Corporate Risk Culture*

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Abstract

We examine the formation and evolution of corporate risk culture, i.e., the preferences towards risk and uncertainty shared by a firm's leaders, as well as its effect on corporate policies. We document persistent commonality in risk attitudes inside firms, which arises through the selection of leaders with similar preferences and is rooted in the founders' risk attitudes. Changes in corporate risk culture over time affect corporate investment policies, while cross-sectional differences in founders' risk attitudes, i.e., firms' initial risk culture, contribute to differences across firms in persistent firm policies, such as R&D intensity.

Key words: Corporate culture, cultural heritage, risk preference, uncertainty avoidance, corporate investment, corporate financial policies, CEO selection, directors, executives.

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I Introduction

Following the recent global financial crisis, corporate culture with respect to risk has caught the attention of regulators, firms, and the media. In a recent survey of about 500 bank executives, half of the respondents identified corporate attitudes towards risk as a leading contributor to the global financial crisis (KPMG (2009)). In a world with incomplete contracts or multiple equilibria, corporate risk culture could indeed play an important role to coordinate and regulate firms' risk-related choices and decisions (e.g., O'Reilly (1989) and Kreps (1990))). However, little is known about how attitudes towards risk and uncertainty inside firms form, evolve over time, and ultimately affect corporate decisions.

We contribute to filling this gap. We characterize a firm's risk culture as the shared preferences towards risk and uncertainty of those at the top of the firm, that is, the CEO, other top executives, and non-executive directors (Schein (1985), van den Steen (2010)). The corporate setting allows us to also observe the initial formation of corporate risk culture in the form of the risk attitudes of the founders, its transmission through generations of corporate leaders, and its lasting effect on corporate culture and corporate risk-taking (Guiso, Sapienza, and Zingales (2015a)).

Recent research shows that individuals' economic preferences, in particular attitudes towards risk, uncertainty, and future-orientation (or patience), are partly shaped by cultural heritage (Chen (2013), Becker, Dohmen, Enke, and Falk (2015)). Similar to biologically predisposed behaviors, culturally transmitted preferences are determined early in life, persistent, and therefore fundamental to understanding an individual's economic decisions (Giavazzi et al. (2014)). Unlike the variation due to genetic differences, variation in cultural origins is in many cases easily observed. In this study, we exploit the diversity of culturally determined preferences towards risk and uncertainty among corporate founders, executives, and board members to characterize corporate risk culture in over 6,000 U.S. public companies from 1996 to 2012.

Specifically, we use a person's last name to infer her cultural heritage based on immigration records of passengers arriving in the port of New York between 1820 and 1957. Using the citizenship information of arriving passengers with a given last name, we obtain a distribution of countries of

origin for each last name. We then employ Hofstede's (1980, 1991, 2001) uncertainty avoidance index (UAI) to capture attitudes towards risk and uncertainty associated with an individual's cultural heritage. According to Hofstede, UAI captures the degree of tolerance for unfamiliar situations and the "level of stress in the face of an unknown future" (Karolyi (2015)). Using the distribution of countries of origin for each last name, we obtain a proxy for corporate leaders' attitudes towards risk and uncertainty in the form of the weighted average UAI across the associated origins. Uncertainty aversion should be particularly relevant in a corporate setting given that outcomes of many corporate decisions are exposed to Knightian uncertainty, that is, risks that cannot be measured or easily insured in insurance markets (LeRoy and Singell (1987)).

We begin our empirical analysis by examining the existence and persistence of commonality in uncertainty avoidance of key decision makers in a firm, and we propose the common component of these preferences as a measure of corporate risk culture. According to van den Steen (2010), corporate culture originates from selection or self-sorting of employees with similar beliefs and preferences into a firm as well as from learning experiences shared by those inside the firm. Given the predetermined nature of the UAI measure, which does not vary with experience, our approach allows us to isolate the (self-) selection channel, as any observed commonality in preferences inside a firm has to come from selection. Specifically, we examine the selection of new CEOs, executives, and outside directors based on the risk preferences of incumbents and past leaders, including the firm's founders.

Next, we study the relationship between corporate risk culture and corporate risk taking. Most corporate investment decisions, particularly large-scale acquisitions and R&D investments, are made under substantial uncertainty (see, e.g., Knight (1921), Dixit and Pindyck (1994), Garlappi et al. (2013)). Thus, we may gain new insights about these corporate investments through the lens of corporate risk culture. Furthermore, founders' UAIs, which shape the firm's initial risk culture and are preserved over time through the selection of new leaders with similar preferences, could contribute to lasting differences in risk taking across firms.

Our results can be summarized as follows. First, we document significant commonality in risk preferences, specifically, uncertainty avoidance, of a firm's CEO, executives, and non-executive

directors. The first principal component of corporate leaders' risk preferences explains 43% of the variation across these leaders, compared to about 33% if corporate leaders were selected randomly. This commonality is persistent across generations of leadership. In particular, using a subset of firms with information on their founders, we find that the founders' risk preferences, that is, the firm's initial risk culture, predict the firm's risk culture even decades later and after the founders' departure from the firm.

Second, persistent commonality in attitudes towards risk and uncertainty arises through the selection of corporate leaders. Specifically, about 19% of the variation in incoming CEOs UAIs can be explained by the pre-turnover corporate risk culture, in particular by the UAIs of outside directors and top executives before the CEO turnover. The matching on risk preferences applies to both insider and outsider new CEOs, and is not driven by boards or top executives selecting incoming CEOs from their own or similar ethnicities. Furthermore, differences in UAI within firms' leadership teams decrease over CEOs' time in office, consistent with CEOs' promoting subordinates and appointing directors with risk preferences similar to their own.

Finally, firms with a more uncertainty averse culture indeed invest less in R&D and make fewer acquisitions than firms with a less uncertainty averse culture. Differences in firms' initial risk culture, related to the uncertainty avoidance of firms' founders and pre-determined relative to corporate policies, predict differences in firms' investment policies, with a persistent and long-term effect in case of R&D investments. Similarly, changes in corporate risk culture over time are associated with changes in corporate investment policies in expected ways. In addition, we find that firms with a more uncertainty averse culture tend to hold more cash and exhibit lower cash flow volatility.

Inferring an individual's country of origin by her last name allows us to approximate risk and uncertainty preferences of a large panel of U.S. corporate leaders, which is essential for our characterization of corporate risk culture as shared risk attitudes among corporate leaders. The drawback is that a person's risk attitude is not fully captured and is measured with imprecision and noise. We assess the impact of measurement error in our analysis and find a pattern consistent with an attenuation bias. Therefore, our estimates should be viewed as a lower bound of the effect

of corporate risk culture.

Our study contributes to a growing literature on corporate culture. While corporate culture has long played a role in micro-economic models (see Hermalin (1998) for a review of early work and van den Steen (2005, 2010) for recent contributions), empirical research has been scarce. Recently, Popadak (2014) uses textual analysis of comments by firms' rank-and-file employees to capture corporate culture regarding customer orientation. Guiso, Sapienza, and Zingales (2015b) use surveys of rank-and-file employees and textual analysis of firms' descriptions on corporate web pages to capture corporate culture regarding integrity. Similar to our approach, Liu (2015) uses the cultural background of corporate leaders to infer their tolerance for opportunistic behavior. Our study focuses on another important dimension of corporate culture – a firm's culture towards risk and uncertainty. Approximating corporate leaders' UAIs based on ethnic background enables us to measure corporate risk culture for a large panel of firms as well as firms' initial risk cultures shaped by their founders' UAIs. The panel setting is critical for examining the formation, evolution, and persistence of a firm's risk culture as well as its effect on corporate policies related to risk taking.

By employing Hofstede's uncertainty avoidance index as our proxy for the relevant preferences for corporate decisions under uncertainty, we also provide empirical evidence related to recent theoretical models that go beyond risk aversion and explore the effect of uncertainty aversion on corporate decisions as well as general business cycle variation when the probability of future states of the world is not precisely known (see, e.g., Garlappi et al. (2013), Ilut and Schneider (2014), Lee (2015)).

Furthermore, our study sheds new light on the persistent differences in corporate policies across firms. An important empirical observation is that there are large and persistent cross-sectional differences in firms' R&D investment and innovation productivity (e.g., Malerba et al. (1997), Syverson (2011)). The corporate finance literature has also documented persistence in corporate financial policies such as cash holding and leverage (e.g., Lemmon, Roberts, and Zender (2008) and Dittmar and Duchin (2011)). Our study suggests that one source of the persistent policy differences across firms lies in corporate culture and the lasting impact of corporate founders. Corporate risk culture is one mechanism through which cross-sectional differences in corporate risk-taking and

innovation persist.

Last but not least, our study highlights the importance of corporate leaders above and beyond the CEO. For a long time, the corporate finance and governance literature has focused on identifying a causal impact of CEOs, while paying less attention to other corporate leaders, their preferences, and the commonality and divergence of their preferences. In addition, the selection of corporate leaders, including the CEOs, has only recently gained attention in finance research. For example, Fee, Hadlock, and Pierce (2013) suggest that CEO "styles" reflected in corporate policies are due to boards' deliberate selection of CEOs. Eisfeldt and Kuhnen (2013) and Fee, Hadlock, Huang, and Pierce (2014) examine the selection of CEOs as a response to industry conditions. Shivdasani and Yermack (1999) and Coles, Daniel, and Naveen (2014) study the involvement of CEOs in the appointment of directors. We add to this literature by highlighting the risk attitudes of corporate leaders as a new and important selection factor. Furthermore, our results suggest that the leadership selection process contributes to the persistence of corporate culture.

The rest of this paper is organized as follows. Section II introduces the main data for our empirical analysis and provides a detailed discussion of our measures of corporate leaders' UAIs. Section III documents the existence of persistent commonality in the uncertainty avoidance of corporate leaders inside a firm. We then examine the role of leadership selection and corporate founders in the formation and evolution of corporate culture. Section IV examines how corporate risk culture and founders' risk preferences affect corporate policies related to risk taking. Section V concludes.

II Data

A Risk Attitudes of Corporate Leaders

Studies of corporate culture face the challenge that preferences and beliefs shared by corporate insiders, in particular by those at the top of the firm, are hard to measure directly.[1] Existing

[1]Prior research, which has related CEOs' risk attitudes to corporate policies, has used survey evidence, work or life experiences, revealed preferences, or gender to measure variation in risk aversion across CEOs (see, e.g., Malmendier et al. (2011), Graham et al. (2013), Cain and McKeon (2014), Dittmar and Duchin (2014), Bernile et al. (2015), Faccio et al. (2015)).

research has often relied on survey data, but those are typically available only for small cross-sections of firms with at best a short time series of data. We propose a different approach to overcome these limitations. The approach is based on the following arguments. First, attitudes towards risk and uncertainty differ across countries and national cultures (e.g., Hofstede (1980), Rieger et al. (2014), and Becker et al. (2015)).

Second, differences in preferences and attitudes often persist between individuals of different origins, even though these individuals grow up in the United States (U.S.) and their families might have been in the U.S. for several generations (e.g., Fernández and Fogli (2006, 2009)) and Giavazzi et al. (2014)). Tran (2013) provides suggestive evidence that relevant culturally inherited differences persist not just in the U.S. population at large, but also in the case of corporate leaders. For example, she finds that Vietnamese American CEOs deal particularly well with "new and unfamiliar" situations and view the unexpected as "a source of inspiration," consistent with the low level of uncertainty avoidance associated with Vietnamese culture.[2]

Finally, historical immigration records associated with a person's last name make it possible to construct a proxy for the countries of origin associated with that person. Thus, using information on a person's likely origin together with risk preferences associated with different countries of origin, we are able to infer culturally transmitted attitudes towards risk and uncertainty for a large set of corporate leaders.[3]

Our sample consists of publicly traded firms headquartered in the U.S., for which we can identify the CEO, other non-CEO top executives, as well as the firm's directors in a given year. Specifically, we collect the first and last names of CEOs and of the four most highly paid non-CEO executives using *Standard & Poor's ExecuComp* database, which covers S&P 1500 firms starting in 1992, and *Capital IQ*, which covers a large number of firms starting in 1996. Similarly, we collect information on directors' identity from *RiskMetrics* and *Capital IQ*. For a subset of firms, we are also able to

[2]Beckmann et al. (2008) provides consistent evidence in the case of asset managers. They show differences in behavior as a function of differences in culturally determined uncertainty avoidance. While the study considers a small set of professionals that work in a rather global industry, the study, like other cross-country studies, suffers from possibly omitted cross-country characteristics.

[3]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 (2014), Du, Yu, and Yu (2014), Liu (2015), and Adhikari and Agrawal (2016) use last names to infer ethnicity in U.S. settings.

identify the names of the firms' founder(s) using data from a number of sources, including *Wikipedia* and *Funding Universe*.

For each individual in our sample of corporate leaders and founders, we estimate the likelihood that an individual's ancestors are from a given country, using the individual's last name together with passenger lists of ships arriving in New York City from foreign ports between 1820 and 1957. The passenger lists, which are available through Ancestry.com, indicate each passenger's first and last name, gender, approximate birth year, and the passenger's nationality (see Appendix A for an example). We search through all available passenger records with non-missing and non-U.S. nationalities and, for each last name in our sample, compute the frequency distribution across 121 countries of origins.[4] The largest origin for each name represents 65% of all non-missing and non-US records on average. Furthermore, 72% of the names have a dominant origin, i.e., an origin with a frequency weight of more than 50%. For example, according to the New York passenger lists, 82% of passengers with the last name Gates are of British origin, and the remaining 18% come from a variety of other countries such as Scotland, Ireland, and Germany.

We construct a proxy for an individual's attitude towards risk and uncertainty by combining this frequency distribution across countries of origin with Hofstede's (1980, 1991, 2001) country-level uncertainty avoidance index (UAI), which we rescale to take on values between 0 and 1. According to Hofstede, the uncertainty avoidance index indicates to what extent members of a national culture "feel either uncomfortable or comfortable in unstructured situations. Unstructured situations are novel, unknown, surprising, and different from usual."[5] Hofstede initially constructed the index by statistically analyzing answers to questions asked in detailed surveys of IBM employees in 53 countries between 1978 and 1983. Since then, the index has been replicated several times with non-IBM populations and extended to additional countries (e.g., Hofstede et al. (2010), Rieger et al. (2014)). According to Hofstede et al. (2010), Denmark, Sweden, China, Ireland, and Great Britain are countries characterized by particularly low uncertainty avoidance, with UAI taking

[4]When needed, we aggregate historical origins to their modern counterparts. 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." See Pan et al. (2014) for further details.

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

on values between 0.21 for Denmark and 0.31 for Great Britain. On the other hand, Greece, Portugal, Poland, France, and Italy are countries with relatively high uncertainty avoidance, with UAI ranging between the maximum of 1.00 in the case of Greece and 0.67 in the case of Italy.

