The Cultural Origin of Preferences: CEO Cultural Heritage and Corporate Investment

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Abstract

Does culture shape risk preferences? In this study, we exploit variation in cultural heritage across CEOs of public U.S. companies and document a significant association between CEOs' culturally transmitted risk preferences and corporate investment decisions. A one standard deviation increase in a CEO's uncertainty avoidance, a proxy for risk preference, is associated with a 17% reduction in acquisitions and a 7% reduction in capital expenditures (Capx). Our findings are robust to controlling for economic and institutional differences as well as genetic differences across countries of origin and do not depend on first-generation immigrant CEOs. CEOs' risk preferences seem to have a causal influence on acquisitions, while the association between CEO risk preferences and Capx is largely explained by firm-CEO matching. Our results provide novel evidence of important social transmission of risk preferences, their effect on corporate investment policies, and the interplay of the culturally transmitted preferences of CEOs, corporate boards, and other top executives.

JEL classification:
Key words: Culture, corporate culture, risk preferences, corporate investment, CEOs

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1. Introduction

There is significant variation in risk and time preferences across individuals. For example, some take a lot of risk when making investment decisions, while others avoid risk. Recent research has provided insights into the source of the heterogeneity in risk as well as time preferences, emphasizing the role of biological determinants (e.g., Cesarini et al. (2009), Cronqvist and Siegel (2014)) as well as events and experiences throughout individuals' lives (e.g., Malmendier and Nagel (2011)). What role does culture play in shaping risk preferences? In this paper, we explore this question; in particular we study how culturally transmitted attitudes towards risk among top executives are related to investment decisions of large, public U.S. firms.

Culture is the set of preferences and beliefs widely shared by a group of people (Fernandez (2011)). Culture is learnt and transmitted socially, by parents to their children, between peers, and in an oblique way by society as a whole. Although culture is often slow-moving, the social transmission mechanism is important, as it allows for a faster and more calculated response to environmental changes than would be possible by genetic evolution alone (Robalino and Robson (2013)). However, despite the proposed importance of cultural transmission of preferences, empirically identifying the effect of cultural heritage on preferences is challenging. On the one hand, while cross-country studies document significant correlations between national culture and savings and investment decisions of households and firms (e.g., Guiso, Sapienza, and Zingales (2006), Shao, Kwok, and Zhang (2013)), those studies cannot easily separate the effects of cultural differences from institutional and economic differences across countries. On the other hand, studies of households in a single country often face the problem of cultural homogeneity. Studying investment decisions of CEOs in the U.S. allows us to exploit variation in culturally transmitted preferences that might be absent in culturally more homogenous countries, while at the same time holding constant the institutional and economic environment.

Making investment decisions under uncertainty is a central task for corporate executives and in particular CEOs. While in simple and frictionless models CEO preferences might not matter for corporate policies, several studies have shown that corporate decisions are not independent of CEO characteristics (e.g., Bertrand and Schoar (2003), Malmendier and Tate (2005)). On the one hand, firms likely select top executives based on risk and time preferences; on the other hand, CEOs' preferences may also have a causal effect on corporate policies. In addition to assessing the importance of cultural transmission of risk preferences, we also examine the underlying mechanism through which CEOs' risk preferences might matter for corporate investments as well as the interaction between CEOs' culturally transmitted preferences and those of the board as well as other executives. We are thus able to shed light on the evolution of corporate culture with respect to risk attitudes.

An important advantage of studying the culturally transmitted risk preferences of executives of public companies as opposed to of individual households included, for example, in the Survey of Consumer Finances (SCF), is that we can easily obtain the last names of corporate executives. We use these last names to infer the executives' cultural heritage and to measure their culturally transmitted preferences.[1] Specifically, we identify CEOs of public U.S. firms between 1980 and 2012 and match their last names as well as those of firms' top executives and board members to immigration records of passengers arriving in the port of New York between 1820 and 1957. Based on the citizenship of arriving passengers with a given last name, we obtain a distribution of countries of origin for each last name. For example, according to the New York passenger lists, 55% of passengers with the last name *Welch* are of English origin, while 25% are Irish. The remaining 20% come from a variety of other countries.

[1] Similar to our approach, Grinblatt and Keloharju (2001) use the last name and native language of CEOs in Finland to distinguish between Swedish and Finnish CEOs, while Kerr and Lincoln (2010), Gompers, Mukharlyamov, and Xuan (2012), Liu (2013), and Du, Yu, and Yu (2014) use last names to infer ethnicity in U.S. settings.

To measure risk preferences associated with a national culture, we employ Hofstede's (1980, 1991, 2001) uncertainty avoidance index (UAI), which captures a culture's tolerance for uncertain and unfamiliar situations, and has been shown to significantly correlate with individuals' risk preferences in surveys with participants from a large number of countries (Rieger, Wang, and Hens (2014)). For each last name, we then form the weighted average of uncertainty avoidance across the associated countries of origin. This approach yields culturally transmitted preferences that are independent of personal characteristics and, in particular, personal experiences that could also affect risk attitudes.

To capture corporate investments, we focus on acquisitions and regular capital expenditures (Capx). While both types of decisions are about a firm's growth, relative to Capx, acquisitions typically occur less frequently, have more uncertain outcomes, require more CEO involvement and allow for more CEO discretion.

Our results can be summarized as follows. CEOs with larger culturally transmitted uncertainty avoidance are significantly less likely to engage in corporate acquisitions and invest less in fixed assets. A one standard deviation increase in the CEO's uncertainty avoidance is related to a 17% reduction in the probability of acquisitions and a 7% reduction in capital expenditures. These magnitudes are comparable to other documented effects of CEO characteristics on corporate investments. The UAI effect is not limited to first generation immigrant CEOs, but applies also to CEOs whose families have likely been in the U.S. for multiple generations. Furthermore, while time preferences as well as economic and institutional characteristics of countries of origin exhibit substantial correlation with risk preferences, they do not confound the effect of risk preferences on corporate investment decisions. Finally, differences in cultural heritage of risk preferences seem to play a distinct role with respect to investment decisions relative to the effect of genetic differences between the countries of origin.

We investigate two possible channels through which the CEOs' culturally inherited risk preferences could matter for investment decisions. On the one hand, we find strong evidence of

matching between firms and CEOs on the culturally transmitted risk preference dimension. The board's and top management teams' risk preferences appear to be the most important determinants of the incoming CEOs' risk preferences. The matching effect explains the effect of CEOs' risk preferences on capital expenditures decisions, but does not explain its impact on M&A decisions. Similarly, firm fixed effects absorb the effect of CEOs' risk preferences on capital expenditures, but not on acquisitions. These results suggest that CEOs' risk preferences can have a causal effect on complex corporate investment decisions that allow for CEO discretion.

Finally, we examine how the interaction between firms' boards and CEOs leads to convergence in corporate risk attitudes. On the one hand, we find that the compensation-induced risk taking incentives, as reflected in the compensation vega, are on average higher for CEOs who are more uncertainty averse than the corresponding boards, suggesting that boards use compensation contracts to align the CEOs' risk preferences with theirs. On the other hand, the absolute difference between the CEO's and the board's uncertainty avoidance decreases over the CEO's tenure, consistent with CEOs favoring or attracting new directors with risk preferences similar to theirs.

In many ways, our research approach is biased against finding evidence that culturally transmitted preferences matter. First, the families of U.S. executives have likely been in the U.S. for several generations. Hence, the influence of cultural heritage on risk preferences is likely weaker in our study than in studies that use first or second generation immigrants to the U.S. (e.g., Fernandez (2007), Fernandez and Fogli (2009)). Furthermore, the characteristics of those leaving their home countries to immigrate to the U.S. may deviate from their home country's cultural norms (e.g., Borjas and Bratsberg (1996)), potentially adding noise to our proxies. Finally, different from financial decisions at the household level, the interaction between CEO preferences and corporate decisions, particularly in publicly traded companies, occur in an environment in which various institutional constraints apply. Hence, any support for a cultural

effect in our setting would likely represent a lower bound for the true effect of culturally transmitted preferences on individual decision making.

Our paper contributes to the growing literature on the origin of preferences by explicitly documenting the social transmission of attitudes towards uncertainty. Despite compelling theoretical arguments for social, i.e., non-biological transmission of preferences, (see, e.g., Robalino and Robson (2013) and Bisin and Verdier (2001)), empirical support with respect to risk or time preferences is largely missing. For example, in early work, Carroll, Rhee, and Rhee (1994, 1999) study savings behavior of immigrants to Canada and the U.S., but fail to find evidence in support of cultural transmission.[2] Recent studies of risk and time preferences of Swedish twins also find little evidence of social transmission within families (Cesarini et al. (2010), Barnea, Cronqvist and Siegel (2010)).[3] The lack of support for social transmission of risk and time preferences contrasts with studies by Fernandez and Fogli (2006, 2009), who document the influence of culture on female labor market participation and fertility choices of second generation immigrants to the U.S.[4] Our study shows that CEOs' culturally determined risk preferences do have an economically meaningful impact on corporate investment decisions in a large sample of public U.S. companies, thus providing novel and important support for the social transmission of risk preferences.[5]

Our paper is also related to research in economics and sociology on the speed of cultural assimilation of immigrants, particularly in the U.S. (e.g., Lazear (1999), Bisin and Verdier (2000,

[2] The authors point out that the results could be due to data limitations in the Canadian study and sample selection in the U.S. study, as immigrants to the U.S. from Mexico may belong to a very different socioeconomic stratum than those from, for example, Germany. The sample selection issue is mitigated in our research setting, as we focus on a group of individuals--top corporate executives--who are likely to come from a more homogeneous socioeconomic stratum than immigrant households in the U.S. in the 1980s and 90s.

[3] While there is significant parent-child similarity with respect to savings and risk-taking behavior (e.g., Chiteji and Stafford (1999), Charles and Hurst (2003)), there is little evidence of a cultural channel within families once genetic transmission has been accounted for.

[4] See also Ichino and Maggi (2000) and Guiso, Sapienza, and Zingales (2004) who show the effect of culture on work attitudes and financial development using movers within Italy.

[5] A recent study by Ahern, Duchin, and Shumway (2014) provides evidence of horizontal social transmission of risk preference in the form of peer effects among MBA students.

2001, 2010)). The idea of a "melting pot" and fast assimilation of immigrants in the U.S. has been rejected at least since Glazer and Moynihan (1963) concluded that the melting pot "did not happen." Persistent income differences across ethnic groups have been documented by several authors (see, e.g., Farley (1990)). In a recent study, Giavazzi, Petkov, and Schiantarelli (2014) examine cultural differences for a large set of social preferences and beliefs. They show that the degree of persistence varies across preferences and believes as well as countries of origin. Less than 8% of the CEOs in our sample are first-generation immigrants. Our empirical tests are therefore joint tests of the importance of culturally transmitted preferences and the persistence of cultural differences in the U.S. Our findings offer the first direct evidence on the persistence of culturally transmitted risk preferences in the U.S. and imply that cultural heritage with respect to these preferences is preserved over multiple generations.

Our research also contributes to the literature on the interaction between CEOs' characteristics and corporate policies. While Bertrand and Schoar (2003) focus on CEOs' personal styles on corporate outcomes, other papers have looked at specific traits or characteristics, such as overconfidence, marital status, or gender (e.g., Malmendier, Tate, and Yan (2011), Faccio, Marchica, and Mura (2012), Roussanov and Savor (2013)). Several studies have shown that proxies or measures of CEOs' risk attitudes are related to corporate policies (e.g., Cronqvist, Makhija, and Yonker (2012), Cain and McKeon (2014), and Graham, Harvey, and Puri (2013)). However, these papers are not concerned with the origin of CEOs' risk preferences. Another strand of studies examines how CEOs' risk preferences are potentially shaped by early-life experiences (Bernile, Bhagwat, and Rau (2014)) and work experiences (Custodio and Metzger (2014), Dittmar and Duchin (2014)). In contrast, we focus on culturally transmitted preferences and show that the size of their effect on corporate policies is comparable to the size documented in these other studies. The name-based approach to measure cultural heritage of CEOs should also be useful in many situations in which a proxy for culturally transmitted preferences or simply an exogenous proxy for preferences is needed for a large sample of CEOs.

Finally, our study contributes to a new and growing literature on corporate culture (Guiso, Sapienza, Zingales (2013)). Specifically, our findings suggest that the interactions between the board, the CEO, and the executive team via selection, influence, and incentives give rise to persistence in corporate culture with respect to risk attitudes, despite the regular turnovers at the corporate upper echelon.

The rest of this paper is organized as follows. Section 2 introduces the main data for our empirical analysis and provides a detailed discussion of our measures of culturally transmitted preferences. Section 3 presents our baseline results on the effect of CEOs' culturally transmitted preferences on corporate investment as well as a large number of robustness checks. Sections 4 investigates the channels through which CEO's culturally determined risk preferences matter for corporate investment and explores the interaction between the risk preferences of CEOs, board directors, and other top executives. Section 5 concludes.

