affect the decision to participate in the risky asset market, we show that they have significant effects on the composition of portfolios. More specifically, conditional on participation in the equity market, children of immigrants from countries with more willingness to take risk are much more likely to directly hold stocks, less likely to hold mutual funds, and assign more of their financial wealth to directly held stocks. On the

[7]This data set also contains social preferences (positive and negative reciprocity, altruism, and trust).

[8]The economics literature suggests that risk and time preferences are associated with choices and behavior such as crime, smoking, conduct at school, and career, among others (Åkerlund et al. (2016); Dohmen et al. (2011); Einav et al. (2012); Falk et al. (2018); Golsteyn et al. (2014); Khwaja et al. (2007); Meier and Sprenger (2010); Sutter et al. (2013)).

other hand, those descended from more patient cultures are more likely to hold mutual funds, less likely to hold stocks directly, and devote more of their financial wealth to mutual funds. Importantly, our findings are robust to controlling for parental characteristics, such as education, wealth, or income. This suggests that economic preferences in the country of ancestry are not simply capturing parental characteristics and plausibly have a direct effect on children's investment behavior.

A potential threat to our identification is that migration from different source countries and across time might happen because of different reasons and that could affect the investment behavior of children of immigrants beyond the source countries' average cultural characteristics. The fact that our findings are robust to adding parental characteristics as controls mitigates this concern, since one would expect parental features to pick up the effect of selection of migrants from certain countries and across time to a large extent.[9] However, we go beyond this to explicitly address this concern in a number of ways. First, we show that the findings remain unchanged when we control for source continents plus a separate dummy for Scandinavian countries. Additionally, the findings are robust to controlling for the source countries' GDP per capita or life expectancy. Finally, trust has been shown to influence financial market behavior, especially among migrants (Guiso et al., 2004, 2008). If economic preferences we study are correlated with trust, one might suspect children of migrants from different countries to behave differently due to their differential levels of trust. We show that our results remain unchanged after controlling for trust, a cultural trait reported in the GPS as a social preference. These suggest that variations in some of the most important economic and social indicators of the source country do not derive our findings.

[9]Results are also robust to controlling for age at migration of parents.

Another concern about the proposed interpretation of our findings is that investment behavior of children is not directly affected by their cultural heritage but is simply a reflection of their other outcomes –such as cognitive ability, education, income, and wealth– that are related to investment behavior. However, one should note that, unlike the evidence we find for the effect of cultural preferences, all these other potential confounders increase the likelihood of equity market participation (Black et al., 2018; Briggs et al., 2021a). Also, there is no reason to think that these individual characteristics affect investment in stock and mutual funds in *completely opposite* directions, as we find to be the case for both patience and risk taking preferences.[10] Additionally, we find that the relations between cultural attributes and children of immigrants' investment behavior remain strong after controlling for children's education, income, wealth, and even IQ. Although this exercise suffers from adding "bad controls", it stills indicates that cultural characteristics may be shaping financial behavior on top of their potential impact on other observable outcomes.

We corroborate our findings on the role of risk-taking heritage by using a separate data set from the Ethnographic Atlas (Murdock, 1965), which allows us to approximate ancestral risk-taking culture.[11] The Ethnographic Atlas includes information gathered by ethnographers reflecting various cultural and socio-economic characteristics of pre-modern societies before industrialization and European contact. Recent literature has utilized the Atlas to capture ancestral cultures from ancient times (Alesina et al., 2013; Giuliano and Nunn, 2013; Michalopoulos, 2012; Nunn and Wantchekon, 2011). We proxy the ancestral culture of risk taking in the parents' countries of origin with the prevalence of chance games, as opposed to games relied on physical skills or strategies. Consistent with our baseline

[10] In fact, throughout most of the distribution, wealthier individuals assign more of their wealth to both stocks and mutual funds (Fagereng et al., 2020).

[11] There is no information on the culture of patience in this dataset.

findings, we find that children descending from cultures where their ancestors' games often had an element of chance are more likely to own stocks, as opposed to mutual funds, and also assign more of their financial wealth to directly held stocks.

We also provide additional evidence that we indeed pick up the role of cultural heritage in our analysis. First, we show that the relations we find between economic preferences and financial behavior are stronger for those who are descended from more persistent cultures. Giuliano and Nunn (2021) argue that when the environment is more stable across generations, traits that have evolved up to the previous generation are more likely to be beneficial for the current one, and hence, the more beneficial it is to maintain existing customs. We test this idea in our setting by proxying cultural persistence with exogenous measures of cross-generational climatic variability of the environment and confirm our hypothesis. Second, consistent with the arguments of cultural transmission in Dohmen et al. (2012), we find that the role of cultural background in investment behavior is stronger if parents are from the same country and when second generation migrants live in areas with lower native shares.

Apart from providing insight into the determinants of cross-country variation in financial behavior, our findings have important implications for understanding under-diversification and lack of delegation among investors. Empirical evidence suggests that household portfolios are poorly diversified in many countries (Roussanov, 2010). Additionally, portfolio diversification has been cast as a by-product of investors' trading decisions rather than an objective (Goetzmann and Kumar, 2008; Dorn and Huberman, 2010), since equity portfolio diversification is highly correlated with the propensity to delegate equity investments. The reduced willingness to delegate equity investment decisions results in less investment in mutual funds that are generally better diversified (Alessie et al., 2004; Calvet et al., 2009; Gaudecker, 2015), and substantially more concentrated equity portfolios (Dorn and Weber,

2013). Our findings suggest that descending from more risk-loving and less patient cultures could result in forming under-diversified portfolios by investing less in mutual funds and more in directly held stocks. This cultural explanation of under-diversification could be a reason why we observe persistence of this behavior across time.

This paper also adds to our knowledge on the importance of family background in shaping individual investment behavior. To explain this relation, the literature has predominantly focused on the direct influence of family on children's genetic traits, human capital, wealth or income (Barnea et al., 2010; Calvet and Sodini, 2014; Cesarini et al., 2010; Charles and Hurst, 2003), as well as the possibility of parents influencing children's behavior (Black et al., 2017), all of which could in turn affect financial decisions. In this paper, we show that family could act as a pathway for the effect of cultural heritage.

2 Data

Outcome Variables Our outcome variables are various measures of equity market participation and asset allocation of the population of second-generation migrants in Sweden. These data come from the Swedish Wealth Registry (Förmögenhetsregistret) and were collected by Statistics Sweden (the government's statistical agency) for tax purposes. The data include all financial assets held outside retirement accounts at the end of a tax year, December 31st, reported by a variety of different sources, including the Swedish Tax Agency, welfare agencies, and financial institutions. Importantly, nontaxable securities and securities owned by investors below the wealth tax threshold were included in the reports (Calvet et al., 2007). With information based on statements from financial institutions and the full coverage of the population, issues of measurement error and selection bias, that are frequently substantial

concerns, are negligible in our setting. We have data on assets (linked with the holders' country of birth) from 1999 to 2006.

In our analysis of second-generation migrants, we focus on wealth in the year 2006. Between 1999 and 2005, banks were not required to report small bank accounts to the Swedish Tax Agency unless the account accrued more than 100 SEK (about 11 USD) in interest during the year. From 2006 onward, banks were required to report all bank accounts above 10,000 SEK. Also, focusing on 2006 allows us to have more second-generation migrant children to be old enough to participate in the stock market than earlier in the sample.

Although we look at equity market participation as an outcome, we are most interested in the analysis of portfolio composition conditional on participation, since that could best reveal the role of preferences (that could be transmitted culturally) on investment behavior.[12] Conditional on participation in the equity market through either stocks or mutual funds, we analyze portfolio compositions using four outcome variables. The first variable is an indicator for whether the individual owns stocks directly —we refer to this as stock market participation. The second is an indicator for participation in mutual funds. This includes holdings of mutual funds that only include stocks, as well as mutual funds that have a mixture of stocks and other financial instruments considered less risky than stocks, such as bonds. Our final two measures are the share of financial assets held directly in stocks and the share of financial assets held in mutual funds.[13]

[12]This choice is also justified technically since, as we show later in the paper, we do not find any effect of cultural traits on participation.

[13]Investment data from the wealth register that is linked with country of birth for the population of Sweden is only available to us at the aggregated level, meaning that we observe the total value of individuals' stocks and mutual funds but not the composition of stocks and fund portfolios. We do have access to the detailed, asset-level, wealth register that is not linked with the county of birth and we use that to investigate the period of fund and stock ownership.

Variables of Interest Our variables of interest are measures of risk and time preferences associated with second-generation migrants' ancestral countries (i.e. the country of origin of their parents). These data mainly come from the Global Preference Survey (GPS); an experimentally validated survey data set of the global variation in preferences (Falk et al., 2018).[14] GPS provides us with measures specifically designed to capture economic preferences — risk and time preferences — from 80,000 people in 76 countries that represent approximately 90% of the world population.[15] The surveys are carried out on representative samples within each country, and exhibit substantial heterogeneity in preferences across countries.[16]

Risk preferences (risk taking) were elicited through a series of related quantitative questions as well as one qualitative question (see Falk et al. (2018) for details). The quantitative survey measure consists of a series of five interdependent hypothetical binary choices, a format commonly referred to as a "staircase" (or "unfolding brackets") procedure (Cornsweet, 1962). Choices were between a fixed lottery, in which the individual could win x or zero, and varying sure payments, y.[17]

The qualitative item asks for the respondents' self-assessment of their willingness to take risks on an 11-point Likert scale, *"In general, how willing are you to take risks?"*.

[14] Available at https://www.briq-institute.org/global-preferences/home.

