Cross Country Cultural Differences, Hedge Fund Contracting, and Risk Taking

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Abstract

We examine the cultural determinants of hedge funds' contractual structure and risk taking behavior in a cross-country setting. Using the Hofstede framework, we find hedge funds domiciled in individualistic cultures structure contracts with more performance driven incentives and take greater risk. In contrast, hedge funds domiciled in cultures with greater aversion to uncertainty structure contracts that are less performance-driven and take less risk. Culture also influences hedge fund risk shifting behavior: when performance is inferior the funds take on more risk in individualistic cultures but not in uncertainty avoiding cultures. Our results are robust to additional tests that use alternate cultural measures and linguistic data as instruments for culture.

1. Introduction

In the asset management industry, two key differentiating characteristics of hedge funds from other investment vehicles are their performance-driven compensation structures and heightened risk-taking incentives. While taking risk is fundamental to hedge funds, a compensation structure that incentivizes and rewards risk taking is equally central to their existence and growth. Both aspects have been subject to extensive investigation although the analyses are limited primarily to the domestic (US) hedge fund industry. In this study, we analyze hedge fund compensation structure and the incentives for risk-taking in a cross-country setting by focusing on cultural variation among nations.

The implications of incentive structure for hedge fund performance are well established (e.g., Goetzmann, Ingersoll, and Ross, 2003; Hodder and Jackwerth, 2007; Agarwal, Daniel, and Naik, 2009; Panageas and Westerfield; 2009). What has received much less attention is how the incentive provisions in hedge fund contracts come about in the first place. By conducting a cross-country analysis we aim to provide a deeper understanding of the cultural genesis of contractual provisions and risk-taking in the hedge fund industry.[1] To our knowledge, there exists no cross-country evidence on the impact of cultural values on the compensation and incentive structure of hedge fund contracts. The hedge fund (HF) industry provides an ideal setting for this investigation not only because of data availability, but also due to the richness of contracts with variation in compensation and incentive schemes.

Much of our understanding of incentive-based managerial compensation is stylized and based on the Anglo-Saxon datasets. A key finding is that firm-level corporate governance is one

[1] A long research tradition involving cross-country analysis has yielded useful insights into several broad and diverse fields such as corporate finance, governance, investments, and venture capital, among others.

of the primary determinants of executive compensation. In a recent study however, Griffin, Guedhami, Kwok, Li, and Shao (2017) point out that Anglo-Saxon business practices such as board independence, financial disclosure, and equity-based compensation are not common across cultures. They also show that country-level culture affects firm-level corporate governance, which in turn is likely to affect the structure of executive compensation.

In recent years, investigation of cultural issues has become increasingly prominent in analysis of both corporate and investment decisions as noted below. The Hofstede framework, commonly used for measuring cultures, has had a profound impact on several business disciplines including international business, management, and business strategy. Two pillars of the Hofstede framework are a society's attitude toward uncertainty avoidance and individualism (versus collectivism). *Uncertainty Avoidance (UAI)* captures the outlook towards uncertainty and a society's attempt to cope with anxiety in uncertain situations. *Individualism (IDV)* refers to the extent society helps in reinforcing the individual achievement as opposed to *collectivism* that emphasizes collective action by individuals. Using these two constructs, Griffin et al. (2017) point out that cultures that emphasize independence and tolerance of uncertainty prefer the Anglo-Saxon approach to business practices. Therefore, we hypothesize that uncertainty-tolerant and individualistic cultures are likely to have HF compensation and incentive structures that resemble those in the Anglo-Saxon nations.

Culture is also likely to determine the attitude toward risk taking in the hedge fund industry. There exists evidence that cultural values are associated with risky corporate decision-making (Li, Griffin, Yue, and Zhao, JCF, 2013). Similarly, religion, which also influences culture, has been found to affect mutual fund and bank risk taking (Shu, Sulaeman, and Yeung, 2011; Adhikari and Agrawal, 2015). Li et al. (2013) show that uncertainty avoidance and

individualism (or collectivism), in particular, capture social attitudes that have implications for risk. Hence, our expectation is that while uncertainty avoidance is likely to reduce risk, individualism is likely to increase HF risk taking since collective decision making typically reduces the choice of actions under uncertainty.

Our findings are consistent with our ex ante expectations. Hedge funds domiciled in cultures that score high on uncertainty avoidance take less risk and structure contracts that are less performance-driven. On the other hand, hedge funds located in individualistic cultures take more risk and emphasize performance-incentivizing compensation structures. These results are robust to several metrics of risk and managerial compensation described below.

Salient performance-incentivizing terms that are commonly found in US hedge fund contracts include incentive fees (carry), high watermark, requirement to invest personal capital, redemption clause, and the length of lockup period. We find that each is positively related to individualism and negatively related to uncertainty avoidance. Cultures that emphasize individualism seek to reward enterprise and initiative-taking, largely individualistic traits, through performance related incentives. On the other hand, cultures that score high on uncertainty avoidance tend to avoid usage of carry, high watermark, or personal investment requirement, standard features that incentivize risk taking to boost performance. Similarly, the reduced length of redemption and lockup periods in uncertainty avoiding cultures indicate greater restrictions on hedge fund managers to invest in risky and illiquid assets. Interestingly, and consistent with these findings, we find that the management fees are lower in cultures that emphasize individualism and tolerance for uncertainty. This finding also emphasizes a greater focus on incentive compensation rather than on flat rate compensation in cultures that resemble the Anglo-Saxon nations.

The actual HF risk taking behavior also reflects local culture and consequently the compensation and incentive structure of contracts. We find that both total risk (standard deviation of monthly returns) and market risk (coefficient of the market factor in a 9-factor model explaining monthly returns) of HF investments are greater in individualistic and lower in uncertainty avoiding nations. The idiosyncratic risk of the investment portfolio tells a similar story although it does not emerge statistically significant in either individualistic or uncertainty avoiding cultures. Interestingly, the Sharpe Ratio is significantly lower (higher) in cultures that emphasize individualism (uncertainty avoidance). This is due to higher (lower) HF risk taking in individualistic (uncertainty-avoiding) nations since the performance–alpha, the intercept in a 9-factor model explaining monthly returns–is not systematically different across cultures.

We further show that culture plays a role in HF risk shifting in response to the fund's performance relative to both its high watermark and a peer HF group. When performance is relatively inferior (both with respect to high watermark and the peer HF group) in the first six months of a year, the hedge funds tend to increase total risk of their portfolio in the second half of the year to improve their annual performance. This is particularly true of hedge funds domiciled in individualistic cultures; interestingly they also significantly reduce their risk in response to relatively superior performance in the first half of the year. We find no evidence of incremental risk-shifting behavior in hedge funds located in uncertainty avoiding cultures, which again highlights their lack of risk-taking incentives.

We run several tests to ensure robustness of our findings. First, the results on all incentive terms in HF contracts are uniformly robust to using Schwartz measures of culture, namely affective autonomy, mastery, and harmony. While autonomy and mastery reflect individualism, harmony emphasizes collectivism. In HF risk-taking regressions however, only market risk is

significantly affected by the Schwartz cultural measures although the coefficients on other risk measures obtain the expected sign.[2] Second, using linguistic instrumental variables (IV) for our two Hofstede measures (Kashima and Kashima; 1998), we obtain results that are mostly robust.[3] Thus, by employing instruments that represent deep antecedents of culture, these findings lessen concerns regarding the omitted variables problem and validate the causal impact of culture on HF contracting and risk-taking.