For a long time, finance research has focused on risk as opposed to uncertainty, even though many outcomes, in particular of corporate decisions, are exposed to substantial uncertainty, which, according to Knight (1921), represents unmeasurable or uninsurable risks. Knight (1921, p. 232) explicitly states that "*[i]t is this true uncertainty which ... gives the characteristic form of 'enterprise' to economic organization as a whole and accounts for the peculiar income of the entrepreneur.*" Several recent theory papers suggest that accounting for uncertainty and uncertainty aversion might be important for understanding corporate decisions as well as macro-economic fluctuations (see, e.g., Garlappi et al. (2013), Ilut and Schneider (2014), Lee (2015)). At the same time, Hofstede's UAI, which is based on factor analysis of a large number of survey responses, rather than derived from a decision-theoretic model, has been related to anxiety and neuroticism (e.g., Hofstede and McCrae (2004)). Several studies, including recent evidence from neuroscience, show that anxiety and neuroticism are also related to several risk taking measures (see, e.g., Eisenberg et al. (1996), Paulus et al. (2003), Maner et al. (2007), Hartley and Phelps (2012)). It is therefore not surprising that UAI is significantly correlated with measures of risk aversions such as subjective assessments of a person's willingness to take risks.[6] Hence, we employ corporate leaders' UAI as a general proxy for risk attitudes, especially since uncertainty appears to be omnipresent in a corporate setting, while risk in the strict sense of known probability distributions seems to be rare. While uncertainty avoidance and risk aversion are not the same thing in general (see, e.g, Camerer and Weber (1992)), we nevertheless use uncertainty avoidance (UAI), risk preferences, and risk attitudes interchangeably given the context of the paper.[7]

For each individual in our sample of corporate leaders, we form a weighted average of UAI

[6]Indeed, data from Becker et al. (2015), the most comprehensive international study of risk aversion that we are aware of, reveals a positive and significant correlation of 0.35 between Hofstedes UAI measure used in our study and their country-level, survey-based measure of risk aversion. Becker et al. survey 80,000 participants in 76 countries about their self-assessed willingness to take risk. We thank Benjamin Enke for providing the correlation statistic for the Becker et al. (2015) data.

[7]For a similar approach, see Bloom (2014) who uses uncertainty as "a stand-in for a mixture of risk and uncertainty." See also Izhakian (2012), who defines uncertainty as "the aggregation of risk and ambiguity."

associated with each relevant country of origin. That is, we calculate UAI for an individual with last name l as $UAI_l = \Sigma w_{lj} UAI_j$, where w_{lj} represents the passenger-record based frequency for last name l with respect to country j. We rescale the weights appropriately as we have country-level UAI values for only 91 out of the 121 possible countries of origins.

Table 1 Panel A reports summary statistics of uncertainty avoidance for CEOs (*UAI (CEO)*), other executives, directors, and founder(s). To characterize the risk attitudes of a firm's executive team (*UAI (Executives)*), we average the UAI of the four most highly paid non-CEO executives for each firm-year. To capture the corresponding preferences of a firm's board of directors (*UAI (Outside Directors)*), we average the UAI of the non-executive directors, for each firm-year. That is, we exclude inside directors, such as the CEO and other executives, to avoid double-counting the effect of these insiders in our analysis below. On average, we include five outside directors in the calculation of *UAI (Outside Directors)*. The average firm with data on its founders has 1.4 founders. We again average the UAIs across the members of the founding team and report *UAI (Founders)* as a time-invariant firm characteristic. Overall, average UAIs are very similar across all groups, ranging between 0.448 (executives) and 0.467 (CEOs).[8]

Our approach to measuring corporate leaders' attitudes towards risk and uncertainty has a number of strengths as well as several weaknesses that we briefly discuss here and address in more detail in our analysis below. First, our characterization of corporate risk culture as the risk preferences shared by senior corporate leaders requires a consistent measure of uncertainty avoidance across a large set of individuals. The last-name-based approach allows us to approximate corporate leaders' preferences not only for a large number of firms, but also across generations of leadership within a firm, including the preferences of a firm's founder(s) even after the founder has long left the firm. The resulting large panel data set of corporate risk culture enables us to study the formation and evolution of corporate risk culture as well as its impact on the firm's risk-taking policies over time. However, the approximation based on last names introduces measurement errors. For example, in the U.S., a person's last name is typically inherited from only the father, which does

[8]In untabulated results, we indeed find that CEO tenure increases in CEO UAI, while CEO turnover probability decreases in CEO UAI, consistent with more risk averse CEO selecting "safer" and stabler firms or positions. We thank an anonymous referee for this suggestion.

not necessarily reveal the person's cultural heritage from the mother. This concern is alleviated, though, by relatively high intra-ethnic marriage rates.[9] Another source of measurement error is due to our inability to precisely determine a person's heritage based on the person's last name. Instead, we use a distribution of origins, derived from many immigration records, to approximate a person's true origin.

Second, by relying on culturally transmitted aspects of a person's UAI, we capture a predetermined and time-invariant component of an individual's preference that by design cannot be caused by experiences, life events, or choices an individual makes (except for the rare events of changing one's last name). In the corporate context, this implies that any commonality we observe among a firm's leaders is due to (self-) selection of these leaders as opposed to social influences (Ahern, Duchin, and Shumway (2014)) or shared experiences (van den Steen (2010)) inside the firm. While this means that the mechanism by which corporate risk culture arises in our context is well-identified, it also implies that we do not capture a firm's corporate risk culture in its entirety.

B Outcome Variables

In our empirical analysis, we examine the selection of corporate leaders based on their preferences towards risk and uncertainty (Section III) and the impact of the shared risk preferences on corporate policies (Section IV). Panel B of Table 1 provides summary statistics for the related outcome variables and Appendix B contains detailed definitions of all variables.

Part of our selection analysis in Section III examines the absolute difference in UAI between the CEO and the board, $|UAI\ (CEO)\ -\ UAI\ (Outside\ Dir.)|$, and between the CEO and the executive team, $|UAI\ (CEO)\ -\ UAI\ (Exec.)|$, over the course of a CEO's tenure. Table 1 Panel B reveals that on average the CEO's UAI differs from that of the outside directors as well as the executive team by about 0.14 or about 30% relative to the average CEO UAI.

In Section IV, we study the association between the corporate leaders' UAI and corporate policies related to risk taking. Corporate investment decisions are often made under substantial uncertainty (Dixit and Pindyck (1994)). In general, uncertainty averse agents will invest less or not

[9] While rates vary across ethnic groups, using data from the 1980, 1990, and 2000 Census on spouses' ethnic origins, comparable to those used in our study, we find that the average intra-ethnic marriage rate is about 50%.

at all when confronted with such uncertainty, due to their relatively more pessimistic estimation of the outlook (Epstein and Schneider (2010), Garlappi et al. (2013)). Two types of investments stand out in particular. Acquisitions and the subsequent integration and reorganization are unique events for a given firm and are often marked by substantial uncertainty. Similarly, R&D investments often require long-term commitment towards, almost by definition, unknown outcomes. Sutton (2004), who models the outcome of R&D under Knightian uncertainty, observes that "when a firm invests in acquiring the know-how to produce some new product, it may turn out at some future date that the know-how it has acquired in this way will be of value in producing further products, whose nature was not foreseeable when the initial investment was made." Doraszelski and Jaumandreu (2013) indeed find that R&D investments increase the degree of uncertainty in the evolution of a firm's productivity level. The existing literature has therefore used both policies when examining firms' willingness to take risk (e.g., Coles, Daniel, and Naveen (2006), Kim and Lu (2011), Hirshleifer et al. (2012), and Graham et al. (2013)) and to expose itself to uncertainty (e.g., Shane (1993) and Cozzi and Giordani (2011)). For most of the analysis, we use an indicator variable *Acquisition* that equals one if a firm makes a completed acquisition with disclosed transaction values covered by the SDC database during a given year and zero otherwise.[10] In an extension, we also consider *Acquisition Rate*, defined as the value of acquisition in a year scaled by book assets, which measures the intensive margin of corporate acquisitiveness. For R&D investment, we calculate the *R&D Rate* as R&D expenses scaled by total sales, following Hirschey and Weygandt (1985), Lev and Sougiannis (1996), and Chambers et al. (2002).

In a simple capital structure model, Lee (2015) shows that uncertainty aversion of managers decreases financial leverage. In an extension, we therefore also consider financial policies: *Cash Rate*, defined as cash holdings scaled by total book assets, and *Leverage*, defined as total book debt scaled by the sum of book debt and book equity. While debt payments pose constraints on a firm's financial flexibility, especially in case of negative firm-specific or macro-economic shocks, cash holdings offer financial flexibility and lower risk.

We focus on firm policies rather than outcomes such as cash flow or return volatility since

[10] We exclude leveraged buyouts, exchange offers, repurchases, spinoffs, minority stake purchases, recapitalizations, self-tenders, and privatizations. We include only deals after which the acquirer owns at least 50% of the target.

we believe that firm policies more directly reflect senior leaders' preferences than volatility, which can be influenced by factors that are out of the managers' control. Furthermore, based on existing models, the implications of risk as well as uncertainty aversion of corporate leaders typically coincide with respect to corporate policies, i.e., more risk or uncertainty averse leaders are expected to invest less, have lower leverage, and hold more cash, while volatility is more closely related to the concept and measurement of risk than the measurement of uncertainty or ambiguity for which no generally agreed upon measure exists yet (see, for example, Izhakian (2012)). Nevertheless, we also consider the effect of corporate risk culture on firms' cash flow volatility, defined as the forward four-year rolling volatility of the ratio of quarterly cash flows from operations over lagged book assets. Finally, we also examine the interaction between corporate culture and CEO compensation by considering *vega*, the sensitivity of CEO wealth to stock return volatility, as an outcome variable.

All corporate policy and outcome variables are winsorized at the 1^{st} and 99^{th} percentiles, except *R&D Rate*, which is highly skewed and is winsorized at the 2^{nd} and 98^{th} percentiles.[11] Summary statistics are reported in Table 1, Panel B.

C Additional Variables

Throughout our analysis we control for firm characteristics such as firm size (logarithm of net sales), market-to-book ratio, and profitability (return on assets (ROA)). In parts of our empirical analysis, we also control for CEO characteristics such as age, education, and gender. Table 1 Panel C reports summary statistics for these additional variables. Appendix B provides a detailed definition of all variables used in this paper.

III Corporate Risk Culture

Schein (1985) defines corporate culture as the beliefs and preferences shared by an organization's members, in particular by the organization's senior leaders. We therefore define corporate risk culture as the commonality in the risk and uncertainty preferences of a firm's senior leaders. In

[11] We apply a different winsorization to the *R&D Rate* to reduce the effect of outliers. All results hold (with larger effect sizes), when we winsorize the *R&D Rate* at the 1^{st} and 99^{th} percentile.

this section, we first document the existence of such commonality and its persistence and propose the first principle component of corporate leaders' risk preferences as a measure of corporate risk culture. We then study the formation and evolution of the firm's risk culture through leadership selection based on risk preferences as well as through the lasting impact of the founders' risk preferences.

A Existence and Persistence of Corporate Risk Culture

A.1 Commonality in Risk Attitudes among a Firm's Leaders

We define a firm's senior leadership to include the CEO, the executive team, and the non-executive directors. We measure the commonality among these corporate leaders' risk attitudes through a principal component analysis of *UAI (CEO)*, *UAI (Executives)*, and *UAI (Outside Directors)*. Panel A of Table 2 reports the results for our main sample of 6,110 firms with 36,880 firm-year observations. Specifically, the first principal component, which we refer to as "*UAI (Common)*," explains 43% of the total variation across the three parties' risk preferences. That is, *UAI (Common)* explains 10 percentage points more of the variation in UAI relative to what we would observe if corporate leaders were selected randomly and independently of their risk attitudes (33.3%).[12]

Panel B of Table 2 further confirms that the commonality in risk preferences in our data is not due to chance. First, we randomly match CEOs, executive teams, and outside directors in the same year 100 times and extract the first principal component of their UAIs each time. The first principal component on average explains about 33.6% of the total variation in UAIs (with a tight confidence interval ranging from 33.5 to 33.8%), suggesting that the risk attitudes of randomly matched corporate leaders are largely independent of each other.

Commonality in UAI among corporate leaders could arise if corporate leaders come from the same geographical area within the U.S., for example, due to partially segmented executive and director labor markets (see, e.g., Knyazeva, Knyazeva, and Masulis (2013) and Yonker (2015)), and are more likely to share the same ethnic background. To assess the possible impact of ethnicity

[12]Specifically, *UAI (Common)* is defined as the following linear combination: *UAI (Common) = 0.568 UAI (CEO) + 0.590 UAI (Outside Directors) + 0.574 UAI (Executives)*. We rescale *UAI (Common)* to have the same mean and variance as *UAI (CEO)*.

clustering by geographical region, we again randomly select the three leadership parties, but this time from subsets that include only those leadership parties that are in the firm's headquarter state in a given year. In this case, the first principal component of UAIs explains about 35.6% of the total variation, slightly above the 33% expected under completely random selection, but still well below the 43% observed in the actual data. Similarly, we account for potential ethnicity clustering by industry by conducting random matches of corporate leaders within industry-years. We consider industry classifications by 2-digit SIC, 3-digit SIC, and 4-digit SIC. Overall, the industry effect on commonality is even smaller than the geographic effect, with the first principle component on average explaining 34.1% to 34.7% of the total variation.[13] Finally, the last row of Panel B reveals that state and industry effects combined explain only a small part of the commonality we observe in the actual data. Randomly assembling CEOs, outside directors, and executives within the firm's headquarter state and (2-digit SIC) industry in the same year leads to the first principal component explaining 36.0% of the total variation, compared to 43% found in the actual data in Panel A, suggesting that the observed commonality is not simply due to clustering by region or industry.

Although our approach allows us to approximate the preferences of a large sample of U.S. corporate leaders, it is a noisy approximation. In particular, we rely on a distribution of possible origins for a last name to infer the true origin. While 72% of corporate leaders' last names have a dominant origin (i.e., an origin with a frequency weight of more than 50% of the non-US-citizen, non-missing immigration records), the average (median) number of different origins per last names is 23 (20). A large number of countries associated with a given last name likely corresponds to lower precision of our measurement of preferences. Similarly, the dispersion in the different UAI values entering a person's weighted average should capture the difficulty of accurately identifying an individual's true risk preference. While the average as well as median dispersion across origins associated with a given last name is 0.14, its standard deviation is 0.08 suggesting substantial

[13]Consistent with these results based on randomization, we find that the within-industry (2-digit SIC) variation of corporate risk culture (0.156) is more than five times larger than the between-industry variation (0.03), based on a one-way ANOVA analysis. Similarly, we find that for each of the five most frequent CEO origins in our sample (i.e., English, German, Italian, Irish, and Jewish), the within-industry variation is five to eight times larger than the corresponding between-industry variation.

variation in dispersion across last names.