[15] Crucially, the authors also validate that variation in economic preferences actually predicts economically important real-life behavior (in addition to being experimentally validated).

[16] An alternative to GPS is the Hofstede data set with various cultural measures based on a set of qualitative survey questions (Hofstede, 2001). Two cultural dimensions are reminiscent of time and risk preferences, respectively: "long-term orientation" and "uncertainty avoidance". However, as Falk et al. (2018) write, both measures include individual components that are distant from time or risk preference and responses to individual items are not available, so one cannot use a subset of components for preference proxies. In contrast, the GPS data has the advantages of employing experimentally validated survey items (as opposed to ad hoc construction) and relying on nationally representative samples, hence, it better captures preferences.

[17] *"Please imagine the following situation. You can choose between a sure payment of a particular amount of money, or a draw, where you would have an equal chance of getting amount x or getting nothing. We will present to you five different situations. What would you prefer: a draw with a 50% chance of receiving amount x, and the same 50% chance of receiving nothing, or the amount of y as a sure payment?"*

This qualitative subjective self-assessment has previously been shown to be predictive of risk-taking behavior in the field in a representative sample (Dohmen et al., 2011) as well as of incentivized experimental risk taking across countries in student samples (Vieider et al., 2015). The qualitative item and the outcome of the quantitative staircase measure were combined through roughly equal weights.

Time preference (patience) measure is derived from a combination of responses to two survey measures, one with a quantitative and one with a qualitative format. The quantitative survey measure consists of a series of five interdependent hypothetical binary choices between immediate and delayed financial rewards. In each of the five questions, participants had to decide between receiving a payment today or larger payments in 12 months.[18]

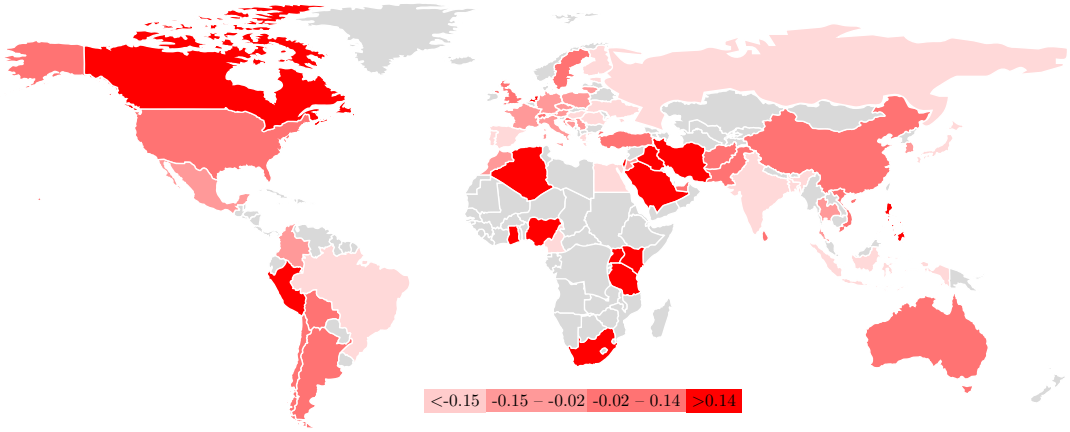
The qualitative measure of patience is given by the respondents' self-assessment regarding their willingness to wait on an 11-point Likert scale, asking *"how willing are you to give up something that is beneficial for you today in order to benefit more from that in the future?"*

Figures 1a and 1b show the distributions of risk taking and patience measures by quartiles across countries in our sample, respectively.[19] Both variables vary substantially geographically, as well as within a set of countries with similar levels of development. For example, within Europe, while France and Austria are in the top patience quartile, Greece and Hungary are in the bottom quartile. Alternatively, while the Netherlands and Canada are in the top risk taking quartile, Spain, South Korea, and Germany are in lower quartiles.

[18] *"Suppose you were given the choice between receiving a payment today or a payment in 12 months. We will now present to you five situations. The payment today is the same in each of these situations. The payment in 12 months is different in every situation. For each of these situations we would like to know which one you would choose. Please assume there is no inflation, i.e., future prices are the same as today's prices. Please consider the following: Would you rather receive amount x today or y in 12 months?"*

[19] Risk taking measure ranges between -0.79 and 0.97, while patience lies between -0.43 and 1.07. For a complete list of countries and their risk taking and patience scores, see Table A.1.

(a) Risk Taking



(b) Patience

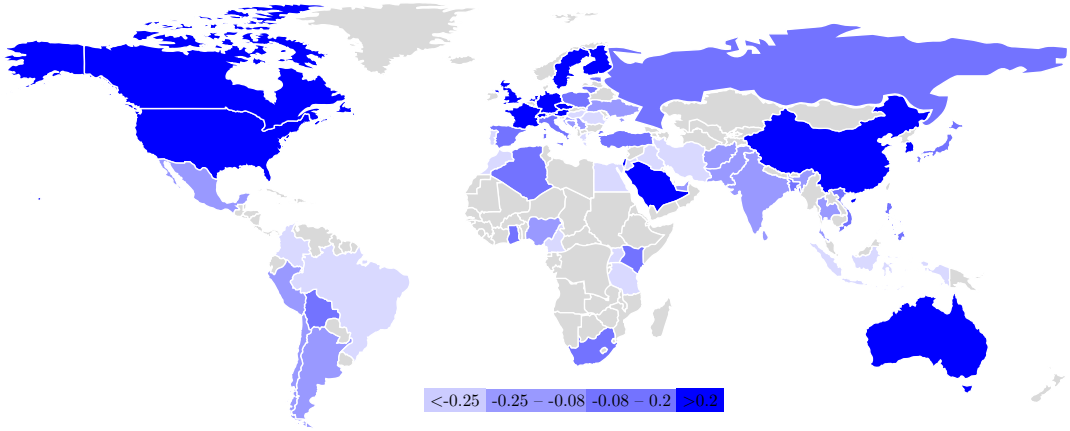


Figure 1 Risk Taking and Patience across Countries

Controls In our baseline regressions, we control for gender, whether the individual has one Sweden born parent, and year of birth. Additionally, in our robustness exercises, we take into account parents' years of birth, education, income ranks and parental wealth ranks (both within parental birth cohort) as well as individuals' education level, income rank,

wealth rank, and industrial sector of employment at the 4-digit level.[20] All of the variables are provided by Statistics Sweden and are based on administrative records, mainly from the Swedish tax authority.

Our final baseline sample for the analysis contains 172,033 observations. Table 1 provides summary statistics. In 2006, the average age of the children of migrants is 36 and they have more than 12 years of education. Conditional on participation in equity markets, 43 percent directly hold stocks (with 15 percent holding only stocks) and 85 percent hold mutual funds (with 57 percent investing only in mutual funds). Looking instead at the share of financial wealth invested in risky assets, individuals in our sample allocate 15 and 42 percent, respectively, to direct stock holdings and mutual funds.

3 Empirical Strategy

Our main specification relates an outcome of interest for the children of migrants in Sweden to the parents' cultural heritage. We estimate the following specification:

$$Y_{ic} = \alpha + \beta_R RiskTaking_c + \beta_P Patience_c + \gamma X_i + \varepsilon_{ic}, \tag{1}$$

where Y_{ic} denotes an outcome of interest for individual i from a heritage of origin c, where c is a mnemonic for *country*. $RiskTaking_c$ and $Patience_c$ are to capture children of migrants' cultural heritage of economic preferences in their parents' country of origin. Where parents come from two different countries, these variables indicate the average preferences of those countries. X_i refers to the set of control variables, which in the baseline regressions includes

[20] Following the literature on intergenerational mobility, we calculate income ranks for parents as average income rank over several years, specifically 1990-1994.

Table 1 Summary Statistics

	Mean	Std. Dev.	Min	Max	Obs.
Outcomes, 2006					
Share Stocks	0.15	0.27	0	1	172033
Stock-Market Participation	0.43	0.50	0	1	172033
Share Mutual Funds	0.42	0.37	0	1	172033
Mutual-Fund Participation	0.85	0.36	0	1	172033
Cultural Variables					
Risk taking	0.002	0.289	-0.8	1.0	62
Patience	0.043	0.376	-0.4	1.1	62
Individual Characteristics					
Female	0.47	0.50	0	1	172033
Age	36.5	10.5	19	59	172033
One Native-born Parent	0.78	0.42	0	1	172033
Years of Education	12.7	2.14	8	20	172033
Labor Income	241	214	0	9389	172033
Financial Wealth	300	8935	1	2537637	172033
Parental Characteristics, 1999					
Age, Father	60.4	11.28	30	90	172033
Age, Mother	57.2	10.97	27	89	172033
Years of Educ., Father	11.3	2.85	8	20	172033
Years of Educ., Mother	11.1	2.63	8	20	172033
Labor Income, Father	145	188	0	7631	154177
Labor Income, Mother	107	118	0	2024	165629
Financial Wealth Parents	993	134262	0	53599776	172033

Notes: Monetary values for income and wealth are denoted in thousands SEK.

a dummy variable for the gender of the individual, year-of-birth dummies for the child, and an indicator for having one Sweden-born parent. X_i also includes parental and individual characteristics in subsequent regressions. ε_{ic} is the error term, two-way clustered at the level of parental countries of birth.

Identifying Assumption The key assumption of our empirical strategy is that, by including the economic preference measures in parents' countries of origin, we capture the effect of cultural preferences and not that of potentially omitted variables. By observing second-generation immigrants in a common environment, we are able to distinguish cultural factors from institutional and economic ones, as these latter ones do not vary, while cultural heritage does. The assumption will be violated if proxies for cultural preferences are systematically correlated with other factors that affect financial behavior. One such example is if migrants from relatively risk-loving countries are wealthier (for other reasons than their high tolerance of risk) and children of wealthier parents hold a greater share of their wealth in directly-owned stocks. The fact that we can observe and control for other characteristics of parents greatly mitigates these concerns. In subsequent sections, we address the issue of confounding variables in detail and perform a number of robustness analyses.