2. Data

2.1. CEOs' Cultural Heritage

We construct a comprehensive sample of chief executive officers (CEOs) of publicly traded firms headquartered in the United States (U.S.). We identify CEOs, including their first and last name, using *Standard & Poor's ExecuComp* database, which covers S&P 1500 firms starting in 1992, and *Capital IQ*, which covers a large range of firms starting in 1996. We are able to identify 19,414 CEOs that were in office in 12,969 U.S. public firms between 1980 and 2012.[6]

We use the CEO's last name to identify the CEO's cultural heritage. In particular, we collect information from passenger lists of ships arriving from foreign ports in the port of New York between 1820 and 1957. These records, which are available through *Ancestry.com*, indicate

[6] About 40% of CEO-firm observations are from *ExecuComp*; about 45% are from *Capital IQ* with CEO flag; and the remaining 15% are from the consolidated career history in *Capital IQ's People Intelligence* database.

each passenger's first and last name, gender, approximate birth year, and the passenger's ethnicity or nationality. Appendix A provides a sample screen shot for passenger John *Welch* who arrived in New York on May 2, 1851, travelling on the *Oriental* from Liverpool, England. The passenger list which is used for U.S. immigration purposes reports his nationality as British (English). For each last name in our CEO sample, we search through all available records with non-missing ethnicity or nationality data for passengers with the same last name.

For 863 of the 19,414 CEOs, we cannot find passenger records that are associated with their last names and also have non-missing nationality data. For each last name of the remaining 18,551 CEOs, we aggregate nationality and ethnicity data at the country level and compute the frequency distribution across 122 countries of origins, including the U.S.[7] We denote the frequency of records of passengers with last name *l* from country *j* as w_{lj}^{PR}. On average, a CEO's last name is associated with 25 different countries. At the same time, the average (median) frequency of the largest origin per CEO is 51% (49%), suggesting that passenger records may include a long list of origins with low frequencies for a given last name. Overall, our passenger records provide a unique proxy of each CEO's heritage, reflecting over 100 years of immigration records of those arriving in New York, one of the central historical entry points to the United States.

To summarize the heritage of the CEOs in our sample, we calculate the average frequency for each country of origin across all 18,551 CEOs. Table 1 Panel A reports the most common countries of origin, the fraction that report U.S. as their nationality, as well as the fraction of non-missing, but uninformative origins ("Unidentifiable").[8] As in the 1990 U.S. Census, English, German, Irish, and Italian are the largest four ethnicities (excluding African-

[7] For example, we group different German origins, such as Hesse, Pomerania, and Preussen under Germany. In a few cases, we further group certain, typically smaller nationalities into larger groups. For example, we group Syrian and Tunisian passengers with those who state their nationality as "Arab", "Arabic", or "Arabian."

[8] For example, some ethnicity data is incomplete or very generic (e.g., "White").

Americans, which rank fourth in the Census data). Appendix B reports the average frequency for all 121 countries of origins as well as those for the U.S. and Unidentifiable.

While we employ the passenger record data to identify countries of origin for most of our analysis, we consider an alternative source, which also utilizes last names. Specifically, we use the *Dictionary of American Family Names* (Dictionary) which classifies 70,315 last names along 46 possible origins.[9] Differently from our main source, the Dictionary indicates only whether a last name is associated with a given origin or not. For example, according to the dictionary the last name *Welch* is of English, German, and Welsh origin. For last names not included in the dictionary, we obtain information about ethnic origin from *List Service Direct Inc*. (LSDI), a commercial data provider that uses a proprietary algorithm to identify a person's ethnicity based on the person's first and last name. We again calculate the frequency for each CEO's last name and country of origin based on the combined Dictionary-LSDI (for short, Dictionary) data.

2.2. Culturally Transmitted Preferences

To measure CEOs' culturally transmitted risk preferences, we use Hofstede's (1980, 1991, 2001) uncertainty avoidance index (UAI) which is rescaled to take on values between 0 and 1. According to Hofstede, the uncertainty avoidance index indicates "to what extent a culture programs its members to feel either uncomfortable or comfortable in unstructured situations. Unstructured situations are novel, unknown, surprising, and different from usual."[10] Hofstede constructs the index by statistically analyzing answers to questions asked in detailed interviews of hundreds of IBM employees in 53 countries between 1978 and 1983.[11] Since then the index has

[9] The Dictionary of American Family Names is based on names of about 90 million U.S. telephone subscribers, included in the 1997 edition of Info USA's ProCD Select Phone product and representing about 33% of the U.S. population in 1997. Out of 1.75 million distinct last names, 70,315 were included in the dictionary as they were sufficiently common (i.e, with at least 100 occurrences) or otherwise historically or etymologically important. Instead of nationality, the classification of origins in DAFN is based on cultural-ethnic-linguistic groups (CELG). CELG of a given last names is determined based on combined information from the first and last names. See Mateos (2007) for a detailed description of the dictionary's algorithm.

[10] See Geert Hofstede's website: http://www.geerthofstede.nl/dimensions-of-national-cultures

[11] Specifically, three questions are asked: "How often do you feel nervous or tense at work?", agreement with the statement "Company rules should not be broken – even when the employee thinks it is in the

been replicated several times and extended to additional countries (see, Hofstede, Hofstede, and Minkov (2010)). Hofstede et al. (2010) characterize low uncertainty avoidance cultures, like Great Britain (0.31), Ireland (0.31), China (0.27), Sweden (0.26), and Denmark (0.21), as low stress and low anxiety countries with an attitude that "what is different is curious." High uncertainty avoidance cultures, such as Greece (1.00), Portugal (0.93), Poland (0.83), France (0.77), and Italy (0.67), on the other hand, are described as high stress and high anxiety countries with an attitude that "what is different is dangerous."

While uncertainty and risk differ with respect to whether the probabilities of future events are known, Rieger, Wang, and Hens (2014) show that Hofstede's uncertainty avoidance index is significantly correlated with individuals' risk aversion elicited in a multi-country survey (correlation=0.5). Furthermore, almost all real-world decisions, in particular with respect to M&A and other corporate investments, are made under uncertainty. We therefore consider uncertainty avoidance a meaningful measure of relevant risk preferences in our context.

For each CEO, we form the weighted average of the uncertainty avoidance index associated with each country of origin other than the U.S. Since we do not have UAI values for all countries of origin, we rescale the weights of all countries appropriately. That is, we calculate the *UAI* of a CEO with last name l as $UAI_l = \sum w_{lj}^{PR,UAI}\, UAI_j$, where $w_{lj}^{PR,UAI}$ represents the rescaled passenger-record (PR) based frequency for last name l with respect to country j.[12] In the same way, we calculate each CEO's *UAI* based on the Dictionary frequency distribution.

We also construct a proxy for culturally transmitted time preferences, using attitudes towards thrift from the fourth wave (1999-2004) of the world value survey (WVS), complemented by data from the European value survey (EVS) for those European countries not covered by the WVS. Following Guiso, Sapienza, and Zingales (2006), we infer time preference

company's best interest", and "How long do you think you will continue working for IBM?" See Hofstede, Hofstede, and Minkov (2010) for details.

[12] We cannot observe UAI for countries representing 2.5% of the average CEO's cultural heritage. For 34 CEOs we cannot calculate their UAI values, as in each case all origins with non-zero weights have missing UAI values.

based on answers to the question: “Here is a list of qualities that children can be encouraged to learn at home. Which, if any, do you consider to be especially important?” We create an indicator variable that equals one if the respondent lists as important ‘‘Thrift, saving money and things.’’ We then aggregate this variable at the country level by calculating the average across all respondents in a given country and call this “Thrift”. Guiso, Sapienza, and Zingales (2006) show that thrift attitudes are indeed correlated with national savings rates. Finally, we calculate each CEO’s *Thrift* as the weighted average using passenger records based frequency weights.

For the subset of 13,533 CEOs that is employed in the following empirical analysis, we report summary statistics of *UAI* and *Thrift* in Panel B of Table 1. On average, CEOs exhibit uncertainty avoidance of 0.468 when measuring cultural heritage based on passenger records and of 0.458 when using our Dictionary-based weights. The two measures of uncertainty avoidance are highly correlated ($\rho = 0.85$), reflecting substantial agreement between both sources of cultural origins. The average value of *Thrift* across all CEOs is 0.320 and Thrift is significantly positively correlated with *UAI* ($\rho = 0.42$ for our main *UAI* measure based on passenger records).

In addition to measuring culturally transmitted preferences, we collect CEOs’ demographic information such as age (*CEO Age*), gender (*Female*), education (*CEO Education*), and whether the CEO is born outside the U.S. (*First Generation*). We also collect information from *ExecuComp* and *Capital IQ* whether a CEO was promoted to the CEO position after having been with the firm for at least three years (*Insider CEO*), as well as his or her total tenure length as the CEO of a given firm. Panel B of Table 1 again provides summary statistics for these additional CEO and CEO-firm characteristics. Panel D of Table 1 reports the correlation between CEO UAI and other CEO characteristics and firm characteristics. Overall, the correlations are small in magnitudes. Appendix C provides detailed definitions of all variables.

2.3. Corporate Investment and Firm Characteristics

We focus on corporate investment in physical capital, since Bertrand and Schoar (2003) show that CEO style has a much larger impact on physical investment than other corporate policies such as R&D, cash holding, and financial leverage. Since almost all corporate investment decisions are made under uncertainty, we expect firms with more uncertainty-avoiding CEOs to invest less. There are two types of corporate physical investment, M&A decisions and capital expenditures. Both types of decisions are about firm growth. But they have meaningful differences that are relevant in our context. M&A decisions are infrequent, considered riskier with more uncertain outcomes, and likely require more CEO discretion, while capital expenditures tend to capture more routine and recurrent investment in physical capital.

We construct an indicator variable *Acquisition* that equals one if a firm engages in M&A during a given year and zero otherwise. *Acquisition Rate* is the total value of acquisitions in a year scaled by the firm's book assets. Acquisitions include completed acquisitions of assets or equity interests with disclosed transaction values covered by the SDC database.[13] In addition, we differentiate between focused acquisitions and diversifying acquisitions. *Focused Acquisition* indicates acquisitions within the firm's 2-digit SIC industry, while *Diversifying Acquisition* indicates acquisitions outside the firm's 2-digit SIC industry. Finally, we measure *Capx Rate* as annual capital expenditures scaled by book assets. Panel C of Table 1 reports summary statistics for these corporate investment policies. Firms in our sample make acquisitions in about 15% of the firm-year observations, with an average *Acquisition Rate* of 2.6%. Focused acquisitions are more frequent than diversifying ones (11% vs. 7%). Finally, the average *Capx Rate* for firms in our sample is 6.0%.

In some of our analysis, we also consider financial policies, in particular cash holdings, leverage, and payout ratio. We define *Cash Rate* as cash holding scaled by total book assets,

[13] We exclude leveraged buyouts, exchange offers, repurchases, spinoffs, minority stake purchases, recapitalizations, self-tenders, and privatizations.

Leverage as total book debt scaled by the sum of book debt and book equity, and *Payout Ratio* as total dividend payout divided by total earnings. Panel C of Table 1 again reports summary statistics for these financial policies as well as for a number of firm characteristic typically employed as controls: size as measured by the logarithm of net sales (*Log(Sales)*); profitability as measured by EBITDA over the beginning of the period assets (*ROA*); growth prospect as measured by the logarithm of market equity over book equity (*Log(MB)*). All firm level financial variables are winsorized at the top and bottom 1% of the sample distribution. Appendix C provides definitions of all variables.

3. CEOs' Culturally Transmitted Risk Preferences and Corporate Investments

3.1. Main Results

Table 2 presents our first test of the relationship between CEOs' culturally transmitted risk preferences and risk taking behavior as captured by corporate investment decisions. All results are obtained from linear panel regressions of firm *i*'s investment decision (y_{it}) in year *t* on the uncertainty avoidance index (UAI_{it}) of the firm's CEO and several controls:

$$y_{it} = a + bUAI_{it} + c'X_{it} + d'Z_{it-1} + \delta_t + \varepsilon_{it},$$

where X_{it} represents the CEO's gender, age, and education in year *t*, while Z_{it-1} denotes firm-level controls for firm size (*Log(Sales)*), growth opportunities (*Log(MB)*), and profitability (*ROA*) at the end of the previous year. All specifications include year fixed effects (δ_t); standard errors are clustered by firms, accounting for possibly non-zero residual correlation across observations for the same firm.

We report the effect of the CEO's uncertainty avoidance related to his cultural heritage on acquisitions and capital expenditures. Column (1) of Table 2 indicates that firms with a more uncertainty avoiding CEO are less likely to engage in an acquisition in a given year. In Column (2), we control for CEO characteristics, firm characteristics, and year fixed effects. Not surprisingly, firms with larger growth opportunities are more acquisitive, while female CEOs

appear to be less likely to initiate corporate acquisitions (see, Faccio, Marchica, and Mura (2012)). However, the effect of the CEO's culturally transmitted risk preferences is essentially unchanged, suggesting that the effect of CEO uncertainty avoidance is largely independent of these controls. Panel D of Table 1 indeed reveals that while *UAI* is significantly positively correlated with education and significantly negatively with firm profitability (*ROA*) and size (*Log(Sales)*), all correlations are small in absolute terms.

The coefficient estimate on *UAI* in Column (2) of Table 2 implies that a one standard deviation increase in the CEO's uncertainty avoidance (0.16) is related to a 2.5 percentage point (pp) drop in the likelihood that a firm will make an acquisition. Relative to an average annual acquisition probability of 15.0% in our sample, this drop corresponds to a 17% decrease. This result implies that for a firm with a CEO of 100% British origin (UAI of 0.31, ranked 9th) the probability of making an acquisition is about 6 pp higher relative to an otherwise similar firm with a CEO of 100% Italian origin (UAI of 0.67, ranked 62nd).