To gauge the impact of possible measurement error, we first consider a subsample of firm-years for which the number of origins associated with the CEO's last name, the average number of origins associated with outside directors, and the average number of origins associated with the executives are all in the bottom half of their sample distributions. We compute *UAI (Common)* for this subsample, which is presumably less affected by measurement error. Panel C of Table 2 shows that *UAI (Common)* explains 45.1% of the total variation in leadership's UAIs, only slightly higher than the 43% in the full sample.[14] We obtain an even smaller improvement in the commonality estimate when using the dispersion of UAI values across all possible origins associated with a given last name to create, in the same way, a subsample that is less affected by possible measurement error.

Overall, the results in Panel C suggest that measurement error in UAI imposes some downward bias on the estimate of commonality in risk preferences. We also note that any measurement error in corporate leaders' UAIs and *UAI (Common)* applies equally to the actual sample in Panel A and the randomly generated samples in Panel B. Thus, the differences in the estimated commonality between the two panels cannot be due to measurement errors.

A.2 Persistence of Corporate Risk Culture

Culture in general is perceived to be slow-moving and persistent. We therefore examine the persistence of corporate risk culture, as proxied for by *UAI (Common)*.

Table 3 reports the autocorrelation in *UAI (Common)* across generations of firm leaders. A generation is defined by the regime of a given CEO as CEO turnovers are often also accompanied by substantial turnovers in the top executive team (Fee and Hadlock (2004); Hayes, Oyer, and Schaefer (2006)) and director turnovers (Coles, Daniel, and Naveen (2014)). We average *UAI (Common)* over the years belonging to one CEO's tenure. The results in Column (1) of Table 3 suggest that *UAI (Common)* is highly persistent, with high correlations in *UAI (Common)* across

[14] We have verified that the higher fraction of variation explained by *UAI (Common)* in the subsamples in Panel C of Table 2 is not driven by the sample size. We randomly form additional subsamples of the same size as those in Panel C and then compute the fraction of variation explained by *UAI (Common)* in these subsamples. The fraction is always very close to 43%, the corresponding number in the full sample.

multiple generations of firm leaders. Specifically, the autocorrelation of *UAI (Common)* between two adjacent generations is 0.632, while the correlation across five generations is still 0.301.

In Column (2), we report corresponding results for up to four generations when the new CEO is an outsider. When a company hires a CEO from outside the firm, it often signals the desire for a different type of leadership and a change in the firm's strategy going forward. Based on information from *ExecuComp* and *Boardex* available for a subset of new CEOs, about 29% of them are outsider CEOs, who were not part of the firms' leadership before their appointment as CEOs. We find that in case of an outsider CEO, the autocorrelations of *UAI (Common)* are slightly lower compared to the full sample. Thus, while outsider CEO successions lead to larger changes in firms' risk culture than insider CEO successions, corporate risk culture is still quite persistent. Interestingly, for forced CEO turnovers, we find a much lower first-order auto correlation of *UAI (Common)* of only 0.282 (untabulated) compared to 0.560 for outsiders and 0.632 for the full sample. This change in risk culture is consistent with existing evidence that forced CEO turnovers are often followed by appointments of CEOs outside the "normal" choice set as well as significant restructuring of the firm (Denis and Denis (1995), Fee et al. (2013)).

B Origin of Corporate Risk Culture

How does the commonality in risk attitudes among the firm's leaders arise and why is it related across generations of leaders? We address these questions by studying the selection of leaders over time and by tracing a firm's culture back to its origin as represented by its founders.

B.1 Leadership Selection

According to van den Steen (2010), corporate culture can originate in two ways: through the selection or self-sorting of employees with similar beliefs or preferences and through shared experiences at work. Since our UAI measure for a given individual does not vary with time and cannot be affected by shared work experiences, any commonality in risk preferences has to come from the (self-)selection of corporate leaders with similar risk preferences into a firm and the subsequent retention and promotion decisions inside the firm. Thus, our approach allows us to isolate the role

leadership selection plays for the origin and persistence of corporate risk culture. We first discuss the selection of the CEO and then the selection of the executive team and the outside directors.

B.1.1 Selection of CEOs

What determines an incoming CEO's UAI? Do firms select CEOs to match the UAI of the existing leadership? Answers to these questions can shed light on how leadership selection gives rise to correlated risk preferences within a leadership team (the basis of corporate risk culture), and how the risk preferences of one generation of leaders relates to those of the next (the persistence of risk culture).

To answer these questions, we focus on a subset of 3,571 CEO turnovers between 1996 and 2012 with information on the composition of the pre-turnover board and the pre-turnover executive team. First, we relate the incoming CEO's UAI to the firm's risk culture in the year before the CEO turnover, which we refer to as *Pre-turnover UAI (Common)*. Column (1) of Table 4 reports a positive and significant relation between the two. The firm's existing risk culture alone explains 13% of the variation in the incoming CEO's risk preferences. One explanation for this finding is that the firm's fundamental characteristics attract CEOs with certain preferences and that these firm characteristics are also correlated with the incumbent management's preferences. To evaluate this possibility, we control for pre-turnover firm characteristics that capture the nature of the firm's business: firm size, profitability, growth potential, industry membership (2-digit SIC), and headquarter location. In addition, we control for the incoming CEO's characteristics such as age, education, and gender. Interestingly, in the presence of the firm's risk culture, the fundamental firm characteristics listed above do not have additional explanatory power for the new CEO's UAI. This result suggests that to understand firm-CEO matching, it is important to go beyond firm characteristics and study the preferences of those who are part of the selection process.

One of the board's main responsibilities is to select the CEO. The departing CEO and the top executives will in many cases be consulted in the search process as well. We therefore examine the relation between the UAI of the incoming CEO and the UAIs of pre-turnover leaders: the pre-turnover outside directors, *Pre-turnover UAI (Outside Directors)*, the pre-turnover non-CEO

top executives, *Pre-turnover UAI (Executives)*, and the departing CEO, *Pre-turnover UAI (CEO)*. The results in Column (2) of Table 4 show that both the outside directors' and the top executive team's uncertainty avoidance are important and highly significant determinants of the new CEO's UAI, while the departing CEO's UAI has an insignificant effect.[15] Together, the risk preferences of the existing leadership explain 19% of the variation in the incoming CEO's risk preference.[16]

Next, in Column (3), we distinguish between insider and outsider new CEOs by introducing interaction terms between an insider new CEO indicator and the pre-turnover board's or executive team's UAIs. For the pre-turnover board, the interaction is close to zero and statistically insignificant, suggesting that the matching between pre-turnover board's UAI and the new CEO's UAI does not vary between insider and outsider CEOs. However, for the executive team the interaction effect is significantly positive, consistent with insider new CEOs likely being former members of the executive team. Nevertheless, the significant and large direct effects of *Pre-turnover UAI (Outside Directors)* and of *Pre-turnover UAI (Executives)* in Column (3) confirm that matching based on risk preferences is important for outsider as well as insider CEOs.

Finally, in Columns (4) through (6), we address the possibility that directors and executives choose or attract CEOs based on general ethnic similarity rather than specifically similarity in risk attitudes. We first measure ethnicity matching based on the countries of origin of the incoming CEO as well as of the member of the pre-turnover board and the pre-turnover executive team. We then consider broader forms of ethnicity matching based on language families and broader geographic regions.

We first construct two indicator variables, *Ethnicity Match (Directors)* and *Ethnicity Match (Exec.)*, which equal one if the dominant origin associated with a CEO's last name, i.e., the origin with a frequency weight of more than 50%, is the same as the most common dominant origin among the pre-turnover outside directors or among the pre-turnover executives and zero otherwise. We find that in 27% (25%) of the CEO turnovers in our sample, the dominant ethnicity of the incoming CEO and the most common dominant origin of the pre-turnover board (executive team)

[15] In untabulated results, we find that the UAI of the departing CEO matters when considered in isolation from the pre-turnover board and executive team.

[16] The *adjusted* R^2 of Columns 1 and 2 of Table 4 remains unchanged when excluding all additional controls.

coincide, compared to random matches between CEOs and boards (executive teams) for which we would observe a match based on the dominant ethnicity in 12% (11%) of the cases. It is hence possible that ethnicity matching might indeed play a role in the selection of CEOs. In Column (4), we account for the effect of ethnicity matching, by including interaction terms between the outside directors' UAI and *Ethnicity Match (Directors)* and between the executive team's UAI and *Ethnicity Match (Exec.)*. While the direct effects of *Pre-turnover UAI (Outside Directors)* and *Pre-turnover UAI (Exec.)* are reduced by about one third, they remain statistically significant, consistent with the selection of CEOs based on uncertainty avoidance and not just on ethnicity.[17]

Next, we consider two broader forms of ethnicity matching by forming clusters of countries of origins based on linguistic similarity or geographic regions. We form 25 language-based clusters by grouping countries of origin by the second sub-division of the language family to which the language spoken by the majority in a given country belongs.[18] We create indicator variables *LanguageMatch(Director)* and *LanguageMatch(Exec.)* which are one if the language subdivision associated with an incoming CEO is the same as the modal language subdivision of the board or the executive team and zero otherwise. We find that a language match between the CEO and the board (executive team) occurs in 28% (26%) of the cases. We also form seven clusters based on six regions within Europe and one "rest-of-the-world" region for all non-European origins.[19] We again create indicator variables, *GeographyMatch(Director)* and *GeographyMatch(Exec.)*, which are one if the region associated with an incoming CEO is the same as the modal region of the board or the executive team and zero otherwise. We exclude observations that contain matches between the rest of the world on both sides, which leads to a slightly smaller sample of 3,536 observations as opposed to 3,571. We find that a region match between the CEO and the board (executive team) occurs in 39% (38%) of the cases. In Columns (5) and (6) of Table 4, we control for matching based on

[17] In a robustness check, we construct the fraction of outside directors (executives) whose dominant origin is the same as the dominant origin of the CEO. We find a positive and significant relation between the CEO's UAI and the pre-turnover board's (or executive team's) UAI even when there is no ethnicity overlap at all between the incoming CEO and the outside directors (executives).

[18] The language families and subdivisions are based on Glottolog, a catalog of the worlds languages maintained by Hammarström et al. (2016) at the Max Planck Institute for the Science of Human History. We use the second sub-division to group countries of origin into language clusters. For example, German and Swedish both belong to the family of Indo-European languages and both also belong to the sub-division of Northwest Germanic languages.

[19] Europes six principal regions (North, East, Central, South, South-East, and West) are based on cultural similarity according to Jordan (2005).

these broader clusters. As before, the direct effect of the past boards UAI and the past executive teams UAI remains significant in all cases, suggesting that there is indeed matching between the new CEO and the incumbent leaders based on their risk preferences.

While we control for insider CEOs in most of the analysis reported in Table 4, we have repeated the analysis for the subset of outsider CEOs. The results are reported in Appendix C and lead to the same conclusion: The risk preferences of the board and the executive team matter for the CEO selection after controlling for different forms of ethnicity matching.

While the shared risk attitude between outsider CEOs and the pre-turnover boards (executive teams) implies that risk attitudes are an important dimension for the initial selection decision, commonality in risk preferences can also arise from retention and promotion decisions inside a firm. For insider CEOs, we can better gauge the short list of final candidates, which allows us to provide more detailed evidence on the role of preference match in this final race to the top. Focusing on insider CEO succession, we compile a list of likely internal candidates, consisting of the CEO-to-be and the firm's top four pre-turnover executives. We then examine whether the fit with the firms existing risk culture matters in this ultimate race to the top. That is, we ask whether a candidate's fit with the existing corporate risk culture influences his or her chance of being selected as the CEO. We measure a candidate's (lack of) fit with the firms risk culture by the absolute distance between the candidate's UAI and the firm's (pre-turnover) risk culture (i.e., pre-turnover UAI (Common)). We regress an indicator variable that is one when a candidate is selected as the next CEO and zero otherwise on the absolute distance between the candidate's UAI and the firm's risk culture. We control for firm-year fixed effects so that the comparison is among the short-listed candidates within a firm for a given CEO turnover. In untabulated results, we indeed find that a candidate whose UAI differs less from the firm's risk culture is significantly more likely to be selected as the next CEO. Specifically, a one-standard-deviation increase in the absolute distance in UAI decreases a candidate's probability of being selected as the next CEO by 2 percentage points (about 10% reduction relative to the unconditional mean probability for the short-listed candidates). Thus, at least the final promotion to the CEO position reflects selection based on similarity in uncertainty avoidance.

Overall, the results in Table 4 and our additional investigations suggest that the existing corporate risk culture, consisting of the UAI of the pre-turnover corporate leaders involved in the selection of the new CEO, plays a significant role in determining the UAI of the incoming CEO. This is the case for outsider CEOs as well as the promotion of insiders to the CEO position.

B.1.2 Selection of Executives and Outside Directors

While boards and top executive teams tend to select CEOs whose risk preferences are similar to theirs, CEOs may also influence risk preferences in the board room and the executive suits by selecting new outside directors and promoting or hiring new subordinates whose risk attitudes are closer to their own. If this hypothesis is true, we expect the outside directors' and the executive team's average risk preferences to become closer to that of the CEO as the CEO's time in office lengthens.

In Column (1) of Table 5, we relate the CEO's time in office (in years), *Tenure*, in year t to the absolute difference (multiplied by 100) between the UAIs of the outside directors and the CEO in year t, controlling for year fixed effects, headquarter state fixed effects, and (2-digit SIC) industry fixed effects. We find that the difference decreases as the CEO's tenure increases. While statistically significant, the effect is relatively small in magnitude. Specifically, over the average tenure length of 6.8 years, the absolute difference in risk preferences decreases by about 2.5% relative to the sample mean. Similarly, the *adjusted* R^2 is low, likely due to measurement error in our UAI measure as well as a large number of additional determinants that play a role in the selection of outside directors.

Column (2) shows that the absolute difference between CEO's UAI and executive team's UAI decreases over the CEO's tenure in a similar way. Therefore, over time the CEO likely appoints or attracts immediate subordinates that share her risk preferences. Not surprisingly, we find in Column (3) that the divergence between the CEO's UAI and the firm's risk culture decreases over the CEO's time in office as well. In Column (4), we control for firm-CEO fixed effects, identifying the CEO's influence purely from the time-series variation within a firm-CEO pair. This approach mitigates the concern that the effect is driven by the correlation between unobservable, time-invariant firm or CEO characteristics and the CEOs' average tenure lengths. The coefficient estimates on *Tenure*

remains statistically significant. According to Column (4), over a CEO's average time in office the absolute difference between the CEO's UAI and the firm's risk culture drops by 3.5%.