4 Baseline Results

4.1 Equity Market Participation

Although in this paper we are primarily interested in the allocation of assets between directly held stocks and mutual funds within the portfolio of risky assets, we start our analysis by showing the effects of country of origin risk and time preferences on equity market participation, regardless of whether participation is through mutual funds or directly owning stocks.

Panel A in Table 2 presents the results. In all specifications, we control for having a Sweden-born parent and year-of-birth fixed effects. We do this because the previous literature has documented that the life cycle has important implications for equity-market participation (Fagereng et al., 2017) and those with a Sweden-born parent might systematically differ from others with two immigrant parents.[21] Column (1) also controls for gender. We do not find any effect of culturally transmitted economic preferences on participation. The previous literature has documented that financial market behavior could differ between men and women. In our baseline analysis, we show findings separately for the two groups. The estimates in columns (2) and (3) of Table 2 remain negligible and insignificant. In the literature, the decision to participate in risky asset markets is usually ascribed to overcoming a fixed cost that could be related to factors such as cognitive ability and wealth. The findings in Panel A suggest that culturally transmitted economic preferences are not (at least strongly) related to the participation decisions through those factors. In subsequent analysis, we show more evidence in support of this hypothesis.

[21] We run a robustness analysis on individuals with no Sweden-born parent later in the paper and confirm all our findings.

Table 2 Participation in Financial Markets, and Risk- and Time-Preferences

Sample:	All	Males	Females
Panel A:	Risky-Asset Participation		
	(1)	(2)	(3)
Risk taking	0.020	0.036	0.0028
	(0.032)	(0.034)	(0.035)
Patience	0.002	-0.006	0.012
	(0.015)	(0.014)	(0.017)
Observations	264719	137465	127254
Panel B:	Stock-Market Participation		
	(1)	(2)	(3)
Risk taking	0.220***	0.220***	0.219***
	(0.044)	(0.049)	(0.041)
Patience	-0.149***	-0.157***	-0.140***
	(0.018)	(0.019)	(0.019)
Observations	172032	90535	81497
Panel C:	Mutual-Fund Participation		
	(1)	(2)	(3)
Risk taking	-0.101***	-0.117***	-0.083**
	(0.038)	(0.043)	(0.032)
Patience	0.083***	0.096***	0.068***
	(0.017)	(0.020)	(0.014)
Observations	172032	90535	81497
Cohort FE	Yes	Yes	Yes
Gender FE	Yes	No	No
One Native-Born Parent FE	Yes	Yes	Yes

Notes: Ordinary least squares. The dependent variable in Panel A is a binary variable taking the value 1 if the individual allocates some fraction of financial wealth to risky assets. Panels B and C restrict the sample to those individuals who own at least some risky assets. In Panel B, the dependent variable is a binary variable taking the value 1 if the individual invests some fraction of financial wealth directly in the stock market; Panel C shows the analogous participation variable for mutual funds. *Risk taking* and *Patience* are the average risk-taking and patience scores associated with the individual's parents' birth countries from the Global Preference Survey; the standard deviation across countries for these two variables are 0.29 and 0.37 for risk-taking and patience, respectively. The sample in all columns are restricted to those individuals with existing data on parental education, income, and wealth. All columns include year-of-birth, gender, and one native-born-parent fixed effects. Column 1 includes both males and females while Column 2 includes only males and Column 3 only females. Standard errors (in parentheses) are two-way clustered by parental country of birth. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Considering the null effects in Panel A, in the subsequent Panels B and C, we attempt to understand whether culturally transmitted economic preferences have compositional effects. We limit the sample of analysis to equity market participants and investigate the effects of risk and time preferences on stock-market and mutual-fund participation. All estimates are highly significant and economically meaningful. Coefficient estimates for ancestral risk preferences in Panels B and C indicate that, while a culture of risk taking increases the likelihood of holding stocks directly, it decreases the probability of participation in mutual-fund market. A one-standard-deviation increase in risk taking (0.29) increases the probability of stock-market participation by 6.4 percentage points compared to the mean of 43%, and decreases the likelihood of holding mutual funds by 3 percentage points relative to a mean participation of 85%. These findings suggest that culturally transmitted risk-taking preferences have a compositional effect on individuals' portfolios by inducing people to hold stocks directly and shy away from mutual funds. This is consistent with direct investments in stocks generally exhibiting higher volatility, with potentially more extreme returns, compared to investments in mutual funds, characteristics more appealing for risk-loving investors.

Interestingly, the signs of the coefficient estimates reverse when we examine the effects of patience. People from more patient cultures are less likely to hold stocks and more likely to hold mutual funds. The coefficient estimates in column (1) of Panels B and C indicate that a one-standard-deviation increase in patience (0.37) decreases the probability of holding stocks by 5.5 percentage points and increases the likelihood of holding funds by 3.1 percentage points. This is in line with the idea that mutual funds typically have longer time horizons and they are not traded as frequently as direct stocks. In order to provide more support for this hypothesis, we use data at the individual asset level between 1999-2007 from the

Swedish Wealth Register, in which we can observe close to the universe of assets held by the population of Sweden and investigate the turnover for mutual funds and stocks.[22]

We assume that there are only two assets in the economy, funds (F) and stocks (S). Note that in this exercise we do not identify between different funds or different directly held stocks. Then, we count all holdings of funds and stocks in a given year, t, starting in 1999. Each individual-asset pair form one observation in year t. As an example, if there are two individuals in the economy, and one holds 100 funds and the other one holds one fund, we count 101 observations (aka holding opportunities) for funds between year t and $t+1$. In the next step, we observe how many of those individual-asset partnerships (unique one-to-one observations) exist in year $t+1$. We do this for funds across all years and calculate the probability of holding on to funds during the whole period as well as between two consecutive years. We do the same for stocks. We find that the probability of holding funds between 1999 and 2007 is 78 percent and the average annual probability of holding a fund is 89 percent. The corresponding numbers for directly held stocks are 72 and 80 percent, respectively. This shows that funds are held for a longer period by their owners compared to stocks. This is consistent with fund owners being, on average, more patient.

An alternative way to get a sense of the quantitative significance of the effects we find in Table 2 is to compare individuals from countries in the top and bottom quartiles of the risk-taking and patience distributions. For example, if an individual with a Portuguese heritage (-0.79) had the risk taking preferences of someone with Algerian heritage (0.39), her probability of stock-market participation would go up by 26 percentage points. Instead,

[22]Investment data from the wealth register that is linked with country of birth for the population of Sweden is only currently available to us at the aggregated level - we observe the total value of individuals' stocks and mutual funds but not the composition of stocks and fund portfolios. This limits our ability to analyze, for example, the role of culturally transmitted preferences on the performance of portfolios.

an individual who inherited Canadian patience (0.71) is 15.8 percentage points less likely to participate in the stock market than someone who inherited Colombian patience (-0.34).

It is also noteworthy that there is no significant difference in how culturally transmitted economic preferences shape men's and women's participation in the stock or fund markets.

4.2 The "Intensive Margin"

Next, in Table 3, we directly investigate the composition of risky financial assets by asking how culturally inherited preferences affect the intensive margins of investment in risky financial asset market. In order to do so, we look at the shares of financial wealth held directly in stocks or mutual funds, restricting the sample to individuals who participate in the equity market, as we did in Panels B and C of Table 2. Given the distinct features of individual stocks versus mutual funds discussed before, investigating these two margins sheds more light on the investment behavior of those descended from different cultures.

The coefficient estimates in the two panels suggest that those descended from more risk-loving cultures assign a larger share of their portfolio to directly held stocks that comes at the expense of their mutual-fund holdings, which is significantly reduced. A one-standard-deviation increase in ancestral risk-taking preferences leads to a 3 percentage-point increase in the share of financial wealth held in stocks (compared to a mean of 15% of portfolio in stocks). In light of what the prior literature has established, our findings show that culturally inherited risk preferences induce individuals to tolerate more risk in their financial portfolios.

The relation is the opposite for those with a heritage of greater patience; they devote a greater share to mutual funds and a smaller share to stocks. A one standard-deviation increase in patience results in a 2.6 percentage-point reduction in the share of financial

Table 3 Share of Financial Wealth Allocated to Directly held Stocks and Mutual Funds, and Risk- and Time-Preferences

Sample:	All	Males	Females
Panel A:	Share Stocks		
	(1)	(2)	(3)
Risk taking	0.102***	0.114***	0.0877***
	(0.022)	(0.026)	(0.019)
Patience	-0.070***	-0.078***	-0.060***
	(0.010)	(0.013)	(0.009)
Panel B:	Share Mutual Funds		
	(1)	(2)	(3)
Risk taking	-0.117***	-0.109***	-0.127***
	(0.027)	(0.027)	(0.028)
Patience	0.088***	0.088***	0.088***
	(0.010)	(0.010)	(0.011)
Cohort FE	Yes	Yes	Yes
Gender FE	Yes	No	No
One Native-Born Parent FE	Yes	Yes	Yes
Observations	172032	90535	81497

Notes: In Panel A, the dependent variable is the share of financial wealth allocated directly to stocks; Panel B shows the analogous share variable for mutual funds. The sample in both panels is restricted to those individuals whose risky assets (mutual funds or stocks) represent a strictly positive fraction of financial wealth. *Risk taking* and *Patience* are the average risk-taking and patience scores associated with the individual's parents' birth countries from the Global Preference Survey; the standard deviation across countries for these two variables are 0.29 and 0.37 for risk-taking and patience, respectively. The sample in all columns are restricted to those individuals with existing data on parental education, income, and wealth. All columns include year-of-birth, gender, and one native-born-parent fixed effects. Column 1 includes both males and females while Column 2 includes only males and Column 3 only females. Standard errors (in parentheses) are two-way clustered by parental country of birth. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

wealth held in stocks. Those with a culture characterized by a greater readiness to sacrifice immediate gains for future benefits end up with an arguably more diversified portfolio and forming portfolios for the longer run.