Some acquisitions might be riskier than others, especially from the manager's perspective. For example, focused acquisitions, that is, acquisitions of firms in the same industry, might be riskier than diversifying acquisitions that could potentially reduce firm-specific risk (see, Amihud and Lev (1981), May (1995), Acharya, Amihud, and Litov (2011), Cain and McKeon (2014), Gormley and Matsa (2011, 2014)). We explore this distinction between focused and diversifying acquisition for a subsample in Columns (3) and (4). We indeed find that the marginal effect of a CEO's uncertainty avoidance on the probability of a focused acquisition (Column (3)) is twice as large as its effect on the probability of a diversifying acquisition (Column (4)).[14]

In Column (5), we perform the same analysis for the *Acquisition Rate*. The effect of the CEO's UAI is again negative and highly statistically significant; a one standard deviation

[14] Since the average probability of focused acquisition is larger than that of diversifying probability (0.11 vs. 0.07), the relative UAI effect is about 35% larger for focused acquisitions relative to diversifying acquisitions.

increase in UAI is associated with a decrease in the acquisition rate by about 17% relative to the average rate.

Finally, in Column (6) we examine the impact of the CEO's risk preferences on capital expenditures (*Capx Rate*). Differently from acquisition decisions, investments in fixed assets exhibit less relative variation across firms and times and likely require less direct involvement of the CEO. The coefficient of variation for *Capx Rate* in our sample is indeed about one third of that for the *Acquisition Rate* and the two types of investment decision exhibit a correlation of only 10%. The result in Column (6) implies a decrease of *Capx Rate* of about 7% relative to the mean per standard deviation increase in *UAI*. While the *UAI* effect is statistically significant at the 1% level, its relative impact is smaller than those found for corporate acquisitions.

Our results so far provide novel and important evidence consistent with the cultural transmission of preferences. To gauge the importance of UAI, we compare the magnitude of the estimated UAI effects to the magnitude associated with alternative measures of CEO's preferences or characteristics that are correlated with corporate investment decisions. For example, Graham, Harvey, and Puri (2013) conduct a survey of CEOs to elicit risk preferences through responses to several gambles as in Barsky, Kimball, Juster, and Sharpio (1997). Their measure is designed to characterize CEOs' risk preferences in a comprehensive way, independent of the preferences' origin. Graham et al. (2013) find that highly risk-averse CEOs (about 10% of their CEO sample) are 9.0 pp less likely to engage in mergers and acquisitions relative to less risk-averse CEOs. By comparison, we find in our sample that CEOs, whose UAI values are in the top 10% of the UAI distribution, are about 7.3 pp less likely to engage in acquisitions, only slightly smaller than the effect of the comprehensive and gamble based measure of Graham, et al. (2013).

In Appendix D, we further compare the effect of culturally transmitted preferences, as captured by CEOs' *UAI* in our paper, with the effect of other non-skill based characteristics of the CEO related to investment decisions, in particular experiences of financial distress at work

(Dittmar and Duchan (2014)), sensation seeking as a private pilot (Cain and McKeon (2014)), military experiences (Benmelech and Frydman (2014)), and over-confidence (Malmendier and Tate (2008)). Overall, the effect of culturally transmitted CEO risk preferences seems to be comparable in magnitude to those related to other CEO characteristics or preferences.

3.2. Measuring UAI

Differently from studies that use first or second generation immigrants to study the effect of culture on economic outcomes (see, e.g., Fernandez and Fogli (2006, 2009)), we construct our proxies for culturally transmitted preferences using CEOs' last names and the distribution of passengers with the same last name arriving in New York between 1820 and 1957 to identify the countries of origins associated with a given name.

Although our approach allows us to approximate the culturally inherited preferences for a large sample of U.S. CEOs, it is a noisy approximation. We therefore discuss several potential sources of noise in our *UAI* measure and assess their impact on our baseline results reported in Table 2. We also consider an alternative data source to infer the origins associated with a given last name. We consider five specific sources of noise and imprecision in the construction of *UAI*, our passenger record based measure of culturally transmitted preferences. We report the related empirical evidence in Table 3 Panel A, focusing on the acquisition probability. We report additional and largely similar results for *Acquisition Rate* and *Capx Rate* in Appendix E.

First, on average we cannot identify the origin of 1.6% of the passengers arriving in New York (see *Fraction Unidentifiable* in Table 1 Panel B), but the *Fraction Unidentifiable* varies across last names. The CEO's *UAI* could be noisier for last names with a higher *Fraction Unidentifiable*. Column (1) of Table 3 Panel A shows that interaction effect between *UAI* and *Fraction Unidentifiable* is positive, but not statistically significant.

Second, while for about half of the last names in our sample, the most common origin accounts for at least 50% of the arriving passengers, the average (median) number of different origins per last names is 25 (20). We test the effect of origin diversity on our results by

interacting *UAI* with three different proxies: (i) the number of origins, excluding the USA, associated with a given last name (*# of Origins*); (ii) an indicator variable equal to one for last names with an origin, other than the USA, that represents at least 50% of the passengers with the same last name (*Dominant Origin*); (iii) the standard deviation across all UAI values associated with a given last name (*Dispersion in UAI)*. Column (2) of Table 3 Panel A shows that the effect of *UAI* on acquisitions is indeed significantly weaker when the number of origins is larger. At same time, as Column (3) reveals, whether a last name has a dominant origin does not have a significant impact on the effect of *UAI*. Finally, Column (4) suggests that dispersion in *UAI* indeed lowers its effect.

Finally, we consider the fact that some of the countries of origins listed in Appendix B are not covered by the Hofstede surveys and thus have missing UAI values. *UAI* could be measured less precisely for last names with a larger fraction of origins with missing UAI values (*Fraction of Origins Missing UAI*). However, Column (5) of Table 3 Panel A suggests that this is not a big concern, as the impact of UAI on firm acquisition does not seem to vary with *Fraction of Origins Missing UAI*.

In summary, while *UAI* is measured with noise, the estimated impact of UAI on corporate investment decisions appears fairly robust to noise and measurement error. Nevertheless, our baseline results in Table 2 should be viewed as providing a lower bound for the effect of culturally transmitted preferences on corporate policies.

In addition to addressing specific sources of noise and imprecision in our passenger record based UAI measure, we repeat our analysis from Table 2, employing *UAI (Dictionary)* which uses the *Dictionary of American Family Names* to determine the countries of origin associated with a last name. Panel B of Table 3 reports the corresponding results for the effect of *UAI (Dictionary)* on the three investment decisions. We again find that CEOs' culturally determined risk preferences are significantly and negatively associated with corporate acquisitions and capital expenditures. Both passenger records and Dictionary data therefore

appear to provide equally useful approaches to identify a person's cultural heritage based on the person's last name.

3.3. Alternative Interpretations: Time Preferences and Economic Development

3.3.1. Time Preferences

Empirical evidence suggests that acquirers might overspend in corporate acquisitions, resulting in negative announcement and negative long run abnormal returns for the acquirer (see, e.g., Rau and Vermaelen (1998), Moeller, Schlingemann, and Stulz (2005), Malmendier, Moretti, and Peters (2012)). Since *UAI* exhibits a positive correlation with *Thrift*, we examine next whether our conclusions from Table 2 are altered, when we explicitly control for CEOs' attitudes towards thrift.

Table 4 Panel A shows that although *Thrift* is associated with lower corporate investments, its effect disappears once we also include *UAI*. Thus, a CEO's risk preference, not his time preference, seems to explain corporate investment decisions. In Panel B of Table 4, we compare the effects of *UAI* and *Thrift* on corporate financial policies. For corporate cash holdings (*Cash Ratio*), both *UAI* and *Thrift* matter, indicating that firms with more uncertainty-avoiding or more thrifty CEOs hold slightly more cash than other firms (Column (1)). In particular, a standard deviation increase of *UAI* (*Thrift*) is associated with a relative increase in cash holding of about 2.5% (2.4%). The choice of financial leverage (*Leverage)* has been linked to corporate risk taking, since leverage increases the risk of equity. Column (2) of Panel B suggests that CEOs' risk preferences are associated with financial leverage, while time preferences are not. Finally, Column (3) suggests that the same is true for corporate payout policy.

3.3.2. Economic Development and Quality of Institutions

National culture is not independent from the economic development and the quality of institutions of a country. In cross-country studies of the effect of culture on economic outcomes, this lack of independence poses a significant challenge in identifying the effect of culture, as decisions are made in different economic and institutional environments. In contrast, our

empirical design allows us to hold the environment constant, and focus on corporate decisions made by CEOs of public U.S. firms. Nevertheless, to rule out that variation in *UAI* proxies for omitted economic or institutional differences between CEOs of different ancestry, we collect country-level data for 1980 from the World Development Indicator (WDI) database on GDP per capita, life expectancy, as well as secondary school enrollment. We also obtain the quality of institutions index from Bekaert, Harvey, Lundblad, and Siegel (2011). The index, which is higher for better institutions, reflects corruption, the strength and impartiality of the legal system, and bureaucratic quality.

For each CEO in our sample and for each of these country-level variables, we construct the corresponding weighted average across the origins associated with a CEO's last name used in the construction of *UAI*. *Log(GDP) at Origin*, for example, is the natural logarithm of the weighted average GDP per capita, where the average is calculated using the same weights as for constructing *UAI* by passenger records. *Log(Life Expectancy) at Origin*, *Schooling at Origin*, and *Quality of Institutions at Origin* reflect the average life expectancy, the average fraction of those enrolled in secondary education institutions, and the quality of institutions at each possible origin, and are constructed in the same way.

Column (1) of Table 5 reveals the strong association between *UAI* and these proxies of economic development and institutional quality. The *adjusted R-squared* of a CEO-level regression of UAI on all four economic and institutional proxies is 65%.

In Columns (2) through (4) of Table 5, we add all four variables to our base specification from Table 2. The effect of the CEO's *UAI* on corporate investment is essentially unchanged. That is, even though *UAI* is significantly correlated with the economic development and the quality of institutions of the CEO's countries of origin, the economic or institutional characteristics of these countries do not confound *UAI*'s effect on corporate investment decisions.

3.4. Persistence and Genetic Transmission

3.4.1. Persistence in Culturally Transmitted Risk Preferences

Early research on cultural differences in the U.S. revealed that differences are surprisingly persistent and can often still be detected in higher generation immigrants. Giavazzi et al. (2014) show that persistence varies substantially across cultural norms and that attitudes toward cooperation and redistribution, for example, converge fairly quickly. Since no direct evidence exists with respect to the convergence of risk attitudes of different cultural groups in the U.S., we examine the persistence of *UAI* in two steps.

First, for a subset of CEOs in our sample we are able to identify their birthplace using data from Marquis Who's Who and from Bernile, Bhagwat, and Rau (2014). About 8% of the CEOs with birthplace information are first-generation immigrants. To which extent is the effect of culturally transmitted risk preferences on corporate investment decisions due to these foreign-born CEOs? We compare the effect of *UAI* for CEOs that were born outside the U.S. and immigrated to the U.S. later (*First Generation*) to the effect of those who were born in the U.S. Columns (1) to (3) of Table 6 report the results for each of the three corporate investment decisions. In all three cases, the direct effect of CEO's *UAI* on corporate investment is still negative and significant and of similar magnitude as in Table 2. Our main findings are therefore not due to first generation CEOs. For acquisition decisions, there is some evidence that the effect of UAI is stronger for first generation CEOs, as indicated by the negative coefficient estimate for the interaction between *First Generation* and *UAI*, but only in case of the *Acquisition Rate* is the coefficient statistically significant at the 10% level. For the Capx Rate, the interaction term is positive and insignificant from zero.

Second, given that most CEOs are born in the U.S., we construct a more continuous measure of the U.S. presence for each last name to further assess the degree of persistence in culturally transmitted risk preferences. In particular, we use the fraction of passengers with a given last name who were already U.S. citizens between 1820 and 1957 (*Fraction U.S. Citizens*)

as a proxy for the length of time a last name has existed in the U.S. The larger this fraction, the longer a last name has possibly existed in the U.S.

The results are reported in Columns (4) to (6) in Table 6. For both acquisition outcomes, the interaction effect of *Fraction U.S. Citizens* and *UAI* is positive and significant, while it is insignificant for the Capx Rate. That is, the longer a CEO's ancestors have possibly lived in the U.S., as captured by a larger *Fraction U.S. Citizens*, the weaker the effect of the CEO's culturally transmitted risk preference on corporate acquisitions. This result is consistent with gradual assimilation of cultural preferences across generations.

Overall, the results in Table 6 suggest that the effect of culturally transmitted risk preference weakens the longer a family name has been in the U.S. The effect of *UAI* is not all limited to first generation immigrant however, but applies to those whose families have likely been in the U.S. for several generations.

3.4.2. Genetic Transmission

Similarly to other studies of economics and culture that use data about immigrants and their descendants,[15] we have interpreted our findings as consistent with the cultural or social transmission of risk preferences. Importantly, evidence of vertical cultural transmission in the domain of risk or time preferences has been largely missing, while several recent studies have provided evidence for genetic transmission. While about 95% of total genetic variability among humans occurs within populations and only 5% between populations (Rosenberg et al. (2002)), it is still possible that variation in *UAI* partially reflects genetic differences between countries of origin. Specifically, to the extent that the allele frequency of specific genes or group of genes that are causally related to risk taking behavior (for possible candidate genes, see, Dreber, Apicella, Eisenberg, Garcia, and Zamore, (2009); Kuhnen and Chiao (2009)) varies across countries of

[15] The research design is sometimes referred to as the epidemiological approach (see, e.g., Fernandez (2011)).

origin, our findings might be due to genetic transmission, instead of or in addition to cultural transmission.