Overall, the results in Table 5 are consistent with the hypothesis that CEOs influence corporate risk culture by influencing the composition of the firms' senior leadership. However, the magnitude of the effect is modest, which is likely due to the persistence in the composition of the board and the executive teams, but which may also reflect the measurement error of our risk preference proxy.

B.2 Founders

Our results suggest that the persistent commonality in corporate leaders' risk preferences arise due to selection of corporate leaders. A firm's shared risk attitudes are transmitted from one generation of corporate leaders to the next. What is the origin of the selection process? Differently from societal culture in general, a firm's history and thus its culture can be traced back to its beginning and to the people who founded the firm (Guiso et al. (2015a)). We therefore examine whether and to what extent a firm's risk culture is related to the firm's founders, who, as van den Steen (2010) hypothesizes, might have endowed the firm with its initial risk culture.

To do so, we use a subsample of 3,309 firms for which we are able to measure the firm's founders' average UAI (*UAI (Founders)*). A firm's founders represent those that are credited, either by the firm or by other public sources, with having established the firm, often a long time ago. Compared to our full sample, the founder subsample consists of slightly larger firms, with an average firm size of $4.5 billion (net sales) compared to $3.7 billion in the full sample. In 63% of the firm-years with founder information, the founders are no longer part of the firms' leadership.Even when a firm's founders are known, pinning down the year in which the firm was established is often difficult. We therefore measure a firm's age in terms of years since the firm's IPO, which is 21 years in the founder sample and 20 years in the full sample.[20]

Panel A of Table 6 reveals that the founders' UAI is positively and significantly related to the UAI of the firm's subsequent generations of CEOs (Column (1)), executive teams (Column (2)), and

[20]For a subset of 1,040 firms in our founder sample, we are able to identify the year in which the firm was established. The average "age since founding" is 33 years, and the maximum is 162 years.

outside directors (Column (3)).[21] As discussed above, given our approach to measuring corporate risk culture, the positive relation between founders and subsequent leaders has to come from (self-) selection of future leaders with risk preferences similar to those of the founders. Column (4) shows that the founders' risk preferences are also positively correlated with the firm's risk culture, even when the founder is no longer on the leadership team. Columns (5) and (6) further show that the link between founders' risk preferences and corporate risk culture does not simply operate through firm characteristics or the firm's headquarter state and industry.

The results in Panel A suggest that the cross-sectional differences in the risk preferences of firms' founders could lead to long-lasting differences in corporate risk culture. To gauge the magnitude of such persistence, we follow Lemmon, Roberts, and Zender (2008) and conduct the following exercise. From our founder sample, we select three subsamples with firm-years that are 11 to 20 years, 21 to 30 years, and 31 to 40 years after a firm's IPO.[22] From each subsample, we drop firm-years with founders on the leadership team. For each subsample, we then sort firms into quartiles based on their founders' UAIs. Finally, for each subsample, we report the average *UAI (Founders)* and the average *UAI (Common)* for each quartile and the difference between the averages of the top and bottom quartiles. The results are reported in Panel B of Table 6.[23]

There is substantial dispersion in the founders' UAI, with the difference between the top and bottom quartiles ranging between 0.31 and 0.35, about two times the standard deviation of *UAI (Founders)*). In each subsample, the ranking of the groups based on the founders' UAI predicts the ranking based on the average corporate risk culture even decades after the IPO and after the departure of the founders, and the difference between the top and bottom groups is statistically significantly different from zero. Even 31 to 40 year after the IPO, about one quarter of the initial spread in *UAI (Founders)* is preserved in the difference in firms' risk culture as measured by *UAI (Common)*.

Overall, the results in Table 6 suggest that the founders' risk preferences are an important de-

[21] To avoid a mechanical association, we excluded cases where at least one founder would be included in the dependent as well as the independent variable.

[22] Given that our data set covers a maximum of 17 years, the number of firms included in each subsample differs.

[23] Given the time between founding and IPO, firms' "age since founding" will be greater than the years after the IPO. As mentioned above "age since founding" is missing for a large fraction for firms in our sample.

terminant of corporate risk culture, contributing to its persistence across generations of leadership, and likely operating, at least in part, through the selection of corporate leaders as documented in Tables 4 and 5.

IV Corporate Risk Culture and Corporate Policies

Firms select leaders with preferences and beliefs similar to those of existing leaders because the resulting corporate culture is one way to coordinate decision making inside the firm. In this section, we examine how corporate investment decisions, which are the outcome of such coordination, are related to corporate risk culture. Specifically, we predict that firms with more uncertainty avoidant corporate culture invest less due to the more pessimistic outlook associated with uncertainty aversion (Epstein and Schneider (2010), Garlappi et al. (2013)).

While the evolving corporate culture is an endogenous outcome of matching between firms and their leaders, we exploit the predetermined nature of firms' initial risk culture, shaped by their founders, as well as time-variation in corporate risk culture to examine how differences in corporate culture lead to differences in corporate decisions.

Finally, we provide several robustness checks and test whether a more risk averse corporate culture is associated with more "conservative" financial policies, i.e., lower leverage and higher cash holdings, as predicted by Lee (2015), and overall lower cash flow volatility.

A Corporate Risk Culture and Investment Decisions

We focus on acquisitions and R&D investments as both are investments under considerable uncertainty. In all specifications, we control for firms' market-to-book ratio, ROA, and the logarithm of net sales, measured at the beginning of a fiscal year. To account for possibly industry-specific macroeconomic shocks, we include and 2-digit SIC industry-year fixed effects. To distinguish between firm-specific associations and regional associations, which could arise due to ethnicity clustering by state (see Section III. A.1), we also include headquarter state fixed effects. To account for serial dependence across firm-years, we report standard errors that allow for clustering at the firm level.

The results in Table 7 reveal a negative and significant relation between corporate risk culture

and corporate investments. The effect of *UAI (Common)* is largely unaffected by the inclusion of state and industry-year fixed effects.[24] Focusing on Columns (3) and (6), firms with a one-standard-deviation higher *UAI (Common)* exhibit a 2 percentage points lower acquisition probability, a difference of 11% relative to the sample mean,[25] as well as a 7 percentage points lower R&D rate, 15% relative to the sample mean. Given the presence of measurement error in UAI (see Section II. A.1), these results likely represent a *lower* bound of the effect of corporate risk culture on corporate investments.

Although the evidence in Table 7 offers validation of UAI as a measure of uncertainty and risk avoidance, it is reasonable to expect that corporate leaders share preferences and beliefs across a number of dimensions. To further validate *UAI (Common)* as a proxy for corporate risk culture, we examine a number of other, correlated dimensions of corporate culture. In particular, we construct corresponding measures of corporate culture using the three additional measures originally proposed by Hofstede to characterize key differences across countries with respect to shared values or beliefs: individualism (IDV), power distance (PDI), and masculinity (MAS). Performing corresponding principle component analyses (untabulated), we indeed find evidence of commonality among corporate leaders along these cultural dimensions, with the first principle component for IDV, PDI, and MAS explaining 48%, 44%, and 39% of the respective variation across corporate leaders. Panel A of Table 8 reveals that the inclusion of the additional Hofstede dimensions leads to only a slight reduction of the effect of corporate risk culture on investment decisions. When considering the full specifications in Columns (4) and (8), though, only the effect of *UAI (Common)* is statistically significant.

In Panel B of Table 8, we consider additional shared economic preferences, in the form of thrift attitudes and trust, which could be correlated with corporate attitude towards risk. For example, firms that place more value on thrift may avoid expensive acquisitions. The existing literature also

[24]The lack of a pronounced industry effect might be surprising. We find that in our data the within-industry (2-digit SIC) variation of corporate risk culture (0.156) is more than five times larger than between-industry variation (0.03), based on a one-way ANOVA analysis. We find a similar pattern firms' investment policies. The within-industry variation of corporate R&D is 2.36, while the between-industry variation is only 0.74. Similarly, the within-industry variation of corporate acquisitiveness is 0.37, while the between-industry variation is only 0.05.

[25]We acknowledge that the *adjusted* R^2 is relatively low suggesting that a large set of additional factors determine corporate acquisition decisions.

suggests a positive relation between trust and risk-taking (see, e.g., Guiso, Sapienza, and Zingales (2008), Fehr (2009)). Following Guiso, Sapienza, and Zingales (2006, 2008), we use data from the World Value Survey (WVS) and European Value Survey (EVS) collected between 1999 and 2004 for each country of origin and calculate the fraction of respondents that identify thrift and saving money as an important quality as well as the fraction that believe that most people can generally be trusted. Following the same approach as before, we measure corporate culture with respect to *Thrift (Common)* and *Trust (Common)* as the shared preferences among corporate leaders. The first principal component explains 45% in the case of thrift and 42% in the case of trust, of the total variation across corporate leaders. The results in Table 8 Panel B suggest that the effect of *UAI (Common)* is robust to controlling for these additional dimensions of corporate culture.[26]

Overall, the results in Table 8 lend further support to our hypothesis that corporate risk culture is associated with corporate investment decisions, by ruling out the alternative hypothesis that the ethnic composition of the firm's leadership team by itself or omitted economic preferences explain the effect of *UAI (Common)*.

B Predetermined and Time-varying Corporate Risk Culture

B.1 Founders and Predetermined Corporate Risk Culture

The preferences of a firm's founders establish the firm's initial culture. In Section III. B.2, we show that a firm's initial risk culture has a long-lasting impact on the firm's subsequent risk culture, which extends to periods after the founders have left the firm. That is, cross-sectional differences in firms' initial risk culture lead to persistent differences in firms' risk culture. Differently from subsequent corporate leaders, firms' founders are not selected. In other words, founders' preferences are predetermined relative to corporate policies and therefore their effect on the firm's future investment policies allows us to uncover a more causal effect of a firm's (initial) culture on corporate decisions.

To test the effect of firms' (initial) corporate risk culture on investment decisions, we examine the

[26]Note that *UAI (Common)* is significantly correlated with *Thrift (Common)* (32%) as well as with *Trust (Common)* (-21%).

impact of *UAI (Founders)* on *Acquisition* and *R&D Rate* aggregated at the firm level. Specifically, we collapse the panel data into a pure cross section of firm-level averages of the investment policies, *Acquisition* and *R&D Rate*, and the control variables, *Log(M/B)*, *ROA*, and *Log(Sales)*. Panel A of Table 9 reports the summary statistics of the relevant variables in this subsample. We then regress the firm-level average *Acquisition* or *R&D Rate* on *UAI (Founders)*, controlling for firm characteristics. Results reported in Panel B of Table 9 suggest that a firm's initial risk culture indeed has a significant effect on the firm's long-run investment policies, with higher values of *UAI (Founders)* leading to fewer acquisitions and less R&D investment. According to Columns (1) and (5), a one-standard-deviation increase in *UAI (Founders)* leads to a 1 percentage-point drop in *Acquisition* (a 7% drop relative to the mean of the subsample) and a 8 percentage-point drop in *R&D Rate* (a 11% drop relative to the mean of the subsample). State and industry fixed effects reduce the effect of *UAI (Founders)* on *Acquisition* slightly, but increase the effect on *R&D Rate*. To the extent that the firm's headquarter location and industry membership are choices made by the founders, this implies that the firm's policy choices are affected by these initial choices made by the founders.

To further assess the persistence of the founders' effect on corporate investment policies, we identify firm-years during which founders are part of the firm's leadership team. In Columns (4) and (8), we include an interaction term between *UAI (Founders)* and an indicator variable *On Leadership* that takes on one when at least one founder is in a leadership position in a given firm-year and zero otherwise. The results in Column (4) suggest that the effect of founders on corporate acquisitiveness is concentrated in time periods when at least one founder is among the firm's leaders, suggesting that the contemporaneous corporate risk culture could be more important for discrete and infrequent corporate investments like acquisitions. For R&D investments, however, the results in Column (8) suggest that founders' risk preferences matter no matter whether any founders are part of the leadership team or not, suggesting a long-lasting impact of of founders on firms' R&D investment.

Overall, the results in Table 9 reveal an effect of firms' (initial) risk culture on investment decisions that is not due to selection or reverse causality, but that is rather consistent with a causal

effect of a firm's risk culture on investment decisions.

B.2 Firm Fixed Effect and Time-varying Corporate Risk Culture

While founders' risk preferences provide predetermined, cross-sectional variation in corporate risk culture, a causal effect of corporate risk culture on firm policies would also require that changes in corporate risk culture over time are associated with changes in firms' investment decisions. We acknowledge that it is difficult to identify exogenous shocks to corporate risk culture in the time-series dimension. Still, we do observe changes in corporate culture as the leadership team turns over. We therefore employ a firm fixed effect specification in a sample of firms with CEO turnovers to examine how changes in corporate investment decisions relate to changes in corporate risk culture. Controlling for firm fixed effects also reveals how much of the corporate risk culture effect operates through time-invariant elements, including the founders' risk attitudes, and how much operates through the time-varying changes in corporate culture.

Corporate risk culture is highly persistent over the tenure of a given CEO (auto-correlation is 0.89). To better isolate the effect of time-varying corporate risk culture, we perform our analysis for the subsample of firms that experience at least one CEO turnover during our sample period. Columns (1) and (3) of Table 10 establish the benchmark effects of *UAI (Common)* on corporate investment policies for this subsample without the firm fixed effects. Columns (2) and (4) report the results with firm fixed effects. For both acquisition and R&D, the estimated effects of *UAI (Common)* are negative and significant, suggesting that the time-series variations in corporate risk culture are associated with changes in firm investment policies in the expected ways. For discrete and opportunity-driven investment such as acquisitions (autocorrelation=28%), the estimated effect of *UAI (Common)* slightly increases when we include firm fixed effects (Column (2) relative to Column (1)), suggesting that the corporate culture effect largely operates through the time-varying part. For persistent policies such as R&D investment (autocorrelation=77%), the estimated effect of *UAI (Common)* decreases by about 20 percent when we include firm fixed effects (Column (4) relative to Column (2)), suggesting that both the time-varying part and the time-invariant part related to the firm's initial risk culture play a role. These results are consistent with those in Table

9 that founders' preferences have a persistent impact on corporate R&D, but not on acquisition.

Overall, the cross-sectional evidence based on founders' UAI suggests that preferences with respect to risk and uncertainty can shape firms' investment decisions. At the same time, the evidence from specifications with firm fixed effects suggests that the association between corporate risk culture and investment decisions is not simply due to selection related to time-invariant firm characteristics.

C Robustness

Our approach to measuring individuals' risk preferences likely leads to measurement error in *UAI (Founders)* and *UAI (Common)*. Furthermore, the fact that all measures of risk attitudes are derived from a limited set of 91 origins could create a downward bias in the regression standard errors if the error term of the regression model exhibits clustering by origin. In this subsection, we address these issues. For simplicity, we focus on regressions involving *UAI (Founders)*.