Our study relates to at least three streams of HF literature. The first stream focuses on the impact of incentive contracts on HF risk-taking and performance (e.g., Goetzmann, Ingersoll, and Ross, 2003; Hodder and Jackwerth, 2007; Agarwal, Daniel, and Naik, 2009). The second (and most research) stream analyzes HF risk-taking behavior per se (e.g., Ackerman et al., 1999; Fung and Hsieh, 2001, 2004; Lo, 2001; Agarwal and Naik, 2004; Liang and Park, 2007; Aragon, 2007; Bali, Gokcan, and Liang, 2007; Fung, Hsieh, Naik, and Ramadorai, 2008; Sadka, 2010). The third stream examines the determinants of HF contracting with geographical location being the primary focus as in Aragon, Liang, and Park (2014) and Cumming, Dai, and Johan (2015). These analyses have predominantly been on US-domiciled hedge funds. To our knowledge, there has been limited examination of cross-country differences on HF contracting and risk-taking. Given the importance of incentive structure for performance, we fill the gap by providing evidence that cross-country cultural differences matter for hedge fund contract

[2] Both autonomy and mastery are positively correlated with market risk whereas harmony is negatively correlated.
[3] In IV regressions on HF contracting terms, cultural variables significantly affect incentive fees, high watermark provision, and the redemption period clause. Personal capital requirement is also significantly affected but only by individualism. Regressions on lockup period clause and management fees, however, do not lead to significant coefficients on the cultural variables. In HF risk-taking regressions, all of our earlier findings on total risk, market risk, and Sharpe ratio are robust in the IV framework.

structure and risk-taking. More generally, our study adds to the growing literature on culture and finance that analyzes a multitude of investment and corporate financing decisions.[4]

The rest of the paper proceeds as follows. Section 2 discusses the sample, methodology, and summary statistics. Section 3 presents the empirical results. Section 4 concludes.

2. Data and Sample

We obtain the hedge fund data from the Lipper TASS database. We start with both live and graveyard hedge funds that were initiated between 1997 and 2015. We exclude fund of funds since their incentive structures are very different from hedge funds. We also exclude offshore funds domiciled in tax havens such as the Cayman Islands, British Virgin Islands, and Bermuda.[5] Moreover, we require each fund to have at least 24 consecutive return observations for estimating meaningful fund level risk and performance measures. After applying these filters, our final sample consists of 4,775 on-shore hedge funds domiciled in 20 countries. As shown in Table 1, about 50% of these funds are domiciled in the United States.

[Insert Table 1 about here.]

We quantify national culture using the original Hofstede measures. Hofstede in his *Culture's Consequences: International Differences in Work Related Values,* explains how cultures evolve under the influence of factors that include climate, economic development,

[4] Among early studies, Grinblatt and Keloharju (2001) analyze culture's role in determining investors' stock trading behavior and Guiso et al. (2008) focus on trust as a cultural attribute for stock market participation. In cross-country analyses, Chui et al. (2010) and Sun et al. (2015) find that individualism explains variation in stock trading volume, magnitude of momentum profits, and stock price synchronicity across countries. From a corporate perspective, Stulz and Williamson (2003) examine the role of religion toward understanding why legal protections for shareholders and creditors differ across countries. Several recent studies such as Chui et al. (2002), Shao et al. (2010, 2013), Li et al. (2013), Zheng et al. (2013), Boubakri et al. (2016), and Griffin, et al. (2017) explore the impact of cultural on corporate financial policies.

[5] According to Clifford et al (2017), the most common domiciles for offshore hedge funds include the Cayman slands, British Virgin Islands, and Bermuda. Collectively, these three locales account for 89% of the offshore funds in their sample.

and history. The Hofstede measures have been widely used in several business disciplines such as international business, management, and strategy. We focus on two dimensions of culture, namely individualism (IND) and uncertainty avoidance (UAI) that are likely to have key implications for hedge funds' contractual structures and risk-taking behavior. In our sample of 20 countries, IDV ranges from a high of 91 (USA, the most individualistic) to a low of 38 (Brazil, the most collectivist). UAI obtains a highest value of 96 for Malta and lowest of 23 for Denmark. Scandinavian and Common Law nations obtain lower values of UAI highlighting their greater tolerance for uncertainty.[6]

As a robustness check we repeat our analyses using the Schwartz' measures of national culture. Schwartz' measures are based on the needs derived from individuals' requirements as biological organisms, society's requirement for coordinated social interaction, and groups' requirement for survival and support (Schwartz, 1992). Schwartz's value types were derived from a set of items "developed to measure the content of individual values recognized across cultures" (Schwartz, 1994, p. 88). In comparing the two, while Hofstede derived his framework empirically, Schwartz developed his' theoretically.

Specifically, we consider the following three Schwartz dimensions, *Affective Autonomy, Mastery, and Harmony*. Affective autonomy and mastery are positively correlated and harmony is negatively correlated with individualism in the Hofstede framework. We are not able to obtain Schwartz' measures for all nations, so hedge funds domiciled in Luxembourg, Malta, and South Africa are excluded from these analyses.

[6] We obtain the value of individualism and uncertainty avoidance for our sample countries from the following website: https://www.hofstede-insights.com

From the Lipper TASS database, we extract snapshot data on hedge fund contracts and other fund characteristics, including management fee, incentive fee, the use of high watermark, whether fund managers invest their personal capital, redemption notice period, lockup period, minimum investment requirement, whether the fund uses leverage and derivatives, and whether the fund audits its financials regularly. We use the most recent snapshot (December 2016) in our analysis.[7]

[Insert Table 2 about here]

As shown in Table 2, the mean management fee is 1.4% and the mean incentive fee is 14.4%. About 56% of hedge funds include high watermark in their contract, and 21% of them request fund managers to invest their personal capital in the fund. The average length of redemption notice period is 26 days. The average lockup period is about 3 months. Many funds require minimum investment, with a median around $250 thousand and a mean at $1.7 million. More than 50% of the hedge funds use leverage but only 12% of them use derivatives. Auditing of funds' financials appears to be rather prevalent. About 90% of our sample stated that they audit their financials regularly.

We consider five empirical measures with regard to hedge fund risk taking and its implications: total risk, market risk, idiosyncratic risk, alpha, and Sharpe ratio. In our analysis, we also use changes in risk to determine whether hedge funds engage in risk shifting in response to inferior performance. All these measures are winsorized by 0.5% at each tail. They are measured as follows:

[7] We checked the variability of these fund level data using multiple snapshots provided by Lipper TASS. We observe some changes, but overall these fund level data are rather stable over time.

Total Risk (Volatility of Return): Total Risk is estimated by the standard deviation of the monthly net-of-fee returns over the rolling 24-month period. Total risk is comprised of both systematic risk and idiosyncratic risk.

Market Risk: Market Risk measures the fund's exposure to the equity market. For each fund, we run time series regression of fund monthly excess returns on nine factors as identified in Bali et al (2012) over the rolling 24-month window. The Bali et al. (2012) nine-factor model combines the four factors in the Fama-French model (Market, SML, HML, and UMD) and the five factors from the Fung and Hsieh (1997, 2001) model (Bond market factor, credit spread factor, PTFSBD, PTFSFX, and PTFSCOM). The coefficient of the market factor is our measure of a hedge fund's market risk.

Idiosyncratic Risk: Idiosyncratic risk is measured as the standard deviation of residuals estimated off the regression using Bali et al (2012) nine-factor model over the rolling 24-month window.

Alpha: Alpha is the intercept from regression using Bali et al (2012) nine-factor model over the rolling 24-month window.

Sharpe Ratio: Sharpe ratio is the ratio of average excess return to total risk in the rolling 24-month windows.

Risk Change: Risk change is the difference between the standard deviation of monthly returns in the second and first halves of the year. Similar to Aragon and Nanda (2011), we require that a fund has the full six monthly observations to be included in the estimate of semi-annual standard deviation.

Table 2 summarizes these six measures of hedge funds' risk-taking and risk shifting. The average total risk is 3.02%, with a market beta of 0.25 and residual risk of 6.45%. The mean monthly alpha is 0.42. The average Sharpe ratio is around 0.6. On average, hedge funds increase their total risk in the second half of the year by 7% relative to the first half of the year.

In Table 3, we compare hedge funds contract characteristics and their risk taking behavior based on the values of IDV and UAI. Specifically, if a hedge fund is domiciled in a country with an IDV or UAI value above (below) median, we assign the hedge fund to the corresponding high (low) group. We find hedge funds receive significantly higher management and incentive fees when domiciled in high-IDV countries. These hedge funds are also more likely to enforce the high watermark provision. About 70% of hedge funds in high-IDV countries use high watermark provisions, while only less than 2% of hedge funds in low-IDV countries do so. About 26% of hedge funds domiciled in high-IDV countries require fund managers to invest their personal capital. In contrast, less than 1% of funds domiciled in low-IDV countries make the same request. We also observe that hedge funds in high-IDV countries often have significantly longer redemption notice and lockup periods, allowing hedge fund managers to take on more illiquidity risk.