To distinguish between genetic and cultural transmission, we obtain genetic distance data for a global set of country pairs (*Genetic Distance (World)*) and for a smaller set of European country pairs (*Genetic Distance (Europe)*) from Spolaore and Wacziarg (2009). Genetic distance measures the genetic differences between two populations and is based on differences in allele frequencies (see, Cavalli-Sforza, Menozzi, and Piazza (1994)). Only neutral characteristics that are not affected by selection are used in the calculation of genetic distances. That is, the concept of genetic distance was designed to provide a summary measure of the length of time that two populations have been separated from one another, rather than to characterize differences with respect to specific genetic traits. Indeed, as Spolaore and Wacziarg (2009) point out, the genetic distance between populations is expected to capture biological as well as possibly very persistent cultural differences. Importantly though, evidence from populations genetics suggests that the gene frequency patterns seen for a very large number of specific genes across populations largely reflects the divergence of populations, captured by genetic distance. This general finding also applies to the dopamine receptor gene (DRD4 7-repeat allele) that has been linked to financial risk taking (Kidd, Pakstis, and Yun (2014)).

In order to assess whether the impact of *UAI* on corporate investment decisions are driven by genetic differences related to risk preferences, we select all 50,881 observations from our sample that are associated with CEOs with a dominant origin. We average all observations for each dominant origin and form pairs between all dominant origins. After combining these data at the country-pair level with the genetic distance data from Spolaore and Wacziarg (2009), we obtain 819 unique global pairs as well as 299 unique European pairs. For each pair, we calculate the absolute difference in the average country-level acquisition probabilities as well as in the country-level *UAI* values associated with each country in a pair. In untabulated results, we confirm that absolute differences between country-level UAI values are indeed significantly

positively correlated with genetic distances between countries (Becker, Dohmen, Enke, and Falk (2014)).[16] We therefore test whether the pairwise difference in acquisition probabilities are related to pairwise differences in UAI when controlling for pairwise genetic distance.

Table 7 reports the results for the global sample as well as the European sample. In Column (1), we provide the base line effect of the absolute difference in *UAI* on the absolute difference in acquisition probabilities, using the world sample. Column (2) shows that accounting for the genetic distance does not change the effect of absolute difference in *UAI* at all. Columns (3) and (4) repeat the analysis for the smaller European subset, for which genetic distance is more precisely measured (see, Spolaore and Wacziarg (2009)). Overall, we find little evidence that genetic distances can account for the effect of UAI on corporate acquisition decisions.[17]

4. Why Do CEOs' Preference Matter? Selection vs. Influence

There are at least two channels through which the association between CEOs' cultural traits and corporate policies can emerge. First, firms might select CEOs whose risk preferences match firms' existing culture towards risk, which in turn determine firms' investment policies. Second, CEOs could actively influence corporate policies based on their risk preferences. In this section, we evaluate the empirical relevance of these two non-mutually exclusive channels for the documented relation between CEOs' culturally transmitted risk preference and corporate investment decisions. We also examine the interactions between the board and the CEO when their risk preferences differ.

4.1. Determinants of CEOs' UAI

Given the significant relation between CEOs' risk preferences and corporate policies documented in Section 3, we examine the determinants of newly selected CEOs' *UAI*. In

[16] Becker, Dohmen, Enke, and Falk (2014) find that absolute differences in survey-based risk preferences across countries are significantly related to the genetic distance between countries.

[17] In untabulated results, we find qualitatively similar results for the acquisition rate. On the other hand, for Capx rate, we do not find any association with between absolute differences in Capx Rate and absolute differences in UAI at the country-pair level.

particular, we ask whether CEOs are selected to match the existing firm attributes and whether decision makers, such as the board, select CEOs with preferences similar to theirs.

To answer these questions, we focus on a subset of 4,302 CEO-firm observations with detailed information on firm policies as well as on the composition of the board and the executive team before CEO turnover. All observations are for SP1500 firms between 1996 and 2012.

We begin by asking whether CEOs' *UAI* is correlated with the average UAI of the general population in the state (*UAI (State)*) in which the firm is headquartered or with the average UAI of CEOs in the same (2-digit SIC) industry (*UAI (Industry)*).[18] Significant correlations with state or industry UAI could arise if the CEO labor market is geographically segmented (Yonker (2012)) or if the ethnic composition of industry employees is non-random. If state or industry UAI also affect firms' investment policies, for example, due to similarity in the desirable risk taking in a given industry (Roberts and Leary (2014)), CEOs' UAI would be associated with firms' investment decisions. Based on results in Column (1) of Table 8, CEOs *UAI* is indeed significantly positively correlated with both state and industry UAI.

In Column (2) we examine the firm's past investment policies as potential determinants for the desired risk preference of the incoming CEO. The results show that new CEO's *UAI* is negatively and (marginally) significantly correlated with the average acquisition probability and Capx rate during the three years before turnover, suggesting that firms with more aggressive investment policies in the past tend to hire CEOs with lower *UAI*. Therefore, CEOs could be appointed to match the on-going corporate investment strategies.

In Column (3), we correlate the UAI of the incoming CEO with the UAI of important decision makers: the departing CEO, the pre-turnover board of directors, and the pre-turnover non-CEO top executives. One of the board's main responsibilities is the CEO selection. The departing CEO as well as the top executives will in many cases be consulted in the search process.

[18] We compute *UAI (State)* as the weighted average UAI of a given state, using the fraction of residents that based on the U.S. Census 1990 belong to a certain origin as weights. *UAI (Industry)* is calculated as the (2-digit SIC) industry average of CEOs' *UAI* in the year before turnover.

Using the last names of directors and the top four most highly paid non-CEO executives, we calculate UAI for each individual applying the same algorithm as for CEOs.[19] *UAI (Pre-turnover Board)* is then the average UAI of the directors the year before the CEO turnover, while *UAI (Pre-turnover Exec.)* reflects the average UAI of the management team prior to CEO turnover.

The results in Column (3) of Table 8 show that both the board's and the top executive team's average uncertainty avoidance are important and highly significant determinants of the new CEO's *UAI*. The *adjusted R-squared* increases from about 2% in Columns (1) and (2) to 26%. Interestingly, the departing CEO's *UAI* is not related to the *UAI* of his successor. Furthermore, the effects of *UAI (State), UAI (Industry),* and past investment policies become largely insignificant in the presence of the board's and the executive team's UAI. Overall the results suggest substantial matching between the firms' existing leadership team's risk preferences and those of new the CEO. Since a firm's culture towards risk taking is simply the shared risk preferences of all employees, and of the corporate upper echelon in particular, then our results suggest that firms tend to select CEOs whose risk preferences match the firm's culture towards risk.

First, one potential explanation for the above results is that directors simply choose CEOs with the same ethnicity. This explanation does not invalidate the importance of cultural traits. However, the correlation could also arise from similarities in other attributes within an ethnicity group beyond the culturally transmitted risk preference we study in this paper. In Column (4) of Table 8, we interact the board's UAI with *EthnicityMatch (Board),* an indicator variable that equals one if a CEO's (dominant) origin is the same as the most common origin among the directors on board, and zero otherwise. The significantly positive direct effect of the board's UAI supports the CEO selection based on board's risk preferences. Not surprisingly, the matching in risk preferences becomes even stronger when the new CEO's ethnicity is the same as the most

[19] We collect information on directors from *RiskMetrics* and *CIQ* director file and on the top four most highly paid non-CEO executives from *Execucomp* and *CIQ* executives file.

common origin for the directors, as evident in the positive and significant interaction effect of the board's *UAI* and *EthnicityMatch (Board).* We also find a similar pattern with the executive team: the correlation between the average UAI for the executive team and the new CEO's *UAI* is significant and positive regardless whether they come from the same ethnicity, but stronger if they do.

Second, another concern is that the cultural matching between directors or executive team and the new CEO is mechanically driven by the promotion of a top executive who was already on the board or in the top executive team to the chief officer position. More generally, internal candidates are likely to share similar risk preferences as the directors and other executives. To address this concern, we examine whether the board or the executive team tends to also select outsider CEOs with similar risk preferences. Based on information from *ExecuComp* and *Boardex* on the succession origin of the new CEOs, about two thirds of CEOs in our sample are *Insider CEOs*, i.e. they have been with the firm for at least three years at the time of their appointment as CEO. The results in Column (5) of Table 9 reveal that the *UAI* of outside CEOs is significantly positively associated with the board's and the executive team's UAI.

Taken together, Table 8 presents novel evidence that the matching between CEOs and firms is not limited to CEO ability and skills (Gabaix and Landier (2008), Pan (2014)), but extends to culturally transmitted risk preferences.

4.2. Selection vs. Influence

Given the importance of the existing leadership in determining the new CEO's UAI, we ask to which extent the relationship between CEOs' UAI and investment policies that we have documented above indirectly reflects the preferences of the existing leadership team and to which extent the relationship reflects the direct influence of CEOs' preferences beyond selection.

For example, Fee et al. (2013) examine a number of policies, including capital expenditures decisions, and find no significant change in firm policies after CEO turnovers, except after forced CEO turnovers. They argue that CEOs' "managing styles" in terms of

investment and financing policies are mainly determined by the board's selection of the CEO. On the other hand, Bertrand and Schoar (2003)) find evidence of CEOs' influence on corporate investment decisions. We thus examine whether controlling for CEO selection eliminates or reduces the effect of CEO's UAI on investment policies.

Columns (1), (4), and (7) in Table 9 Panel A report results for our baseline regression of investment policies onto CEOs' *UAI*, repeated on a subset of observations with the appropriate data on the composition of the board and the executive team. While the sample is much smaller (N = 16,550) than our full data set used in Table 2 (N = 71,175), the coefficient estimates for the effect of *UAI* are very similar to those reported in Table 2. Given the importance of the risk preferences of the firm's leadership team that selected the CEO, we first include the UAI of the previous CEO as well as of the pre-turnover board and executive team. The results in Columns (2), (5), and (8) show little effect on *UAI* in the case of acquisition decisions, while the effect of UAI on the *Capx Rate* is reduced in absolute terms and no longer statistically significant. In the case of the *Capx Rate*, the outgoing CEO's UAI as well as the UAI of the pre-turnover board and executive team have a negative effect, with the board's and executive team's UAI being jointly significant at the 5% level. In Columns (3), (6), and (9), we add the remaining selection factors from Table 8 (measured as of the year before the turnover in all cases). For all three outcomes, past policies have a significant effect on current investment decision. For acquisitions, the effect of CEOs' *UAI* remains statistically significant and economically unchanged. In the case capital expenditures, the CEOs' UAI effect is largely subsumed by the selection controls.

Overall, the results are consistent with CEOs' risk preference having a causal impact on acquisition decisions, while the effect on capital expenditures decisions largely arises through firm-CEO matching. It is possible that large, discrete investment decisions such as acquisitions involve substantial CEO discretion, such that CEOs' risk preferences causally affect these corporate decisions (Bertrand and Schoar (2003)). On the other hand, capital expenditures more likely reflect routine and persistent policies that involve less CEO discretion and are determined

by firms' past policies and overall firm culture (Fee et al. (2013)), to which the firm-CEO matching effect is more relevant.[20]

To control for CEO selection in our full sample, we repeat our baseline estimation from Table 2, but include either firm fixed effects or firm fixed effects together with industry-turnover year fixed effects. Table 9 Panel B Columns (1), (3), and (5) report results when we include only firm fixed effects to the baseline regressions in Table 2, while Columns (2), (4), and (6) report results when we further add industry-turnover-year fixed effects to capture potential industry conditions at the time of CEO turnover that may affect the desired CEO risk preference (e.g., industry merger waves or investment booms/busts).

For the M&A decisions, adding these fixed effects does not change the effect of CEO's UAI at all, which implies that the CEO's risk preference likely has a causal impact on M&A decisions beyond the potential firm selection of CEO risk preference due to these unobservable factors. In contrast, the effect of CEO's UAI on capital expenditure decisions disappears in both specifications, again consistent with the "selected style" argument for more persistent routine corporate investment policies.

4.3. Divergence and Convergence in Risk Attitudes

Despite the tendency of boards and top management teams to select CEOs who share their culturally transmitted risk preferences, the match on risk preference is, of course, not perfect and the degree of divergence in risk preferences in the corporate upper echelon varies across firms. The divergence could also arise because CEO turnovers are often accompanied by a higher than usual rate of director and top executive turnovers (Fee and Hadlock (2004); Hayes, Oyer, and Schaefer (2006)).

How do boards and CEOs respond to differences in their risk attitudes? On the one hand, the board can design CEO compensation contracts to alter the CEO's risk attitude, in particular to

[20] Note that with respect to firm policies, Fee et al. (2013) examine capital expenditures and leverage, both are pretty persistent policies. Indeed, in our data the auto correlation is 0.72 for *Capx Rate*, 0.90 for *Leverage*, but only 0.17 for *Acquisition Rate*.

encourage risk-taking behavior (see, e.g., Coles, Daniel, and Naveen (2006)). On the other hand, the CEO can influence the board's risk preference by appointing or attracting directors whose risk preference is closer to his own. In this subsection, we examine the empirical relevance of these mechanisms that could lead to converging risk preferences. Such convergence, together with the CEO selection process, can shed light on the persistence and evolution of corporate culture towards risk, i.e. the risk attitudes shared by key decision makers in the firm.

4.3.1. CEO UAI, Board UAI, and Compensation Vega

When the selected CEO does not have the desirable risk preference, the board may use compensation contracts to induce the "optimal" risk taking by the CEO, even though such compensation incentives are of course not costless for the firm. Does the board design CEO compensation taking into consideration of the CEO's risk preference?