C.1 Measurement Error

While our UAI measures might suffer from a number of measurement errors, we again use the number of different origins associated with a last name (*# of Origins*) and the standard deviation of UAIs across the origins associated with a last name (*Dispersion in UAI*) to gauge the impact of measuring an individual's origin with noise. In Columns (1) and (4) of Appendix D, Panel A, we regress firm policies on *UAI (Founders)*, controlling for firm characteristics and various fixed effects. In Columns (2), (3), (5), and (6), we add the interactions terms between *UAI (Founders)* and *# of Origins* or *Dispersion in UAI*.[27] We expect that the effect of *UAI (Founders)* is stronger when the number of origins associated with a given founder's last name or the dispersion in UAI across these origins is smaller. The results in Appendix C, Panel A suggest that this is the case. Specifically, in Column (2) the direct effect of *UAI (Founders)* on corporate acquisitiveness reflects the effect of UAI on *Acquisition* when noise in the form of *# of Origins* is controlled for. The effect (-0.130) is indeed larger than that in Column (1) (-0.059). Furthermore, this difference is

[27]For the 952 firms that have more than one founder, we average the number of origins and the dispersion in UAI for all founders of a firm.

statistically significant based on a Wald test. Finally, the interaction effect between *UAI (Founder)* and *# of Origins* is positive and significant. Both results suggest that the true effect of founders' attitude towards uncertainty on acquisition decisions might be larger in absolute terms. We find a similar effect in Column (3), with an interaction term between founder's UAI and *Dispersion in UAI*, although the interaction term has only a p-value of 0.17. While we find similarly increased effects (in absolute terms) of *UAI (Founders)* on R&D when controlling for measurement error, the interaction terms between *UAI (Founders)* and *# of Origins* or *Dispersion in UAI* are insignificant.

In conclusion, addressing measurement error due to the imprecision with which we identify a person's origin suggests that the true effect of *UAI (Founders)* on corporate policies might be larger than what we document in our main results above.

C.2 Regression Standard Errors

UAI (Founders) is time-invariant and, given the limited number of origins, positively correlated across observations with overlapping origins. As is well known from the recent literature on clustered standard errors (e.g., Petersen (2009), Thompson (2011), and Cameron and Miller (2015)), such within cluster (here, within firm or origin) correlation of a regressor will affect standard errors, if regression errors are also correlated across observations within clusters.[28]

While we allow for standard errors to be clustered at the firm level in all our panel regressions, we do not account for possible correlations across firms with corporate leaders from the same origin. In Appendix D, Panel B, we explore the effect of firm-level and origin-level clustering on our regression standard errors. To do so, we select the 2,364 firms with a single founder for whom we identify their largest origins, or with multiple founders that share the same largest origin.

In Columns (1) and (5), we report panel regressions for *Acquisition* and *R&D Rate* with standard errors not clustered at either the firm level or the founder's origin level. In Columns (2) and (6) we report standard errors that are clustered at the firm level, in Columns (3) and (7) we report standard errors that are clustered at the founder's origin level, and in Columns (4) and (8) we report double-

[28] Cameron and Miller (2015, p. 322, eq. 6) provide an approximate scaler for standard errors in case of correlation within clusters which translates to $1 + \rho_e \rho_{UAI}(N_{cluster} - 1)$ in our context, where ρ_e is the average correlation of the regression residuals within a cluster, ρ_{UAI} is the correlation of UAI within a cluster, and $N_{cluster}$ is the number of observations in a cluster.

clustered standard errors by firm and origin. We find that clustering by origin actually reduces standard errors relative to clustering by firm. Double-clustering reduces standard errors relative to clustering by firm, but not relative to clustering by origin.

Based on the evidence in Panel B, clustering standard errors by firm, as we do in all panel regressions, appears to be a more conservative approach than cluster by origin or double-clustering by firm and origin.

D Additional Outcomes

While corporate investment decisions are subject to substantial uncertainty and hence likely affected by *UAI (Common)*, firms' financial policies such cash holdings and financial leverage are likely also shaped by a firm's corporate risk culture (Lee (2015)). In Table 11 Panel A, we repeat our analysis from Table 7 for cash holdings and financial leverage. In Columns (1) and (4), we observe a significantly positive effect of *UAI (Common)* on *Cash Rate* and a significantly negative effect on *Leverage*. However, differently from the results on investment policies, state and industry-year fixed effects account for a sizable portion of the association between corporate risk culture and the financial policies. The effect of risk culture on leverage even becomes insignificant after the inclusion of industry-year fixed effects.[29]

In Column (1) of Table 11 Panel B, we examine an alternative, continuous measure of a firm's acquisition intensity in form of the *Acquisition Rate*. We again find a negative and significant effect of corporate risk culture. Specifically, a one standard deviation increase in *UAI (Common)* reduces the acquisition rate by about 11% relative to its sample mean. While we focus on corporate policies and decisions to characterize corporate risk taking in this paper, in Column (2), we consider the volatility of a firm's operating cash flow. We find a negative association with the firm's risk culture, which is significant at the 10%-level. Similar to the case of the acquisition rate, a one standard deviation increase in *UAI (Common)* is associated with a 9% drop in cash flow volatility (relative to the sample mean).

[29]Consistent with prior research (e.g., Welch (2004), MacKay and Phillips (2005), Frank and Goyal (2009), Leary and Roberts (2014)), we find a stronger industry effect in financial policies - the ratio of between-industry variation to the within-industry variation for leverage and cash holding is much higher compared to the ratios for investment policies.

In summary, the additional results in Table 11 provide further support for the argument that our measure of corporate risk culture, *UAI (Common)*, indeed captures a firm's preferences with respect to risk and uncertainty.

V Conclusion

The popular press as well as corporate executives often describe croporate culture as a critical determinant of corporate decisions. For example, Jim Sinegal, Costco's co-founder and former CEO, said in a 2012 CNBC documentary that "culture is not the most important thing; it's the only thing".[30] Financial economists, though, have only recently started to examine the role of corporate culture in detail, partly due to the difficulty of empirically measuring corporate culture. We study the formation and evolution of corporate *risk* culture, defined as the preferences towards risk and uncertainty shared by a firm's leaders. Approximating corporate leaders' preferences based on their ethnic background allows us to measure not only corporate risk cultures for a large panel of firms but also firms' initial risk cultures that are shaped by their founders' attitudes. This approach also provides initial evidence on how cultural heritage and culturally transmitted traits shape the selection and promotion of corporate leaders as well as corporate policies.

Our findings suggest that risk preferences are significantly correlated across members of a firm's leadership team as well as across generations of leadership. Selection of managers and directors based on their preferences with respect to risk and uncertainty plays an important role in the formation and persistence of the firm's risk culture, preserving the firm's founders' preferences in the firm's culture.

Understanding a firm's culture with respect to risk and uncertainty also advances our understanding of corporate investment decisions that expose firms to uncertainty. We find that acquisitions and R&D investments respond to a firm's contemporaneous risk culture, with firms having more uncertainty averse cultures exhibiting lower acquisitiveness and R&D intensity. Furthermore, investments in R&D also reflect the persistent part of firms' corporate risk culture rooted in the

[30] http://blog.marketculture.com/2012/09/14/culture-is-not-the-most-important-thing-its-the-only-thing-costcos-jim-sinegal/

founders' risk preferences. Thus, differences in firms' initial risk culture contribute to persistent differences in firms' innovation intensity. More broadly, our study suggests that one source of persistence in corporate policies documented by the prior literature is the persistence in corporate culture.

Of course, firms do not rely exclusively on culture but also employ formal governance mechanisms to align incentives and coordinate decision making. For example, while boards select CEOs to match the existing corporate risk culture, they can also adjust the CEOs' compensation contracts to further align risk-taking incentives within a firm. Our initial investigation of risk-taking incentives provided by compensation contracts in the form of *Vega* indeed suggests a significant interaction between formal incentives and corporate culture with respect to risk-taking.[31] Results in Table 12 reveal that the CEO's compensation package exhibits a higher vega, which encourages the CEO to take risk, specifically when the CEO is more uncertainty avoiding than the outside directors.[32] The interplay between corporate culture and corporate governance can be an interesting topic for future research.

Overall, studying corporate culture complements existing research in corporate finance, as it can significantly improve our understanding of leadership selection, corporate decision making, and corporate governance.

[31] *Vega* measures the compensation CEOs are offered for increased risk. Specifically, following Coles, Daniel, and Naveen (2006) *Vega* is the dollar change (in millions) in a CEO's wealth associated with a one percentage-point change in the firm's stock return volatility. It is available for a subset of firms and years with available CEO compensation data.

[32] Note that the compensation committee mainly consists of outside directors, especially after NYSE/Nasdaq required full independence of the compensation committee (NYSE listing rules section 303A.05, Nasdaq listing rules section 5605(d)).

References

Adhikari, B. K., Agrawal, A., 2016. Religion, gambling attitudes and corporate innovation. Journal of Corporate Finance 37, 229 – 248.

Ahern, K. R., Duchin, R., Shumway, T., 2014. Peer effects in risk aversion and trust. Review of Financial Studies 27 (11), 3213–3240.

Becker, A., Dohmen, T., Enke, B., Falk, A., 2015. The ancient origins of the cross-country heterogeneity in risk preferences. Working Paper, University of Bonn.

Beckmann, D., Menkhoff, L., Suto, M., 2008. Does culture influence asset managers views and behavior? Journal of Economic Behavior & Organization 67 (34), 624 – 643.

Bernile, G., Bhagwat, V., Rau, P. R., 2015. What doesn't kill you will only make you more risk-loving: Early-life disasters and ceo behavior. Working Paper, University of Oregon.

Bloom, N., May 2014. Fluctuations in uncertainty. Journal of Economic Perspectives 28 (2), 153–76.

Cain, M. D., McKeon, S. B., 2014. Ceo personal risk-taking and corporate policies. Journal of Financial and Quantitative Analysis, Forthcoming.

Camerer, C., Weber, M., 1992. Recent developments in modeling preferences: Uncertainty and ambiguity. Journal of Risk and Uncertainty 5 (4), 325–370.

Cameron, A. C., Miller, D. L., 2015. A practitioners guide to cluster-robust inference. Journal of Human Resources 50 (2), 317–372.

Chambers, D., Jennings, R., Thompson II, R. B., 2002. Excess returns to R&D-intensive firms. Review of Accounting Studies 7 (2-3), 133–158.

Chen, M. K., 2013. The effect of language on economic behavior: Evidence from savings rates, health behaviors, and retirement assets. American Economic Review 103, 690–731.

Coles, J. L., Daniel, N. D., Naveen, L., 2006. Managerial incentives and risk-taking. Journal of Financial Economics 79 (2), 431–468.

Coles, J. L., Daniel, N. D., Naveen, L., 2014. Co-opted boards 27 (6), 1751–1796.

Cozzi, G., Giordani, P., 2011. Ambiguity attitude, r&d investments and economic growth. Journal of Evolutionary Economics 21 (2), 303–319.

Denis, D. J., Denis, D. K., 1995. Performance changes following top management dismissals. Journal of Finance 50 (4), 1029–1057.

Dittmar, A. K., Duchin, R., 2011. The dynamics of cash. Working Paper, University of Michigan.

Dittmar, A. K., Duchin, R., 2014. Looking in the rear view mirror: The effect of managers professional experience on corporate financial policy. Review of Financial Studies, Forthcoming.

Dixit, A. K., Pindyck, R. S., 1994. Investment under uncertainty. Princeton university press.

Doraszelski, U., Jaumandreu, J., 2013. R&D and Productivity: Estimating Endogenous Productivity. Review of Economic Studies 80 (4), 1338–1383.

Du, Q., Yu, F., Yu, X., 2014. Cultural proximity and the processing of financial information. Working Paper, CEIBS.

Eisenberg, A. E., Baron, J., Seligman, M. E. P., 1996. Individual differences in risk aversion and anxiety. Working Paper, University of Pennsylvania.

Eisfeldt, A., Kuhnen, C., 2013. CEO turnover in a competitive assignment framework. Journal of Financial Economics 109 (2), 351–372.

Epstein, L. G., Schneider, M., 2010. Ambiguity and asset markets. Annual Review of Financial Economics 2 (1), 315–346.

Faccio, M., Marchica, M.-T., Mura, R., 2015. Ceo gender and corporate risk-taking. Working paper, Purdue University.

Fee, C. E., Hadlock, C. J., Huang, J., Pierce, J. R., 2014. Industry conditions and ceo labor markets: New evidence on relative performance evaluation. Working Paper, Michigan State University.

Fee, C. E., Hadlock, C. J., Pierce, J. R., 2013. Managers with and without style: Evidence using exogenous variation. Review of Financial Studies 26 (3), 567–601.

Fehr, E., 2009. On the economics and biology of trust. Journal of the European Economic Association 7 (2-3), 235–266.

Fernández, R., Fogli, A., 2006. Fertility: The role of culture and family experience. Journal of the European Economic Association 4 (2-3), 552–561.

Fernández, R., Fogli, A., 2009. Culture: An empirical investigation of beliefs, work, and fertility. American Economic Journal: Macroeconomics 1 (1), 146–177.

Frank, M. Z., Goyal, V. K., 2009. Capital structure decisions: which factors are reliably important? Financial Managemen 38 (1), 1–37.

Garlappi, L., Giammarino, R., Lazrak, A., 2013. Ambiguity in corporate finance: Real investment dynamics. Working Paper, University of British Columbia.

Giavazzi, F., Petkov, I., Schiantarelli, F., 2014. Culture: Persistence and evolution. Working Paper, Boston College.

Gompers, P., Mukharlyamov, V., Xuan, Y., 2014. The cost of friendship. Journal of Financial Economics, forthcoming.

Graham, J. R., Harvey, C. R., Puri, M., 2013. Managerial attitudes and corporate actions. Journal of Financial Economics 109 (1), 103–121.

Grinblatt, M., Keloharju, M., 2001. How distance, language, and culture influence stockholdings and trades. Journal of Finance 56 (3), 1053–1073.

Guiso, L., Sapienza, P., Zingales, L., 2006. Does culture affect economic outcomes? Journal of Economic Perspectives 20 (2), 23–48.

Guiso, L., Sapienza, P., Zingales, L., 2008. Trusting the stock market. the Journal of Finance 63 (6), 2557–2600.

Guiso, L., Sapienza, P., Zingales, L., 2015a. Corporate culture, societal culture, and institutions. American Economic Review 105 (5), 336–39.

Guiso, L., Sapienza, P., Zingales, L., 2015b. The value of corporate culture. Journal of Financial Economics 117 (1), 60–76.