The results with respect to UAI are precisely the opposite to that of IDV. High UAI countries have lower management and incentive fees, are less likely to have high watermark provisions, do not require fund managers to invest their personal capital as frequently, and have shorter redemption notice and lockup periods.

With regard to fund risk, we find significantly higher risk (regardless of total risk, or market risk, or idiosyncratic risk), lower alpha, and lower Sharpe Ratio for hedge funds domiciled in countries with high IDV and low UAI.

[Insert Table 3 about here.]

In the next section, we present multivariate analyses to compliment these univariate findings.

3. Empirical Results

We conduct our main empirical testing through the following steps. First, we investigate whether and how national culture relates to contracting in the hedge fund industry. Second, we analyze whether hedge funds' risk taking is conditional on culture of their domicile countries. Third, we ask whether national culture relates to hedge funds' risk shifting and tournament behavior. Finally, we conduct several robustness checks.

While we begin our analyses with Hofstede measures, we also use Schwartz cultural measures to determine whether our results are qualitatively similar. An essential component of our analyses is the recognition of potential endogeneity in the relation between culture and hedge fund contracting and risk taking. The major concern arises from potentially omitted variables in our empirical specifications. We use two approaches to address this issue. First, we include country fixed effects in all our specifications. Second, we adopt an instrumental variable framework to provide further robustness. We discuss these in greater detail in the following sections.

3.1. National Culture and Hedge Fund Contracting

Traditional financial contract theory (e.g., Aghion and Bolton, 1992; Schultz, 1993; Dewatripont and Tirole, 1994) emphasizes how contracts are structured to resolve problems associated with agency costs, moral hazard, and asymmetric information. Adopting this approach, most of the existing hedge fund literature takes hedge fund contracts as exogenous and analyzes how these contractual characteristics impact hedge fund managers' incentives and thus

hedge fund performance (e.g., Agarwal, Daniel, and Naik, 2009; Goetzmann, Ingersoll, and Ross, 2003; Hodder and Jackwerth, 2007; Panageas, S., and M. Westerfield; 2009).

A few studies also examine how the domicile locations influence hedge fund contracting (Aragon, Liang, and Park, 2014; Cumming, Dai, and Johan, 2015). Aragon, et al (2014) argue that there are important differences in investor tax clienteles and regulatory environments between onshore and offshore hedge funds and find that onshore funds are associated with greater share restrictions such as longer redemption notice periods and lockup periods. Cumming, Dai, and Johan (2015) conjecture that less legal uncertainty with the legal and governance structure of Delaware funds allow Delaware fund managers to enjoy higher fees and more managerial discretion. Their empirical findings show that Delaware funds charge significantly higher management and incentive fees and have significantly longer redemption notice periods and lockup periods.

In this study, we propose that in addition to the regulatory environment, the culture of a domicile country plays an important role in informing hedge fund contracts. Specifically, we conjecture that countries with high IDV and low UAI are more likely to encourage contracts that grant performance-driven incentives. Empirically, we examine the following aspects of hedge fund contracts: management fee, incentive fee, high watermark, personal capital, redemption notice period and lockup period.

[Insert Table 4 about here]

As shown in Table 4, specifications (1)-(6) analyze the impact of individualism (*IDV*) on hedge fund contracts; specifications (7)-(12) analyze the impact of uncertainty avoidance (*UAI*) on hedge fund contracts. In the analysis of high watermark and personal capital requirement

(specifications (3), (4), (9) and (10)), we use probit regressions, while the rest of the specifications are OLS regressions. In all specifications, we include a control variable *Common*, which is equal to one if the country is a common-law country and zero otherwise, fund inception year dummies, fund primary investment strategy dummies, and country dummies.[8]

We find countries with high IDV (low UAI) are associated with lower management fees, higher incentive fees, a higher likelihood of using high watermark and requesting personal capital, longer redemption notice and lockup periods. This is consistent with the notion that countries with a culture of encouraging individualism and tolerance for uncertainty often adopt contracts that provide incentive driven contracts and greater managerial discretion.

3.2. National Culture and Hedge Fund Risk Taking

Hedge fund risk-taking is fundamental to their performance and survival. There is a large body of literature on the risk choices of fund managers. These studies have documented several important factors that influence such choices. For instance, factors such as convex payoffs can induce fund managers to increase portfolio risk (Carpenter, 2000; Hodder and Jackwerth, 2007; Panageas and Westerfield; 2009). On the other hand, the incentive to increase risk may be curbed by factors such as managerial risk aversion, managerial ownership, and reputational and career concerns (e.g., Starks, 1987; Chevalier and Ellison, 1997; Carpenter, 2000; Basak, Pavlova, and Shapiro, 2007).

However, as Li et al. (2013) point out, the focus on incentives of individual managers overlooks the cultural context in which managers make decisions. Moreover, as we established

[8] We considered other institutional variables such as GDP, GDP per capita, GDP growth, and other law variables. One potential issue arises from including these variables in one regression is the multicollinearity due to the high correlations among these variables. We include country fixed effects instead to avoid this problem. Another advantage of including country fixed effect is to avoid the potential omitted variable problem.

in the prior section, incentive contracts and managerial discretion are often conditional on the cultural characteristics of the funds' domicile locations. In this section, we investigate whether and how the risk choices of hedge fund managers relate to the culture of the funds' domicile locations after we control for contractual differences across countries.

Empirically, we consider five measures with regard to hedge fund risk taking; we consider *change in risk* separately in the next section. Our fund-level measures of risk are total risk, market risk, idiosyncratic risk, alpha, and Sharpe ratio. We run panel regressions with these risk measures being the dependent variables. Our key variables of interest are the Hofstede cultural measures, IDV and UAI, and we control for fund level contractual differences and other fund characteristics in all specifications. These fund level characteristics are fund minimum investment requirement, average fund assets under management, fund age, use of leverage, use of derivatives, management fee, incentive fee, high watermark, fund requests for personal capital, length of redemption period, length of lockup period, whether the fund regularly audits, and whether the domicile location is a common law country. Definitions for these variables are in the appendix. Finally, we include year fixed effects, investment strategy fixed effect, and country fixed effect in all regressions.

[Insert Table 5 about here.]

As shown in Table 5, IDV is significantly and positively correlated with funds' total risk and market risk. It is also positively correlated with funds' idiosyncratic risk and alpha, but not significant. The Sharpe ratio of funds domiciled in more individualistic countries are significantly lower. In contrast, UAI is significantly and negatively correlated with funds' total risk and market risk, but positively with fund Sharpe ratio.

Our analyses in this section shows that national culture not only influences hedge fund contracts, which are documented to have impact on portfolio risk, but also directly affects fund managers' risk choices. In more individualistic countries, fund managers tend to take on significantly greater risk, which does not necessarily lead to a higher alpha, resulting in a lower Sharpe ratio. On the other hand, in societies with lower tolerance for uncertainty, fund managers take much lower risk ceteris paribus.

3.3. National Culture and Hedge Fund Risk Shifting

Fund managers might be especially concerned about their performance relative to a benchmark or that of other funds, thereby inducing relatively poor performers to increase risk in order to improve performance. This is often termed as risk-shifting or "tournament" behavior in the fund management industry. Most existing research focuses on risk shifting behavior of mutual funds with a few exceptions as noted below.

In the hedge fund literature, Brown et al. (2001) report evidence of tournament behavior while both Hodder and Jackwerth (2007) and Panageas and Westerfiled (2009) argue that hedge fund managers are more likely to increase risk when their funds are below their high watermarks. Basak, Pavlova, and Shapiro (2007) and Hodder and Jackwerth (2007) further show that managers' incentives for risk-shifting can be mitigated if they are exposed to some downside risk, either through a personal capital stake in the fund or through management fees based on end-of-period assets. Aragon and Nanda (2012) find empirical evidence consistent with these predictions. Specifically, they show that the high watermark provisions are less effective in moderating risk-shifting behavior following poor performance, when the funds are likely to be liquidated. They also show that managers' personal capital stake does reduce their incentives for

risk shifting. However, the cultural context in which HF managers make decisions with regard to risk shifting have not been analyzed in the extant literature.