5 Confounding Factors

So far, we have interpreted our findings as the *effect* of cultural preferences. However, potential confounders could be systematically correlated with cultural preferences and affect investment behavior. In this section, we address this concern in a variety of ways.

5.1 Selection of Migrating Parents

In our baseline analysis, we have found that the cultural heritage of second-generation migrants matters for investment behavior. The most important concern in interpreting the coefficients of interest as the effects of ancestral and cultural traits is selection of migrant parents —those who migrate from certain countries in which people have been historically more risk loving or patient could display specific characteristics that affect their children's investment behavior. In other words, cultural traits could be correlated with the socioeconomic status of parents that might in turn determine children's financial-market behavior.

To the extent that parental characteristics are shaped by cultural traits, they do not pose a threat to our identification as those characteristics can be thought of as mechanisms through which cultural traits affect children's behavior. If a parent is wealthy due to her patience and wealth induces greater mutual-fund holdings, then wealth is not a confounder but a channel. Nevertheless, parental characteristics that cause children to behave in a certain way in the financial markets could co-vary with ancestral cultural traits in a non-random way without having been caused by those cultural traits. To address this concern,

we control for the most important parental features that could arguably affect children's financial behavior and investigate how the coefficient estimates change.[23]

The results for equity market participation and risky shares are shown in Tables 4 and 5, respectively. Column (1) in both tables repeat the baseline findings in column (1) of Tables 2 and 3. Table 4 starts out with taking into account parental fixed effects for eight education levels and parental year of birth fixed effects in regressions of stock market and mutual fund participation.[24] The following two specifications add controls for parents' income rank (added separately) and their wealth quartiles in their birth cohorts. Compared to column (1), the coefficients of interest remain largely intact with slight reductions in magnitudes when we control for parental characteristics.

Table 5 scrutinizes the robustness of regressions of stock and mutual fund shares in financial wealth to parental characteristics. Both sets of regressions are robust to parental education, income, and wealth controls. This suggests that cultural traits do not simply proxy for and capture parental characteristics and they could have a direct effect on children's financial behavior beyond inter-generational transmission of parental socio-economic characteristics. [25]

Importantly, we also assess the degree of omitted variable bias by studying the stability of the estimates –by comparing baseline estimates to fully controlled specifications with parental characteristics. The method of Altonji et al. (2005) allows us to evaluate how

[23]See Black et al. (2017) for a discussion of how parents could affect children's behavior in the risky financial markets.

[24]Following the eight-level ISCED11 classification, we create eight categories for the Swedish education system.

[25]When we carry out an R^2 decomposition exercise to assess the importance of cultural legacy relative to other factors in explaining individual financial behavior, cultural variables make a substantial contribution to explaining financial behavior even when we take into account parental characteristics. For instance, in the analysis of stock shares in column (4) of Panel A in Table 5, the contribution of cultural preferences is almost as large as the combined contribution of parental education, income and wealth.

Table 4 Owning Stocks and Mutual Funds, and Risk- and Time-Preferences, Controlling for Parental Characteristics

Panel A:	Stock Market Participation			
	(1)	(2)	(3)	(4)
Risk taking	0.220***	0.176***	0.188***	0.183***
	(0.044)	(0.061)	(0.062)	(0.058)
Patience	-0.149***	-0.131***	-0.138***	-0.134***
	(0.018)	(0.027)	(0.027)	(0.027)
Altonji ratio (risk taking)		4	5.87	4.94
Altonji ratio (patience)		7.27	12.54	8.93
Panel B:	Mutual Fund Participation			
	(1)	(2)	(3)	(4)
Risk taking	-0.101***	-0.102**	-0.098**	-0.098**
	(0.038)	(0.040)	(0.039)	(0.039)
Patience	0.083***	0.081***	0.079***	0.079***
	(0.017)	(0.018)	(0.017)	(0.017)
Altonji ratio (risk taking)		-102	29.6	31.58
Altonji ratio (patience)		45.16	18.32	19.26
Parental Education fixed effects	No	Yes	Yes	Yes
Income Rank, Father	No	No	Yes	Yes
Income Rank, Mother	No	No	Yes	Yes
Parental Wealth Quartiles	No	No	No	Yes
Parental Cohort FE	No	Yes	Yes	Yes
One Native-Born Parent FE	Yes	Yes	Yes	Yes
Gender FE	Yes	Yes	Yes	Yes
Individual Cohort FE	Yes	Yes	Yes	Yes
Observations	172032	172032	172032	172032

Notes: Ordinary least squares. In Panel A, the dependent variable throughout is a binary variable taking the value 1 if the individual participates directly in the stock market. In Panel B, the dependent variable throughout is a binary variable taking the value 1 if the individual invests some fraction of financial wealth greater than zero in mutual funds. *Risk taking* and *Patience* are the average risk-taking and patience score associated with the individual's parents' birth countries from the Global Preference Survey; the standard deviation across countries for these two variables are 0.29 and 0.37 for risk-taking and patience, respectively. Parental *Income Rank* is the average percentile labor earnings rank in 1990-1994 by birth cohort. The sample in all columns are restricted to those who allocate some strictly positive fraction of financial wealth to risky assets, and furthermore to individuals with existing data on parental education, income, and wealth. Columns 2–4 include parental and individual year-of-birth fixed effects and parental fixed effects for eight education levels. Standard errors clustered by parental country of birth in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 5 Share of Financial Wealth Allocated Directly to Stocks and Mutual Funds, and Risk- and Time-Preferences, Controlling for Parental Characteristics

Panel A:	Share Stocks			
	(1)	(2)	(3)	(4)
Risk taking	0.102***	0.086***	0.085***	0.084***
	(0.022)	(0.030)	(0.029)	(0.028)
Patience	-0.070***	-0.062***	-0.062***	-0.061***
	(0.010)	(0.014)	(0.013)	(0.013)
Altonji ratio (risk taking)		5.2	5.14	4.76
Altonji ratio (patience)		8.26	8.4	7.27
Panel B:	Share Mutual Funds			
	(1)	(2)	(3)	(4)
Risk taking	-0.117***	-0.100***	-0.103***	-0.101***
	(0.027)	(0.035)	(0.036)	(0.034)
Patience	0.088***	0.081***	0.083***	0.081***
	(0.010)	(0.014)	(0.014)	(0.014)
Altonji ratio (risk taking)		5.68	7.35	6.31
Altonji ratio (patience)		10.89	16.6	11.75
Parental Education fixed effects	No	Yes	Yes	Yes
Income Rank, Father	No	No	Yes	Yes
Income Rank, Mother	No	No	Yes	Yes
Parental Wealth Quartiles	No	No	No	Yes
Parental Cohort fixed effects	No	Yes	Yes	Yes
One Native-born Parent FE	Yes	Yes	Yes	Yes
Gender FE	Yes	Yes	Yes	Yes
Individual Cohort FE	Yes	Yes	Yes	Yes
Observations	172032	172032	172032	172032

Notes: In Panel A, the dependent variable throughout is the share of financial wealth allocated directly to stocks, conditional on allocating a fraction greater than 0 to risky assets (mutual funds or stocks). In Panel B, the dependent variable throughout is the share of financial wealth allocated to mutual funds, conditional on allocating a fraction greater than 0 to risky assets (mutual funds or stocks). *Risk taking* and *Patience* are the average risk-taking and patience score associated with the individual's parents' birth countries from the Global Preference Survey; the standard deviation across countries for these two variables are 0.29 and 0.37 for risk-taking and patience, respectively. Parental *Income Rank* is the average percentile labor earnings rank in 1990-1994 by birth cohort. The sample in all columns are restricted to those individuals with existing data on parental education, income, and wealth. Columns 2–4 include parental year-of-birth fixed effects and parental fixed effects for eight education levels. Standard errors clustered by parental country of birth in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

large selection on unobservables would have to be relative to the selection on observables in order to entirely explain away our result by an unobservable selection effect. For example, let us compare the baseline estimates in column (1) of Table 5 including exogenous controls to column (4) controlling for all of the parental characteristics.[26] In the share of stocks regression of Panel A, Altonji ratios are 4.76 and 7.27 for risk taking and patience, respectively. This suggests that selection on unobservables would have to be much stronger than selection on observables for our main result to be explained away by unobservable selection. In the case of mutual fund share regressions in Panel B, Altonji ratios are 6.31 and 11.75 for risk taking and patience, respectively. Given that all of these ratios are greater than the rule of thumb of one, our results are very unlikely to be biased by selection on omitted unobservables.

Overall, the findings presented in Tables 4 and 5 suggest that it is unlikely that parental selection is driving our baseline results.

5.2 Alternative Country of Origin Characteristics

Another possible scenario is that countries with higher measures of cultural risk taking or patience might be different in other ways that affect the investment behavior of children of immigrants from those countries. One should note that, for this to be a threat to our identification, these potential effects should be in addition to their impact on the socioeconomic characteristics of the first-generation immigrants themselves, which we account for.