To measure risk taking incentives provided by compensation contracts, we follow Coles, Daniel, and Naveen (2006) and calculate vega, the dollar change (in millions) in a CEO's wealth associated with a 1% change in the firm's stock return volatility, for a subset of firms and years with available ExecuComp data.

In Column (1) of Table 10, we examine the relation between a CEO's UAI and the average vega of his compensation contract during his tenure at a given firm, controlling for CEO and firm characteristics, averaged over time. Vega and *UAI* are positively and significantly related, suggesting that when the CEO's uncertainty avoidance is high, the board tends to compensate the CEO more for taking risks. Specifically, a CEO with a one-standard-deviation higher UAI is given a compensation contract with an 8% higher vega relative to the sample mean (i.e., an additional $8,320 in CEO's wealth for a 1% increase in firm volatility).

In Column (2) of Table 10, we further examine how vega responds to differences between the CEO's UAI and the board's UAI. If the board's UAI reflects the level of uncertainty avoidance desired by shareholders, and if the CEO is more uncertainty averse (higher UAI) than the board, then the board could use a higher-vega compensation contract to counter the CEO's

uncertainty avoidance. This is indeed what we find. The higher the CEO's UAI relative to that of the board's, the higher vega. Column (3) shows that this result also holds if we use firm-year level panel data instead of data at the firm-CEO level and is robust to controlling for firm fixed effects and year fixed effects. Finally, note, that the interaction between CEO's UAI and vega also provides an external validation that the UAI measure is indeed related to risk preference.[21]

4.3.2. CEO's Influence on Board's Risk Attitude

While the board may use compensation contracts to alter the CEO's risk attitude, the CEO may also influence the board's risk attitude over time by appointing or attracting new directors whose risk attitudes are closer to his own. Since the degree of co-option between the CEO and the board tends to increase over the CEO's time in office (Coles, Daniel and Naveen (2014), Pan, Wang, and Weisbach (2014)), in Table 11 we examine whether the board's and the CEO's preferences become more aligned over the CEO's tenure.

We use the logarithm of the CEO's time (in years) in office, "*Log(Tenure)*", in year *t* to predict the absolute difference between the board's and the CEO's UAI in year *t+1*. Controlling for firm fixed effects, we find in Column (1) that the absolute difference between the board's and the CEO's UAI decreases as the CEO's tenure increases, consistent with the CEO appointing or attracting new directors with risk attitudes similar to his own. The result holds in Column (2) when we further control for firm-CEO fixed effects, identifying the CEO's influence purely from the time-series variation within a firm-CEO pair, mitigating the concern that the effect is driven by cross-sectional heterogeneity in other CEO characteristics and their tenure lengths.

In Columns (3) and (4), we show that the divergence between CEO's UAI and executive team's UAI also decreases slowly over tenure. Therefore, the CEO also likely appoints or attracts immediate subordinates that share more similar risk preferences over time.

[21] In untabulated tests, we find that despite the correlation between the CEO's UAI and his compensation vega, controlling for vega in our baseline specifications in Table 2 does not change the effect of UAI on corporate investment much at all.

In summary, the results in Section 4 shed light on why the CEO's culturally transmitted risk preferences matter for corporate policies as well as on the persistence and evolution of corporate culture towards uncertainty and risk. Selection, influence, and incentives along risk preferences seem to play an important role in this process. Firms tend to select CEOs whose risk preferences match the firms' culture, as reflected by the risk preferences of directors and top executives. Remaining differences in risk attitudes between the CEO and the board appear to be partially addressed by CEO compensation design, but also tend to decrease over time, due to the appointment of new directors.

5. Concluding Remarks

Risk and time preferences play an important role in our understanding of how individuals make savings and investment decisions. Recent research has examined the origins and thereby the stability and evolution of these preferences. While compelling evidence exists with respect to the biological basis as well as the influences of life events, researchers have struggled providing robust evidence on cultural origins of risk and time preferences. In this paper, we attempt to fill this gap. In particular, we examine how culturally transmitted risk preferences of CEOs of large, public U.S. firms affect corporate investments.

For each CEO, we identify his or her cultural heritage using immigration records of passengers arriving in New York during 1820-1957 with the same last name as the CEO's. We measure a CEO's culturally determined risk preferences by forming the weighted average of Hofstede's (1980, 1991, 2001) uncertainty avoidance index (UAI) across all countries of origins associated with the CEO's last name. While this measure is noisy, we document a significant association between CEOs' culturally determined risk preferences and corporate acquisition and capital expenditures decisions. A one standard deviation increase in a CEO's uncertainty avoidance is associated with a 17% reduction in acquisitions and a 7% reduction in capital

expenditures. These magnitudes are similar to those recently documented by other studies of the effect of CEO characteristics on corporate investments.

This effect is not limited to first generation immigrant CEOs, but applies equally to CEOs whose families have likely been in the U.S. for multiple generations. Furthermore, while time preferences as well as economic and institutional characteristics of countries of origin exhibit substantial correlation with UAI, they do not determine the effect of UAI on corporate investment decisions. Our findings also suggest that culture is an important transmission channel for risk preferences, which is distinct from previously documented genetic transmission.

The most important determinant of newly selected CEOs' culturally transmitted risk preferences is the risk preferences of those involved in the selection of the CEO, i.e. the pre-turnover board and top executives. Our findings suggest that the selection along culturally determined risk preferences is not simply due to cultural familiarity, but appears specifically related to the preference dimension. The selection process explains the relationship between CEO's risk preference and routine, persistent capital expenditure decisions, but not M&A decisions that likely require more CEO involvement and allow for more CEO discretion.

Finally, we find that beyond the CEO selection process, the board tends to design compensation contracts to further align the CEO's risk preference towards theirs, while the CEO tends to influence the board's preference by appointing or attracting new directors with similar risk preference as his own over his tenure. The interaction between the two parties via selection, influence, and incentives gives rise to the persistence of corporate culture with respect to risk preferences.

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Table 1: Summary Statistics

Panel A: Distribution of Origins

This table reports the ten most common countries of origin as well as the average fraction of passengers of a given last name that report U.S. as their nationality and the average fraction of non-missing but uninformative origins ("Unidentifiable") for 18,551 CEOs.

Origin	Probability
England	16.54%
Germany	13.71%
Italy	9.57%
Ireland	6.09%
Jewish	4.45%
France	2.70%
Scotland	2.26%
Poland	2.06%
Russia	1.91%
Netherlands	1.83%
USA	17.77%
Unidentifiable	1.68%

Panel B: CEO Risk and Time Preferences and Other Characteristics

This table reports summary statistics for variables related to CEOs' culturally transmitted risk and time preferences as well as other CEO characteristics.

Variables by CEO	Obs.	Mean	Std. Dev.
UAI (Passenger Records)	13,533	0.468	0.161
UAI (Dictionary)	12,807	0.458	0.180
Thrift (Passenger Records)	13,533	0.320	0.053
CEO Education	6,930	1.725	0.618
Missing Edu. (Indicator)	13,533	0.488	0.500
Missing Age (Indicator)	13,533	0.270	0.444
Female (Indicator)	13,533	0.024	0.152
First Generation (Indicator)	8,180	0.079	0.269
Fraction US Citizens	13,533	0.166	0.120
Fraction Unidentifiable	13,533	0.016	0.027
# of Origins	13,533	25.00	19.00
Dominant Origin (Indicator)	13,533	0.473	0.499
Dispersion in UAI (Passenger Records)	13,533	0.175	0.083
Fraction of Origin Missing UAI	13,533	0.024	0.064
Log(GDP) at Origin	13,428	8.986	0.447
Log(Life Expectancy) at Origin	13,515	4.262	0.114
Schooling at Origin	13,286	0.659	0.221
Quality of Institutions at Origin	13,368	0.788	0.172

Variables by CEO-Firm	Obs.	Mean	Std. Dev.
CEO Age (1st year in a firm)	10,443	51.00	8.000
Tenure (total length in years)	11,453	7.443	6.719
UAI (State)	4,302	0.524	0.034
UAI (Industry)	4,302	0.473	0.026
UAI (Outgoing CEO)	4,302	0.462	0.157
UAI (Pre-turnover Board)	4,302	0.460	0.099
UAI (Pre-turnover Exec.)	4,302	0.452	0.094
EthinicityMatchBoard	4,302	0.333	0.471
EthinicityMatchExec	4,302	0.360	0.480
Insider CEO (ExecuComp Only)	1,838	0.664	0.473

Panel C: Firm Level Variables

This table reports summary statistics for firm-year level financial variables, as well as variables related to the culturally transmitted risk and time preferences of the board, executives, and employees.

Variables by Firm-Year	Obs.	Mean	Std. Dev.
Acquisition (Indicator)	71,175	0.150	0.357
Acquisition Rate (%)	71,175	2.589	10.886
Focused Acquisition (Indicator)	63,150	0.112	0.316
Diversifying Acquisition (Indicator)	63,150	0.074	0.262
Capx Rate (%)	67,219	6.022	8.571
Cash Rate (%)	71,161	16.798	20.405
Leverage (%)	69,505	32.752	26.781
Payout Ratio (%)	50,551	24.413	36.85
Log(MB)	71,175	0.723	0.875
ROA (%)	71,175	8.754	20.204
Log(Sales)	71,175	5.336	2.423
Vega	28,283	0.104	0.194
UAI - UAI (Board)	21,538	0.016	0.161
|UAI - UAI (Board)|	21,538	0.132	0.093
UAI - UAI (Exec)	28,201	0.016	0.171
|UAI - UAI (Exec)|	28,201	0.137	0.103

Panel D: Correlation Table

This table reports the correlation between CEO's *UAI* with CEO characteristics and (lagged) firm characteristics. ***, **, * denote significance at 1%, 5%, and 10% levels, respectively. The correlation with age (education) are calculated for the sample of 9,882 CEOs (6,930 CEOs) with non-missing age (education) information.

	Correlation with UAI	Level of Observations
CEO Age when first appearing in sample	-0.021**	CEO
Missing Age	-0.002	CEO
CEO Education	0.047***	CEO
Missing Edu.	-0.008	CEO
Female	-0.015*	CEO
Log(MB)	-0.001	Firm-Year
ROA	-0.030***	Firm-Year
Log(Sales)	-0.061***	Firm-Year

Table 2: Culturally Transmitted Risk Preferences and Corporate Investment Policies

This table reports the effect of CEOs' *UAI* on corporate acquisitions and capital expenditures. Firm-year level control variables (*Log(MB*), *ROA*, and *Log(Sales)*) are lagged. Definitions of all variables are provided in Appendix C. Standard errors are clustered at the firm level. All regressions include a constant term and year fixed effects. ***, **, * denote significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Acquisition		Focused Acquisition	Diversifying Acquisition	Acquisition Rate	Capx Rate
UAI	-0.177***	-0.155***	-0.137***	-0.067***	-2.584***	-2.500***
	(0.013)	(0.013)	(0.011)	(0.009)	(0.322)	(0.440)
CEO Age		-0.001***	-0.001***	-0.000	-0.061***	-0.021*
		(0.000)	(0.000)	(0.000)	(0.009)	(0.012)
Missing Age		-0.083***	-0.068***	-0.021	-3.726***	-1.775**
		(0.019)	(0.017)	(0.014)	(0.539)	(0.744)
CEO Education		0.002	-0.004	0.003	-0.207	-0.453***
		(0.005)	(0.004)	(0.004)	(0.130)	(0.173)
Missing Edu.		-0.009	-0.003	-0.007	-0.487*	-0.360
		(0.011)	(0.010)	(0.008)	(0.278)	(0.405)
Female		-0.034***	-0.025**	-0.021**	-0.666**	-0.115
		(0.012)	(0.011)	(0.008)	(0.286)	(0.458)
Log(MB)		0.026***	0.013***	0.010***	1.112***	1.686***
		(0.002)	(0.002)	(0.002)	(0.066)	(0.069)
ROA		0.000*	0.000**	-0.000**	0.014***	0.022***
		(0.000)	(0.000)	(0.000)	(0.002)	(0.002)
Log(Sales)		0.022***	0.013***	0.013***	-0.220***	-0.140***
		(0.001)	(0.001)	(0.001)	(0.024)	(0.035)
Year FE	x	x	x	x	x	x
Obs.	71,175	71,175	63,150	63,150	71,175	67,219
Adj. R^2	0.020	0.041	0.033	0.030	0.031	0.087

Table 3: Measuring UAI

Panel A: Noise and Imprecision in Measuring UAI

This table reports the impact of noise and imprecision in measuring *UAI* on corporate acquisitiveness. In Column (1), we use *Fraction Unidentifiable*, which is fraction of immigrants with a given last name that has unidentifiable origin. In Column (2), we use *# of Origins*, which is the number of identified, non-USA origins. In Column (3), we use an indicator variable *Dominant Origin*, which equals one if a CEO's last name is associated with a dominant origin (outside US). In Column (4), we use *Dispersion in UAI*, which is the standard deviation of UAI values associated with different origins of a given last name. In Column (5), we use *Fraction of Origins Missing UAI*, which is the percentage of records without missing UAI values for a given last name. Firm-year level control variables (*Log(MB)*, *ROA*, and *Log(Sales)*) are lagged. Definitions of all variables are provided in Appendix C. Standard errors are clustered at the firm level. ***, **, * denote significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)
			Acquisition		
UAI	-0.156***	-0.228***	-0.139***	-0.131***	-0.154***
	(0.014)	(0.017)	(0.020)	(0.024)	(0.013)
UAI x (Frac. Unidentifiable)	0.204				
	(0.418)				
Frac. Unidentifiable	0.067				
	(0.241)				
UAI x (# of Origins)		0.006***			
		(0.001)			
# of Origins		-0.001***			
		(0.000)			
UAI x (Dominant Origin)			-0.021		
			(0.025)		
Dominant Origin			-0.006		
			(0.013)		
UAI x (Dispersion in UAI)				0.349**	
				(0.136)	
Dispersion in UAI				0.096	
				(0.074)	
UAI x (Fraction of Origins Missing UAI)					0.020
					(0.213)
Fraction of Origins Missing UAI					0.074
					(0.112)
Controls and Year FE	x	x	x	x	x
Obs.	71,175	71,175	71,175	71,175	71,175
Adj. R^2	0.041	0.047	0.042	0.044	0.041

Panel B: Measuring UAI with Dictionary Data

This table reports the effect of CEO's *UAI* derived based on Dictionary data on corporate acquisitions and capital expenditures. Definitions of all variables are provided in Appendix C. Standard errors are clustered at the firm level. All regressions include the controls from Table 2, a constant term, and year fixed effects. ***, **, * denote significance at 1%, 5%, and 10% levels, respectively.