To examine the relation between fund managers' decisions on increasing or reducing risk and the cultural context in which managers make such decisions, we follow the methodology used in Aragon and Nanda (2012). Specifically, our dependent variable is the difference between the fund's standard deviations of monthly returns in the second and first halves of the year. Our key variables of interest are the interaction terms between IDV/UAI and measures of fund past performance in excess of a benchmark. Two benchmarks are considered when calculating fund past performance. The first benchmark is the median return for funds within the same investment category during the first half of the year. Arguably, fund managers are more likely to increase portfolio risk if their funds were underperforming their peer funds. The second benchmark relates to the use of high watermark provision, which requires fund managers to recover losses before they can charge a performance fee on new profits. If the fund was under-the-water in the previous year and was not able to fully recover in the first half of the current year, fund managers have greater incentives to increase portfolio risk in the second half of the year in order to earn the performance fee. The value of the second benchmark is calculated as $\max(\frac{1}{1+R_{t-1}} - 1,0)$ where R_{t-1} is the fund return in the prior year (t-1). The coefficients of the interaction terms between cultural dimensions and the fund's past performance relative to a benchmark allow us to infer whether a specific cultural environment encourages or discourages fund managers' risk shifting behavior. Specifically, a negative coefficient implies a propensity to increase risk following poor performance relative to the benchmarks.

Following Aaron and Nanda (2012), we also include lagged risk in our specifications to control for mean reversion in risk changes induced by mismeasurement. We control for the same

fund level characteristics as discussed previously. Moreover, we include year fixed effects, investment strategy fixed effect, and country fixed effect in all regressions. Results are presented in Table 6.

[Insert Table 6 about here.]

Consistent with Aaron and Nanda (2012), we show that fund's past performance relative to both benchmarks in the first half of the year is significantly and negatively associated with funds' risk change in the second half of the year (in all six specifications). In other words, the greater is the fund underperformance relative to its peer funds (or below the hurdle rate), the higher is the fund managers' propensity to increase portfolio risk in the second half of the year. When we include the interaction terms between IDV and fund's past performance relative to the benchmarks (specifications (2) and (5)), the coefficients on the fund's past performance remain significantly negative. The coefficients on the interaction term are significantly negative, suggesting that an individualistic cultural context encourages fund managers' risk shifting. The coefficients of the interaction terms between UAI and fund's past performance relative to the benchmarks (specifications (3) and (6)) are however not significant. This finding plausibly reflects the lack of risk-taking incentives in the first place in cultures that emphasize uncertainty avoidance.

Among the control variables, we find negative coefficients on the funds' lagged risk and the use of high watermark provision, which is consistent with Aaron and Nanda (2012). In addition, we show that the use of leverage and derivatives increase risk shifting, arguably, because they give managers greater financial flexibility to adjust portfolio risk. The length of lockup period is also positively associated with risk change. This makes sense as managers are better able to invest in illiquid assets (which often have higher risk) when longer lockup periods are in place.

3.4. Robustness Checks: Using Schwartz' Culture Measures

We repeat our analysis using the Schwartz' measures of national culture. Specifically, we consider the following three dimensions, *Affective Autonomy, Mastery, and Harmony*. Definitions of these cultural dimensions are in the appendix. While *Affective Autonomy* and *Mastery* reflect individualism, harmony emphasizes collectivism.

In Table 7, we examine the relation between Schwartz' measures of natural culture and hedge fund contracts. Similar to Table 4, we examine the following aspects of hedge fund contracts: management fee, incentive fee, high watermark, personal capital, redemption notice period and lockup period. In all specifications, we include a control variable *Common,* fund inception year dummies, fund primary investment strategy dummies, and country dummies. To save space, we only report the coefficients and the corresponding standard errors for the three Schwartz culture measures from the 18 regressions described above.

As shown in Table 7, we find that hedge funds domiciled in countries emphasizing harmony are strongly associated with higher management fees, lower incentive fees, lower likelihood of using high watermark, lower propensity to request personal capital investment, and shorter redemption notice and lockup periods. On the other hand, we find significantly lower management fees, higher incentive fees, greater likelihood of using high watermark and personal capital requirements, and longer redemption notice and lockup periods among funds domiciled in countries with higher values of Affective Autonomy and Mastery. Consistent with our earlier results using Hofstede culture measures, these findings suggest that cultures that emphasize individuals' independent pursuit of their personal goals often grant incentive driven contracts and greater managerial discretion to encourage outperformance. In contrast, cultures that value social order and stability of the group are less likely to do so.

[Insert Table 7 about here]

In Table 8, we examine the relation between natural culture and hedge funds risk taking behavior using Schwartz' measures of national culture. As in Table 5, the dependent variables include total risk, market risk, idiosyncratic risk, alpha, and Sharpe ratio. In all specifications, we control for fund level contractual differences and other fund characteristics, as well as year fixed effects, investment strategy fixed effects, and country fixed effects.

Similar to Table 7, we only report the coefficients and the corresponding standard errors for the three Schwartz culture measures from the regressions described above. We find Affective Autonomy and Mastery are significantly and positively associated with funds' market risk; they are also positively correlated with total risk and idiosyncratic risk, but are statistically insignificant. Harmony is significantly and negatively associated with fund's market risk. It is also negatively correlated with total risk and idiosyncratic risk, but insignificant. These results compliment the analyses using the Hofstede measures in Table 5.

[Insert Table 8 about here.]

3.5. Robustness Check: Instrumental Variable Analysis

As discussed in Nash and Patel (2016), studies that relate national culture to economic outcomes often suffer from the correlated omitted variables problem. Specifically, the empirical findings from these studies might be influenced by omitted variables that are correlated with measures of national culture and the economic outcomes being analyzed. We address this concern by first including country fixed effects in all our specifications. To further mitigate concerns about omitted variables and more clearly demonstrate causality, we utilize instrumental

variable analysis and employ exogenous instruments identified in the existing "culture and finance" literature that represent inherited, slow-moving components of culture.

In our search for an instrument for national culture, we lean on a body of research that focuses on language as an underlying factor affecting national culture. Long standing work in the social sciences by Sapir (1970) and Whorf (1956) acknowledges that language and culture interact in such a way that "language… influences the way we look at our world". The linguistics literature takes this a step further and identifies how grammatical rules offer insights into a particular culture. Specifically, the use of person-indexing pronouns in a particular language reflects a culture's emphasis on *the individual*. Thus, a language's rules regarding "pronoun drop" reflect whether a culture places a greater focus on the uniqueness of the speaker or on the significance of the wider social context or group (Kashima and Kashima, 1998). As such, "pronoun drop" relates to a culture's emphasis on individualism versus collectivism. In recent empirical studies, Gorodnichenko and Roland (2011a, 2011b, 2015) use "pronoun drop" as an instrument for Individualism.

Lastly, Kashima and Kashima (1998) also find a strong relation between the prevalence of multiple second-person pronoun languages and Uncertainty Avoidance. Accordingly, as suggested in Breuer and Salzmann (2012), if a majority of a country's population speaks a language with multiple second-person pronouns, than the use of second-person pronoun can serve as an instrument for Uncertainty Avoidance.

[Insert Table 9 about here.]

In Table 9, we examine the relation between national culture and hedge fund contracts using pronoun drop as an instrument for IDV and the use of multiple second-person pronouns as an

instrument for UAI. Similar to Kashima and Kashima (1998), we find a strong negative association between the use of pronoun drop in a language and IDV and a strong positive association between the use of multiple second-person pronouns in a language and UAI. The findings from the instrumental variable analysis are in general consistent with our earlier findings in Table 4. For instance, hedge funds contracts are more likely to include higher incentive fees, high water mark, request personal capital and allow for a longer redemption notice period in more individualistic cultures. On the other hand, lower incentive fees, shorter redemption notice period, and a much lower likelihood of using high watermark are observed in hedge fund contracts in cultures with strong uncertainty avoidance.