To investigate this, in Tables 6 and 7, we add controls for GDP per capita and life expectancy of the source countries in columns (2) and (3). Data on GDP per capita are

[26]To perform this test, we calculate the ratio of $\beta_F/(\beta_R - \beta_F)$, where β_F is the coefficient of interest from a regression with a full set of controls while β_R is the coefficient of interest from a regression with a restricted set of controls (Altonji et al., 2005). We take β_R from the restricted specification in column (1) of Table 5 with exogenous controls.

from the Penn World Tables, measured in 1995, and data on Life Expectancy are from the World Bank, WDI, measured in 2016.

Column (1) includes continent fixed effects on top of controls we had in the last columns of Tables 4 and 5 showing that a few country clusters do not drive the results. Estimates of the coefficients of interest in the following two columns are very similar to the previous estimates. GDP per capita and life expectancy coefficient estimates are both economically and statistically insignificant. This suggests that the level of development of the source countries is unlikely to drive our findings and it is not confounding the cultural variables of interest.

Alternatively one could argue that selection of immigrants from countries with differential levels of development is not what we are picking up in our regressions, but economic preferences could be correlated with social preferences affecting financial behavior. This is not an argument against the role of culturally transmissible traits in general, but the coefficient estimates for our variables of interest could be biased. More specifically, Guiso et al. (2004, 2008) suggest that *trust* (or social capital in general) is a cultural factor shaping financial behavior. To address this, in the last column, we account for the *trust* measure from the GPS, which could potentially affect our outcomes independently. Results suggest that controlling for trust has no effect on the coefficients of interest.

5.3 Role of Other Child Outcomes as Mediating Variables

We have so far documented that the cultural legacy of the country of origin is related to, and could have a direct influence on, second-generation migrants' financial behavior even after controlling for some of the most consequential parental and country of origin characteristics. One other possibility is that the investment behavior of children is simply a reflection of their

Table 6 Owning Stocks and Mutual Funds, and Risk- and Time-Preferences, Other Cross-Country Controls

Panel A:	Stock Market Participation			
	(1)	(2)	(3)	(4)
Risk taking	0.189**	0.175***	0.176***	0.186***
	(0.092)	(0.055)	(0.053)	(0.060)
Patience	-0.134***	-0.116***	-0.125***	-0.136***
	(0.050)	(0.032)	(0.027)	(0.031)
Panel B:	Mutual Fund Participation			
	(1)	(2)	(3)	(4)
Risk taking	-0.140**	-0.097**	-0.096***	-0.103***
	(0.060)	(0.038)	(0.036)	(0.040)
Patience	0.103***	0.077***	0.077***	0.084***
	(0.031)	(0.021)	(0.019)	(0.020)
Continent Fixed Effects	Yes	No	No	No
Log GDP/Cap.	No	Yes	No	No
Life Expectancy	No	No	Yes	No
Trust	No	No	No	Yes
Parental Education and Cohort fixed effects	Yes	Yes	Yes	Yes
Parental Income and Wealth Rank	Yes	Yes	Yes	Yes
One Native-born Parent	Yes	Yes	Yes	Yes
Gender	Yes	Yes	Yes	Yes
Individual Cohort fixed effects	Yes	Yes	Yes	Yes
Observations	171925	172032	172032	172032

Notes: In Panel A, the dependent variable throughout is a binary variable taking the value 1 if the individual participates directly in the stock market. In Panel B, the dependent variable throughout is a binary variable taking the value 1 if the individual invests some fraction of financial wealth greater than zero in mutual funds. *Risk taking*, *Patience*, and *Trust* are the average scores associated with the individual's parents' birth countries from the Global Preference Survey. Parental *Income Rank* is the average percentile labor earnings rank in 1990-1994 by birth cohort. All columns include parental and individual year-of-birth fixed effects, parental fixed effects for eight education levels, dummies for having one native-born parent and gender. Standard errors (in parentheses) are two-way clustered by parental country of birth. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 7 Share of Financial Wealth Allocated Directly to Stocks and Mutual Funds, and Risk- and Time-Preferences, Other Cross-Country Controls

Panel A:	Share Stocks			
	(1)	(2)	(3)	(4)
Risk taking	0.106**	0.082***	0.084***	0.087***
	(0.046)	(0.028)	(0.027)	(0.029)
Patience	-0.075***	-0.057***	-0.060***	-0.064***
	(0.025)	(0.017)	(0.015)	(0.015)
Panel B:	Share Mutual Funds			
	(1)	(2)	(3)	(4)
Risk taking	-0.111**	-0.102***	-0.104***	-0.104***
	(0.051)	(0.033)	(0.032)	(0.036)
Patience	0.0820***	0.082***	0.085***	0.084***
	(0.024)	(0.016)	(0.015)	(0.016)
Continent Fixed Effects	Yes	No	No	No
Log GDP/Cap.	No	Yes	No	No
Life Expectancy	No	No	Yes	No
Trust	No	No	No	Yes
Parental Education and Cohort fixed effects	Yes	Yes	Yes	Yes
Parental Income and Wealth Rank	Yes	Yes	Yes	Yes
One Native-born Parent	Yes	Yes	Yes	Yes
Gender	Yes	Yes	Yes	Yes
Individual Cohort fixed effects	Yes	Yes	Yes	Yes
Observations	171925	172032	172032	172032

Notes: In Panel A, the dependent variable throughout is the share of financial wealth allocated directly to the stock-market, conditional on allocating a fraction greater than 0 to risky assets (mutual funds or stocks). In Panel B, the dependent variable throughout is the share of financial wealth allocated to mutual funds, conditional on allocating a fraction greater than 0 to risky assets (mutual funds or stocks). *Risk taking*, *Patience*, and *Trust* are the average scores associated with the individual's parents' birth countries from the Global Preference Survey. Parental *Income Rank* is the average percentile labor earnings rank in 1990-1994 by birth cohort. All columns include parental and individual year-of-birth fixed effects, parental fixed effects for eight education levels, dummies for having one native-born parent and gender. Standard errors (in parentheses) are two-way clustered by parental country of birth. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

other outcomes and is not directly affected by their cultural heritage. From the previous literature we know that cognitive ability, education, income, and wealth are directly related to investment behavior. If cultural heritage affects these outcomes (and on top of the parental characteristics that we analyzed before), one might argue that the coefficient estimates for cultural heritage could reflect the direct effects on these other individual features and not investment behavior.

It should be noted, there is no reason to think the potentially influential individual characteristics mentioned above affect stock and mutual fund investments in *completely opposite* directions, as we have found to be the case for both patience and risk taking preferences, and also they all increase the likelihood of equity market participation, unlike the evidence we found for the effect of cultural preferences in Panel A of Table 2. For example, those with more wealth are more likely to participate in both asset markets and assign more of their financial wealth to risky assets in general. This suggests that we should not expect the estimates for cultural variables to simply reflect their effects on other characteristics of children of immigrants.

Nevertheless, to assess this possible scenario more formally, we discuss potential mediating factors that could affect investment behavior directly and also be affected by culturally transmitted preferences, and investigate whether adding those controls sequentially change the estimates we found in Tables 4 and 5. We acknowledge that since these variables, by construction, are potentially influenced by cultural traits of patience and risk-taking, they could be described as "bad controls" in the terminology of Angrist and Pischke (2009), as the ceteris paribus assumption could be violated.[27] Note, though, that this is a standard mediation analysis, as our goal is to see how the coefficients on risk-taking and patience

[27]In other words, controlling for covariates that are affected by the treatment might bias the estimate of the treatment effect by capturing part of its impact.

change when we control for these variables. If adding a particular control changes the estimated coefficients considerably, it suggests that the effects on financial market behavior might be mediated by the effects of cultural traits on the variable included.

The estimates are in Tables 8 and 9 for stock market and mutual fund participation and shares, respectively. Column (1) in both tables repeat the findings in the last columns of Tables 4 and 5, controlling for all parental characteristics. In column (2), we add controls for children's education. The literature suggest that patience increases education (Falk et al., 2018; Figlio et al., 2019), while education affects financial market behavior (Black et al., 2017; Cole et al., 2014; Cooper and Zhu, 2016). However, our coefficients of interest barely change in column (2) of both Tables 8 and 9 and they are not statistically different from those in column (1). Therefore, the effect of our cultural preference variables on portfolio composition does not seem to be mediated through education.

Higher earnings could affect financial behavior by acting as a higher stable return to human capital that can partially substitute for bond holding, or because the fixed costs of investment decrease with financial wealth, and hence, with earnings (Black et al., 2017; Calvet and Sodini, 2014; Cooper and Zhu, 2016). Also, the literature suggests that wealth affects participation in the equity markets and the extent of risk taking (Andersen and Nielsen, 2011; Briggs et al., 2021b; Calvet and Sodini, 2014).