Hammarström, H., Forkel, R., Haspelmath, M., Bank, S., 2016. Glottolog 2.7. Jena: Max Planck Institute for the Science of Human History.

Hartley, C. A., Phelps, E. A., 2012. Anxiety and decision-making. Biological Psychiatry 72 (2), 113–118, recent Advances Using Neuroeconomics to Investigate Psychopathology.

Hermalin, B. E., 1998. Toward an economic theory of leadership: Leading by example. American Economic Review 88 (5), 1188–1206.

Hirschey, M., Weygandt, J. J., 1985. Amortization policy for advertising and research and development expenditures. Journal of Accounting Research, 326–335.

Hirshleifer, D., Low, A., Teoh, S. H., 2012. Are overconfident ceos better innovators? The Journal of Finance 67 (4), 1457–1498.

Hofstede, G., 1980. Culture's Consequences: International Differences in Work-Related Values. Beverly Hills, CA: Sage.

Hofstede, G., 1991. Cultures and Organizations: Software of the Mind. London, UK: McGraw-Hill.

Hofstede, G., 2001. Culture's Consequences: Comparing Values, Behaviors, Institutions and Organizations across Nations. Thousand Oaks, CA: Sage.

Hofstede, G., Hofstede, G. J., Minkov, M., 2010. Cultures and Organizations: Software of the Mind. USA: McGraw-Hill.

Hofstede, G., McCrae, R. R., 2004. Personality and culture revisited: Linking traits and dimensions of culture. Cross-Cultural Research 38 (1), 52–88.

Ilut, C. L., Schneider, M., August 2014. Ambiguous business cycles. American Economic Review 104 (8), 2368–99.

Izhakian, Y., 2012. Ambiguity measurement. Working paper, New York University.

Jordan, P., 2005. Grogliederung europas nach kulturrumlichen kriterien. Europa Regional 13 (4).

Karolyi, G. A., 2015. The gravity of culture for finance. Working Paper, Cornell University.

Kerr, W. R., Lincoln, W. F., 2010. The supply side of innovation: H-1b visa reforms and us ethnic invention. Journal of Labor Economics 28 (3), 473–508.

Kim, E. H., Lu, Y., 2011. Ceo ownership, external governance, and risk-taking. Journal of Financial Economics 102 (2), 272–292.

Knight, F. H., 1921. Risk, Uncertainty and Profit. Boston: Houghton Mifflin.

Knyazeva, A., Knyazeva, D., Masulis, R. W., 2013. The supply of corporate directors and board independence. Review of Financial Studies 26 (6), 1561–1605.

KPMG, 2009. Never again? Risk management in banking beyond the credit crisis.

Kreps, D. M., 1990. Corporate culture and economic theory. In: Alt, J. E., Shepsle, K. A. (Eds.), Perspectives on Positive Political Economy. Cambridge University Press, Cambridge, England, pp. 90–143.

Leary, M. T., Roberts, M. R., 2014. Do peer firms affect corporate financial policy? Journal of Finance 69 (1), 139–178.

Lee, S., 2015. Knightian uncertainty and capital structure: Theory and evidence. Working Paper, George Mason University.

Lemmon, M. L., Roberts, M. R., Zender, J. F., 2008. Back to the Beginning: Persistence and the Cross-Section of Corporate Capital Structure. Journal of Finance 63 (4), 1575–1608.

LeRoy, S. F., Singell, L. D., 1987. Knight on risk and uncertainty. Journal of Political Economy 95 (2), 394–406.

Lev, B., Sougiannis, T., 1996. The capitalization, amortization, and value-relevance of R&D. Journal of Accounting and Economics 21 (1), 107–138.

Liu, X., 2015. Corruption culture and corporate misconduct. Journal of Financial Economics forthcoming.

MacKay, P., Phillips, G. M., 2005. How does industry affect firm financial structure? Review of Financial Studies 18 (4), 1433–1466.

Malerba, F., Orsenigo, L., Peretto, P., 10 1997. Persistence of innovative activities, sectoral patterns of innovation and international technological specialization. International Journal of Industrial Organization 15 (6), 801–826.

Malmendier, U., Tate, G., Yan, J., 2011. Overconfidence and early-life experiences: The effect of managerial traits on corporate financial policies. Journal of Finance 66 (5), 1687–1733.

Maner, J. K., Richey, J. A., Cromer, K., Mallott, M., Lejuez, C. W., Joiner, T. E., Schmidt, N. B., 2007. Dispositional anxiety and risk-avoidant decision-making. Personality and Individual Differences 42 (4), 665–675.

O'Reilly, C. A., 1989. Corporations, cultures, and commitment: Motivation and social control in organizations. California Management Review 31 (4), 9–25.

Pan, Y., Siegel, S., Wang, T. Y., 2014. The cultural origin of preferences: CEO cultural heritage and corporate investment. Working Paper, University of Utah.

Paulus, M. P., Rogalsky, C., Simmons, A., Feinstein, J. S., Stein, M. B., 2003. Increased activation in the right insula during risk-taking decision making is related to harm avoidance and neuroticism. NeuroImage 19 (4), 1439 – 1448.

Petersen, M. A., 2009. Estimating standard errors in finance panel data sets: Comparing approaches. Review of Financial Studies 22 (1), 435–480.

Popadak, J., 2014. A corporate culture channel: How increased shareholder governance reduces firm value. Working Paper, Duke University.

Rieger, M. O., Wang, M., Hens, T., 2014. Risk preferences around the world. Management Science 61 (3), 637–648.

Schein, E. H., 1985. Organizational Culture and Leadership. San Francisco,CA: Jossey-Bass.

Shane, S., 1993. Cultural influences on national rates of innovation. Journal of Business Venturing 8 (1), 59–73.

Shivdasani, A., Yermack, D., 1999. CEO involvement in the selection of new board members: An empirical analysis. Journal of Finance 54 (5), 1829–1853.

Sutton, J., 2004. Flexibility, profitability and survival in an (objective) model of knightian uncertainty. Working Paper, London School of Economics.

Syverson, C., 2011. What determines productivity? Journal of Economic Literature 49 (2), 326–65.

Thompson, S. B., 2011. Simple formulas for standard errors that cluster by both firm and time. Journal of Financial Economics 99 (1), 1–10.

Tran, L., 2013. Compassionate Vietnamese American CEOs. USA: Happy About.

van den Steen, E., 2005. Organizational beliefs and managerial vision. Journal of Law, Economics, and Organization 21 (1), 256–83.

van den Steen, E., 2010. On the origin of shared beliefs (and corporate culture). RAND Journal of Economics 41 (4), 617648.

Welch, I., 2004. Capital structure and stock returns. Journal of Political Economy 112 (1), 106–132.

Yonker, S. E., 2015. Geography and the market for CEOs. Management Science, Forthcoming.

Table 1: Summary Statistics

Panel A: Uncertainty Avoidance Index (UAI)

This table reports summary statistics for variables related to corporate leader's culturally transmitted risk preferences, by firm, or firm-CEO pair, or firm-year. Definitions of all variables are provided in Appendix B.

Variables by Firm-CEO	Obs.	Mean	Std. Dev.
UAI (CEO)	9,698	0.467	0.160
Variables by Firm-Year			
UAI (Executives)	36,880	0.448	0.097
UAI (Outside Directors)	36,880	0.453	0.090
UAI (Common)	36,880	0.467	0.160
Variables by Firm			
UAI (Founders)	3,309	0.461	0.146

Panel B: Outcome Variables

This table reports summary statistics for all outcome variables. The unit of observation for each variables is also reported. Definitions of all variables are provided in Appendix B.

Selection	Unit	Obs.	Mean	Std. Dev.
|UAI (CEO) - UAI (Outside Dir.)|	Firm-Year	36,673	13.805	10.083
|UAI (CEO) - UAI (Exec.)|	Firm-Year	36,673	14.131	10.655
|UAI (CEO) - UAI (Common)|	Firm-Year	36,673	10.486	8.250
Corporate Policies and Outcomes				
Acquisition (Indicator)	Firm-Year	36,112	0.172	0.377
Acquisition Rate	Firm-Year	36,112	2.411	10.112
R&D Rate	Firm-Year	17,955	0.467	2.470
Cash Rate	Firm-Year	36,112	0.163	0.196
Leverage	Firm-Year	36,112	0.331	0.262
Cash Flow Volatility	Firm-Year	36,112	0.074	0.504
Incentives				
Vega	Firm-Year	18,706	0.143	0.232

Panel C: Control Variables

This table reports summary statistics for control variables at the firm-CEO or firm-year levels. Definitions of all variables are provided in Appendix B.

Variables by Firm-CEO	Obs.	Mean	Std. Dev.
CEO Education	9,698	0.986	0.974
Missing CEO Edu. (Indicator)	9,698	0.431	0.495
Missing CEO Age (Indicator)	9,698	0.198	0.399
Female CEO (Indicator)	9,698	0.026	0.159
Variables by Firm-CEO at Turnover			
CEO Age (1st year as CEO in firm)	3,651	46.405	17.648
EthinicityMatch (Director) (Indicator)	3,651	0.271	0.444
EthinicityMatch (Exec) (Indicator)	3,651	0.250	0.433
Fraction of Match (Director)	3,651	0.218	0.243
Fraction of Match (Exec)	3,651	0.276	0.302
Insider CEO (Indicator)	1,924	0.758	0.428
Variables by Firm-Year			
Log(MB)	36,112	0.739	0.814
ROA (%)	36,112	9.425	19.250
Log(Sales)	36,112	6.167	2.205
CEO Tenure	33,673	6.838	7.049

Table 2: Commonality of Risk Preferences of CEOs, Executive Teams, and Outside Directors

Panel A: Actual Combinations of CEOs, Executive Team, and Outside Directors

We conduct a principle component analysis to examine the commonality of risk attitudes among corporate leaders inside a firm. Panel A reports the fraction of the total variation in UAI (CEO), UAI (Executives) and UAI (Outside Directors) that is explained by the first, second, and third principal components in the actual data.

	Obs.	% of toal variation explained
UAI (Common): First Principal Component	36,880	43.02%
Second Principal Component	36,880	28.83%
Third Principal Component	36,880	28.15%

Panel B: Random Combinations of CEO, Executive Team, and Outside Directors

This panel reports the fraction of the total variation in randomly matched UAI (CEO), UAI (Executives) and UAI (Outside Directors) that is explained by the first principal component. In each row, we report the mean and the [5%, 95%] confidence interval for the fraction explained from 100 iterations of randomly matching CEOs, executive teams, and outside directors. In this exercise, we take the executives or outside directors in a firm-year as a group. In row (1), CEOs, executive teams, and outside directors are randomly drawn from the same year, in row (2) from the same year and firm headquarter state, in row (3) from the same year and industry (2, 3, or 4-digit SIC), and in row (4), from the same year, state and (2-digit SIC) industry. We drop cases in which the randomly drawn combination of CEO, executive team, and outside directors coincides with an actual combination.

	First Principal Component Mean [5%, 95%]
(1) Draw from the same year	33.63% [33.45%, 33.84%]
(2) Draw from the same year-state	35.63% [35.29%, 35.93%]
(3a) Draw from the same year-(2-digit SIC) industry	34.12% [33.83%, 34.47%]
(3b) Draw from the same year-(3-digit SIC) industry	34.94% [34.22%, 34.80%]
(3c) Draw from the same year-(4-digit SIC) industry	34.67% [33.30%, 35.12%]
(4) Draw from the same year-(2-digit SIC) industry-state	36.03% [35.46%, 36.54%]

Panel C: Subsample Analysis

This panel reports the fraction of the total variation in UAI (CEO), UAI (Executives) and UAI (Outside Directors) explained by the first principal component. In the first row, we use a subsample of firm-years for which the number of origins associated with the CEO's last name, the average number of origins associated with outside directors, and the average number of origins associated with the executives are all in the bottom 50 percentile of their sample distributions. In the second row, we use a subsample of firm-years for which the standard deviation of UAI values across all possible origins associated with the CEO's last name, the average dispersion associated with outside directors, and the average dispersion associated with the executives are all in the bottom 50 percentile of their sample distributions.

Sample	Obs.	% explained by the first principal component
# of Origins in bottom 50% for each group	5,061	45.08%
Std. Dev. of UAI in bottom 50% for each group	5,639	43.35%

Table 3: Persistence in Corporate Risk Culture across Generations of Leadership

Column (1) reports the auto-correlations between UAI (Common) of a generation of leadership (measured as the average UAI (Common) over a CEO's tenure) with the UAI (Common) of previous generations, in the same firm. LG1.UAI (Common) is the UAI (Common) of one generation prior, and so on. Column (2) reports the corresponding auto-correlations when the new CEO is an outsider. The correlation between current UAI (Common) and LG4.UAI (Common) is missing due to an insufficient number of observations.