In Table 10, we perform instrumental variable analysis with regard to the relation between national culture and hedge fund risk taking. As shown in Table 10, we continue to find that IDV significantly increases fund total risk and market risk and decreases alpha and Sharpe ratio, while UAI exhibits stronger negative associations with fund total risk and market risk, and positive associations with alpha and Sharpe ratio.

[Insert Table 10 about here.]

4. Conclusion and Discussion

In this study, we analyze hedge fund contracts and risk-taking in a cross-country setting by focusing on cultural variation among nations. Our findings suggest that cultural environments in which contracts are structured and negotiated play an important role in shaping the contracts.

Specifically, we find cultures that emphasize individualism are more likely to use performance driven provisions, such as high incentives fees, high watermark, personal investment requirement, longer redemption notice period and lockup periods. On the other hand,

cultures that score high on uncertainty avoidance tend to avoid usage of these terms, with control of risk being their main objective.

Moreover, we show that culture has a direct impact on hedge fund mangers' choices of risk level even after we control for the contractual differences at the fund level. Hedge funds domiciled in cultures that score high on uncertainty avoidance generally take less risk. On the other hand, hedge funds located in individualistic cultures take more risk and are more likely to increase risk when funds underperform the hurdle rate specified in the high watermark provision and/or their peer funds.

These findings are robust to alternative measures of national culture, alternate specifications, and controlling for potential endogeneity in the instrumental variables framework. We also perform additional robustness checks such as excluding funds domiciled in the U.S., sub-period analysis, studying only long-short hedge funds, and using different instruments.[9] Our main conclusions remain qualitatively valid.

Our study represents an early endeavor in understanding the role of culture in shaping financial contracts. We believe additional studies on how cultural attributes impact financial contracts observed in corporations, venture capital and private equity industry, or the mutual fund industry may be fruitful in our further understanding of culture's role in sophisticated financial and economic decisions.

[9] These results are not reported to save space. They are available upon request.

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Appendix: Definitions of Variables

Variable	Definition
Country Level Variables	
IDV	Hofstede culture measure of individualism. It measures the degree to which people in a society are integrated into groups. Individualistic societies have loose ties that often only relates an individual to his/her immediate family.
UAI	Hofstede culture measure of uncertainty avoidance. It is defined as a society's tolerance for ambiguity, in which people embrace or avert an event of something unexpected, unknown, or away from the status quo.
Affective Autonomy	In Schwartz culture model, affective autonomy is the independent pursuit of pleasure, seeking enjoyment by any means without censure.
Mastery	In Schwartz culture model, in a mastery culture, individuals seek success through personal action. Mastery needs independence , courage, ambition, drive and competence.
Harmony	In a harmony culture, rather than seek self-improvement, people are happy to accept their place in the world. People here put greater emphasis on the group than on the individual.
Common	A dummy variable which is set to 1 if the nation has common law, 0 otherwise.
Hedge Fund Characteristics	
Managementfee	The fees charges as a precentage of assets under management
Incentivefee	The fees charges as a percentage of the profits
Highwatermark	Dummy variable which is equal to 1 if a highwater mark provision is included
Personalcapital	Dummy variable which is equal to 1 if managers are requedsted to invest their personal capital
lnmininvest	Natural logarithm of minimum investment
lnavgaum	Natural logarithm of the fund's average assets under management over the rolling 24-month window
lnfundage	Natural logarithm of the fund's age which is estimated as the difference between the prefermance date and the fund's inception date
leveraged	Dummy variable which is equal to 1 if a fund uses leverage
derivatives	Dummy varaible which is equal to 1 if a fund uses derivatives
lnredemption	Natural logarithm of the redemption period
lnlockup	Natural logarithm of the lockup period
Audit	Dummy variable which is equal to 1 if a fund audits its financials
Risk and Performance Measures	
Total Risk	Standard deviation of monthly returns over the rolling 24-month window
Market Risk	Coefficient of the market factor from the 9-factor alpha regression using monthly returns over the rolling 24-month window
Idiosyncratic Risk	Standard deviation of the residuals estimated off the 9-factor alpha regression over the rolling 24-month window

Alpha	Intercept of the 9-factor alpha regression estimated using monthly returns over the rolling 24-month window
Sharp Ratio	The ratio of average excess return and standard deviation
Risk Change	The difference between the standard deviation of monthly returns in the second half year and that in the first half year
Median Adjusted BHR	A fund's buy and hold return in the first half year adjusted by the median return for funds within the same investment category
Distance to HWM	The return that the fund needs to recover the (possible) previous year's losses. HWM Benchmark=$\max(1/(1+R_{t-1})-1,0)$

Table 1 Number of Hedge Funds and National Culture by Country

This table presents cultural dimensions of 20 domicile locations of 4775 on-shore hedge funds that were initiated between 1997 to 2015. Funds of funds are not included.

		Culture				
		Hofstede		Schwartz		
Country Name	N of Hedge Funds	IDV	UAI	Affective Autonomy	Mastery	Harmony
Australia	144	90	51	3.39	3.75	4.13
Austria	8	55	70	3.89	3.72	4.62
Brazil	939	38	76	3.04	3.84	4.25
Canada	225	80	48	3.71	3.93	4.20
China	10	80	66	3.20	4.41	3.76
Denmark	7	74	23	4.08	3.74	4.32
Finland	35	63	59	3.61	3.39	4.59
France	77	71	86	4.31	3.57	4.50
Germany	34	67	65	3.75	3.75	4.71
Ireland	370	70	35	3.62	3.84	3.90
Italy	28	76	75	2.84	3.60	4.91
Luxembourg	304	60	70			
Malta	76	59	96			
Netherlands	39	80	53	3.65	3.80	4.19
South Africa	10	65	49			
Spain	33	51	86	3.59	3.68	4.64
Sweden	67	71	29	3.97	3.61	4.54
Switzerland	17	68	58	4.13	3.74	4.53
United Kingdom	22	89	35	3.86	3.88	3.81
United States	2330	91	46	3.51	3.92	3.69

Table 2 Summary Statistics

This table summarizes the key contractual terms and measures of risk-taking of the 4775 hedge funds. Definitions of these variables are provided in Appendix.

	N of Observations	Mean	Median	StdEV
Fund Characteristics				
Management Fee	4775	1.39%	1.50%	0.80%
Incentive Fee	4775	14.42%	20%	9.16%
% with High Watermark	4775	0.56	1	0.5
% Request Personal Capital	4775	0.21	0	0.4
Redemption Notice Period (days)	4775	26.44	22	30.93
Lockup Period (months)	4775	3.38	0	7.09
Minimum Investment ($000)	4775	1659	250	2570
Leveraged	4775	0.57	1	0.49
Derivatives	4775	0.12	0	0.32
Audit	4775	0.89	1	0.31
Risk and Performance				
Total Risk	17063	3.02%	2.15%	3.06%
Market Risk	17063	0.25	0.14	0.42
Residual Risk	17063	6.45%	5.29%	3.48%
Alpha	17063	0.42	0.45	1.02
Sharpe Ratio	17063	0.61	0.3	1.12
Risk Change	17063	7.01%	0%	3.83%

Table 3 Hedge Fund Contract Characteristics and National Culture

In this table, we group hedge funds based on the value of IDV and UAI of their domicile country. Specifically, if a fund is domiciled in a country with an IDV (UAI) value above/below median, we assign the hedge fund to high-IDV(UAI)/low-IDV (UAI) group. Then we compare contract characteristics and fund risk and performance between these groups. Two-tailed t-tests are performed and the p-values for the differences are provided.