In columns (3) and (4), we add earnings rank and wealth quartiles (both constructed within cohorts) as controls. In column (5), we control for sector of employment, by adding fixed effects for four-digit industry dummies, since it could affect financial market behavior above and beyond earnings by, for example, exposing an individual to different levels of income risk, and be affected by risk-taking and patience. In the last column, we control for all of these potential mediating variables in one specification. While there are slight changes

Table 8 Owning Stocks and Mutual Funds Markets, and Risk- and Time-Preferences, Controlling for Individual Characteristics

Panel A:	Stock Market Participation					
	(1)	(2)	(3)	(4)	(5)	(6)
Risk taking	0.183***	0.178***	0.189***	0.166***	0.134***	0.117***
	(0.058)	(0.056)	(0.058)	(0.056)	(0.045)	(0.044)
Patience	-0.134***	-0.125***	-0.135***	-0.115***	-0.102***	-0.086***
	(0.027)	(0.025)	(0.027)	(0.025)	(0.020)	(0.019)
Panel B:	Mutual Fund Participation					
	(1)	(2)	(3)	(4)	(5)	(6)
Risk taking	-0.098**	-0.098**	-0.096**	-0.095**	-0.105***	-0.101**
	(0.039)	(0.039)	(0.039)	(0.039)	(0.040)	(0.040)
Patience	0.079***	0.080***	0.079***	0.076***	0.084***	0.080***
	(0.017)	(0.017)	(0.017)	(0.017)	(0.018)	(0.018)
Individual Education fixed effects	No	Yes	No	No	No	Yes
Individual Income Rank	No	No	Yes	No	No	Yes
Individual Wealth Quartiles	No	No	No	Yes	No	Yes
Employment Industry fixed effects	No	No	No	No	Yes	Yes
Parental Education fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Income Rank, Father	Yes	Yes	Yes	Yes	Yes	Yes
Income Rank, Mother	Yes	Yes	Yes	Yes	Yes	Yes
Parental Wealth Quartiles	Yes	Yes	Yes	Yes	Yes	Yes
Parental Cohort fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
One Native-born Parent	Yes	Yes	Yes	Yes	Yes	Yes
Female	Yes	Yes	Yes	Yes	Yes	Yes
Individual Cohort fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	172032	172032	172032	142879	172032	142879

Notes: In Panel A, the dependent variable throughout is a binary variable taking the value 1 if the individual participates directly in the stock market. In Panel B, the dependent variable throughout is a binary variable taking the value 1 if the individual invests some fraction of financial wealth greater than zero in mutual funds. *Risk taking* and *Patience* are the average risk-taking and patience scores associated with the individual's parents' birth countries from the Global Preference Survey; the standard deviation across countries for these two variables are 0.29 and 0.37 for risk-taking and patience, respectively. Parental *Income Rank* is the average percentile labor earnings rank in 1990-1994 by birth cohort. The sample in all columns are restricted to those individuals with existing data on parental education, income, and wealth. All columns include parental and individual year-of-birth fixed effects and parental fixed effects for eight education levels. Columns 2 and 6 include education fixed effects also for the individual; Columns 5 and 6 include industry fixed effects for the individual's employer at the 4-digit level. Standard errors clustered by parental country of birth in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 9 Share of Financial Wealth Allocated Directly to Stocks and Mutual Funds, and Risk- and Time-Preferences, Controlling for Individual Characteristics

Panel A:	Share Stocks					
	(1)	(2)	(3)	(4)	(5)	(6)
Risk taking	0.084***	0.083***	0.083***	0.070**	0.084***	0.068**
	(0.028)	(0.028)	(0.028)	(0.027)	(0.028)	(0.027)
Patience	-0.061***	-0.060***	-0.061***	-0.051***	-0.061***	-0.050***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Panel B:	Share Mutual Funds					
	(1)	(2)	(3)	(4)	(5)	(6)
Risk taking	-0.101***	-0.099***	-0.107***	-0.101***	-0.061***	-0.063**
	(0.034)	(0.033)	(0.035)	(0.035)	(0.023)	(0.027)
Patience	0.081***	0.077***	0.083***	0.077***	0.055***	0.054***
	(0.014)	(0.014)	(0.014)	(0.014)	(0.010)	(0.011)
Individual Education fixed effects	No	Yes	No	No	No	Yes
Individual Income Rank	No	No	Yes	No	No	Yes
Individual Wealth Quartiles	No	No	No	Yes	No	Yes
Employment Industry fixed effects	No	No	No	No	Yes	Yes
Parental Education fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Income Rank, Father	Yes	Yes	Yes	Yes	Yes	Yes
Income Rank, Mother	Yes	Yes	Yes	Yes	Yes	Yes
Parental Wealth Quartiles	Yes	Yes	Yes	Yes	Yes	Yes
Parental Cohort fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
One Native-born Parent	Yes	Yes	Yes	Yes	Yes	Yes
Female	Yes	Yes	Yes	Yes	Yes	Yes
Individual Cohort fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	172032	172032	172032	142879	172032	142879

Notes: In Panel A, the dependent variable throughout is the share of financial wealth allocated directly to stocks, conditional on allocating a fraction greater than 0 to risky assets (mutual funds or stocks). In Panel B, the dependent variable throughout is the share of financial wealth allocated to mutual funds, conditional on allocating a fraction greater than 0 to risky assets (mutual funds or stocks). *Risk taking* and *Patience* are the average risk-taking and patience scores associated with the individual's parents' birth countries from the Global Preference Survey; the standard deviation across countries for these two variables are 0.29 and 0.37 for risk-taking and patience, respectively. Parental *Income Rank* is the average percentile labor earnings rank in 1990-1994 by birth cohort. The sample in all columns are restricted to those individuals with existing data on parental education, income, and wealth. All columns include parental and individual year-of-birth fixed effects and parental fixed effects for eight education levels. Columns 2 and 6 include education fixed effects also for the individual; Columns 5 and 6 include industry fixed effects for the individual's employer at the 4-digit level. Standard errors clustered by parental country of birth in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

in the coefficients of interest, a large portion of the association remains intact, suggesting that these variables are not large enough mediators, and the direct effect of ancestral risk taking and patience on financial behavior remains important.

In Table A.2, we additionally investigate the role of cognitive ability by controlling for IQ test score in a subsample of our analysis. We get the IQ test scores from the military enlistment data that takes place at age 18 or 19 for enlisted men. We do not have this test score for all men in our sample of analysis, since it became less and less common through time for men to enlist in military service. The IQ test consists of four different parts, graded separately and transformed into a general measure of cognitive ability with values 1 to 9. The findings in columns (1)-(4) paint a very similar picture to those found in Tables 8 and 9.

6 Further Robustness

6.1 Ancestral Risk Taking Proxied by Ethnographic Chance Games in Parental Birth Country

Part of the literature that studies the impact of cultural values on economic outcomes has focused on cultural variables that are measured before modernization and that predate economic outcomes by a very long time (Alesina et al., 2013; Giuliano and Nunn, 2013; Michalopoulos, 2012; Nunn and Wantchekon, 2011). The advantages of using cultural variables measured very far back in time are twofold. Firstly, it rules out reverse causality; for example, gender norms today cannot have caused plough usage centuries ago (Alesina et al., 2013). Secondly, it provides an intuitive understanding of where the differing cultural norms

come from, as these measures capture characteristics of ancestral tribes or communities before any modernization and industrialization took place.

In our setup, with the spatial separation that our identification strategy relies on, reverse causality is already ruled out —there is no plausible mechanism by which cross-sectional variance in financial decision-making in Sweden has a material impact on measured average risk- and time-preferences across countries. Furthermore, as we are mainly concerned with the impact of cultural values on financial decision-making, and not how those cultural values are formed, we prefer using a direct measure of risk- and time-preferences as our baseline. Nevertheless, using a "deeper" measure of cultural risk-taking provides an intuitive justification for where these differences may come from. Also, this addresses the unlikely concern that our main cultural preferences, obtained from the GPS, might have been formed (even partly) by contemporaneous institutional and economic policies that could have also affected parents of immigrants in ways not reflected in their wealth, income, and education.[28]

Therefore, we draw on the Ethnographic Atlas from Murdock (1965) which allows us to approximate ancestral risk-taking culture (no information is available on the culture of patience). It further buttresses the interpretation of the GPS measure of risk-taking as capturing deeper cultural differences with an actual bearing on economic decisions, as opposed to solely reflecting some economic or institutional difference across countries that induces differences in survey-respondents' lottery certainty-equivalence.

The Ethnographic Atlas includes information gathered by ethnographers reflecting various cultural and socio-economic characteristics of pre-modern societies before industrialization and European contact.[29] The Atlas provides us with information on what types

[28]One should note that preferences outlined in the GPS are correlated with deep cultural variables and their determinants, such as agricultural suitability, language structure, and religion.

[29]Most of the societies are observed in the 19th and early 20th centuries.

of games a given society had in their cultures. It classifies societies' games when any combination of the following three elements were present: i. chance, ii. physical skills, iii. strategy.[30] We proxy the ancestral culture of risk taking in the parents' country of origin with the share of people whose ancestors played chance games.[31] In Table 10, we present our findings using the alternative cultural measure of risk-taking described above. Namely, we investigate to what extent children descended from cultures in which their ancestors' games were more heavily based on chance, rather than strategy or physical activities, are more likely to take more risks in the financial markets, keeping the institutional setting constant.

Consistent with the baseline findings, in columns (1) and (3) we find that children with an ancestral culture of risk taking are more likely to participate in the stock market and also have a greater share of their financial wealth directly in stocks. Whereas, columns (2) and (4) indicate that they are less likely to own mutual funds and have a smaller share of mutual funds.

In sum, this analysis reassures that cultural traits, defined in this analysis based on those descended from centuries ago, influence individuals' financial behavior today and the effect is similar to traits drawn from contemporary societies.

[30]E.g. dice games are chance games. Foot racing or wrestling are physical skill games. Chess would be an example of a strategy game.

[31]We rely on the data from Giuliano and Nunn (2018) who aggregate the Ethnographic Atlas to the country level from the ethnographic society level.