	(1) Acquisition	(2) Acquisition Rate	(3) Capx Rate
UAI (Dictionary)	-0.092***	-1.498***	-2.681***
	(0.012)	(0.304)	(0.393)
Controls and Year FE	x	x	x
Obs.	69,002	69,002	65,141
Adj. R^2	0.040	0.031	0.090

Table 4: Risk Preferences versus Time Preferences

Panel A of this table reports the effect of CEOs' *UAI* and *Thrift* on corporate acquisitions and capital expenditures. Panel B reports the effect on corporate financial policies. Definitions of all variables are provided in Appendix C. Standard errors are clustered at the firm level. All regressions include controls from Table 2, a constant term, and year fixed effects. ***, **, * denote significance at 1%, 5%, and 10% levels, respectively.

Panel A: Corporate Investment Policies

	(1)	(2)	(3)	(4)	(5)	(6)
	Acquisition		Acquisition Rate		Capx Rate	
Thrift	-0.162***	0.034	-3.371***	-0.224	-3.560***	-0.593
	(0.038)	(0.040)	(0.940)	(1.015)	(1.214)	(1.289)
UAI		-0.160***		-2.553***		-2.421***
		(0.013)		(0.351)		(0.467)
Controls and Year FE	x	x	x	x	x	x
Obs.	71,175	71,175	71,175	71,175	67,219	67,219
Adj. R^2	0.037	0.041	0.020	0.021	0.085	0.087

Panel B: Corporate Financial Policies

	(1)	(2)	(3)
	Cash Ratio	Leverage	Payout Ratio
Thrift	7.843*	0.552	2.579
	(4.181)	(5.322)	(6.473)
UAI	2.525*	-5.739***	-12.904***
	(1.297)	(1.745)	(2.330)
Controls and Year FE	x	x	x
Obs.	71,161	69,505	50,551
Adj. R^2	0.235	0.089	0.063

Table 5: Risk Preferences versus Economic Development and Quality of Institutions

In Column (1), we report the correlation between CEO's *UAI* with various economic and institutional variables of countries of origin. The observations are at the CEO level. In Columns (2) to (4), we control for the economic development and the quality of institutions of the countries of origins. *Log(GDP) at Origin* is the logarithm of the origin-probability-weighted average 1980 GDP per capital for each CEO. *Log(Life Expectancy) at Origin* is the logarithm of the origin-probability-weighted average 1980 life expectancy for each CEO. *Schooling at Origin* is the origin-probability-weighted average fraction of population with secondary school education in 1980 for each CEO. *Quality of Institution at Origin* is the origin-probability-weighted average quality of institution's index in 1980 for each CEO. Definitions of all variables are in provided Appendix C. Standard errors are clustered at the firm level. Regressions in Columns (2) through (4) include controls from Table 2, a constant term, and year fixed effects. ***, **, * denote significance at 1%, 5%, and 10% levels, respectively.

	(1) UAI	(2) Acquisition	(3) Acquisition Rate	(4) CAPX
UAI		-0.144***	-2.069***	-2.521***
		(0.021)	(0.517)	(0.720)
Log(GDP) at Origin	0.158***	0.003	0.116	0.618**
	(0.006)	(0.008)	(0.195)	(0.263)
Log(Life Expectancy) at Origin	0.578***	0.047**	0.751	-0.958
	(0.031)	(0.023)	(0.511)	(0.914)
Schooling at Origin	-0.002***	-0.032***	-0.382	-0.346
	(0.000)	(0.011)	(0.278)	(0.398)
Quality of Institution at Origin	-0.916***	0.023	0.633	-0.443
	(0.019)	(0.028)	(0.664)	(1.036)
Controls and Year FE		x	x	x
Obs.	13,187	69,355	69,355	65,568
Adj. R^2	0.645	0.041	0.021	0.087

Table 6: Persistence of Culturally Transmitted Risk Preferences

This table examines the persistence of UAI. In Column (1) to (3), we interact CEO's *UAI* with *First Generation*, which is an indicator variable for CEOs who are born outside the U.S. In Column (4) to (6), we interact CEO's *UAI* with *Fraction US Citizens*, which is the fraction of passengers with a given last name who were already U.S. citizens during 1820-1957. Definitions of all variables are provided in Appendix C. All regressions include controls from Table 2, a constant term, and year fixed effects. Standard errors are clustered at the firm level. ***, **, * denote significance at 1%, 5%, and 10% levels, respectively.

	(1) Acquisition	(2) Acquisition Rate	(3) Capx Rate	(4) Acquisition	(5) Acquisition Rate	(6) Capx Rate
UAI	-0.160***	-2.148***	-2.435***	-0.166***	-2.970***	-1.464**
	(0.018)	(0.434)	(0.597)	(0.019)	(0.475)	(0.650)
UAI x First Generation	-0.047	-2.444*	0.805			
	(0.048)	(1.348)	(1.369)			
First Generation	0.003	1.085	-1.361*			
	(0.026)	(0.749)	(0.723)			
UAI x Fraction US Citizens				0.310***	5.494**	-4.389
				(0.117)	(2.672)	(3.871)
Fraction US Citizens				-0.040	-1.506	3.303*
				(0.059)	(1.413)	(1.983)
Controls and Year FE	x	x	x	x	x	x
Obs.	43,138	43,138	41,246	67,587	67,587	63,891
Adj. R^2	0.041	0.019	0.081	0.042	0.020	0.088

Table 7: Genetic versus Cultural Transmission

In this table, we conduct an analysis at the origin country-pair level. For this analysis, we select 8,830 CEOs with a dominant origin. We aggregate all acquisitions across all observations of CEOs with the same dominant country of origin. We then form country-pairs and calculate the absolute difference between the average acquisition probabilities of the two countries in a pair (|*Difference in Acquisition*|). |*Difference in UAI*| is the absolute difference between the UAI of the countries in a country pair. Genetic Distance measures the genetic difference between two populations (Cavalli-Sforza, Menozzi, and Piazza (1994)). We obtain genetic distance data for a global set of country pairs (*Genetic Distance (World)*) and for a smaller set of European country pairs (*Genetic Distance (Europe)*) from Spolaore and Wacziarg (2009). All regressions include a constant term. Definitions of all variables are provided in Appendix C. Standard errors are double clustered by each country in a pair. ***, **, * denote significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
		Difference in Acquisition			
|Difference in UAI|	0.046**	0.046**	0.049*	0.045*
		(0.020)	(0.020)	(0.028)	(0.024)
Genetic Distance (World)		-0.007		
		(0.006)		
Genetic Distance (Europe)				0.045
				(0.054)
Obs.		819	819	299	299
Adj. R^2		0.026	0.027	0.030	0.030

Table 8: Determinants of CEO's UAI

This table examines the determinants of CEO's UAI. *UAI (State)* is a weighted average of the general population in the firm's headquartering state. *UAI (Industry)* is the average of CEOs' UAI in the 2-digit SIC industry in the year before turnover. *Past Acquisition (Acquisition Rate, Capx Rate)* is the average acquisitiveness (acquisition rate, Capx rate) in the three years before turnover. *UAI (Outgoing CEO) (Pre-turnover Board, Pre-turnover Exec.)* is the UAI of the departing CEO (the average UAI of the board, top four non-CEO executives in the year before turnover). *EthnicityMatchBoard (Exec)* is an indicator variable that equals to one if the ethnicity of the incoming CEO's (dominant) origin is the same as the most common origin among the directors (or top four non-CEO executives) in the year before turnover. "*Insider CEO*" is an indicator variable equals one if a CEO is promoted to the position from within the firm. All regressions include the controls from Table 2, a constant term, and year fixed effects. Standard errors are clustered at the firm level. ***, **, * denote significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)
	Incoming CEO's UAI				
UAI (State)	0.506***		0.071	-0.010	0.005
	(0.068)		(0.058)	(0.055)	(0.089)
UAI (Industry)	0.190**		-0.072	-0.080	0.046
	(0.094)		(0.081)	(0.078)	(0.119)
Past Prob.(Acquisition)		-0.020*	-0.018*	-0.014	-0.013
(3-year average)		(0.011)	(0.010)	(0.009)	(0.013)
Past Acquisition Rate		0.018	0.019	0.022	0.037
(3-year average)		(0.038)	(0.031)	(0.030)	(0.057)
Past Capx Rate		-0.077**	-0.036	-0.019	-0.003
(3-year average)		(0.031)	(0.028)	(0.028)	(0.048)
UAI (Outgoing CEO)			-0.009	-0.026*	-0.009
			(0.015)	(0.014)	(0.022)
UAI (Pre-turnover Board)			0.510***	0.416***	0.466***
			(0.026)	(0.029)	(0.081)
UAI (Pre-turnover Exec.)			0.495***	0.342***	0.456***
			(0.028)	(0.034)	(0.076)
UAI (Pre-turnover Board)				0.128***	
x EthnicityMatchBoard				(0.046)	
UAI (Pre-turnover Exec.)				0.279***	
x EthnicityMatchExec				(0.047)	
EthnicityMatchBoard				-0.117***	
				(0.020)	
EthnicityMatchExec				-0.167***	
(3-year average)				(0.020)	
UAI (Pre-turnover Board)					0.054
x Insider CEO					(0.098)
UAI (Pre-turnover Exec.)					0.284***
x Insider CEO					(0.087)
Insider CEO					-0.161***
					(0.044)
Controls and Year FE	x	x	x	x	x
Obs.	4,302	4,302	4,302	4,302	1,838
Adj. R^2	0.016	0.017	0.264	0.342	0.259

Table 9: Selection vs. Influence

Panel A: Controlling for Selection with Pre-turnover Characteristics

Panel A reports the effect of CEO's UAI on corporate investments for firms with detailed pre-turnover characteristics: *UAI (Outgoing CEO)*, *UAI (Pre-turnover Board)*, *UAI (Pre-turnover Exec.)*, *UAI (State)*, and *UAI (Industry)*, and the average acquisitiveness (acquisition rate, Capx rate) in the three years before turnover. All regressions include the controls from Table 2, a constant term, and year fixed effects. Definitions of all variables are provided in Appendix C. Standard errors are clustered at the firm level. ***, **, * denote significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		Acquisition			Acquisition Rate			Capx Rate	
UAI	-0.185***	-0.208***	-0.196***	-2.404***	-2.814***	-2.792***	-1.741***	-0.730	-0.362
	(0.023)	(0.028)	(0.027)	(0.452)	(0.538)	(0.538)	(0.613)	(0.691)	(0.515)
UAI (Outgoing CEO)		-0.050*	-0.016		-0.753	-0.547		-1.033*	0.238
		(0.025)	(0.025)		(0.507)	(0.521)		(0.617)	(0.485)
UAI (Pre-turnover Board)		0.029	0.019		1.133	1.288		-1.407	-0.296
		(0.045)	(0.043)		(0.957)	(0.952)		(1.157)	(0.871)
UAI (Pre-turnover Exec.)		0.073	0.061		0.606	0.478		-1.798	-0.114
		(0.053)	(0.049)		(0.964)	(0.948)		(1.149)	(0.814)
UAI (Industry)			-0.061			2.342			-32.334***
			(0.145)			(2.610)			(4.090)
UAI (State)			0.097			-0.198			0.011
			(0.112)			(2.234)			(2.228)
Past Acquisition			0.221***						
(3-year average)			(0.018)						
Past Acquisition Rate						0.082***			
(3-year average)						(0.015)			
Past Capx Rate									0.442***
(3-year average)									(0.025)
Controls and Year FE	x	x	x	x	x	x	x	x	x
Obs.	16,550	16,550	16,550	16,550	16,550	16,550	16,344	16,344	16,344
Adj. R^2	0.036	0.037	0.064	0.017	0.017	0.023	0.064	0.066	0.356

Panel B: Controlling for Selection with Firm Fixed Effects

Panel B reports the effect of CEO's UAI on corporate acquisitions and capital expenditures in the presence of firm fixed effects and industry-turnover year fixed effects. All regressions include the controls from Table 2, a constant term, and year fixed effects. Definitions of all variables are provided in Appendix C. Standard errors are clustered at the firm level. ***, **, * denote significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Acquisition		Acquisition Rate		Capx Rate	
UAI	-0.157***	-0.173***	-2.718***	-3.102***	-0.473	-0.469
	(0.024)	(0.029)	(0.579)	(0.723)	(0.376)	(0.429)
Firm FE	x	x	x	x	x	x
Ind-To Yr FE		x		x		x
Controls and Year FE	x	x	x	x	x	x
Obs.	71,175	62,065	71,175	62,065	67,219	59,130
Adj. R^2	0.192	0.212	0.139	0.142	0.590	0.603

Table 10: Culturally Transmitted vs. Compensation-Induced Risk Preferences

This table reports the relationship between CEO's compensation vega and his UAI or the difference between board's and CEO's UAI. The analysis in Columns (1) and (2) is at the firm-CEO level. In these two columns, all the variables are the average values over a CEO's tenure at a given firm. The analysis in Columns (3) is at the firm-CEO-year level. In this column, firm-year level control variables (*Log(MB), ROA,* and *Log(Sales)*) are lagged, and we also control for firm fixed effects and year fixed effects. *UAI - UAI (board)* is the difference between CEO's UAI and board' UAI. Definitions of all variables are in provided Appendix C. Standard errors are clustered at the firm level. All regressions include a constant term. ***, **, * denote significance at 1%, 5%, and 10% levels, respectively.