	IDV			UAI		
Contract Characteristics	Low	High	p-value on diff.	Low	High	p-value on diff.
Management Fee	1.25%	1.43%	0.000	1.43%	1.30%	0.000
Incentive Fee	4.96%	16.76%	0.000	17.71%	6.98%	0.000
% with High Watermark	1.50%	70.07%	0.000	73.68%	17.47%	0.000
% Request Personal Capital	0.20%	25.64%	0.000	28.64%	2.39%	0.000
Redemption Notice Period (days)	0.21	32.95	0.000	36.08	4.67	0.000
Lockup Period (months)	0.07	4.20	0.000	4.77	0.24	0.000
N of Observations	949	3826		3310	1465	
Risk and Performance	Low	High	p-value on diff.	Low	High	p-value on diff.
Total Risk	1.42%	3.50%	0.000	3.61%	1.68%	0.000
Market Risk	0.065	0.30	0.000	0.31	0.10	0.000
Idiosyncratic Risk	5.66%	6.69%	0.000	6.73%	5.83%	0.000
Alpha	0.71	0.33	0.000	0.36	0.54	0.000
Sharpe Ratio	1.75	0.28	0.000	0.28	1.37	0.000
N of Fund-Year Observations	3877	13186		11882	5181	

Table 4 National Culture and Hedge Fund Contract Characteristics: Hofstede Culture Measures

In this table, we examine the relation between national culture (IDV and UAI) and characteristics of hedge fund contracts in multiariate regressions. The dependent variables include management fee, incentive fee, high watermark dummy, personalcapital dummy, lnredemption and lnlockup. Specifications (3), (4), (9) and (10) are probit regressions and the rest are OLS regressions. In all specifications, we also include fund inception year fixed effect, fund investment strategy fixed effect, and country fixed effect. Detailed definitions of all variables are provided in appendix. ***, **, and * denote statistical significance at 1%, 5%, and 10% levels, respectively.

Panel A: IDV and Hedge Fund Contract

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Management Fee	Incentive Fee	High Watermark	Personal Capital	Redemption	Lockup
IDV	***-0.215****	***4.709****	***0.878****	***0.773****	***1.788****	***1.007****
	(0.069)	***(0.619)***	***(0.114)***	***(0.145)***	***(0.092)***	***(0.083)***
Common	4.604***	-95.779***	-18.437***	-14.507***	-38.264***	-21.938***
	(1.589)	(14.290)	(2.632)	(2.903)	(2.121)	(1.921)
Constant	16.236***	-314.095***	-61.449***	-56.147***	-121.021***	-68.927***
	(4.693)	(42.218)	(7.770)	(10.308)	(6.267)	(5.676
Fund Inception Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Investment Strategy Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,775	4,775	4,773	4,660	4,775	4,775
Adjusted R-squared	0.039	0.409			0.651	0.3046
Pseudo R2			0.381	0.194		

Panel B: UAI and Hedge Fund Contracts

	(7)	(8)	(9)	(10)	(11)	(12)
VARIABLES	Management Fee	Incentive Fee	High Watermark	Personal Capital	Redemption	Lockup
UAI	***0.043****	***-0.942****	***-0.176****	***-0.155****	***-0.358****	***-0.201****
	(0.014)	***(0.124)***	***(0.023)***	***(0.029)***	***(0.018)***	***(0.017)***
Common	0.182	1.219	-0.351	3.577***	-1.437***	-1.204***
	(0.249)	(2.240)	(0.453)	(0.547)	(0.333)	(0.301)
Constant	-0.850	60.711***	8.438***	3.205***	21.279***	11.191***
	(0.822)	(7.397)	(1.372)	(0.888)	(1.098)	(0.995)
Fund Inception Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Investment Strategy Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,775	4,775	4,773	4,660	4,775	4,775
Adjusted R-squared	0.039	0.409			0.651	0.304
Pseudo R2			0.381	0.194		

Table 5 National Culture and Hedge Fund Risk Taking: Hofstede Culture Measures

In this table, we examine the relation between national culture (IDV and UAI) and hedge fund risk taking in multivariate regressions. The dependent variables include total risk, market risk, idiosyncratic risk, alpha, and Sharpe ratio. All these variables are estimated in a rolling 24-month window and are winsorized at 0.5% at each tail. In all specifications, we control for fund characteristics such as minimum investment, average assets under management, fund age, leveraged dummy, derivatives dummy, management fee, incentive fee, high watermark dummy, personal capital dummy, length of redemption notice period, length of lock up period, audit dummy, and common dummy. Definitions of all variables are provide in appendix. We further include fund inception year fixed effect, fund investment strategy fixed effect, and country fixed effect. ***, **, and * denote statistical significance at 1%, 5%, and 10% levels, respectively.

VARIABLES	(1) Total Risk	(2) Market Risk	(3) Idiosyncratic Risk	(4) Alpha	(5) Sharpe Ratio	(6) Total Risk	(7) Market Risk	(8) Idiosyncratic Risk	(9) Alpha	(10) Sharpe Ratio
IDV	***0.234****	***0.132*****	0.106	0.020	***-0.124*****					
	(0.139)	***(0.020)***	(0.094)	(0.051)	***(0.047)***					
UAI						***-0.047****	***-0.026*****	-0.021	-0.004	***0.025*****
						(0.028)	***(0.004)***	(0.019)	(0.010)	***(0.009)***
lnmininvest	-0.003	-0.001	-0.012***	0.001	-0.011***	-0.003	-0.001	-0.012***	0.001	-0.011***
	(0.007)	(0.001)	(0.005)	(0.003)	(0.002)	(0.007)	(0.001)	(0.005)	(0.003)	(0.002)
lnavgaum	-0.060	0.003	-0.035	0.179***	0.117***	-0.060	0.003	-0.035	0.179***	0.117***
	(0.041)	(0.006)	(0.028)	(0.015)	(0.014)	(0.041)	(0.006)	(0.028)	(0.015)	(0.014)
lnfundage	-0.048	0.055***	0.309***	-0.109***	0.053***	-0.048	0.055***	0.309***	-0.109***	0.053***
	(0.052)	(0.008)	(0.036)	(0.019)	(0.018)	(0.052)	(0.008)	(0.036)	(0.019)	(0.018)
leveraged	0.123***	-0.011*	0.040	0.045***	-0.125***	0.123***	-0.011*	0.040	0.045***	-0.125***
	(0.046)	(0.007)	(0.031)	(0.017)	(0.016)	(0.046)	(0.007)	(0.031)	(0.017)	(0.016)
derivatives	0.483***	0.016	0.206***	-0.001	-0.051**	0.483***	0.016	0.206***	-0.001	-0.051**
	(0.075)	(0.011)	(0.051)	(0.027)	(0.025)	(0.075)	(0.011)	(0.051)	(0.027)	(0.025)
managementfee	0.147***	0.002	0.067***	0.009	-0.125***	0.147***	0.002	0.067***	0.009	-0.125***
	(0.028)	(0.004)	(0.019)	(0.010)	(0.009)	(0.028)	(0.004)	(0.019)	(0.010)	(0.009)
incentivefee	-0.008**	-0.003***	-0.009***	0.004***	0.002	-0.008**	-0.003***	-0.009***	0.004***	0.002
	(0.003)	(0.001)	(0.002)	(0.001)	(0.001)	(0.003)	(0.001)	(0.002)	(0.001)	(0.001)
highwatermark	-0.265***	-0.006	-0.132***	0.092***	0.024	-0.265***	-0.006	-0.132***	0.092***	0.024
	(0.065)	(0.009)	(0.044)	(0.024)	(0.022)	(0.065)	(0.009)	(0.044)	(0.024)	(0.022)
personalcapital	0.148***	0.016**	0.035	0.050**	0.045**	0.148***	0.016**	0.035	0.050**	0.045**
	(0.056)	(0.008)	(0.038)	(0.020)	(0.019)	(0.056)	(0.008)	(0.038)	(0.020)	(0.019)

lnredemption	-0.045*	-0.010***	-0.030*	0.032***	0.055***	-0.045*	-0.010***	-0.030*	0.032***	0.055***
	(0.023)	(0.003)	(0.016)	(0.008)	(0.008)	(0.023)	(0.003)	(0.016)	(0.008)	(0.008)
lnlockup	0.129***	0.003	0.055***	0.034***	0.018**	0.129***	0.003	0.055***	0.034***	0.018**
	(0.021)	(0.003)	(0.015)	(0.008)	(0.007)	(0.021)	(0.003)	(0.015)	(0.008)	(0.007)
audit	-0.126	-0.006	-0.213***	0.054	0.020	-0.126	-0.006	-0.213***	0.054	0.020
	(0.102)	(0.015)	(0.069)	(0.037)	(0.034)	(0.102)	(0.015)	(0.069)	(0.037)	(0.034)
common	-4.404	-2.955***	-1.732	-0.280	2.881***	0.424	-0.232***	0.443	0.135	0.334**
	(3.175)	(0.455)	(2.155)	(1.157)	(1.073)	(0.475)	(0.068)	(0.322)	(0.173)	(0.160)
Constant	-10.513	-8.751***	-0.717	-6.080*	5.766*	8.144***	1.772***	7.688***	-4.478***	-4.078***
	(9.570)	(1.373)	(6.494)	(3.488)	(3.233)	(1.996)	(0.286)	(1.355)	(0.727)	(0.674)
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Investment Strategy Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	17,063	17,063	17,063	17,063	17,063	17,063	17,063	17,063	17,063	17,063
Adjusted R-squared	0.249	0.201	0.733	0.104	0.362	0.249	0.201	0.733	0.104	0.362