Table 10 Ancestral Chance Games and Financial Decision-Making

	Stock-Market Participation	Mutual Fund Participation	Share Stocks	Share Mutual Funds
	(1)	(2)	(3)	(4)
Ancestral Chance Games	0.100***	-0.048**	0.040**	-0.057***
	(0.033)	(0.022)	(0.016)	(0.019)
Parental Education fixed effects	Yes	Yes	Yes	Yes
Income Rank, Father	Yes	Yes	Yes	Yes
Income Rank, Mother	Yes	Yes	Yes	Yes
Parental Wealth Rank	Yes	Yes	Yes	Yes
Parental Cohort fixed effects	Yes	Yes	Yes	Yes
One Native-born Parent	Yes	Yes	Yes	Yes
Female	Yes	Yes	Yes	Yes
Individual Cohort fixed effects	Yes	Yes	Yes	Yes
Observations	172032	172032	172032	172032

Notes: The dependent variable in columns 1–4 are, respectively, stock-market participation, mutual-fund participation, share of financial wealth invested directly in stocks, and share of financial wealth invested in mutual funds. *Ancestral Chance Games* is a measure of ancestral risk taking constructed from the Ethnographic Atlas of Murdock (1965), capturing to what extent chance games were played historically in the parental countries of origin. Parental *Income Rank* is the percentile labor earnings rank by birth cohort, averaged over the years 1990–1994. All columns include parental and individual year-of-birth fixed effects, and parental fixed effects for eight education levels. Standard errors (in parentheses) are two-way clustered by parental country of birth. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

6.2 Two foreign born parents

So far, our analysis includes individuals with at least one foreign-born parent. Like all other individuals in our sample, for those with one parent born in Sweden we have averaged the cultural traits of the two parents. However, one might argue that those with one parent born in Sweden could be different in systematic ways from the rest of the sample. For example, they would face less language barrier growing up or assimilation into the society might happen in a more smooth way that could affect their behavior. To address this concern, we repeat our main empirical analyses on a sample of children with two migrant parents.

Table 11 Financial Decision-Making and Risk- and Time-Preferences, Two Foreign-Born Parents

	Stock-Market Participation	Mutual Fund Participation	Share Stocks	Share Mutual Funds
	(1)	(2)	(3)	(4)
Risk taking	0.197***	-0.091**	0.094***	-0.106***
	(0.064)	(0.038)	(0.028)	(0.037)
Patience	-0.144***	0.093***	-0.066***	0.082***
	(0.026)	(0.015)	(0.013)	(0.015)
Parental Education fixed effects	Yes	Yes	Yes	Yes
Income Rank, Father	Yes	Yes	Yes	Yes
Income Rank, Mother	Yes	Yes	Yes	Yes
Parental Wealth Rank	Yes	Yes	Yes	Yes
Parental Cohort fixed effects	Yes	Yes	Yes	Yes
Female	Yes	Yes	Yes	Yes
Individual Cohort fixed effects	Yes	Yes	Yes	Yes
Observations	38702	38702	38702	38702

Notes: The dependent variable in columns 1–4 are, respectively, stock-market participation, mutual-fund participation, share of financial wealth invested directly in the stock market, and share of financial wealth invested in mutual funds. *Risk taking* and *Patience* are the average risk-taking and patience scores associated with the individual's parents' birth countries from the Global Preference Survey; the standard deviation across countries for these two variables are 0.29 and 0.37 for risk-taking and patience, respectively. Parental *Income Rank* is the percentile labor earnings rank by birth cohort, averaged over the years 1990–1994. All columns include parental and individual year-of-birth fixed effects, and parental fixed effects for eight education levels. Standard errors (in parentheses) are two-way clustered by parental country of birth. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 11 presents results analogous to those in column (4) of Tables 4 and 5. Results are very similar and previous conclusions carry over, with a positive relation between risk taking and stock-market investment, and patience and mutual-fund investment, respectively.

7 Is It Really Culture?

In the previous sections, we have argued that economic preferences extracted from countries of the parents of second-generation immigrants capture the effect of cultural heritage, and we have tried to rule out potential competing narratives. Here, we try to provide additional

evidence in support of our hypothesis by generating predictions that are compatible with the role of culture and testing them in our setup.

The first analysis is based on the idea that cultural transmission is stronger for individuals whose parents come from countries in which maintaining cultural norms has been more beneficial across generations. Giuliano and Nunn (2021) study cultural persistence and change, and argue that similarity of environment across generations matters for cultural transmission. When the environment is more stable across generations, traits that have evolved up to the previous generation are more likely to be beneficial for the current one, and hence, the more beneficial it is to maintain existing customs. They empirically show that populations whose ancestors lived in environments with more cross-generational instability exhibit less cultural persistence. Based on this, we expect the relations we find between culturally transmitted preferences and financial behavior to be weaker for those from more unstable places, as cultural persistence is weaker. We test this idea by interacting our variables of interest with an exogenous measure of cross-generational climatic variability of the environment built by Giuliano and Nunn (2021), where they calculate cross-generational climatic instability of the ancestors of individuals living in each country today by measuring the average temperature variation over 70 generations (20-year a generation) from 500 to 1900 using sources of paleoclimatic data.[32]

[32]They first calculate standard deviations of temperature at the grid-cell level and then link these to the locations of pre-industrial ethnic groups, from which they create country-level measures by mapping ethnic groups to spoken languages (with a mean of 0.25, min of 0.05, and max of 0.52).

Table 12 Ancestral Climatic Instability, Cultural Preferences and Financial Decision Making

	Stock-Market Participation	Mutual Fund Participation	Share Stocks	Share Mutual Funds
	(1)	(2)	(3)	(4)
Risk taking	0.103	-0.176	0.168**	-0.00637
	(0.145)	(0.121)	(0.0725)	(0.0964)
Patience	-0.220**	0.165***	-0.122***	0.131**
	(0.0883)	(0.0564)	(0.0399)	(0.0510)
Risktaking × Climatic Instability	-0.0772	0.399	-0.353*	-0.0452
	(0.370)	(0.301)	(0.184)	(0.253)
Patience × Climatic Instability	0.386*	-0.330**	0.235**	-0.228*
	(0.223)	(0.149)	(0.102)	(0.132)
Climatic Instability	Yes	Yes	Yes	Yes
Parental Education fixed effects	Yes	Yes	Yes	Yes
Income Rank, Father	Yes	Yes	Yes	Yes
Income Rank, Mother	Yes	Yes	Yes	Yes
Parental Wealth Rank	Yes	Yes	Yes	Yes
Parental Cohort fixed effects	Yes	Yes	Yes	Yes
One Native-born Parent	Yes	Yes	Yes	Yes
Female	Yes	Yes	Yes	Yes
Individual Cohort fixed effects	Yes	Yes	Yes	Yes
Observations	165902	165902	165902	165902

Notes: The dependent variable in columns 1–4 are, respectively, stock-market participation, mutual-fund participation, share of financial wealth invested directly in stocks, and share of financial wealth invested in mutual funds. *Climatic Instability* is from Giuliano and Nunn (2021) and is a measure of cross-generational climatic variability of the environment between 500 and 1900 in the parental countries of origin (with mean 0.25, min 0.05, and max 0.52). Parental *Income Rank* is the percentile labor earnings rank by birth cohort, averaged over the years 1990–1994. All columns include parental and individual year-of-birth fixed effects, and parental fixed effects for eight education levels. Standard errors (in parentheses) are two-way clustered by parental country of birth. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 12 depicts a general pattern even though estimates for the interaction variables are not always statistically significant at conventional levels. For individuals whose ancestors come from more unstable countries, the effects of culturally transmitted preferences on financial decision-making are mitigated. For instance, if we look at the share of directly-held stocks as the outcome of analysis in column (3), the net effect of risk-taking for those from highly unstable countries (90th percentile=0.41) is small at 0.02. Whereas, the net

effect of risk-taking for those from highly stable countries (10th percentile of instability measure=0.12) is substantial at 0.125. Similarly for the estimated effect of patience, the impact is larger for those coming from more stable countries (with net effects of -0.09 and -0.02 at the 10th and the 90th percentiles of instability measure, respectively). These results are consistent with the idea that variables of interest we use in our analysis indeed capture cultural transmission of economic preferences.

In addition, we explore a few channels of cultural transmission and socialization (Bisin and Verdier, 2000). Dohmen et al. (2012) find that the correlation between parents' and children's cultural attitudes are stronger when parents are from similar cultures. To test this idea, we create a *Same Country* indicator - a binary variable equal 1 if both parents originate from the same country - and interact it with our risk taking and patience measures. If cultural transmission is stronger when parents are from the same country, the relationship between risk and time preferences and investment behavior should be accentuated. The results in Table 13 are largely consistent with this idea (although estimates are not always statistically significant at conventional levels). For instance, column (3) suggests that the association between risk taking and stock shares is twice as strong for those with both parents from the same country. Alternatively, in column (4), the effect of patience on the share of mutual funds is about 50% larger for those with both parents from the same country.