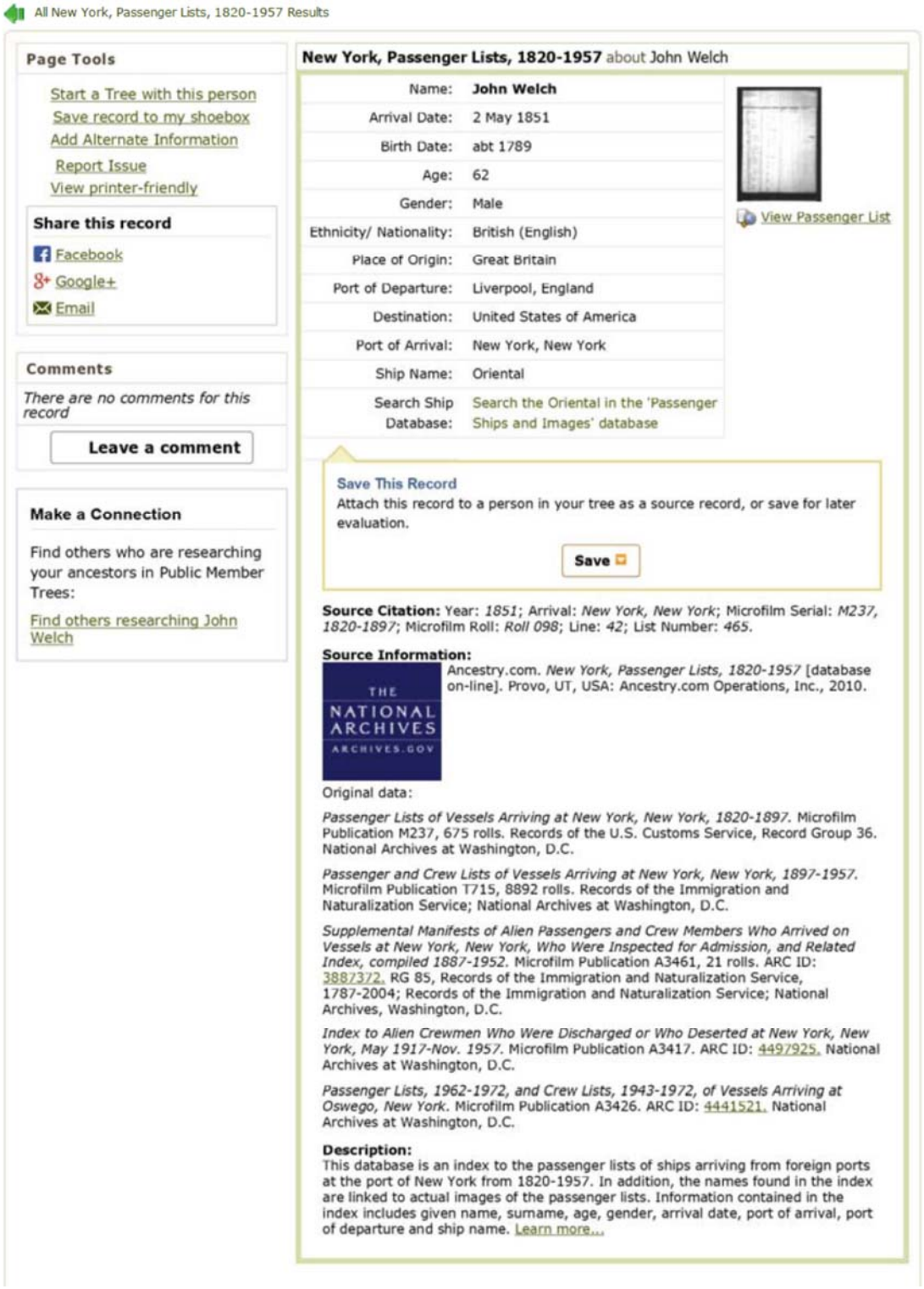
	(1)	(2)	(3)
		Vega	
UAI	0.044***		
	(0.012)		
UAI - UAI (board)		0.031**	0.038*
		(0.013)	(0.021)
CEO Age	-0.0001	-0.00001	0.002***
	(0.0003)	(0.0003)	(0.001)
Missing Age	-0.016	-0.008	0.150***
	(0.016)	(0.018)	(0.032)
CEO Education	0.022***	0.023***	0.005
	(0.005)	(0.005)	(0.010)
Missing Edu.	0.0003	0.007	0.006
	(0.010)	(0.010)	(0.020)
Female	0.001	0.004	0.001
	(0.012)	(0.013)	(0.019)
Log(MB)	0.051***	0.056***	0.013***
	(0.004)	(0.004)	(0.004)
ROA	-0.001***	-0.001***	0
	(0.0002)	(0.0002)	(0.0002)
Log(Sales)	0.045***	0.049***	0.059***
	(0.002)	(0.002)	(0.007)
Firm and Year FE			x
Obs.	5,082	4,426	19,501
Adj. R^2	0.303	0.311	0.645

Table 11: CEO's Influence on Board's and Executive Team's Preference over CEO Tenure

This table reports how the divergence between board's (executive team's) and CEO's UAI changes over CEO tenure. In Columns (1) and (2), the dependent variable is the absolute difference between the UAI of the board and the UAI of the CEO in year t+1. In Columns (3) and (4), the dependent variable is the absolute difference between the UAI of the executive team and the UAI of the CEO in year t+1. *Log(Tenure)* is the logarithm of CEO's tenure as of year t. We control for firm fixed effects in Column (1), and firm-CEO fixed effects in Column (2). Definitions of all variables are in Appendix C. Standard errors are clustered at the firm level. ***, **, * denote significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
	$\lvert UAI - UAI\ (Board) \rvert_{t+1}$		$\lvert UAI - UAI\ (Exec) \rvert_{t+1}$	
$Log(Tenure)_t$	-0.005***	-0.002**	-0.004***	-0.002*
	(0.001)	(0.001)	(0.001)	(0.001)
Firm FE	x		x	
CEO-Firm FE		x		x
Obs.	35,945	35,945	35,591	35,591
Adj. R^2	0.617	0.794	0.645	0.818

Appendix A: Image of a Passenger Record from Ancestry.com



All New York, Passenger Lists, 1820-1957 Results

Page Tools

Start a Tree with this person
Save record to my shoebox
Add Alternate Information
Report Issue
View printer-friendly

Share this record

Facebook
Google+
Email

Comments

There are no comments for this record

Leave a comment

Make a Connection

Find others who are researching your ancestors in Public Member Trees:

Find others researching John Welch

New York, Passenger Lists, 1820-1957 about John Welch

Name:	**John Welch**
Arrival Date:	2 May 1851
Birth Date:	abt 1789
Age:	62
Gender:	Male
Ethnicity/ Nationality:	British (English)
Place of Origin:	Great Britain
Port of Departure:	Liverpool, England
Destination:	United States of America
Port of Arrival:	New York, New York
Ship Name:	Oriental
Search Ship Database:	Search the Oriental in the 'Passenger Ships and Images' database

View Passenger List

Save This Record
Attach this record to a person in your tree as a source record, or save for later evaluation.

Save

Source Citation: Year: *1851*; Arrival: *New York, New York*; Microfilm Serial: *M237, 1820-1897*; Microfilm Roll: *Roll 098*; Line: *42*; List Number: *465*.

Source Information:

Ancestry.com. *New York, Passenger Lists, 1820-1957* [database on-line]. Provo, UT, USA: Ancestry.com Operations, Inc., 2010.

Original data:

Passenger Lists of Vessels Arriving at New York, New York, 1820-1897. Microfilm Publication M237, 675 rolls. Records of the U.S. Customs Service, Record Group 36. National Archives at Washington, D.C.

Passenger and Crew Lists of Vessels Arriving at New York, New York, 1897-1957. Microfilm Publication T715, 8892 rolls. Records of the Immigration and Naturalization Service; National Archives at Washington, D.C.

Supplemental Manifests of Alien Passengers and Crew Members Who Arrived on Vessels at New York, New York, Who Were Inspected for Admission, and Related Index, compiled 1887-1952. Microfilm Publication A3461, 21 rolls. ARC ID: 3887372. RG 85, Records of the Immigration and Naturalization Service, 1787-2004; Records of the Immigration and Naturalization Service; National Archives, Washington, D.C.

Index to Alien Crewmen Who Were Discharged or Who Deserted at New York, New York, May 1917-Nov. 1957. Microfilm Publication A3417. ARC ID: 4497925. National Archives at Washington, D.C.

Passenger Lists, 1962-1972, and Crew Lists, 1943-1972, of Vessels Arriving at Oswego, New York. Microfilm Publication A3426. ARC ID: 4441521. National Archives at Washington, D.C.

Description:
This database is an index to the passenger lists of ships arriving from foreign ports at the port of New York from 1820-1957. In addition, the names found in the index are linked to actual images of the passenger lists. Information contained in the index includes given name, surname, age, gender, arrival date, port of arrival, port of departure and ship name. Learn more...

Appendix B: Distribution of Origins

This table lists all the countries of origins associated with passenger records of the same last name, their average and maximum frequency of occurrence, and the *UAI* and *Thrift* values by origin. *UAI* is the uncertainty avoidance index from the Hofstede Surveys (rescaled to fall between zero and one); *Thrift* is the average attitude towards thrift for each origin from the World Value Surveys. A maximum probability of 100% associated with an origin means that there exists at least one last name for which all passengers with that last name came from that origin. Origins with missing *UAI* or *Thrift* values are not covered by the relevant surveys.

Origin	Average Probability	Maximum Probability	UAI	Thrift
England	16.54%	100.00%	0.313	0.319
Germany	13.71%	100.00%	0.580	0.397
Italy	9.57%	100.00%	0.670	0.347
Ireland	6.09%	100.00%	0.313	0.217
Jewish	4.45%	100.00%	0.723	0.198
France	2.70%	100.00%	0.768	0.376
Scotland	2.26%	100.00%	0.313	0.319
Poland	2.06%	100.00%	0.830	0.393
Russia	1.91%	100.00%	0.848	0.518
Netherlands	1.83%	100.00%	0.473	0.209
Scandinavia	1.77%	100.00%	0.304	0.176
Hungary	1.36%	100.00%	0.732	0.396
Spain	1.18%	100.00%	0.768	0.322
Austria	1.17%	100.00%	0.625	0.487
Greece	1.14%	100.00%	1.000	0.299
Africa	0.96%	100.00%		
Canada	0.96%	100.00%	0.429	0.285
Sweden	0.86%	100.00%	0.259	0.300
China	0.85%	100.00%	0.268	0.572
Native American	0.75%	100.00%		
Norway	0.68%	100.00%	0.446	0.132
Switzerland	0.63%	100.00%	0.518	0.375
Slovakia	0.54%	100.00%	0.455	0.385
Syria	0.46%	100.00%	0.607	0.235
Czech Republic	0.45%	100.00%	0.661	0.304
Belgium	0.43%	100.00%	0.839	0.439
Ukraine	0.35%	100.00%	0.848	0.508
Denmark	0.33%	100.00%	0.205	0.096
Japan	0.31%	100.00%	0.821	0.481
Croatia	0.30%	100.00%	0.714	0.287
Romania	0.29%	100.00%	0.804	0.307
Hispanic	0.29%	100.00%	0.768	0.286
India	0.28%	100.00%	0.357	0.619