Table 6 National Culture and Hedge Funds Risk Shifting

In this table, we analyze the relation between national culture and hedge funds risk shifting. The dependent variable is risk change or the differences in the standard deviations of monthly returns in the second and the first halves of the year. In specifications (1)-(3), Perf is calculated as the buy and hold return of the fund in the first six months adjusted by the median performance of peer funds with same investment strategies. In specifications (4)-(6), Perf is calculated using the difference between the buy and hold return of the fund in the first six months and the return needed to cover previous year's loss if any due to the high watermark provision. Our key variable of interest are the two interaction terms, IDV*Perf and UAI*Perf. Other control variables include IDV, UAI, lagrisk, minimum investment, fund age, average assets under management, leveraged dummy, derivatives dummy, management fee, incentive fee, high watermark dummy, personal capital dummy, length of redemption notice period, length of lock up period, audit dummy, and whether domicile country is a common law nation. Definitions of all variables are provide in appendix. We further include fund inception year fixed effect, fund investment strategy fixed effect, and country fixed effect. ***, **, and * denote statistical significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Perf: Median Adjusted BHR			**Perf: Distance to HWM**		
Perf	-0.017***	-0.008*	-0.026***	-0.018***	-0.010**	-0.022***
	(0.002)	(0.005)	(0.007)	(0.002)	(0.005)	(0.007)
IDV*Perf		***-0.0001****			***-0.0001****	
		(0.0001)			***(0.0001)***	
UAI*Perf			0.0001			0.0001
			(0.0001)			(0.0001)
IDV		0.188			0.211	
		(0.155)			(0.155)	
UAI			0.0002			-0.041
			(0.0001)			(0.031)
lagrisk	-0.604***	-0.604***	-0.604***	-0.605***	-0.605***	-0.603***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
lnmininvest	-0.001	-0.001	-0.001	-0.003	-0.003	-0.001
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
lnfundage	-0.046	-0.047	-0.047	-0.009	-0.011	-0.043
	(0.058)	(0.058)	(0.058)	(0.059)	(0.059)	(0.058)
lnavgaum	-0.059	-0.055	-0.056	-0.009	-0.004	-0.052
	(0.046)	(0.046)	(0.046)	(0.047)	(0.047)	(0.046)
leveraged	0.092*	0.091*	0.091*	0.092*	0.091*	0.092*
	(0.051)	(0.051)	(0.051)	(0.051)	(0.051)	(0.051)
derivatives	0.264***	0.266***	0.265***	0.267***	0.269***	0.272***
	(0.084)	(0.084)	(0.084)	(0.084)	(0.084)	(0.084)
managementfee	0.100***	0.100***	0.100***	0.103***	0.104***	0.100***
	(0.031)	(0.031)	(0.031)	(0.031)	(0.031)	(0.031)
incentivefee	0.002	0.002	0.002	0.003	0.003	0.002
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
highwatermark	-0.205***	-0.202***	-0.203***	-0.210***	-0.208***	-0.203***
	(0.073)	(0.073)	(0.073)	(0.073)	(0.073)	(0.073)
personalcapital	0.127**	0.128**	0.128**	0.135**	0.136**	0.126**

	(0.062)	(0.062)	(0.062)	(0.062)	(0.062)	(0.062)
lnredemption	-0.036	-0.036	-0.036	-0.025	-0.025	-0.034
	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)
lnlockup	0.085***	0.085***	0.085***	0.083***	0.084***	0.085***
	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)
audit	-0.102	-0.101	-0.101	-0.081	-0.080	-0.100
	(0.113)	(0.113)	(0.113)	(0.113)	(0.113)	(0.113)
common	0.349	-3.803	0.087	2.079***	-6.300*	0.106
	(0.429)	(3.544)	(0.530)	(0.508)	(3.555)	(0.523)
Constant	7.059***	-5.873	9.124***	4.695***	4.775***	9.268***
	(1.406)	(10.683)	(2.227)	(0.763)	(0.764)	(2.226)
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Investment Strategy Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Observations	17,063	17,063	17,063	17,063	17,063	17,063
Adjusted R-squared	0.403	0.404	0.404	0.405	0.406	0.404

Table 7 National Culture and Hedge Fund Contract Characteristics: Schwartz Culture Measures

In this table, we examine the relation between national culture and characteristics of hedge fund contracts using the four Schwartz culture measures, Affective Autonomy, Mastery, and Harmony. Similar to Table 4, the dependent variables include management fee, incentive fee, highwatermark dummy, personalcapital dummy, lnredemption and lnlockup. For the analysis of high watermark and personal capital, we use probit regressions and the rest are OLS regressions. In all specifications, we also include fund inception year fixed effect, fund investment strategy fixed effect, and country fixed effect. Detailed definitions of all variables are provided in appendix. To save space, we only report the coefficients and the corresponding standard errors for the four Schwartz culture measures from the above-mentioned regressions. ***, **, and * denote statistical significance at 1%, 5%, and 10% levels, respectively.

VARIABLES	Management Fee	Incentive Fee	Redemption	Lockup	High Watermark	Personal Capital
Affective Autonomy	-1.726***	38.657***	14.477***	8.183***	7.178***	6.221***
	(0.566)	(4.898)	(0.709)	(0.700)	(0.940)	(1.187)
Mastery	-1.196***	26.796***	10.036***	5.672***	4.976***	4.312***
	(0.393)	(3.395)	(0.492)	(0.486)	(0.6515)	(0.823)
Harmony	0.484***	-10.842***	-4.060***	-2.295***	-2.013***	-1.745***
	(0.159)	(1.374)	(0.199)	(0.196)	(0.264)	(0.333)

Table 8 National Culture and Hedge Fund Risk Taking: Schwartz Culture Measures

In this table, we examine the relation between national culture and characteristics of hedge fund risk taking using the four Schwartz culture measures, Affective Autonomy, Mastery, and Harmony. Similar to Table 7, the dependent variables include management fee, incentive fee, high watermark dummy, personalcapital dummy, lnredemption and lnlockup. For the analysis of high watermark and personal capital, we use probit regressions and the rest are OLS regressions. In all specifications, we also include fund inception year fixed effect, fund investment strategy fixed effect, and country fixed effect. Detailed definitions of all variables are provided in appendix. To save space, we only report the coefficients and the corresponding standard errors for the four Schwartz culture measures from the above-mentioned regressions. ***, **, and * denote statistical significance at 1%, 5%, and 10% levels, respectively.

VARIABLES	Total Risk	Market Risk	Idiosyncratic Risk	Alpha	Sharpe Ratio
Affective Autonomy	1.550	***1.048******	0.649	0.420	-0.337
	(1.164)	***(0.166)***	(0.784)	(0.422)	(0.383)
Mastery	1.075	***0.727******	0.450	0.291	-0.234
	(0.807)	***(0.115)***	(0.543)	(0.292)	(0.265)
Harmony	-0.437	***-0.294******	-0.182	-0.118	0.095
	(0.326)	***(0.046)***	(0.220)	(0.118)	(0.107)

Table 9 National Culture and Hedge Fund Contract Characteristics: Instrumental Variable Analysis

In this table, we examine the relation between national culture (IDV and UAI) and characteristics of hedge fund contracts in instrumental variable framework. Specifically, we use pronoun drop as the instrumental variable for IDV and use the multiple second-person pronouns as the instrumental variable for UAI. The dependent variables include management fee, incentive fee, high watermark dummy, personalcapital dummy, lnredemption and lnlockup. Specifications (3), (4), (9) and (10) are probit regressions and the rest are OLS regressions. In all specifications, we also include fund inception year fixed effect, fund investment strategy fixed effect, and country fixed effect. Detailed definitions of all variables are provided in appendix. ***, **, and * denote statistical significance at 1%, 5%, and 10% levels, respectively.