Table 13 Parents from the Same Country, Cultural Socialization and Financial Decision Making

	Stock-Market Participation	Mutual Fund Participation	Share Stocks	Share Mutual Funds
	(1)	(2)	(3)	(4)
Risk taking	0.129***	-0.0641***	0.0581***	-0.0676***
	(0.0285)	(0.0236)	(0.0141)	(0.0190)
Patience	-0.104***	0.0559***	-0.0484***	0.0641***
	(0.0131)	(0.00713)	(0.00749)	(0.00603)
Risktaking × Same Country	0.101	-0.0529	0.0554	-0.0659
	(0.0950)	(0.0592)	(0.0445)	(0.0485)
Patience × Same Country	-0.0585*	0.0498***	-0.0236	0.0316**
	(0.0309)	(0.0181)	(0.0163)	(0.0156)
Same Country	Yes	Yes	Yes	Yes
Parental Education fixed effects	Yes	Yes	Yes	Yes
Income Rank, Father	Yes	Yes	Yes	Yes
Income Rank, Mother	Yes	Yes	Yes	Yes
Parental Wealth Rank	Yes	Yes	Yes	Yes
Parental Cohort fixed effects	Yes	Yes	Yes	Yes
One Native-born Parent	Yes	Yes	Yes	Yes
Female	Yes	Yes	Yes	Yes
Individual Cohort fixed effects	Yes	Yes	Yes	Yes
Observations	172032	172032	172032	172032

Notes: The dependent variable in columns 1–4 are, respectively, stock-market participation, mutual-fund participation, share of financial wealth invested directly in stocks, and share of financial wealth invested in mutual funds. *Same Country* is an indicator that takes one if both parents originate from the same country. Parental *Income Rank* is the percentile labor earnings rank by birth cohort, averaged over the years 1990–1994. All columns include parental and individual year-of-birth fixed effects, and parental fixed effects for eight education levels. Standard errors (in parentheses) are two-way clustered by parental country of birth. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

According to Dohmen et al. (2012), another mechanism determining the strength of cultural transmission is the region of residence. If migrants live in an area with a lower share of natives, they might integrate more slowly and transmit their own culture to a greater extent. To test this idea, we create an indicator capturing *Low Native Share*, which takes the value 1 for 25% of individuals living in the parishes with the lowest share of natives (where natives are defined as being born in Sweden with two native-born parents). Then, we

interact this indicator with our risk and time attitudes. If migrants transmit their culture to a greater extent in areas with low native share, the influence of cultural attitude variables should be stronger in those areas. The results in Table 14 are consistent with this hypothesis. For instance, in column (3), the negative effect of patience on stock share is more than 50% stronger for those who reside in areas with a low native share.

Table 14 Low Native Shares, Cultural Socialization and Financial Decision Making

	Stock-Market Participation	Mutual Fund Participation	Share Stocks	Share Mutual Funds
	(1)	(2)	(3)	(4)
Risk taking	0.169***	-0.0796**	0.0746***	-0.0981***
	(0.0443)	(0.0319)	(0.0233)	(0.0262)
Patience	-0.118***	0.0615***	-0.0508***	0.0719***
	(0.0184)	(0.0109)	(0.00958)	(0.00811)
Risktaking × Low Native Share	0.0144	-0.0283	0.0122	0.0101
	(0.0413)	(0.0345)	(0.0209)	(0.0363)
Patience × Low Native Share	-0.0426**	0.0466***	-0.0278***	0.0255
	(0.0214)	(0.0150)	(0.00951)	(0.0162)
Low Native Share	Yes	Yes	Yes	Yes
Parental Education fixed effects	Yes	Yes	Yes	Yes
Income Rank, Father	Yes	Yes	Yes	Yes
Income Rank, Mother	Yes	Yes	Yes	Yes
Parental Wealth Rank	Yes	Yes	Yes	Yes
Parental Cohort fixed effects	Yes	Yes	Yes	Yes
One Native-born Parent	Yes	Yes	Yes	Yes
Female	Yes	Yes	Yes	Yes
Individual Cohort fixed effects	Yes	Yes	Yes	Yes
Observations	172032	172032	172032	172032

Notes: The dependent variable in columns 1–4 are, respectively, stock-market participation, mutual-fund participation, share of financial wealth invested directly in stocks, and share of financial wealth invested in mutual funds. *Low Native Share* is an indicator that takes one for 25% of individuals living in the parishes with the lowest share of natives, where natives are defined as being born in Sweden with two native-born parents. Parental *Income Rank* is the percentile labor earnings rank by birth cohort, averaged over the years 1990–1994. All columns include parental and individual year-of-birth fixed effects, and parental fixed effects for eight education levels. Standard errors (in parentheses) are two-way clustered by parental country of birth. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

8 Conclusion

This paper investigates the cultural origins of investment behavior. More specifically, by combining Swedish wealth registry data on second-generation immigrants with risk and time preferences in their parents' countries of origin, we examine the influence of culturally transmitted economic preferences on individual investments in the equity market. Children of immigrants from more risk-loving cultures are more likely to hold stocks directly, invest a greater share of their financial wealth in stocks, and a smaller share in mutual funds. On the other hand, those descending from cultures that are more patient invest more in mutual funds and less in stocks. We show that our results are not driven by the selection of migrating parents and culturally transmitted preferences have an independent and direct effect on individuals' financial decisions beyond their potential impact on parental and individual socio-economic characteristics.

In addition to advancing our understanding of the vast differences in investment behavior across countries, our findings have important implications for understanding under-diversification and lack of delegation among investors. We also emphasize the role of culture, and intergenerational nature of it, as another mechanism through which parents influence their children's economic behavior and outcomes: cultural attitudes towards risk and patience, (partially) shaped by transmission from parents, have economically and statistically significant effects on investment behavior.

This paper remains silent about the possibility that some cultural traits might be associated with better expected returns on investment. For instance, more patient individuals might act less on impulse that could generate higher returns over the longer run. However, so far, we do not observe individual assets and their prices in our data that includes country of birth and cannot judge whether individuals from more risk-loving or patient cultures are

more successful in their investment decisions. Thus, whether certain cultural characteristics are more conducive to financial success is a question left for future research.

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Online Appendix for "Cultural Origins of Investment Behavior"

A. Figures and Tables

Table A.1 List of Countries and their Risk- and Time- Preferences

Country	Patience	Risk taking
Afghanistan	-0.2013	0.1207
Algeria	0.0598	0.3915
Argentina	-0.2293	0.0415
Australia	0.6570	0.1371
Austria	0.6082	-0.0618
Bangladesh	0.0811	-0.1980
Bolivia	0.0713	0.1030
Bosnia Herzegovina	-0.2472	-0.1256
Brazil	-0.2600	-0.2505
Cameroon	-0.4274	-0.5350
Canada	0.7184	0.1835
Chile	-0.1554	0.1253
China	0.3981	-0.0198
Colombia	-0.3459	-0.0451
Croatia	-0.0937	0.0684
Czech Republic	0.3843	-0.0204
Egypt	-0.3831	-0.2808
Estonia	0.0253	-0.2954
Finland	0.5995	-0.2827
France	0.3568	-0.0301
Germany	0.6243	-0.0444
Ghana	0.0846	0.6184
Greece	-0.3600	-0.1570
Hungary	-0.4309	-0.4984
India	-0.1087	-0.2752
Indonesia	-0.3618	-0.3216
Iran	-0.3807	0.3378
Iraq	-0.4169	0.1657
Israel	0.4568	0.2437
Italy	0.1084	-0.0936
Japan	0.1084	-0.3558
Jordan	-0.4184	-0.1248
Kenya	-0.0762	0.2439
Lithuania	-0.0617	-0.0459
Mexico	-0.1084	-0.1389
Morocco	-0.3107	-0.0689
Netherlands	0.9517	0.1893
Nigeria	-0.2004	0.3859
Pakistan	-0.0831	0.0196
Peru	-0.1089	0.1549
Philippines	0.0991	0.2946
Poland	0.0716	-0.0735
Portugal	-0.3116	-0.7924
Romania	-0.2681	-0.2295
Russia	-0.0752	-0.3233
Saudi Arabia	0.2001	0.6957
Serbia	-0.1378	-0.1296
South Africa	0.0579	0.9705
South Korea	0.3692	-0.0393
Spain	0.1984	-0.1584
Sri Lanka	-0.1009	0.0627
Sweden	1.0714	0.0518
Switzerland	0.6697	-0.0193
Tanzania	-0.3249	0.4918
Thailand	-0.2297	-0.1235
Turkey	-0.0473	0.0234
Uganda	-0.2552	0.1625
Ukraine	-0.1816	-0.2186
United Arab Emirates	-0.0913	0.0865
United Kingdom	0.5350	0.0486
United States	0.8112	0.1165
Vietnam	0.1104	-0.0086

Table A.2 Role of IQ in Cultural Transmission of Economic Preferences

	Stock-Market Participation	Mutual Fund Participation	Share Stocks	Share Mutual Funds
	(1)	(2)	(3)	(4)
Risktaking	0.218***	-0.116***	0.0946***	-0.108***
	(0.058)	(0.040)	(0.028)	(0.031)
Patience	-0.135***	0.084***	-0.064***	0.081***
	(0.028)	(0.018)	(0.015)	(0.013)
Cognitive Ability Test	Yes	Yes	Yes	Yes
Parental Education fixed effects	Yes	Yes	Yes	Yes
Income Rank, Father	Yes	Yes	Yes	Yes
Income Rank, Mother	Yes	Yes	Yes	Yes
Parental Wealth Rank	Yes	Yes	Yes	Yes
Parental Cohort fixed effects	Yes	Yes	Yes	Yes
One Native-born Parent	Yes	Yes	Yes	Yes
Female	Yes	Yes	Yes	Yes
Individual Cohort fixed effects	Yes	Yes	Yes	Yes
Observations	66785	66785	66785	66785

Notes: The dependent variable in columns 1–4 are, respectively, stock-market participation, mutual-fund participation, share of financial wealth invested directly in stocks, and share of financial wealth invested in mutual funds. *Risk taking* and *Patience* are the average risk-taking and patience scores associated with the individual's parents' birth countries from the Global Preference Survey; the standard deviation across countries for these two variables are 0.29 and 0.37 for risk-taking and patience, respectively. *Ability Test* is a test score akin to an IQ-test administered by the military during mandatory conscription tests; it ranges from 0 (worst) to 9 (best) and follows a normal distribution by construction. Parental *Income Rank* is the percentile labor earnings rank by birth cohort, averaged over the years 1990–1994. All columns include parental and individual year-of-birth fixed effects, and parental fixed effects for eight education levels. Standard errors (in parentheses) are two-way clustered by parental country of birth. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.