		(1)		(2)
	Obs. in (1)	Autocorrelation of UAI (Common) across generations of leadership	Obs. in (2)	Autocorrelation of UAI (Common) when the new CEO is an outsider
LG1.UAI (Common)	3621	0.632***	883	0.560***
LG2.UAI (Common)	1332	0.421***	358	0.393***
LG3.UAI (Common)	423	0.310***	119	0.278***
LG4.UAI (Common)	108	0.301**		

Table 4: CEO Selection

This table examines the determinants of incoming CEO's UAI. Pre-turnover UAI (Common) is the first principle component in UAI (Outside Directors), UAI (Executives), and UAI (CEO) in the year before turnover. Similarly, "Pre-turnover UAI (...)" is the UAI of corresponding corporate leader(s) in the year before turnover. EthnicityMatch (Directors) (Executives) is an indicator variable that equals one if the incoming CEO's dominant origin is the same as the most common dominant origin among the pre-turnover outside directors (or the top four non-CEO executives). LanguageMatch and GeographyMatch variables are similarly defined. "Insider CEO" is an indicator variable equals one if a CEO is promoted to the position from within the firm. Control variables (omitted for brevity) include CEO Age, Missing Age indicator, CEO Education, Missing Education indicator, Female, ROA, log(MB), log(Sales), and the ethnicity/language/geography-match as well as state and industry indicators. Standard errors are clustered at the firm level. ***, **, * denote significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
				UAI (CEO)		
Pre-turnover UAI (common)	0.358***					
	(0.020)					
Pre-turnover UAI (Outside Directors)		0.273***	0.312***	0.179***	0.166***	0.116*
		(0.035)	(0.063)	(0.064)	(0.064)	(0.064)
Pre-turnover UAI (Executives)		0.626***	0.353***	0.249***	0.239***	0.162**
		(0.035)	(0.063)	(0.062)	(0.062)	(0.065)
Pre-turnover UAI (CEO)		0.018	0.018	0.013	0.015	0.004
		(0.021)	(0.021)	(0.020)	(0.020)	(0.019)
Pre-turnover UAI(Outside Directors)			-0.066	-0.032	-0.031	-0.032
x Insider New CEO			(0.072)	(0.070)	(0.070)	(0.066)
Pre-turnover UAI(Executives)			0.406***	0.326***	0.325***	0.335***
x Insider New CEO			(0.075)	(0.071)	(0.071)	(0.069)
Pre-turnover UAI(Outside Directors)				0.296***		
x EthinicityMatch(Directors)				(0.073)		
Pre-turnover UAI(Executives)				0.351***		
x EthinicityMatch(Exec.)				(0.064)		
Pre-turnover UAI(Outside Directors)					0.363***	
x LanguageMatch(Directors)					(0.073)	
Pre-turnover UAI(Executives)					0.388***	
x LanguageMatch(Exec.)					(0.063)	
Pre-turnover UAI(Outside Directors)						0.290***
x GeographyMatch(Directors)						(0.067)
Pre-turnover UAI(Executives)						0.319***
x GeographyMatch(Exec.)						(0.068)
Insider New CEO			-0.155***	-0.130***	-0.131***	-0.134***
			(0.043)	(0.041)	(0.041)	(0.040)
Match Indicators				x	x	x
Control Variables	x	x	x	x	x	x
Industry and State FE	x	x	x	x	x	x
Obs.	3,571	3,571	3,571	3,571	3,571	3,571
Adj. R^2	0.129	0.179	0.190	0.271	0.269	0.336

Table 5: Selection of Executives and Outside Directors

This table reports changes in the divergence between the UAI of the outside directors (or of the executive team) and that of the CEO over CEO tenure. In Column (1), the dependent variable is the absolute difference between the UAI of the outside directors and the UAI of the CEO. In Column (2), the dependent variable is the absolute difference between the UAI of the executive team and the UAI of the CEO. In Columns (3) and (4), the dependent variable is the absolute difference between the UAI of the CEO and the corporate risk culture (measured by UAI (common)). Definitions of all variables are in Appendix B. Standard errors are clustered at the firm level. ***, **, * denote significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
	|UAI (CEO) - UAI (Outside Dir.)|	|UAI (CEO) - UAI (Exec.)|	|UAI (CEO) - UAI (Common)|	
CEO Tenure	-0.050***	-0.033*	-0.025*	-0.052*
	(0.018)	(0.018)	(0.013)	(0.029)
State, Industry, and Year FE	x	x	x	
Firm-CEO and Year FE				x
Obs.	33,673	33,673	33,673	33,673
Adj. R^2	0.045	0.029	0.028	0.620

Table 6: The Role of Founders

Panel A: Impact of Founders' UAI on Future Leadership

This panel reports the impact of a firm's founders' UAI on the UAI of future leadership (CEO, executive team, outside directors) of the firm, when the founders are not on the leadership team of the firms they founded (i.e., not CEOs in column (1), not top executives in column (2), not directors of the company in column (3), not taking any of the leadership roles in columns (4) to (6)). The unit of observation is firm-year, as top executives and directors change over time, except for column (1) which is at the firm-CEO level. Definitions of all variables are provided in Appendix B. Standard errors are clustered at the firm level. ***, **, * denote significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	UAI (CEO)	UAI (Executives)	UAI (Outsider Directors)	UAI (Common)		
	[Founders not CEO]	[Founders not Exec.]	[Founders not Director]	[Founder not on Leadership]		
UAI (Founder)	0.135***	0.072***	0.083***	0.192***	0.149***	0.140***
	(0.027)	(0.012)	(0.012)	(0.025)	(0.024)	(0.023)
Log(MB)					-0.006*	-0.003
					(0.003)	(0.003)
ROA					-0.000	-0.000*
					(0.000)	(0.000)
Log(Sales)					-0.004**	-0.003*
					(0.002)	(0.002)
Year and State FF					x	
Year, State, Ind FE						x
Obs.	2,253	18,117	18,034	13,617	13,617	13,617
Adj. R^2	0.013	0.011	0.018	0.029	0.111	0.153

Panel B: Persistent Impact of Founders' Risk Preferences on Firm Risk Culture

We select three subsamples based on firm ages. The first subsample consists of firms 11-20 years after IPO, the second subsample 21-30 years after IPO, and the third 31-40 years after IPO. For each subsample, we keep only the firm-years with founder(s) no longer on the leadership team, and group firms into quartiles based on UAI (Founders). For each subsample, we report the average UAI (Founders) and the average UAI (Common) for each quartile, and the difference between the averages of the top and bottom quartiles. All the differences ((4)-(1)) reported in this panel are significant at 1% confidence level.

	11-20 Years after IPO		21-30 Years after IPO		31-40 Years after IPO	
Quartiles	UAI (Founders)	UAI (Common)	UAI (Founders)	UAI (Common)	UAI (Founders)	UAI (Common)
1	0.319	0.441	0.319	0.419	0.320	0.407
2	0.356	0.455	0.346	0.445	0.338	0.415
3	0.507	0.491	0.477	0.497	0.422	0.463
4	0.664	0.511	0.664	0.514	0.627	0.478
(4)-(1)	0.345	0.071	0.344	0.096	0.307	0.071

Table 7: Corporate Risk Culture and Corporate Investment Policies

This table reports the relationship between measures of corporate risk culture and investment. Definitions of the variables are provided in Appendix B. Standard errors are clustered at the firm level. ***, **, * denote significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
		Acquisition			R&D Rate	
UAI (Common)	-0.117***	-0.118***	-0.106***	-0.371**	-0.402***	-0.421***
	(0.017)	(0.017)	(0.017)	(0.146)	(0.152)	(0.157)
Log(MB)	0.031***	0.029***	0.023***	0.327***	0.328***	0.277***
	(0.003)	(0.003)	(0.003)	(0.033)	(0.034)	(0.037)
ROA	0.000***	0.000***	0.000*	-0.039***	-0.038***	-0.033***
	(0.000)	(0.000)	(0.000)	(0.003)	(0.003)	(0.003)
Log(Sales)	0.018***	0.018***	0.025***	-0.238***	-0.256***	-0.298***
	(0.002)	(0.002)	(0.002)	(0.024)	(0.026)	(0.029)
Year FE	x	x		x	x	
State FE		x	x		x	x
Industry-year FE			x			x
Obs.	36,112	36,112	36,112	17,955	17,955	17,955
Adj. R^2	0.034	0.038	0.058	0.296	0.299	0.314

Table 8: Other Cultural Dimensions

This table reports the estimated effect of risk culture on corporate investment, controlling for the effect of other cultural dimensions. In Panel A, we include the first principal components of other Hofstede dimensions (Individualism versus Collectivism (IDV), Power Distance Index (PDI), Masculinity versus Femininity (MAS)). In Panel B, we include the first principal components of *Trust* and *Thrift*. Definitions of the variables are provided in Appendix B. All regressions include a constant term. ***, **, * denote significance at 1%, 5%, and 10% levels, respectively.

Panel A: Other Hofstede Dimensions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Acquisition				R&D Rate			
UAI (Common)	-0.078***	-0.090***	-0.103***	-0.074***	-0.356*	-0.384**	-0.421**	-0.351*
	(0.022)	(0.019)	(0.018)	(0.022)	(0.207)	(0.176)	(0.163)	(0.211)
IDV (Common)	0.047**			0.029	0.111			0.084
	(0.022)			(0.025)	(0.269)			(0.298)
PDI (Common)		-0.039**		-0.029		-0.087		-0.054
		(0.017)		(0.020)		(0.181)		(0.180)
MAS (Common)			0.014	0.011			0.001	-0.012
			(0.018)	(0.018)			(0.153)	(0.167)
Log(MB)	0.023***	0.023***	0.023***	0.023***	0.277***	0.277***	0.277***	0.277***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.037)	(0.037)	(0.037)	(0.037)
ROA	0.000*	0.000*	0.000*	0.000*	-0.033***	-0.033***	-0.033***	-0.033***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.003)	(0.003)	(0.003)	(0.003)
Log(Sales)	0.025***	0.025***	0.025***	0.025***	-0.299***	-0.298***	-0.298***	-0.298***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.029)	(0.029)	(0.029)	(0.029)
Inddustry-year FE and State FE	x	x	x	x	x	x	x	x
Obs.	36,112	36,112	36,112	36,112	17,955	17,955	17,955	17,955
Adj. R^2	0.058	0.058	0.058	0.058	0.314	0.314	0.314	0.314

Panel B: Trust and Thrift

	(1)	(2)	(3)	(4)	(5)	(6)
		Acquisition			R&D Rate	
UAI (Common)	-0.102***	-0.116***	-0.113***	-0.433**	-0.390**	-0.398**
	(0.018)	(0.018)	(0.019)	(0.170)	(0.162)	(0.171)
Thrift (Common)	-0.013		-0.009	0.041		0.026
	(0.017)		(0.017)	(0.243)		(0.239)
Trust(Common)		-0.042**	-0.041**		0.115	0.111
		(0.018)	(0.018)		(0.181)	(0.174)
Log(MB)	0.023***	0.023***	0.023***	0.277***	0.276***	0.276***
	(0.003)	(0.003)	(0.003)	(0.037)	(0.037)	(0.037)
ROA	0.000*	0.000*	0.000*	-0.033***	-0.033***	-0.033***
	(0.000)	(0.000)	(0.000)	(0.003)	(0.003)	(0.003)
Log(Sales)	0.025***	0.025***	0.025***	-0.298***	-0.298***	-0.298***
	(0.002)	(0.002)	(0.002)	(0.029)	(0.029)	(0.029)
Industry-Year FE and State FE	x	x	x	x	x	x
Obs.	36,112	36,112	36,112	17,955	17,955	17,955
Adj. R^2	0.058	0.058	0.058	0.314	0.314	0.314

Table 9: Corporate Founders and Corporate Investment Policies

Panel A reports the summary statistics for investment policies and control variables used in this table. We take the average values for each firm in our sample period for all the variables. Panel B reports the effect of founders' UAI on corporate investment policies, controlling for log(MB), ROA, and log(sales). *On Leadership* in an indicator variable that equals to one if at least one of the company's founders is in the firm's leadership team (as the CEO, an executive, or a director) in a firm-year. In Columns (1), (2), (3), (5), (6), (7), we use a pure cross-section of 3,309 firms with data on founders' UAI. In Columns (4) and (8), for firms that the founders are not always on or off the leaderhsip, we calculate the average values separately for both periods. As a result, there are more observations in these two columns. Definitions of other variables are provided in Appendix B. All regressions include a constant term. ***, **, * denote significance at 1%, 5%, and 10% levels, respectively.

Panel A: Summary Statistics

Variable	Obs.	Mean	Std. Dev.
Acquisition	3,309	0.165	0.222
R&D	2,083	0.766	2.859
Log(MB)	3,309	0.818	0.706
ROA	3,309	7.542	20.353
Log(Sales)	3,309	5.781	2.096

Panel B: Founder's UAI and Corporate Investment

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Acquisition				R&D Rate			
UAI (Founders)	-0.077***	-0.077***	-0.057**	0.007	-0.575*	-0.596*	-0.789**	-0.757**
	(0.026)	(0.027)	(0.027)	(0.034)	(0.325)	(0.347)	(0.353)	(0.343)
UAI (Founders) x On Leadership				-0.154***				0.106
				(0.051)				(0.625)
On Leadership				0.115***				0.012
				(0.026)				(0.321)
Log(MB)	0.017***	0.015***	0.005	0.006	0.384***	0.401***	0.282***	0.246***
	(0.005)	(0.005)	(0.006)	(0.005)	(0.075)	(0.078)	(0.089)	(0.080)
ROA	0.000**	0.000**	0.000	0.000	-0.061***	-0.061***	-0.051***	-0.047***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.006)	(0.006)	(0.006)	(0.005)
Log(Sales)	0.020***	0.021***	0.029***	0.031***	-0.214***	-0.234***	-0.284***	-0.303***
	(0.002)	(0.002)	(0.003)	(0.003)	(0.047)	(0.049)	(0.056)	(0.051)
State FE		x	x	x		x	x	x
Industry FE			x	x			x	x
Obs.	3,309	3,309	3,309	3,909	2,083	2,083	2,083	2,468
Adj. R^2	0.053	0.057	0.125	0.114	0.417	0.412	0.446	0.429

Table 10: Changes in Corporate Risk Culture

In this table, we consider a sample of firms with CEO turnovers to gauge the impact of the change in corporate risk culture on corporate investments. Definitions of the variables are provided in Appendix B. We control for year fixed effects, 2-digit SIC industry fixed effects, and firm headquarter state fixed effects. Standard errors are clustered at the firm level. ***, **, * denote significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
	Acquisition		R&D	
UAI (Common)	-0.113***	-0.142***	-0.476***	-0.378**
	(0.023)	(0.033)	(0.180)	(0.176)
Log(MB)	0.024***	0.035***	0.240***	-0.024
	(0.005)	(0.006)	(0.045)	(0.051)
ROA	0.000*	0.001***	-0.027***	-0.000
	(0.000)	(0.000)	(0.003)	(0.003)
Log(Sales)	0.023***	-0.030***	-0.255***	-1.396***
	(0.002)	(0.008)	(0.036)	(0.187)
Industry-year FE and State FE	x		x	
Firm and Year FE		x		x
Obs.	23,481	23,481	12,378	12,378
Adj. R^2	0.054	0.181	0.244	0.750

Table 11: Corporate Risk Culture and Other Corporate Outcomes

This table reports the effect of corporate risk culture and founders' UAI on corporate financial policies. In Panel A, we examine the effect of UAI (Common) on cash rate and leverage. In Panel B, we examine the effect of UAI (Common) on acquisition rate and cash flow volatility. Definitions of the variables are provided in Appendix B. All regressions include a constant term. ***, **, * denote significance at 1%, 5%, and 10% levels, respectively.