VARIABLES	(1) Management Fee	(2) Incentive Fee	(3) High Watermark	(4) Personal Capital	(5) Redemption	(6) Lockup	(7) Management Fee	(8) Incentive Fee	(9) High Watermark	(10) Personal Capital	(11) Redemption	(12) Lockup
IDV (pronoun drop)	0.001	***0.132******	***0.049******	***0.044******	***0.033******	-0.002						
	(0.002)	***(0.017)***	***(0.004)***	***(0.009)***	***(0.003)***	(0.003)						
UAI (multiple second-person pronouns)							-0.001	***-0.268******	***-0.045******	0.006	***-0.029******	-0.005
							(0.005)	***(0.043)***	***(0.008)***	(0.019)	***(0.007)***	(0.007)
Common	0.209***	4.484***	0.092	0.128	1.273***	0.748***	0.197	2.678**	0.605***	1.447***	1.735***	0.552***
	(0.077)	(0.684)	(0.134)	(0.227)	(0.104)	(0.101)	(0.124)	(1.095)	(0.2110)	(0.4756)	(0.1752)	(0.163)
Constant	1.087***	1.290	-4.506***	-4.478***	-1.014***	-0.048	1.166***	27.080***	1.349**	-2.143	2.808***	0.210
	(0.155)	(1.377)	(0.304)	(0.621)	(0.210)	(0.203)	(0.362)	(3.188)	(0.595)	(1.348)	(0.510)	(0.475)
Fund Inception Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Investment Strategy Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effect	No	No	No	No	No	No	No	No	No	No	No	No
Observations	4,385	4,385	4,383	4,383	4,385	4,385	4,385	4,385	4,383	4,383	4,385	4,385
Adjusted R-squared	0.031	0.411			0.6362	0.2093	0.0374	0.4271			0.6112	0.2133
Wald Chi2			1213.07	299.45					1421.67	424.27		
Prob>Chi2			0.000	0.000					0.000	0.000		

Table 10 National Culture and Hedge Fund Risk Taking: Instrumental Variable Analysis

In this table, we examine the relation between national culture (IDV and UAI) and characteristics of hedge fund taking in instrumental variable framework. Specifically, we use pronoun drop as instrumental variable for IDV and multiple second-person pronouns as instrumental variable for UAI. The dependent variables include total risk, market risk, idiosyncratic risk, alpha, and Sharpe ratio. All these variables are estimated in a rolling 24-month window and are winsorized at 0.5% at each tail. In all specifications, we control for fund characteristics such as minimum investment, average assets under management, fund age, leveraged dummy, derivatives dummy, management fee, incentive fee, high watermark dummy, personal capital dummy, length of redemption notice period, length of lock up period, audit dummy, and whether domicile country is a common law nation. Definitions of all variables are provide in appendix. We further include fund inception year fixed effect, fund investment strategy fixed effect, and country fixed effect. ***, **, and * denote statistical significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
VARIABLES	Total Risk	Market Risk	Idiosyncratic Risk	Alpha	Sharpe Ratio	Total Risk	Market Risk	Idiosyncratic Risk	Alpha	Sharpe Ratio
IDV (pronoun drop)	***0.031******	***0.004******	0.000	***-0.021******	***-0.053******					
	(0.004)	***(0.001)***	(0.003)	***(0.001)***	***(0.001)***					
UAI(multiple second-person pronouns)						***-0.045******	***-0.005******	-0.000	***0.030******	***0.076******
						(0.005)	***(0.001)***	(0.004)	***(0.002)***	***(0.002)***
lnmininvest	-0.005	-0.001	-0.012**	0.009***	0.001	0.008	0.001	-0.012**	-0.001	-0.021***
	(0.007)	(0.001)	(0.005)	(0.003)	(0.002)	(0.007)	(0.001)	(0.005)	(0.003)	(0.003)
lnavgaum	-0.009	0.001	-0.028	0.166***	0.085***	-0.019	-0.001	-0.028	0.173***	0.102***
	(0.043)	(0.006)	(0.029)	(0.016)	(0.015)	(0.043)	(0.006)	(0.028)	(0.016)	(0.016)
lnfundage	0.002	0.055***	0.337***	-0.085***	0.118***	0.085	0.064***	0.338***	-0.141***	-0.023
	(0.055)	(0.008)	(0.037)	(0.020)	(0.019)	(0.055)	(0.008)	(0.036)	(0.020)	(0.021)
leveraged	0.109**	-0.011*	0.055*	0.057***	-0.076***	0.120**	-0.010	0.055*	0.050***	-0.094***
	(0.047)	(0.007)	(0.032)	(0.017)	(0.016)	(0.048)	(0.007)	(0.032)	(0.018)	(0.018)
derivatives	0.436***	-0.017	0.190***	0.003	-0.043	0.439***	-0.017	0.190***	0.002	-0.047
	(0.080)	(0.011)	(0.054)	(0.029)	(0.027)	(0.081)	(0.011)	(0.054)	(0.030)	(0.030)
managementfee	0.169***	0.005	0.074***	-0.010	-0.161***	0.181***	0.007	0.074***	-0.018*	-0.182***
	(0.029)	(0.004)	(0.019)	(0.011)	(0.010)	(0.029)	(0.004)	(0.019)	(0.011)	(0.011)

incentivefee	-0.0100***	-0.003***	-0.011***	0.004***	-0.001	-0.020***	-0.005***	-0.011***	0.010***	0.016***
	(0.004)	(0.001)	(0.002)	(0.001)	(0.001)	(0.004)	(0.001)	(0.003)	(0.001)	(0.001)
highwatermark	-0.238***	-0.014	-0.121***	0.098***	0.045*	-0.264***	-0.017*	-0.122***	0.115***	0.088***
	(0.068)	(0.010)	(0.046)	(0.025)	(0.024)	(0.070)	(0.010)	(0.046)	(0.025)	(0.026)
personalcapital	0.213***	0.027***	0.062	0.086***	0.122***	0.272***	0.034***	0.062	0.048**	0.023
	(0.057)	(0.008)	(0.038)	(0.021)	(0.020)	(0.058)	(0.008)	(0.038)	(0.021)	(0.022)
lnredemption	-0.075***	-0.003	-0.019	0.040***	0.062***	-0.047*	0.001	-0.019	0.021**	0.015*
	(0.025)	(0.004)	(0.017)	(0.009)	(0.009)	(0.024)	(0.003)	(0.016)	(0.009)	(0.009)
lnlockup	0.130***	0.006**	0.063***	0.063***	0.064***	0.176***	0.012***	0.064***	0.032***	-0.014*
	(0.021)	(0.003)	(0.014)	(0.008)	(0.007)	(0.022)	(0.003)	(0.015)	(0.008)	(0.008)
audit	-0.117	-0.008	-0.212***	0.048	0.006	-0.117	-0.008	-0.212***	0.048	0.007
	(0.104)	(0.015)	(0.070)	(0.038)	(0.036)	(0.105)	(0.015)	(0.070)	(0.038)	(0.039)
common	0.373***	0.020	0.451***	0.371***	0.914***	0.442***	0.028	0.451***	0.325***	0.797***
	(0.134)	(0.019)	(0.090)	(0.049)	(0.046)	(0.129)	(0.018)	(0.086)	(0.047)	(0.048)
Constant	-0.586	-0.234	9.430***	-3.578***	0.959**	3.859***	0.280	9.462***	-6.568***	-6.550***
	(1.288)	(0.183)	(0.864)	(0.469)	(0.443)	(1.297)	(0.184)	(0.861)	(0.474)	(0.486)
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Investment Strategy Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	16,125	16,125	16,125	16,125	16,125	16,125	16,125	16,125	16,125	16,125
Adjusted R-squared	0.237	0.200	0.726	0.083	0.315	0.221	0.184	0.726	0.056	0.170