Finland	0.27%	100.00%	0.527	0.208
Portugal	0.26%	100.00%	0.929	0.322
Cuba	0.24%	100.00%		0.286
Armenia	0.22%	100.00%		
Slovenia	0.21%	100.00%	0.786	0.354
Lithuania	0.17%	100.00%	0.580	0.404
Wales	0.16%	40.43%	0.313	0.319
Iran	0.14%	100.00%	0.527	0.296
Turkey	0.14%	100.00%	0.759	0.303
Puerto Rico	0.13%	37.50%		0.236
Bulgaria	0.09%	100.00%	0.759	0.381
Egypt	0.09%	96.15%	0.607	0.080
Serbia	0.08%	87.50%	0.821	0.343
Arab World	0.08%	100.00%	0.607	0.235
Brazil	0.07%	33.33%	0.679	0.388
Latvia	0.06%	93.62%	0.563	0.451
Australia	0.06%	24.00%	0.455	0.186
Philippines	0.05%	33.33%	0.393	0.452
Venezuela	0.04%	23.24%	0.679	0.390
Albania	0.04%	50.00%		0.549
Yugoslavia	0.03%	100.00%	0.786	0.350
Polynesia	0.03%	50.00%		
Argentina	0.03%	17.95%	0.768	0.152
Malta	0.03%	60.00%	0.857	0.541
Colombia	0.03%	25.00%	0.714	0.251
Asia	0.03%	26.25%		
Chile	0.03%	10.53%	0.768	0.345
Lebanon	0.03%	33.33%	0.607	0.235
Estonia	0.02%	35.90%	0.536	0.444
Jordan	0.02%	40.00%	0.607	0.194
Palestine	0.02%	100.00%	0.607	0.235
Europe	0.02%	50.00%		
Montenegro	0.02%	37.35%		0.343
Macedonia	0.01%	23.08%	0.786	0.394
Honduras	0.01%	10.53%	0.768	0.286
Panama	0.01%	14.92%	0.768	
Dominican Republic	0.01%	25.00%		0.286
Bosnia	0.01%	17.14%	0.786	0.372
Ecuador	0.01%	50.00%	0.598	0.286
Malaysia	0.01%	7.94%	0.321	
Indonesia	0.01%	50.00%	0.429	0.520
Peru	0.01%	23.78%	0.777	0.235
Tunisia	0.01%	66.67%	0.607	0.235
Iceland	0.01%	33.33%		0.205
South Africa	0.01%	20.00%	0.438	0.359

Bermuda	0.01%	3.19%		
Morocco	<0.01%	33.33%	0.607	0.358
Pakistan	<0.01%	36.36%	0.625	0.555
Jamaica	<0.01%	6.78%	0.116	0.286
Iraq	<0.01%	10.00%	0.607	0.282
Czechoslovakia	<0.01%	4.65%	0.558	0.344
Korea	<0.01%	11.76%	0.759	0.675
Sudan	<0.01%	25.00%		
Costa Rica	<0.01%	8.28%	0.768	0.286
Burma	<0.01%	30.00%		
Haiti	<0.01%	5.88%		
New Zealand	<0.01%	1.30%	0.438	0.237
Nicaragua	<0.01%	9.28%		
Muslim	<0.01%	1.75%	0.536	0.313
Uruguay	<0.01%	1.14%	0.893	0.263
Senegal	<0.01%	8.33%		
West Indies	<0.01%	0.70%		
Mongolia	<0.01%	5.88%		
Guatemala	<0.01%	2.50%	0.902	0.286
Vietnam	<0.01%	3.33%	0.268	0.481
Liberia	<0.01%	3.13%		
Afghanistan	<0.01%	3.80%		
Bolivia	<0.01%	0.79%	0.768	0.286
Barbados	<0.01%	0.43%		
Ethiopia	<0.01%	2.70%	0.464	
Thailand	<0.01%	1.16%	0.571	
Germany-France	<0.01%	0.40%	0.674	0.387
Mexico	<0.01%	0.22%	0.732	0.376
Paraguay	<0.01%	0.80%	0.768	0.286
Cyprus	<0.01%	0.77%		
Algeria	<0.01%	0.22%	0.607	0.179
El Salvador	<0.01%	0.32%	0.839	0.286
Sri Lanka	<0.01%	0.74%		
Central America	<0.01%	0.16%	0.625	0.286
Somalia	<0.01%	0.16%		
Luxembourg	<0.01%	0.23%	0.625	0.473
Pacific Islander	<0.01%	0.09%		
Guiana	<0.01%	0.06%		
Isle of Man	<0.01%	0.02%	0.313	0.319
Nigeria	<0.01%	0.02%	0.482	0.103
Germany-Poland	<0.01%	0.01%	0.705	0.395
Grenada	<0.01%	<0.01%		
Virgin Islands	<0.01%	<0.01%		

USA[22]	17.77%	100.00%	0.411	0.228
Unidentifiable	1.68%	100.00%		

[22] Not included in the construction of culturally transmitted preferences.

Appendix C: Variable Definitions

UAI	Uncertainty Avoidance Index, from Hofstede. Please see the data section for detailed explanation.
UAI (Pre-turnover Board)	The average value of *UAI* of the board of directors in the year before CEO turnover.
UAI (Pre-turnover Exec.)	The average value of *UAI* of the top four most highly paid non-CEO executives in the year before CEO turnover.
UAI (Outgoing CEO)	UAI of the departing CEO.
UAI (Industry)	The average of CEOs' UAI in the 2-digit SIC industry in the year before turnover.
UAI (State)	A weighted average of the general population's UAI in the state of the firm's headquarter.
UAI – UAI (Board)	The difference between the CEO's UAI and the current board's UAI.
UAI – UAI (Exec)	The difference between the CEO's UAI and the current executive team's UAI.
Fraction Unidentifiable	The fraction of passengers with a given last name that has unidentifiable origin.
# of Origins	The number of origins associated with a last name.
Dominant Origin	An indicator variable that equals one if a CEO's last name is associated with a dominant origin that represents the origin of more than 50% of the immigrants with the same last name.
Dispersion in UAI	The standard deviation of *UAI* values associated with different origins of a given last name.
Fraction of Origins Missing UAI	The fraction of records per last name without a *UAI* value.
First Generation	An indicator variable that equals one if a CEO is a first generation immigrant in the US and zero otherwise.
Fraction US Citizen	The fraction of passengers with a particular last name that declared themselves to be U.S. citizens when entering the US during 1820-1957.
EthnicityMatchBoard	An indicator variable that equals one if a CEO's origin is the same as the most common origin among the board of directors, and zero otherwise.
EthnicityMatchExec	An indicator variable that equals one if a CEO's origin is the same as the most common origin among the top four non-CEO executives, and zero otherwise.
CEO Age	The age of the CEO.
Missing Age	An indicator variable that equals one if a CEO's age information is missing, and zero otherwise.
CEO Education	The level of the CEO's education. It is equal to three if the CEO holds a doctorate degree (including post-doctoral training), and equal to two if the highest degree is a Master's degree, and equal to one if the highest degree is undergraduate. If the education information is missing, we set "CEO Education" to be zero, and "Missing Education" is equal to one.
Missing Education	An indicator variable that equals one if a CEO's education information is missing, and zero otherwise.
Female	An indicator variable that equals one if a CEO is a female, and zero if female.

Insider CEO	An indicator variable that equals one if a CEO is promoted to the position from within the firm and zero otherwise.
Log(Tenure)	The logarithm of CEO tenure since he took office.
Acquisition	An indicator variable that equals one if the firm engages in mergers or acquisitions during a fiscal year, and zero otherwise.
Acquisition Rate	Acquisition transaction value scaled by the firm's book assets at the beginning of the year, expressed in percentage term.
Focused Acquisition	An indicator variable that equals one if the firm engages in mergers or acquisitions of assets within the 2-digit SIC industry during a fiscal year, and zero otherwise.
Diversifying Acquisition	An indicator variable that equals one if the firm engages in mergers or acquisitions of assets outside the 2-digit SIC industry during a fiscal year, and zero otherwise.
Capx Rate	Annual capital expenditures scaled by the firm's book assets at the beginning of the year, expressed in percentage term.
Cash Rate	Cash holding scaled by the firm's book assets, expressed in percentage term.
Leverage	Total debt scaled by the firm's book assets, expressed in percentage term.
Payout Ratio	Total dividend payout divided by total earnings.
Log(MB)	The logarithm of the firm's market value of equity to book value of equity ratio.
ROA	Earnings before interest, tax, and depreciation scaled by the firm's book assets at the beginning of the year, expressed in percentage term.
Log(Sales)	The logarithm of the firm's net sales.
Vega	The dollar change (in millions) in CEO's wealth associated with a 0.01 change in the standard deviation of the firm's returns.
Log(GDP) at Origin	The logarithm of the origin-probability-weighted average 1980 GDP per capital for each CEO.
Log(Life Expectancy) at Origin	The logarithm of the origin-probability-weighted average 1980 life expectancy for each CEO.
Schooling at Origin	The origin-probability-weighted average fraction of population with secondary school education in 1980 for each CEO.
Quality of Institution at Origin	The origin-probability-weighted average quality of institution's index in 1980 for each CEO.
Genetic Distance	Genetic distance measures the genetic differences between two populations and is based on differences in allele frequencies (see, Cavalli-Sforza, Menozzi, and Piazza (1994)). We obtain genetic distance data for a global set of country pairs (*Genetic Distance (World)*) and for a smaller set of European country pairs (*Genetic Distance (Europe)*) from Spolaore and Wacziarg (2009).
|Difference in Acquisition|	The absolute difference in the average acquisitiveness of two different origin countries over the entire sample period
|Difference in UAI|	The absolute difference in the UAI of each country pair
Past Prob.(Acquisition)	The average acquisitiveness in the three years before turnover
Past Acquisition Rate	The average acquisition rate in the three years before turnover
Past Capx Rate	The average capx rate in the three years before turnover

Appendix D: Comparison of the Effect of CEO Characteristics on Corporate Investments

In this table we compare the effect of CEO's culturally transmitted risk preference in our paper with the effects of CEO characteristics in other papers on corporate investment. The range of the estimated effects of CEO UAI on corporate investment in our paper reflects empirical specifications without industry or firm fixed effects to with firm fixed effects.

Paper	CEO Characteristics	Comparison between	Acquisition	Acquisition Rate	Capx Rate
Pan, Siegel, and Wang (2014)	CEO's culturally transmitted risk preference	Least uncertainty tolerant (top 10% or 25% of the CEO UAI distribution) vs. Others	-4.8pp to -7.3pp Odds ratio (top 10% vs. others): 0.5	-0.7pp to -1.1pp	-0.1pp to -0.9pp
Graham, Harvey, and Puri (2013)	A lottery-based measure of CEO risk preference	Highly risk averse (10% of CEOs in their sample) vs. Others	-9.0pp		
Dittmar and Duchin (2014)	Experience of work-place financial distress	With experience vs. without			-0.3pp to -1.2 pp
Cain and McKeon (2014)	Having small aircraft pilot license	With pilot license (6% of CEOs in their sample) vs. without	Odds ratio (pilot CEOs vs. non-pilot CEOs): 1.7		
Benmelech and Frydman (2014)	Military experience	With military experience (25% of CEOs in their sample) vs. without		0.03pp to -0.1pp	-0.5pp to -0.6pp
Malmendier and Tate (2008)	CEO over-confident based on stock option exercising	Late option exerciser CEOs (11% of CEOs in their sample) vs. others	Odds ratio (overconfident vs. others): 1.6 to 2.0		

Panel E: Noise and Imprecision in Measuring *UAI*

This table reports the impact of noise and imprecision in the measurement of *UAI* on acquisition rate (Panel A) and Capx Rate (Panel B). In Column (1), we use *Fraction Unidentifiable*, which is fraction of passengers with a given last name that has unidentifiable origin. In Column (2), we use *# of Origins*, which is the number of non-USA origins. In Column (3), we use an indicator variable *Dominant Origin*, which equals one if a CEO's last name is associated with a dominant origin (outside US). In Column (4), we use *Dispersion in UAI*, which is the standard deviation of UAI values associated with different origins of a given last name. In Column (5), we use *Fraction of Origins Missing UAI*, which is the percentage of records without missing UAI values for a given last name. Firm-year level control variables (Log(MB), ROA, and Log(Sales)) are lagged. Definitions of all variables are provided in Appendix C. Standard errors are clustered at the firm level. ***, **, * denote significance at 1%, 5%, and 10% levels, respectively.

Panel A: Acquisition Rate

	(1)	(2)	(3)	(4)	(5)
UAI	-2.608***	-3.920***	-2.492***	-2.386***	-2.545***
	(0.353)	(0.439)	(0.513)	(0.593)	(0.339)
UAI x (Frac. Unidentifiable)	1.960				
	(10.921)				
Frac. Unidentifiable	1.478				
	(5.982)				
UAI x (# of Origins)		0.118***			
		(0.020)			
# of Origins		-0.026***			
		(0.009)			
UAI x (Dominant Origin)			-0.077		
			(0.649)		
Dominant Origin			-0.246		
			(0.335)		
UAI x (Dispersion in UAI)				8.104**	
				(3.444)	
Dispersion in UAI				1.089	
				(1.874)	
UAI x (Fraction of Origins Missing UAI)					-1.804
					(3.973)
Fraction of Origins Missing UAI					1.511
					(2.387)
Controls and Year FE	x	x	x	x	x
Obs.	71,175	71,175	71,175	71,175	71,175
Adj. R^2	0.021	0.024	0.021	0.022	0.021

Panel B: Capx Rate

	(1)	(2)	(3)	(4)	(5)
UAI	-2.426***	-2.788***	-3.391***	-2.920***	-2.563***
	(0.484)	(0.675)	(0.662)	(0.967)	(0.455)
UAI x (Frac. Unidentifiable)	-3.600				
	(15.910)				
Frac. Unidentifiable	8.529				
	(8.868)				
UAI x (# of Origins)		0.021			
		(0.026)			
# of Origins		-0.005			
		(0.013)			
UAI x (Dominant Origin)			1.532*		
			(0.876)		
Dominant Origin			-0.776*		
			(0.465)		
UAI x (Dispersion in UAI)				3.111	
				(5.303)	
Dispersion in UAI				-1.156	
				(2.837)	
UAI x (Fraction of Origins Missing UAI)					0.957
					(5.002)
Fraction of Origins Missing UAI					-0.438
					(3.005)
Controls and Year FE	x	x	x	x	x
Obs.	67,219	67,219	67,219	67,219	67,219
Adj. R^2	0.087	0.087	0.087	0.087	0.086