Panel A: Corporate Risk Culture and Financial Policies

	(1)	(2)	(3)	(4)	(5)	(6)
	Cash Rate			Leverage		
UAI (Common)	0.091***	0.063***	0.023**	-0.095***	-0.074***	-0.003
	(0.012)	(0.012)	(0.010)	(0.018)	(0.019)	(0.014)
Log(MB)	0.073***	0.063***	0.032***	-0.034***	-0.025***	0.013***
	(0.002)	(0.002)	(0.002)	(0.004)	(0.004)	(0.003)
ROA	-0.002***	-0.001***	-0.001***	-0.002***	-0.002***	-0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log(Sales)	-0.026***	-0.024***	-0.022***	0.038***	0.036***	0.036***
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)
Year FE	x	x		x	x	
State FE		x	x		x	x
Industry-Year FE			x			x
Obs.	36,112	36,112	36,112	36,112	36,112	36,112
Adj. R^2	0.253	0.326	0.532	0.100	0.143	0.447

Panel B: Other Outcome Variables

	(1)	(2)
	Acquisition Rate	Cash Flow Volatility
UAI (Common)	-1.693***	-0.043*
	(0.413)	(0.024)
Log(MB)	0.756***	0.036***
	(0.092)	(0.007)
ROA	0.038***	-0.003***
	(0.006)	(0.001)
Log(Sales)	-0.448***	-0.012***
	(0.037)	(0.002)
Industry-Year FE and State FE	x	x
Obs.	36,112	30,215
Adj. R^2	0.035	0.028

Table 12: Divergence in Risk Preferences and Compensation Incentives

This table reports the relationship between the CEO's compensation vega and the difference in CEO's UAI relative to outside directors' UAI or executive team's UAI. The analysis is at the firm-year level. Firm-level control variables (Log(MB), ROA, and Log(Sales)) are lagged, and we also control for year fixed effects. Industry fixed effects and state fixed effects are included in Column (1) and firm fixed effects are included in Column (2). *UAI (CEO)- UAI (Outside Directors)* is the difference between CEO's UAI and outside directors' UAI. *UAI (CEO) - UAI (Executives)* is the difference between CEO's UAI and executive team's UAI. Definitions of all variables are provided in Appendix B. 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)
	Vega	
UAI (CEO) - UAI (Outsider Directors)	0.044*	0.065**
	(0.025)	(0.032)
UAI (CEO) - UAI (Executives)	-0.015	-0.022
	(0.023)	(0.030)
CEO Age	-0.001**	0.003***
	(0.000)	(0.001)
Missing Age	-0.052***	0.165***
	(0.019)	(0.035)
CEO Education	0.018***	0.007
	(0.006)	(0.011)
Missing Edu.	0.004	0.011
	(0.010)	(0.022)
Female	-0.005	-0.000
	(0.014)	(0.020)
Log(MB)	0.039***	0.013***
	(0.004)	(0.004)
ROA	-0.001***	0.000
	(0.000)	(0.000)
Log(Sales)	0.062***	0.066***
	(0.002)	(0.008)
State and Industry FE	x	
Year and Firm FE		x
Obs.	4,348	18,706
Adj. R^2	0.357	0.642

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

ancestry

Luke Gates
in the New York, Passenger Lists, 1820-1957

Name:	Luke Gates
Arrival Date:	9 Jan 1865
Birth Date:	abt 1842
Age:	23
Gender:	Male
Ethnicity/ Nationality:	English
Place of Origin:	England
Port of Departure:	Liverpool, England
Destination:	New York
Port of Arrival:	New York, New York
Ship Name:	Escort

Appendix B: Variable Definitions

UAI (CEO)	Uncertainty Avoidance Index for the CEO, from Hofstede. See the data section for detailed explanation.
UAI (Executives)	The average value of UAI of the top four most highly paid non-CEO executives in a firm-year.
UAI (Outside Directors)	The average value of UAI of the non-executive directors in a firm-year.
UAI (Common)	The first principal component of UAI, UAI (Executives), and UAI (Outside Directors) in a firm-year, normalized to have the same mean and standard deviation as UAI (CEO).
LG#.UAI (Common)	Lag of UAI (Common) by generation. LG1.UAI (Common) is the UAI (Common) of the last generation (measured at the first year when the last CEO took office), and so on. A generation of leadership consists of the managers and directors under a CEO's regime.
IDV (Common)	The first principal component of CEO's Individualism (IDV) from Hofstede, IDV (Executives), and IDV (Outside Directors) in a firm-year, normalized to have the same mean and standard deviation as UAI (CEO).
PDI (Common)	The first principal component of CEO's Power Distance Index (PDI) from Hofstede, PDI (Executives), and PDI (Outside Directors) in a firm-year, normalized to have the same mean and standard deviation as UAI (CEO).
MAS (Common)	The first principal component of CEO's Masculinity (MAS) from Hofstede, MAS (Executives), and MAS (Outside Directors) in a firm-year, normalized to have the same mean and standard deviation as UAI (CEO).
Thrift (Common)	The first principal component of CEO's Thrift, constructed based on origin level attitudes toward thrift from the World Value Survey and European Value Survey, Thrift (Executives), and Thrift (Outside Directors) in a firm-year, normalized to have the same mean and standard deviation as UAI (CEO).
Trust (Common)	The first principal component of CEO's Trust, constructed based on origin level trust from the World Value Survey and European Value Survey, Trust (Executives), and Trust (Outside Directors) in a firm-year, normalized to have the same mean and standard deviation as UAI (CEO).

|UAI (CEO) - UAI (Exec.)|	The absolute difference between the CEO's UAI and the executive team's UAI in a firm-year
|UAI (CEO) - UAI (Outside Dir.)|	The absolute difference between the CEO's UAI and the non-executive directors' UAI in a firm-year.
|UAI (CEO) - UAI (Common)|	The absolute difference between the CEO's UAI and the first principal component in UAI among three parties (CEO, executive team, outside directors) in a firm-year.
UAI (Founders)	The UAI of the founder(s), averaged if there are multiple founders.
Pre-turnover UAI (Executives)	The average value of UAI of the top four most highly paid non-CEO executives in the year before CEO turnover.
Pre-turnover UAI (Outside Directors)	The average value of UAI of the non-executive directors in the year before CEO turnover.
Pre-turnover UAI (CEO)	UAI of the departing CEO
EthnicityMatch (Director)	An indicator variable that equals one if a CEO's (dominant) origin is the same as the most common (dominant) origin among the non-executive directors, and zero otherwise.
EthnicityMatch (Exec.)	An indicator variable that equals one if a CEO's (dominant) origin is the same as the most common (dominant) origin among the top four non-CEO executives, and zero otherwise.
LanguageMatch (Director)	An indicator variable that equals one if the dominant origin of a CEO and the most common (dominant) origin among the non-executive directors belong to the same linguistic cluster, and zero otherwise. For details of the linguistic clusters see Hammarström et al. (2016).
LanguageMatch (Exec.)	An indicator variable that equals one if the dominant origin of a CEO and the most common (dominant) origin among the top four non-CEO executives belong to the same linguistic cluster, and zero otherwise.
GeographyMatch (Director)	An indicator variable that equals one if the dominant origin of a CEO and the most common (dominant) origin among the non-executive directors belong to the same geographic region within Europe, and zero otherwise. For details of the European regions see Jordan (2005).
GeographyMatch (Exec.)	An indicator variable that equals one if the dominant origin of a CEO and the most common (dominant) origin among the top four non-CEO executives belong to the same geographic cluster, 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 3 if the CEO holds a doctorate degree (including post-doctoral training), and equal to 2 if the highest degree is a Master's degree, and equal to 1 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.
CEO Tenure	The number of years since the CEO takes office. The value equals zero for the year in which the turnover occurs. This measure varies over time by firm-CEO.
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.
R&D Rate	Annual R&D expenses scaled by the firm's sales at the beginning of the year.
Cash Rate	Cash holdings scaled by the firm's book assets.
Leverage	Total debt scaled by the firm's book assets.
Cash Flow Volatility	Standard deviation of quarterly cash flows from operations scaled by the beginning-of-quarter total book assets over the next sixteen fiscal quarters (with the first fiscal quarter of the current fiscal year being the first of the sixteen quarters)
Log(MB)	The logarithm of the firm's ratio of the market value of equity to the book value of equity.
ROA	Earnings before interest, tax, and depreciation scaled by the firm's book assets at the beginning of the year.
Log(Sales)	The logarithm of the firm's net sales.
Vega	The dollar change (in millions) in CEO's wealth associated with a one-percentage-point change in the standard deviation of the firm's returns.
# of Origins	The number of non-USA origins associated with a last name.
Dispersion in UAI	The standard deviation of UAI values associated with different origins of a last name.
On Leadership	An indicator variable that equals to one if at least ond of the founders is in the company leadership (CEO, executive, or director) in a firm-year; zero otherwise.

Appendix C: Selection of Outsider CEOs

This table repeats the analysis in Table 4, for the sample of outsider CEO successions.

	(1)	(2)	(3)	(4)	(5)
			UAI (CEO)		
Pre-turnover UAI (common)	0.258***				
	(0.033)				
Pre-turnover UAI (Outside Directors)		0.347***	0.198***	0.188***	0.165**
		(0.060)	(0.068)	(0.069)	(0.077)
Pre-turnover UAI (Executives)		0.380***	0.243***	0.226***	0.150*
		(0.061)	(0.068)	(0.069)	(0.077)
Pre-turnover UAI (CEO)		-0.026	-0.031	-0.026	-0.034
		(0.036)	(0.034)	(0.034)	(0.031)
Pre-turnover UAI(Outside Directors)			0.259**		
x EthinicityMatch(Directors)			(0.119)		
Pre-turnover UAI(Executives)			0.517***		
x EthinicityMatch(Exec.)			(0.117)		
Pre-turnover UAI(Outside Directors)				0.315***	
x LanguageMatch(Directors)				(0.120)	
Pre-turnover UAI(Executives)				0.568***	
x LanguageMatch(Exec.)				(0.111)	
Pre-turnover UAI(Outside Directors)					0.189*
x GeographyMatch(Directors)					(0.101)
Pre-turnover UAI(Executives)					0.317***
x GeographyMatch(Exec.)					(0.110)
EthinicityMatch(Directors)			-0.213***		
			(0.051)		
EthinicityMatch(Exec.)			-0.256***		
			(0.049)		
LanguageMatch(Directors)				-0.233***	
				(0.052)	
LanguageMatch(Exec.)				-0.280***	
				(0.047)	
GeographyMatch(Directors)					-0.199***
					(0.046)
GeographyMatch(Exec.)					-0.190***
					(0.049)
Insider New CEO	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
CEO Age	-0.014	-0.017	-0.034	-0.037	-0.043
	(0.050)	(0.050)	(0.046)	(0.046)	(0.042)
Missing CEO Age	0.010	0.011	0.010	0.012	0.012
	(0.012)	(0.012)	(0.011)	(0.011)	(0.010)
CEO Education	0.002	0.006	0.019	0.022	0.021
	(0.024)	(0.024)	(0.022)	(0.022)	(0.022)
Missing CEO Edu.	-0.069***	-0.077***	-0.060**	-0.056**	-0.044**
	(0.024)	(0.024)	(0.025)	(0.024)	(0.020)
Female CEO	0.002	0.000	-0.004	-0.003	-0.002
	(0.006)	(0.006)	(0.005)	(0.006)	(0.005)
Log(MB)	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ROA	-0.001	-0.001	-0.002	-0.001	-0.001
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Log(Sales)	0.311***	0.111	0.308***	0.314***	0.395***
	(0.068)	(0.077)	(0.076)	(0.077)	(0.074)
Industry and State FE	x	x	x	x	x
Obs.	1,047	1,047	1,047	1,047	974
Adj. R^2	0.054	0.083	0.197	0.197	0.297

Appendix D: Robustness Checks

Panel A: Impact of Noise and Imprecision in UAI (Founders)

This table reports the impact of noise and imprecision in the measurement of founders' UAI on corporate investment policies. We interact UAI (Founders) with one of the two measurement error proxies: In Columns (2) and (3), we use # of Origins, which is the number of non-USA origins associated with a founder's last name. In Columns (5) and (6), we use Dispersion in UAI, which is the standard deviation of UAI values associated with different origins of a founder's last name. If a firm has more than one founder, we average # of Origins (or Dispersion in UAI) across all founders for this firm. Definitions of all variables are provided in Appendix B. ***, **, * denote significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
		Acquisition			R&D Rate	
UAI (Founder)	-0.059**	-0.130***	-0.103	-0.601**	-0.752**	-1.317**
	(0.030)	(0.045)	(0.068)	(0.257)	(0.376)	(0.598)
UAI (Founder)		0.004***			0.008	
x # of Origins		(0.002)			(0.014)	
# of Origins		-0.001*			-0.003	
		(0.001)			(0.006)	
UAI (Founder)			0.530			3.517
x Dispersion in UAI			(0.389)			(3.119)
Dispersion in UAI			-0.104			-2.144
			(0.181)			(1.522)
Log(MB)	0.023***	0.023***	0.024***	0.362***	0.362***	0.361***
	(0.005)	(0.005)	(0.005)	(0.054)	(0.054)	(0.054)
ROA	0.001**	0.000**	0.001**	-0.041***	-0.041***	-0.041***
	(0.000)	(0.000)	(0.000)	(0.004)	(0.004)	(0.004)
Log(Sales)	0.024***	0.024***	0.024***	-0.296***	-0.296***	-0.296***
	(0.003)	(0.003)	(0.003)	(0.038)	(0.038)	(0.038)
Industry-Year FE, State FE	x	x	x	x	x	x
Obs.	21,316	21,316	21,316	12,474	12,474	12,474
Adj. R^2	0.052	0.054	0.053	0.343	0.343	0.344

Panel B: Clustering Standard Errors (S. E.) by Largest Origin in the Panel Setting

This table compares the effect of founders' UAI on investment policies, without clustering of standard errors (Columns (1), (5)), clustered by firm (Columns (2), (6)), clustered by the largest origin (by frequency of the nationality in the NY passenger lists) associated with a founder's last name (Columns (3), (7)), and double clustering by both the firm and by the largest origin (Columns (4), (8)). We focus on the subsample of firms with only one founder and firms with founders that all have the same largest origins, so we can clearly identify the largest origin for founder(s) at a firm. Definitions of the variables are provided in Appendix B. ***, **, * denote significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Acquisition				R&D Rate			
UAI (Founders)	-0.059***	-0.059*	-0.059**	-0.059**	-0.489***	-0.489**	-0.489***	-0.489***
	(0.022)	(0.034)	(0.029)	(0.028)	(0.154)	(0.246)	(0.163)	(0.156)
Log(MB)	0.008*	0.008	0.008	0.008	0.332***	0.332***	0.332***	0.332***
	(0.004)	(0.006)	(0.005)	(0.005)	(0.045)	(0.063)	(0.051)	(0.049)
ROA	0.001***	0.001***	0.001	0.001	-0.038***	-0.038***	-0.038***	-0.038***
	(0.000)	(0.000)	(0.001)	(0.001)	(0.004)	(0.005)	(0.004)	(0.004)
Log(Sales)	0.026***	0.026***	0.026***	0.026***	-0.187***	-0.187***	-0.187***	-0.187***
	(0.002)	(0.003)	(0.006)	(0.006)	(0.022)	(0.031)	(0.019)	(0.018)
Industry-Year FE, State FE	x	x	x	x	x	x	x	x
Cluster by firm		x		x		x		x
Cluster by founder's largest origin			x	x			x	x
Obs.	15,828	15,828	15,828	15,828	8,872	8,872	8,872	8,872
Adj. R^2	0.047	0.047	0.047	0.047	0.245	0.245	0.245	0.245